



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

Transnet Port Terminals

an Operating Division **TRANSNET SOC LTD**

[Registration Number 1990/000900/30]

REQUEST FOR PROPOSAL (RFP)

SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12).

RFP NUMBER	: TPT/2024/11/0003/84253/RFP
ISSUE DATE	: 27 February 2025
COMPULSORY BRIEFING	: 07 March 2025
CLOSING DATE	: 31 March 2025
CLOSING TIME	: 10h00am
TENDER VALIDITY PERIOD	: 12 weeks from closing date



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T1.1 TENDER NOTICE AND INVITATION TO TENDER

SECTION 1: NOTICE TO TENDERERS

1. INVITATION TO TENDER

Responses to this Tender [hereinafter referred to as a **Tender**] are requested from persons, companies, close corporations or enterprises [hereinafter referred to as a Tenderer].

DESCRIPTION	SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)
TENDER DOWNLOADING	This Tender may be downloaded directly from the National Treasury eTender Publication Portal at www.etenders.gov.za and the Transnet website at https://transnetetenders.azurewebsites.net (please use Google Chrome to access Transnet link) FREE OF CHARGE.

COMPULSORY TENDER CLARIFICATION MEETING	A Compulsory Tender Clarification Meeting will be conducted at Technical Building, Saldana Bulk Terminal on the 07 March 2025, at 09:00am [09 O'clock] for a period of ± 3 (three) hours. [Tenderers to provide own transportation and accommodation]. The Compulsory Tender Clarification Meeting will start punctually, and information will not be repeated for the benefit of Tenderers arriving late. A Compulsory Site visit/walk will take place, tenderers are to note: • Tenderers are required to wear safety shoes, goggles, long sleeve shirts, high visibility vests and hard hats. • Tenderers without the recommended PPE will not be allowed on the site walk. • Tenderers and their employees, visitors, clients and customers entering Transnet Offices, Depots, Workshops and Stores will have to undergo breathalyser testing. • All forms of firearms are prohibited on Transnet properties and premises. • The relevant persons attending the meeting must ensure that their identity documents, passports or drivers licences are on them for inspection at the access control gates.



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	Certificate of Attendance in the form set out in the Returnable Schedule T2.2-01 hereto must be completed and submitted with your Tender as proof of attendance is required for a compulsory site meeting and/or tender briefing. Tenderers are required to bring this Returnable Schedule T2.2-01 to the Compulsory Tender Clarification Meeting to be signed by the Employer's Representative. Tenderers failing to attend the compulsory tender briefing will be disqualified.
CLOSING DATE	10:00am on (31 March 2025) Tenderers must ensure that tenders are uploaded timeously onto the system. If a tender is late, it will not be accepted for consideration.

2. TENDER SUBMISSION

Transnet has implemented a new electronic tender submission system, the e-Tender Submission Portal, in line with the overall Transnet digitalization strategy where suppliers can view advertised tenders, register their information, log their intent to respond to bids and upload their bid proposals/responses on to the system.

a) The Transnet e-Tender Submission Portal can be accessed as follows:

Log on to the Transnet eTenders management platform website (<https://transnetetenders.azurewebsites.net>);

- Click on "ADVERTISED TENDERS" to view advertised tenders;
- Click on "SIGN IN/REGISTER – for bidder to register their information (must fill in all mandatory information);
- Click on "SIGN IN/REGISTER" - to sign in if already registered;
- Toggle (click to switch) the "Log an Intent" button to submit a bid;
- Submit bid documents by uploading them into the system against each tender selected.
- **Tenderers are required to ensure that electronic bid submissions are done at least a day before the closing date to prevent issues which they may encounter due to their internet speed, bandwidth or the size of the number of uploads they are submitting. Transnet will not be held liable for any challenges experienced by bidders as a result of the technical challenges. Please do not**



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wait for the last hour to submit. A Tenderer can upload 30mb per upload and multiple uploads are permitted.

- b) The tender offers to this tender will be opened as soon as possible after the closing date and time. Transnet shall not, at the opening of tenders, disclose to any other company any confidential details pertaining to the Tender Offers / information received, i.e. pricing, delivery, etc. The names and locations of the Tenderers will be divulged to other Tenderers upon request.
- c) Submissions must not contain documents relating to any Tender other than that shown on the submission.

3. CONFIDENTIALITY

All information related to this RFP is to be treated with strict confidentiality. In this regard Tenderers are required to certify that they have acquainted themselves with the Non-Disclosure Agreement. All information related to a subsequent contract, both during and after completion thereof, will be treated with strict confidence. Should the need however arise to divulge any information gleaned from provision of the Works, which is either directly or indirectly related to Transnet's business, written approval to divulge such information must be obtained from Transnet.

4. DISCLAIMERS

Tenderers are hereby advised that Transnet is not committed to any course of action as a result of its issuance of this Tender and/or its receipt of a tender offer. In particular, please note that Transnet reserves the right to:

- 4.1. Award the business to the highest scoring Tenderer/s unless objective criteria justify the award to another tenderer.
- 4.2. Not necessarily accept the lowest priced tender or an alternative Tender;
- 4.3. Go to the open market if the quoted rates (for award of work) are deemed unreasonable;
- 4.4. Should the Tenderers be awarded business on strength of information furnished by the Tenderer, which after conclusion of the contract is proved to have been incorrect, Transnet reserves the right to terminate the contract;



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- 4.5. Request audited financial statements or other documentation for the purposes of a due diligence exercise;
- 4.6. Not accept any changes or purported changes by the Tenderer to the tender rates after the closing date;
- 4.7. Verify any information supplied by a Tenderer by submitting a tender, the Tenderer/s hereby irrevocably grant the necessary consent to the Transnet to do so;
- 4.8. Conduct the evaluation process in parallel. The evaluation of Tenderers at any given stage must therefore not be interpreted to mean that Tenderers have necessarily passed any previous stage(s);
- 4.9. Unless otherwise expressly stated, each tender lodged in response to the invitation to tender shall be deemed to be an offer by the Tenderer. The Employer has the right in its sole and unfettered discretion not to accept any offer.
- 4.10. Not be held liable if tenderers do not provide the correct contact details during the clarification session and do not receive the latest information regarding this RFP with the possible consequence of being disadvantaged or disqualified as a result thereof.
- 4.11. Transnet reserves the right to exclude any Tenderers from the tender process who has been convicted of a serious breach of law during the preceding 5 [five] years including but not limited to breaches of the Competition Act 89 of 1998, as amended. Tenderers are required to indicate in tender returnable on T2.2-20], [**Breach of Law**] whether or not they have been found guilty of a serious breach of law during the past 5 [five] years.
- 4.12. Transnet reserves the right to perform a risk analysis on the preferred tenderer to ascertain if any of the following might present an unacceptable commercial risk to the employer:
 - *unduly high or unduly low tendered rates or amounts in the tender offer;*
 - *contract data of contract provided by the tenderer; or*
 - *the contents of the tender returnables which are to be included in the contract.*

5. Transnet will not reimburse any Tenderer for any preparatory costs or other work performed in connection with this Tender, whether or not the Tenderer is awarded a contract.



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6. NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE

Tenderer are required to self-register on National Treasury's Central Supplier Database (CSD) which has been established to centrally administer supplier information for all organs of state and facilitate the verification of certain key supplier information. The CSD can be accessed at <https://secure.csd.gov.za/>. Tenderer are required to provide the following to Transnet in order to enable it to verify information on the CSD:

Supplier Number..... and Unique registration reference number.....(**Tender Data**)

**Transnet urges its clients, suppliers and the general public
to report any fraud or corruption to
TIP-OFFS ANONYMOUS: 0800 003 056 OR Transnet@tip-offs.com**



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T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts. The Standard for Uniformity in Construction Procurement was first published in Board Notice 62 of 2004 in Government Gazette No 26427 of 9 June 2004. It was subsequently amended in Board Notice 67 of 2005 in Government Gazette No 28127 of 14 October 2005, Board Notice 93 of 2006 in Government Gazette No 29138 of 18 August 2006, Board Notice No 9 of 2008 in Government Gazette No 31823 of 30 January 2009, Board Notice 86 of 2010 in Government Gazette No 33239 of 28 May 2010, Board Notice 136 of 2015 in Government Gazette 38960 of 10 July 2015 and Board Notice 423 of 2019 in Government Gazette No 42622 of 8 August 2019.

This edition incorporates the amendments made in Board Notice 423 of 2019 in Government Gazette 42622 of 8 August 2019. (see www.cidb.org.za).

The Standard Conditions of Tender make several references to Tender data for detail that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of data given below is cross-referenced in the left-hand column to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause	Data
C.1.1 The <i>Employer</i> is	Transnet SOC Ltd (Reg No. 1990/000900/30) Operating as Transnet Port Terminals
C.1.2 The tender documents issued by the <i>Employer</i> comprise:	
Part T: The Tender	
Part T1: Tendering procedures	T1.1 Tender notice and invitation to tender T1.2 Tender data
Part T2 : Returnable documents	T2.1 List of returnable documents T2.2 Returnable schedules
Part C: The contract	
Part C1: Agreements and contract data	C1.1 Form of offer and acceptance C1.2 Contract data (Part 1 & 2)
Part C2: Pricing data	C2.1 Pricing instructions C2.2 Activity Schedule
Part C3: Scope of work	C3.1 Works Information
Part C4: Site information	C4.1 Site information
C.1.4 The Employer's agent is:	Strategic Sourcing Specialist



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Name:	Nontando Mnguni
Address:	Transnet Port Terminals 202 Anton Lembede Street Durban 4000
Tel No.	077 608 7527
E – mail	Nontando.Mnguni.transnet.net

C.2.1

Step One: Test for Administrative Responsiveness

The test for administrative responsiveness will include the following:

<i>Administrative responsiveness check</i>
Whether the Bid has been lodged on time
Whether all Returnable Documents and/or schedules [where applicable] were completed and returned by the closing date and time
Verify the validity of all returnable documents
Verify if the Bid document has been duly signed by the authorised respondent

The test for administrative responsiveness [Step One] must be passed for a Respondent's Proposal to progress to Step Two for further pre-qualification

Step Two: Test for Substantive Responsiveness to RFP

The test for substantive responsiveness to this RFP will include the following:

Check for substantive responsiveness
Whether any general pre-qualification criteria set by Transnet, have been met
Whether the Bid contains a priced offer
Whether the Bid materially complies with the scope and/or specification given
Whether the compulsory briefing session was attended
Whether the Proof/Confirmation of 8 CE or higher Class of Work registration with CIDB) was submitted.



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The test for substantive responsiveness [Step Two] must be passed for a Respondent's Proposal to progress to Step Three for further evaluation

Any tenderer that fails to meet the stipulated eligibility criteria will be regarded as an unacceptable tender.

Step three - Functionality:

Only those tenderers who obtain the minimum qualifying score for functionality will be evaluated further in terms of price and the applicable preference point system. The minimum qualifying score for functionality is **60 points**.

The evaluation criteria for measuring functionality and the points for each criteria and, if any, each sub-criterion are as stated in C.3.11 below.

Any tenderer that fails to meet the stipulated pre-qualifying criteria will be regarded as an unacceptable tender.

C.2.7 The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. **Tenderers must complete and sign the attendance register.** Addenda will be issued to and tenders will only be received from those tendering entities including those entities that intends forming a joint venture appearing on the attendance register.

Tenderers are also **required to bring their RFP document to the briefing session and have their returnable document T2.2-01 certificate of attendance** signed off by the Employer's authorised representative.

C.2.12 No alternative tender offers will be considered.

C.2.13.3 Each tender offer shall be in the **English Language**.

C.2.13.5 The *Employer's* details and identification details that are to be shown on each tender offer are as follows:

C2.15.1

Identification details:

The tender documents must be uploaded with:

- Name of Tenderer.....
- Contact person and details.....
- The Tender Number: TPT/2024/11/0003/84253/RFP
- The Tender Description: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)



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Documents must be marked for the attention of: **Employer's Agent: Nontando Mnguni**

C.2.13.9 Telephonic, telegraphic, facsimile or e-mailed tender offers will not be accepted.

C.2.15 The closing time for submission of tender offers is:

Time: **10:00am** on the **31 March 2024**

Location: The Transnet e-Tender Submission Portal:

(<https://transnetetenders.azurewebsites.net>);

NO LATE TENDERS WILL BE ACCEPTED

C.2.16 The tender offer validity period is **12 weeks** after the closing date. Tenderers are to note that they may be requested to extend the validity period of their tender, on the same terms and conditions, if Transnet's internal evaluation and governance approval processes has not been finalised within the validity period.

C.2.23 The tenderer is required to submit with his tender:

1. A valid Tax Clearance Certificate issued by the South African Revenue Services.

Tenderers also to provide Transnet with a TCS PIN to verify Tenderers compliance status.

2. A **valid B-BBEE Certificate** from a Verification Agency accredited by the South African Accreditation System [**SANAS**], or a **sworn affidavit** confirming annual turnover and level of black ownership, in line with the code of good practice, together with the tender;

3. Proof of registration on the Central Supplier Database;

4. Letter of Good Standing with the Workmen's compensation fund by the tendering entity or separate Letters of Good Standing from all members of a newly constituted JV.

Note: Refer to Section T2.1 for List of Returnable Documents

C3.11 The minimum number of evaluation points for functionality is: **60**



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The procedure for the evaluation of responsive tenders is Functionality, Price and Preference:

Only those tenderers who attain the minimum number of evaluation points for Functionality will be eligible for further evaluation, failure to meet the minimum threshold will result in the tender being disqualified and removed from any further consideration.

Step Three: Minimum Threshold of 60 points for Technical Criteria

Failure to achieve the 60 points threshold will lead to disqualification. The test for the Technical and Functional threshold will include the following:

EVALUATION SHEET Management & CV's				
Evaluation Criteria	Description	Scoring Principal	Guidelines for Scoring/Evaluating	Weighting
Management & CVs of Key Persons	Organisation chart	The tender must describe the management arrangements for the Works to be performed/Services to be provided. The tender must be able to demonstrate that the project personnel have sufficient knowledge, experience and qualifications to provide the required services. Submit the following information with your tender document: An organizational chart (Organogram) that shows the management structure and composition involved in the works, inclusive of the Six (6) key staff/professional members: • The Six (6) Key Professional Personnel required for this Contract are as follows: (1). Construction Manager (On-site) (2). Site Agent/Supervisor (fulltime on-site). (3). Project Planner (off site) (4). Environmental	Score = 100 An organization chart is included, that shows the management structure and composition to be involved in works. All Six (6) key staff/professional members are included in the organizational chart, with the relevant information requested for each Key member. A detail explanation is provided on how the resources will be utilized for the project. Score = 80 An organization chart is included, that shows the management structure and composition to be involved in works. Five (5) key staff/professional members are included in the organizational chart, with the relevant information requested for each Key member. An explanation is provided on how the	4



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			Officer/Manager/Specialist (off-ste) (5). A registered SHE Officer/Specialist with the South African Council for Project and Construction Management Professions (SACPCMP) who will ensure that: • Health, Safety and Environmental compliance to all applicable legislation throughout the project duration and who will submit weekly statistical reports. (6). Quality Assurance Representative. • A detail explanation must be provided on how these resources will be utilized to ensure that the works is done safely, on time and in accordance with the scope requirement.	resources will be utilized for the project. Score = 60 An organization chart is included, that shows the management structure and composition to be involved in works. Four (4) key staff/professional members are included in the organizational chart, with the relevant information requested for each Key member. An explanation is provided on how the resources will be utilized for the project. Score = 40 An organization chart is included, that shows the management structure and composition to be involved in works. Three (3) key staff/professional members are included in the organizational chart, with some relevant information requested for each Key member. High-level explanation is provided on how the resources will be utilized for the project. Score = 20 High-level organization chart included, that shows some management structure arrangement and composition to be involved in works. Two (2) key staff/professional members are included in the organizational chart, with some relevant information requested for each Key member. High-level explanation is provided on how the resources will be utilized for the project. Score = 0 No submission or	



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				information submitted is not relevant to the requirement. One (1) or no information of the Key staff/professional members is included in the organizational chart.	
		Construction Manager	- CVs to present details of the experience of the staff who will be providing this specific service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation Construction Management. - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to - be performed/Services to be provided. Proof of	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction	5



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		education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	Manager has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.	
	Site Agent/Supervisor (fulltime on-site)	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Site Agent/Supervision. - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has $\geq$	5



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		assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to • be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.	
	Environmental Officer/Manager/Specialist	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Environmental Management.. - Adequacy for the assignment.	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has ≥ 5 but < 10 years' experience. Score = 60	5



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		- Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to • be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.	
	SACPCMP Registered SHE Officer	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: SHE Officer/Specialist has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience,	5



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		submitted). - General experience relevant to the nature of the Work to be carried out in relation to Health & Safety management. - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to • be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	skills and knowledge of issues pertinent to the project: SHE Officer/Specialist has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: SHE Officer/Specialist has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: SHE Officer/Specialist has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: SHE Officer/Specialist has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.	
	Quality Assurance Representative	CVs to present details of the experience of the staff who will be providing this specific Key Role service with	Score = 100 Key staff have outstanding levels of relevant experience,	4



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			respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Quality Management - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to • be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent	skills and knowledge of issues pertinent to the project: Quality Assurance Representative has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.	



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		assignments/experience that has a bearing on the Works/Services.		
	Project Planner	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Project Planning - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to • be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations).	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.	2



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		- Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.		
				30

EVALUATION SHEET Quality Management				
Evaluation Criteria	Description	Scoring Principal	Guidelines for Scoring/Evaluating	Weighting
Quality Management	Audit Schedule during the contract.	Tenderers must submit 2. Audit schedule to be used during the contract, which covers all clauses of ISO 9001	Score = 100 The Audit Schedule exceeds the required quality audit requirements of the scope. All clauses of ISO 9001 are covered. All disciplines covered Score = 80 The Audit Schedule covers all the required audit requirements for the project scope. All clauses of ISO 9001 are covered. All disciplines covered Score = 60 The Audit Schedule has adequate audits to cover most audit quality requirements for the project scope Score = 40 The Audit Schedule is inadequate to cover most of the quality audit (Not all disciplines and covered). Score = 20 Audit Schedule does not cover quality audit requirements of the project scope. Score = 0 No audit schedule submitted	2



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			Score = 100 Index / list of procedures and method statements covers all project scope requirements as per ISO 9001:2015. MS list covers all disciplines as well as list relevant check sheets / forms. Score = 80 Index / list of QMS procedures and method statements fully covers all project scope requirements as per ISO 9001:2015. MS list covers all disciplines Score = 60 Index / list of QMS procedures and method statements partially covers project scope requirements as per ISO 9001:2015. MS list covers Only two (2) disciplines. Score = 40 Index / list of QMS procedures and method statements is inadequate to cover project scope as per ISO 9001:2015. MS list covers Only one (1) discipline. Score = 20 Index / list of QMS procedures and method statement is not project specific as per ISO 9001:2015 Score = 0 No list of QMS procedures and method statement (MS) submitted	2



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	Project specific Quality Control Plan.	Tenderers must submit: 4. Quality Control Plan MUST cover all disciplines of the project scope.	Score = 100 QCP's covers all disciplines and intervention points with reference to standards, specifications, drawings, etc. Score = 80 QCP's shows above average understanding of the project quality requirements, All disciplines covered. Score = 60 QCP's shows adequate understanding of project quality requirements. Only two (2) disciplines covered Score = 40 QCPs are project specific but inadequate to cover project scope. Only one (1) discipline covered Score = 20 QCPs do not cover project scope. Score = 0 No QCPs submitted	2
	Valid ISO 9001 certificate	As part of quality assurance for the project, tenderers MUST submit the: 5. Valid ISO 9001:2015/18 certificate.	Score = 100 ISO 9001:2015/18 certificate is valid / ISO 9001:2015 acknowledgment letter for certification. Score = 0 Submission not Not Applicable/No submission	2



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	Project specific Quality Data Book Index.	Tenderers to must submit: 6. Quality Data book index which covers all disciplines of the project scope including relevant tests and certifications to be provided.	Score = 100 The Data book index covers all disciplines including all relevant tests and certifications to be provided. Score = 80 Data book index shows above average understanding of the project quality requirements. All disciplines covered. Score = 60 Data book index shows adequate understanding of project quality requirements. Only two (2) disciplines covered Score = 40 Quality Data book index is project specific but inadequate to cover project scope. Only one (1) discipline covered Score = 20 Quality Data book index is does not cover project scope Score = 0 No Quality Data book index submitted	2
				10



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EVALUATION SHEET Previous Experience				
Evaluation Criteria	Description	Scoring Principal	Guidelines for Scoring/Evaluating	Weighting
Previous Experience	Bulk Civil Services Works	Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience showing in particular: •Construction of similar works as detailed in the Works Information with reference but not limited to: Civil Work (Construction of stormwater infrastructure, deep excavation work, underground piping, dewatering, pipe jacking). For reference verification purposes, the tenderer should include the following details: 1. Name of the project 2. Name of the client (Name, address, Contact person & Contact details). 3. Total venue of the project (total budget). 4. Date for start/Commence of the project (Start of execution) 5. Date for project completion (Project hand-over).	Score = 100 Tenderer has outstanding experience in projects of a similar nature: The Tenderer has more than 10 years' experience in Civil Work (<i>Which includes construction of stormwater infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 80 Tenderer has extensive experience in relation to the project: The Tenderer has > 7 but ≤ 10 years' experience in Civil Work (<i>Which includes construction of stormwater infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 60 Tenderer has moderate levels of experience: The Tenderer has > 4 but ≤ 7 years' experience in Civil Work (<i>Which includes construction of stormwater infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 40 The Tenderer has limited experience: The Tenderer has ≥ 2 but ≤ 4 years' experience in Civil Work (<i>Which includes construction of stormwater infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 20 The Tenderer's experience is very limited to the project: The Tenderer has less than 2 years' experience in Civil (<i>Which includes construction of stormwater infrastructure, deep excavation work,</i>	20



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				<i>underground piping, dewatering, pipe jacking).</i> Score = 0 The Tenderer has submitted no information or inadequate information or irrelevant information to determine a score.	



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			Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience showing in particular: •Construction of similar works as detailed in the Works Information with reference but not limited to Structural Work (Construction of concrete and steel infrastructure, underground concrete tank structures etc). For reference verification purposes, the tenderer should include the following details: 1. Name of the project 2. Name of the client (Name, address, Contact person & Contact details). 3. Total venue of the project (total budget). 4. Date for start/Commence of the project (Start of execution) 5. Date for project completion (Project hand-over).	Score = 100 Tenderer has outstanding experience in projects of a similar nature: The Tenderer has More than 10 years' experience in Structural Work (Construction of concrete and steel infrastructure, underground concrete tank structures etc). Score = 80 Tenderer has extensive experience in relation to the project: The Tenderer has > 7 but ≤ 10 years' experience in Structural Work (Construction of concrete and steel infrastructure, underground concrete tank structures etc). Score = 60 Tenderer has moderate levels of experience: The Tenderer has > 4 but ≤ 7 years' experience in Structural Work (Construction of concrete and steel infrastructure, underground concrete tank structures etc). Score = 40 The Tenderer has limited experience: The Tenderer has ≥ 2 but ≤ 4 years' experience in Structural Work (Construction of concrete and steel infrastructure, underground concrete tank structures etc). Score = 20 The Tenderer's experience is very limited to the project: The Tenderer has less than 2 years' experience in Structural Work (Construction of concrete and steel infrastructure, underground concrete tank structures etc). Score = 0 The Tenderer has submitted no information or inadequate information or irrelevant information to determine a score.	10
					30



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EVALUATION SHEET Environmental Management				
Evaluation Criteria	Description	Scoring Principal	Guidelines for Scoring/Evaluating	Weighting
Environmental Management.	Environmental Policy.	The tenderer must provide an environmental policy signed by Top Management which, as a minimum: - Is appropriate given the purpose and context of the tenderer's business; - Includes a commitment to fulfil the tenderer's environmental compliance (legal) obligations; - Includes a commitment to the protection of the environment, including prevention of pollution; - Provides framework for setting environmental objectives; and - Includes a commitment to continual improvement of their EMS	Score = 100 Tenderer has provided a signed environmental policy and addressed all five (5) key policy components. Score = 80 Tenderer has provided a signed environmental policy and addressed four (4) key policy components. Score = 60 Tenderer has provided a signed environmental policy and addressed three (3) key policy components. Score = 40 Tenderer has provided a signed environmental policy and addressed two (2) key policy components. Score = 20 Tenderer has provided a signed environmental policy and addressed one (1) key key policy component. Score = 0 Tenderer has not submitted the signed policy and cannot be rated.	5

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[illegible]



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				who and how is covered. Score = 20 Tenderer has provided generic method statements. Score = 0 Tenderer has not submitted the required information/ cannot be rated.	
					10



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EVALUATION SHEET Method Statement				
Evaluation Criteria	Description	Scoring Principal	Guidelines for Scoring/Evaluating	Weighting
Method Statement	Method Statement	The tenderers are required to demonstrate their understanding of the project scope (Works Information) by submitting a detailed method statement that outlines how the work is going to be executed from start to finish. The method statement will need to cover key focus areas within the execution process of the project. The Tenderers must provide a Method Statement which cover the following key focus areas of the project: • Site Establishment, site clearing and ground preparation • Ordering of construction material • Civil & associated works • Structural & associated works • Final completion & hand-over activities	Score = 100 The Method Statement demonstrate a clear understanding of the project scope. The Method Statement is detailed enough and all key focus areas are fully covered. Score = 80 The Method Statement demonstrate some understanding of the project scope. The Method Statement contain some detailing that covers the key focus areas. Score = 60 The Method Statement demonstrate high-level understanding of the project scope. The Method Statement contain some high-level detailing that covers the key focus areas. Score = 40 The Method Statement demonstrate less understanding of the project scope. The Method Statement has no details that covers the key focus areas. Score = 20 The Method Statement does not demonstrate any understanding of the project scope. The Method Statement has no details that covers the key focus areas. Score = 0 The Tenderer has submitted no information or inadequate information or irrelevant information to determine a score.	10
				10



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EVALUATION SHEET Programme				
Evaluation Criteria	Description	Scoring Principal	Guidelines for Scoring/Evaluating	Weighting
Programme	Programme Information	The Tenderers must demonstrate their ability to execute the works in terms of the Employer's requirements, by indicating the order and timing of all activities that will take place in order to provide the work safely and within in the shortest possible duration. A level 3 programme indicating all milestones, activities & information related to the following – 1. Float, 2. Time Risk Allowances, 3. Health and safety requirements, 4. Procedures set out in this contract, 5. Work by the Employer and Others, 6. Access to a part of the site if later than its access date, 7. Acceptances, 8. Plant & Materials and other things to be provided by the employer, 9. Information by Others, 10. starting date, access dates, Key Dates and Completion Date 11. planned Completion for each Key Date for each option and the complete works 12. Shows how each activity on the Activity Schedule relates to the operations on each programme	Score = 100 The tenderer has addressed all data requirements as listed in this returnable (12 of 12 addressed) Score = 80 The tenderer has addressed most but not all data requirements as listed in this returnable (10 of 12 addressed) Score = 60 The tenderer has addressed most but not all data requirements as listed in this returnable (8 of 12 addressed) Score = 40 The tenderer has addressed some but not all data requirements as listed in this returnable (6 of 12 addressed) Score = 20 The tenderer has addressed some but not all data requirements as listed in this returnable (4 or less of 12 addressed) Score = 0 The tenderer has submitted no information or inadequate information to determine a score.	5



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	Alignment between programme and of Method statement	The Programme must clearly support and demonstrate alignment to the Method Statement as contained under T.2.2-12	Score = 100 The tenderer has addressed all the Programme and method statement are fully aligned and submission contains no critical errors or omissions. Score = 80 The tenderer has addressed most but not all the Programme and method statement requirements and are aligned, and submission contains no critical errors or omissions. Score = 60 The tenderer has addressed most but there are minor errors and or omissions in alignment between programme and method statement Score = 40 The tenderer has addressed some but there's critical errors and or omissions in alignment between programme and Method statement. Score = 20 The tenderer has addressed some but there is no alignment between programme and Method Statement. Score = 0 The tenderer has submitted no information or inadequate information to determine a score.	5
				10



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Functionality shall be scored independently by not less than 3 (three) evaluators and averaged in accordance with the following schedules:

- T2.2-03 Management and CV's
- T2.2-04 Quality Management
- T2.2-05 Previous experience
- T2.2-06 Environmental Management
- T2.2-07 Method Statement
- T2.2-08 Programme

Each evaluation criteria will be assessed in terms of scores of 0, 20, 40, 60, 80 or 100

The scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for functionality, unless scored collectively. (See CIDB Inform Practice Note #9).

Note: Any tender not complying with the above mentioned requirements, will be regarded as non-responsive and will therefore not be considered for further evaluation. This note must be read in conjunction with Clause C.2.1.



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Step Four: Evaluation and Final Weighted Scoring

C.3.11 Only tenders that achieve the minimum qualifying score for functionality will be evaluated further in accordance with the 90/10 preference points systems as described in Preferential Procurement Regulations.

90 where the financial value of one or more responsive tenders received have a value above R50 million, inclusive of all applicable taxes.

Thresholds	Minimum Threshold
Technical / functionality	60

Evaluation Criteria	Final Weighted Scores
Price	90
Specific goals - Scorecard	10
TOTAL SCORE:	100

Up to 100 minus W_1 tender evaluation points will be awarded to tenderers who complete the preferencing schedule and who are found to be eligible for the preference claimed. **Should the evidence required for any of the Specific Goals applicable in this tender not be provided, a tenderer will score zero preference points for that particular "Specific Goal".**

In terms of Transnet Preferential Procurement Policy (TPPP) and Procurement Manuals, the following preference points must be awarded to a bidder who provides the relevant required evidence for claiming points

Selected Specific Goal	Number of points allocated (90/10)
B-BBEE Level of contributor – Level 1 and 2	05
30% Sub-Contracting to: BO EMEs / QSE (51% BO)	05
Total	10 points



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The following Table represents the evidence to be submitted for claiming preference points for applicable specific goals in a particular tender:

Specific Goals	Acceptable Evidence
B-BBEE Level 1 & 2	B-BBEE Certificate / Sworn-Affidavit B-BBEE Certificate (in case of JV, a consolidate scorecard will be accept) as per DTIC guidelines
30% Sub-Contracting to: EME or QSE 51% Black Owned	B-BBEE Certificate / Affidavit (in case of JV, a consolidate scorecard will be accept) as per DTIC guidelines

The maximum points for this bid are allocated as follows:

DISCRIPTION	POINTS
PRICE	90
B-BBEE Level of contributor – Level 1&2 = 05	10
30% Sub-Contracting to:BO EMEs / QSE (51% BO) =05	
Total points for Price and Specific Goals must not exceed	100

Note: Transnet reserves the right to carry out an independent audit of the tenderers scorecard components at any stage from the date of close of the tenders until completion of the contract.

Step Five: Post Tender Negotiations

- Respondents are to note that Transnet may not award a contract if the price offered is not market-related. In this regard, Transnet reserves the right to engage in PTN with the view to achieving a market-related price or to cancel the tender. Negotiations will be done in a sequential manner i.e.:
 - first negotiate with the highest ranked bidder or cancel the bid, should such negotiations fail,
 - negotiate with the 2nd and 3rd ranked bidders (if required) in a sequential manner.
- In the event of any Respondent being notified of such short-listed/preferred bidder status, his/her bid, as well as any subsequent negotiated best and final offers (BAFO), will automatically be deemed to remain valid during the negotiation period and until the ultimate award of business.
- Should Transnet conduct post tender negotiations, Respondents will be requested to provide their best and final offers to Transnet based on such negotiations. Where a market related



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price has been achieved through negotiation, the contract will be awarded to the successful Respondent(s).

Step Six: Objective Criteria

Transnet reserves the right to award the business to the highest scoring bidder/s unless objective criteria justify the award to another bidder. The RFP will state that Transnet may apply the following objective criteria to the bid process:

- Geographical location;
- all Risks identified during a risk assessment exercise/probity check (which may be conducted by an authorised third party) that would be done to assess all risks, including but not limited to:
 - the financial stability of the bidder based on key ratio analysis, which would include, but not be limited to Efficiency, Profitability, Financial Risk, Liquidity, Acid Test, and Solvency;
 - a due diligence to assess functional capability and capacity. This could include a site visit;
 - A commercial relationship with a Domestic Prominent Influential Person (DPIP) or Foreign Prominent Public Official (FPPO) or an entity of which such person or official is the beneficial owner; and
 - Reputational and Brand risks

Step Seven: Award of business and conclusion of contract

- Immediately after approval to award the contract has been received, the successful or preferred bidder(s) will be informed of the acceptance of his/their Bid by way of a Letter of Award. Thereafter the final contract will be concluded with the successful Respondent(s).
- A final contract will be concluded and entered into with the successful Bidder at the acceptance of a letter of award by the Respondent.

C.3.1 Tender offers will only be accepted if:

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1. The tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;
 2. the tenderer does not appear on Transnet's list for restricted tenderers and National Treasury's list of Tender Defaulters;
-



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

3. the tenderer has fully and properly completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process and persons in the employ of the state.
4. Transnet reserves the right to award the tender to the tenderer who scores the highest number of points overall, unless there are **objective criteria** which will justify the award of the tender to another tenderer. Objective criteria include but are not limited to the outcome of a due diligence exercise to be conducted. The due diligence exercise may take the following factors into account inter alia;

the tenderer:

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
- b) is not undergoing a process of being restricted by Transnet or other state institution that Transnet may be aware of,
- c) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
- d) has the legal capacity to enter into the contract,
- e) is not insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
- f) complies with the legal requirements, if any, stated in the tender data and
- g) is able, in the option of the employer to perform the contract free of conflicts of interest.

C.3.1 The number of paper copies of the signed contract to be provided by the Employer is 1 (one).

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TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

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T2.1 List of Returnable Documents

2.1.1 These schedules are required for pre-qualification and eligibility purposes:

- T2.2-01 **Step Two as per CIDB: Eligibility Criteria Schedule** - Certificate of attendance at Compulsory Tender Clarification Meeting
- T2.2-02 **Step Two as per CIDB: Eligibility Criteria Schedule** - Proof/Confirmation of 8 CE or higher Class of Work registration with CIDB) submitted.

2.1.2 Step Three as per CIDB: these schedules will be utilised for evaluation purposes:

- T2.2-03 **Evaluation Schedule:** Management and CV's
- T2.2-04 **Evaluation Schedule:** Quality Management
- T2.2-05 **Evaluation Schedule:** Previous experience
- T2.2-06 **Evaluation Schedule:** Environmental Management
- T2.2-07 **Evaluation Schedule:** Method Statement
- T2.2-08 **Evaluation Schedule:** Programme

2.1.3 Returnable Schedules:

General:

- T2.2-09 Authority to submit tender
- T2.2-10 Record of addenda to tender documents
- T2.2-11 Letter of Good Standing
- T2.2-12 Risk Elements
- T2.2-13 Availability of equipment and other resources
- T2.2-14 Schedule of proposed Subcontractors (if subcontract in terms of TPPP is not eligibility)
- T2.2-15 Site Establishment requirements
- T2.2-16 SBD1 Form

Agreement and Commitment by Tenderer:

- T2.2-17 CIDB SFU ANNEX G Compulsory Enterprise Questionnaire
- T2.2-18 Non-Disclosure Agreement
- T2.2-19 RFP Declaration Form
- T2.2-20 RFP – Breach of Law
- T2.2-21 Certificate of Acquaintance with Tender Document



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

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T2.2-22 Service Provider Integrity Pact

T2.2-23 Supplier Code of Conduct

T2.2-24 POPIA

1.3.2 Bonds/Guarantees/Financial/Insurance:

T2.2-25 Insurance provided by the Contractor

T2.2-26 Form of Intent to provide a Defects Correction

T2.2-27 Forecast Rate of Invoicing

T2.2-28 Three (3) years audited financial statements

2.2 C1.1 Offer portion of Form of Offer & Acceptance

2.3 C1.2 Contract Data

2.5 C2.1 Pricing Instructions (Bills of Quantity)

2.6 C2.2 Activity Schedule

2.7 C3: Works Information

2.7 C4: Site Information



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

T2.2-01: Eligibility Criteria Schedule:

Certificate of Attendance at Tender Clarification Meeting

This is to certify that

(Company Name)

Represented
by:

(Name and
Surname)

Was represented at the compulsory tender clarification meeting

Held at:	Technical Building, Saldana Bulk Terminal	
On (date)	07 March 2025	Starting time: 09h00

Particulars of person(s) attending the meeting:

Name

Signature

Capacity

Attendance of the above company at the meeting was confirmed:

Name

Signature

**For and on Behalf of the
Employers Agent.**

Date



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

ELIGIBILITY CRITERIA

T2.2-02 : CIDB Registration

CIDB (Construction Industry Development Board) grade level 8 or higher Civil Engineering Class of Work registration

Tenderers need to be registered with CIDB. The 8 CE or higher (level 8 or higher Civil Engineering Class of Work registration) with the CIDB is a pre-qualification criteria. Tenderers are required to submit a proof/confirmation that they are registered with CIDB in 8 CE or higher (grade level 8 or higher Civil Engineering Class of Work). The registration with CIDB within the required Class of Work will be verified by Transnet.

NB: Failure to submit the above requested document will lead to disqualification of Tenderers.

Eligibility	YES	Proof/Confirmation of 8 CE or higher Class of Work registration with CIDB) submitted.
	NO	The tenderer failed to address/respond to the question / issue. No information submitted.

Construction of the Storm Water System

Comment:.....
.....
.....

Company's Name: _____

Signed _____ Name _____ Position _____ Date: _____



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

T2.2-03: Management & CVs of Key Persons

Tenderers must describe the management arrangements for the Works to be performed/Services to be provided. The tenderers must be able to demonstrate that the project personnel have sufficient knowledge, experience and qualifications to provide the required services.

Organisation chart	Tenderers must submit the following information together with tender documents: An organizational chart (Organogram) that shows the management structure and composition involved in the works, inclusive of the Six (6) key staff/professional members: • The Six (6) Key Professional Personnel required for this Contract are as follows: (1). Construction Manager (On-site). (2). Site Agent/Supervisor (fulltime on-site). (3). Environmental Officer/Manager/Specialist (off-site). (4). A registered SHE Officer/Specialist with the South African Council for Project and Construction Management Professions (SACPCMP) who will ensure that: • Health, Safety and Environmental compliance to all applicable legislation throughout the project duration and who will submit weekly statistical reports (5). Quality Assurance Representative. (6.) Project Planner • A detail explanation must be provided on how these resources will be utilized to ensure that the works is done safety, on time and in accordance with the scope requirement.	Score = 100 An organization chart is included, that shows the management structure and composition to be involved in works. All Six (6) key staff/professional members are included in the organizational chart, with the relevant information requested for each Key member. A detail explanation is provided on how the resources will be utilized for the project. Score = 80 An organization chart is included, that shows the management structure and composition to be involved in works. Five (5) key staff/professional members are included in the organizational chart, with the relevant information requested for each Key member. An explanation is provided on how the resources will be utilized for the project. Score = 60 An organization chart is included, that shows the management structure and composition to be involved in works. Four (4) key staff/professional members are included in the organizational chart, with the relevant information requested for each Key member. An explanation is provided on how the resources will be utilized for the project. Score = 40 An organization chart is included, that shows the management structure and composition to be involved in works. Three (3) key staff/professional members are included in the organizational chart, with some relevant information requested for each Key member. High-level explanation is provided on how the resources will be utilized for the project. Score = 20 High-level organization chart included, that shows some management structure arrangement and composition to be involved in works. Two (2) key staff/professional members are included in the organizational chart, with some relevant information requested for each Key member. High-level explanation is provided on how the resources will be utilized for the project. Score = 0 No submission or information submitted is not relevant to the requirement. One (1) or no information of the Key staff/professional members is included in the organizational chart.
1. Construction Manager	• CVs to present details of the experience of the staff who will be providing this specific service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has ≥ 10 years' experience.



	have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Construction Management. - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: ▸ Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. ▸ Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). ▸ Name of current employer and position in enterprise. ▸ Overview of post graduate experience (year, organization and position). ▸ Outline of recent assignments/experience that has a bearing on the Works/Services.	Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Construction Manager has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.
2. Site Agent/Supervisor (fulltime on-site)	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Site Agent/Supervision. - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: ▸ Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. ▸ Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). ▸ Name of current employer and position in enterprise.	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Site Agent/Supervisor has < 1 year experience. Score = 0



	- Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.
3. Environmental Officer/Manager/Specialist	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Environmental Management.. - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to • be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Environmental Officer/Manager/Specialist has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.
4. SACPCMP Registered SHE Officer	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Health & Safety management. - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to • be performed/Services to be provided. Proof of education and training must be attached to the CV.	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: SHE Officer/Specialist has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: SHE Officer/Specialist has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: SHE Officer Specialist has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant



	• Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	experience, skills and knowledge of issues pertinent to the project: SHE Officer/Specialist has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: SHE Officer/ Specialist has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.
5. Quality Assurance Representative	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted). - General experience relevant to the nature of the Work to be carried out in relation to Quality Management - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has ≥ 10 years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Quality Assurance Representative has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.
6. Project Planner	CVs to present details of the experience of the staff who will be providing this specific Key Role service with respect to: - Experience with the Contract Option chosen for this Contract. (If experience of these matters is limited, an indication of relevant training that they have attended should be submitted).	Score = 100 Key staff have outstanding levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has ≥ 10

	- General experience relevant to the nature of the Work to be carried out in relation to Project Planning - Adequacy for the assignment. - Extensive knowledge of issues pertinent to the Scope, e.g. local conditions, affected communities, legislation, techniques, etc. - The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Works to be performed/Services to be provided. Proof of education and training must be attached to the CV. • Comprehensive CVs should be attached to this schedule and as a minimum each CV should address the following, but not limited to: - Personal particulars: ▸ Name. ▸ Place(s) of tertiary education and dates associated therewith. ▸ Professional awards. - Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations). - Name of current employer and position in enterprise. - Overview of post graduate experience (year, organization and position). - Outline of recent assignments/experience that has a bearing on the Works/Services.	years' experience. Score = 80 Key staff have extensive levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has ≥ 5 but < 10 years' experience. Score = 60 Key staff have reasonable and acceptable levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has ≥ 3 but < 5 years' experience. Score = 40 Key staff have limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has ≥ 1 but < 3 years' experience. Score = 20 Key staff have very limited levels of relevant experience, skills and knowledge of issues pertinent to the project: Project Planner has < 1 year experience. Score = 0 The Tenderer has either submitted no information or information that is not relevant. A score cannot be determined.

Total point allocation=30 Points

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

Signed _____ Date _____

Name _____ Position _____

Tenderer _____



T2.2-04: Quality Management

Reference Standard: QAL-STD-0001 (**See Annexure E**) General Quality Requirements for Contractors and Suppliers.

Due consideration must be given to the deliverables required to execute and complete the contract as per the Quality Management Standard, QAL-STD-0001 General Quality Requirements for Contractors and Suppliers as stated above and should include but not be limited to:

1. Audit schedule during the contract
2. Index or list of QMS procedures including list of method statements and forms to be used during the contract as per ISO 9001:2015
3. Quality Control Plan MUST cover all disciplines of the project scope
4. Valid ISO 9001:2015 certificate
5. Quality Data book index MUST cover all disciplines of the project scope including relevant tests and certifications to be provided.

The scoring of the programme will be as follows:

Audit Schedule during the contract.	Tenderers must submit 1. Audit schedule to be used during the contract, which covers all clauses of ISO 9001	Score = 100 The Audit Schedule exceeds the required quality audit requirements of the scope. All clauses of ISO 9001 are covered. All disciplines covered Score = 80 The Audit Schedule covers all the required audit requirements for the project scope. All clauses of ISO 9001 are covered. All disciplines covered Score = 60 The Audit Schedule has adequate audits to cover most audit quality requirements for the project scope Score = 40 The Audit Schedule is inadequate to cover most of the quality audit (Not all disciplines and covered). Score = 20 Audit Schedule does not cover quality audit requirements of the project scope. Score = 0 No audit schedule submitted
Index or list of QMS procedures including method	Tenderers must submit: 2. Index or list of QMS procedures including list of method statements and	Score = 100 Index / list of procedures and method statements covers all project scope requirements as per ISO 9001:2015. MS list covers all disciplines as well as list relevant check sheets / forms.



statements to be used.	forms to be used during the contract as per ISO 9001:2015	Score = 80 Index / list of QMS procedures and method statements fully covers all project scope requirements as per ISO 9001:2015. MS list covers all disciplines Score = 60 Index / list of QMS procedures and method statements partially covers project scope requirements as per ISO 9001:2015. MS list covers Only two (2) disciplines. Score = 40 Index / list of QMS procedures and method statements is inadequate to cover project scope as per ISO 9001:2015. MS list covers Only one (1) discipline. Score = 20 Index / list of QMS procedures and method statement is not project specific as per ISO 9001:2015 Score = 0 No list of QMS procedures and method statement (MS) submitted
Project specific Quality Control Plan.	Tenderers must submit: 3. Quality Control Plan MUST cover all disciplines of the project scope.	Score = 100 QCP's covers all disciplines and intervention points with reference to standards, specifications, drawings, etc. Score = 80 QCP's shows above average understanding of the project quality requirements, All disciplines covered. Score = 60 QCP's shows adequate understanding of project quality requirements. Only two (2) disciplines covered Score = 40 QCPs are project specific but inadequate to cover project scope. Only one (1) discipline covered Score = 20 QCPs do not cover project scope. Score = 0 No QCPs submitted
Valid ISO 9001 certificate	As part of quality assurance for the project, tenderers MUST submit the: 4. Valid ISO 9001:2015/18 certificate.	Score = 100 ISO 9001:2015 certificate is valid / ISO 9001:2015/18 acknowledgment letter for certification. Score = 80 Not Applicable Score = 0 Submission Not Applicable/No Submission
Project specific Quality Data Book Index.	Tenderers to must submit: 5. Quality Data book index which covers all disciplines of the project scope	Score = 100 The Data book index covers all disciplines including all relevant tests and certifications to be provided.



	including relevant tests and certifications to be provided.	Score = 80 Data book index shows above average understanding of the project quality requirements. All disciplines covered. Score = 60 Data book index shows adequate understanding of project quality requirements. Only two (2) disciplines covered Score = 40 Quality Data book index is project specific but inadequate to cover project scope. Only one (1) discipline covered Score = 20 Quality Data book index is does not cover project scope Score = 0 No Quality Data book index submitted

Total point allocation=10 Points

Reference to attached submissions to this schedule:

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.....

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

Signed	Date
_____	_____
Name	Position
_____	_____
Tenderer	

T2.2-05: Evaluation Schedule: Previous Experience

1. Bulk Civil Services Works	Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience showing in particular: •Construction of similar works as detailed in the Works Information with reference but not limited to: Civil Work (<i>Construction of storm water infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). For reference verification purposes, the tenderer should include the following details: 1. Name of the project 2. Name of the client (Name, address, Contact person & Contact details). 3. Total venue of the project (total budget). 4. Date for start/Commence of the project (Start of execution) 5. Date for project completion (Project hand-over).	Score = 100 Tenderer has outstanding experience in projects of a similar nature: The Tenderer has more than 10 years' experience in Civil Work (<i>Which includes construction of storm water infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 80 Tenderer has extensive experience in relation to the project: The Tenderer has > 7 but ≤ 10 years' experience in Civil Work (<i>Which includes construction of storm water infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 60 Tenderer has moderate levels of experience: The Tenderer has > 4 but ≤ 7 years' experience in Civil Work (<i>Which includes construction of storm water infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 40 The Tenderer has limited experience: The Tenderer has ≥ 2 but ≤ 4 years' experience in Civil Work (<i>Which includes construction of storm water infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 20 The Tenderer's experience is very limited to the project: The Tenderer has less than 2 years' experience in Civil (<i>Which includes construction of storm water infrastructure, deep excavation work, underground piping, dewatering, pipe jacking</i>). Score = 0 The Tenderer has submitted no information or inadequate information or irrelevant information to determine a score.
2. Structural Works	Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience showing in particular: •Construction of similar works as detailed in the Works Information with reference but not limited to Structural Work (<i>Construction of concrete and steel infrastructure, underground concrete tank structures etc.</i>).	Score = 100 Tenderer has outstanding experience in projects of a similar nature: The Tenderer has More than 10 years' experience in Structural Work (<i>Construction of concrete and steel infrastructure, underground concrete tank structures etc.</i>). Score = 80 Tenderer has extensive experience in

	For reference verification purposes, the tenderer should include the following details: 1. Name of the project 2. Name of the client (Name, address, Contact person & Contact details). 3. Total venue of the project (total budget). 4. Date for start/Commence of the project (Start of execution) 5. Date for project completion (Project hand-over).	relation to the project: The Tenderer has > 7 but ≤ 10 years’ experience in Structural Work (<i>Construction of concrete and steel infrastructure, underground concrete tank structures etc.</i>) Score = 60 Tenderer has moderate levels of experience: The Tenderer has > 4 but ≤ 7 years’ experience in Structural Work (<i>Construction of concrete and steel infrastructure, underground concrete tank structures etc.</i>). Score = 40 The Tenderer has limited experience: The Tenderer has ≥ 2 but ≤ 4 years’ experience in Structural Work (<i>Construction of concrete and steel infrastructure, underground concrete tank structures etc.</i>). Score = 20 The Tenderer’s experience is very limited to the project: The Tenderer has less than 2 years’ experience in Structural Work (<i>Construction of concrete and steel infrastructure, underground concrete tank structures etc.</i>). Score = 0 The Tenderer has submitted no information or inadequate information or irrelevant information to determine a score.
Total point allocation=30 Points	1. Bulk Civil Services Works=20 Points 2. Structural Works=10 Points	

Reference to attached submissions to this schedule:

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

Signed _____ Date _____

Name _____ Position _____

Tenderer _____



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

T2.2.06: Evaluation Schedule: Environmental Management

The Tenderer must review the following documents for context to meet the environmental requirements, namely:

- Transnet SOC Limited – Transnet Integrated Management System (TIMS) Policy Commitment Statement - IMS-GRP-GDL-002-1 (**Annexure F**)
- Contractor Environmental and Sustainable Specifications TRN-IMS-GRP-GDL-014.4 (**Annexure G**)
- Standard Operating Procedure- Construction Environmental Management - 009-TCC-CLO-SUS-11386 (**Annexure H**)

The scoring of the Tenderer's Environmental Management will be as follows:

1. Environmental Policy	The tenderer must provide an environmental policy signed by Top Management which, as a minimum: - Is appropriate given the purpose and context of the tenderer's business; - Includes a commitment to fulfil the tenderer's environmental compliance (legal) obligations; - Includes a commitment to the protection of the environment, including prevention of pollution; - Provides framework for setting environmental objectives; and Includes a commitment to continual improvement of their EMS	Score = 100 Tenderer has provided a signed environmental policy and addressed all five (5) key policy components. Score = 80 Tenderer has provided a signed environmental policy and addressed four (4) key policy components. Score = 60 Tenderer has provided a signed environmental policy and addressed three (3) key policy components. Score = 40 Tenderer has provided a signed environmental policy and addressed two (2) key policy components. Score = 20 Tenderer has provided a signed environmental policy and addressed one (1) key key policy component. Score = 0 Tenderer has not submitted the signed policy and cannot be rated.



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2. Environmental method statements	The tenderer must provide environmental method statements which describe relevant roles and responsibilities; the when, where, what, who and how the Tenderer intends to manage and mitigate potential environmental impacts including the monitoring and recording. These include, but are not limited to, the following where applicable: - Site establishment and demarcation - Hazardous and non-hazardous waste management - Prevention of marine pollution - Environmental awareness training - Rehabilitation	Score = 100 All the environmental method statements listed above have been provided and the when, where, what, who and how is covered. Score = 80 Four (4) of the environmental method statements listed above have been provided and the when, where, what, who and how is covered. Score = 60 Three (3) of the environmental method statements listed above have been provided and the when, where, what, who and how is covered. Score = 40 Two (2) of the environmental method statements listed above have been provided and the when, where, what, who and how is covered. Score = 20 Tenderer has provided generic method statements. Score = 0 Tenderer has not submitted the required information/ cannot be rated.
Total point allocation=5 Points	1. Environmental Policy=2,5 Points 2. Environmental method statements =2,5 Points	

Reference to attached submissions to this schedule:

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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.

Signed

Date

Name

Position

Tenderer



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

Page 2 of 2

T2.2-07: Evaluation Schedule: Method Statement

The scoring of the programme will be as follows:

The tenderers are required to demonstrate their understanding of the project scope (Works Information) by submitting a detailed method statement that outlines how the work is going to be executed from start to finish. The method statement will need to cover key focus areas within the execution process of the project. The Tenderers must provide a Method Statement which cover the following key focus areas of the project: • Site Establishment, site clearing and ground preparation • Ordering of construction material • Civil & associated works • Structural & associated works • Final completion & hand-over activities	Score = 100 The Method Statement demonstrate a clear understanding of the project scope. The Method Statement is detailed enough and all key focus areas are fully covered.
	Score = 80 The Method Statement demonstrate some understanding of the project scope. The Method Statement contain some detailing that covers the key focus areas.
	Score = 60 The Method Statement demonstrate high-level understanding of the project scope. The Method Statement contain some high-level detailing that covers the key focus areas.
	Score = 40 The Method Statement demonstrate less understanding of the project scope. The Method Statement has no details that covers the key focus areas.
	Score = 20 The Method Statement demonstrate less understanding of the project scope. The Method Statement has no details that covers the key focus areas.
	Score = 0 The Tenderer has submitted no information or inadequate information or irrelevant information to determine a score

Total point allocation=10 Points

Reference to attached submissions to this schedule:

.....

.....

.....

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

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

T2.2-08: Evaluation Schedule: Programme

Note to tenderers:

The Tenderer provides a hard copy proposed programme and/or refers to his proposed programme and attaches it to this returnable schedule.

The Programme should indicate the following columns as a bare minimum:

Task ID	Task description	Start date	Finish date	Successor	Time risk allowances (TRA)

The tenderer shall provide the proposed programme detailed to minimum of level 3 showing as a minimum the following:

▪ Programme Information:

The *Contractor* clearly indicates in the schedule all milestones, activities & information related to the following –

1. Float,
2. Time Risk Allowances,
3. Health and safety requirements,
4. Procedures set out in this contract,
5. Work by the *Employer* and Others,
6. Access to a part of the site if later than its *access date*,
7. Acceptances,
8. Plant & Materials and other things to be provided by the employer,
9. Information by Others,
10. *starting date*, *access dates*, Key Dates and Completion Date
11. planned Completion for each Key Date for each option and the complete works
12. Shows how each activity on the Activity Schedule relates to the operations on each programme

Alignment between programme and of Method statement

The Programme must clearly support and demonstrate alignment to the Method Statement as contained under T.2.2-12

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

The scoring of the programme will be as follows:

1. Programme Information	The Tenderers must demonstrate their ability to execute the works in terms of the Employer's requirements, by indicating the order and timing of all activities that will take place in order to provide the work safely and within in the shortest possible duration. A level 3 programme indicating all milestones, activities & information related to the following – 1. Float, 2. Time Risk Allowances, 3. Health and safety requirements, 4. Procedures set out in this contract, 5. Work by the Employer and Others, 6. Access to a part of the site if later than its access date, 7. Acceptances, 8. Plant & Materials and other things to be provided by the employer, 9. Information by Others, 10. Starting date, access dates, Key Dates and Completion Date 11. Planned Completion for each Key Date for each option and the complete works 12. Shows how each activity on the Activity Schedule relates to the operations on each programme	Score = 100 The tenderer has addressed all data requirements as listed in this returnable (12 of 12 addressed). Score = 80 The tenderer has addressed most but not all data requirements as listed in this returnable (10 of 12 addressed). Score = 60 The tenderer has addressed most but not all data requirements as listed in this returnable (8 of 12 addressed). Score = 40 The tenderer has addressed some but not all data requirements as listed in this returnable (6 of 12 addressed). Score = 20 The tenderer has addressed some but not all data requirements as listed in this returnable (4 or less of 12 addressed) Score = 0 The tenderer has submitted no information or inadequate information to determine a score.

2. Alignment between programme and of Method statement	The Programme must clearly support and demonstrate alignment to the Method Statement as contained under T.2.2-12	Score = 100 The tenderer has addressed all the Programme and method statement are fully aligned and submission contains no critical errors or omissions. Score = 80 The tenderer has addressed most but not all the Programme and method statement requirements and are aligned, and submission contains no critical errors or omissions. Score = 60 The tenderer has addressed most but there are minor errors and or omissions in alignment between programme and method statement. Score = 40 The tenderer has addressed some but there’s critical errors and or omissions in alignment between programme and Method statement. Score = 20 The tenderer has addressed some but there is no alignment between programme and Method Statement. Score = 0 The tenderer has submitted no information or inadequate information to determine a score.
Total point allocation=10 Points		1. Programme Information=5 Points 2. Alignment between programme and of Method statement=5 Points

Reference to attached submissions to this schedule:

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

Signed

Date

Name

Position

Tenderer



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

T2.2-09: Authority to submit a Tender

Indicate the status of the tenderer by ticking the appropriate box hereunder. The tenderer must complete the certificate set out below for his category of organisation or alternatively attach a certified copy of a company / organisation document which provides the same information for the relevant category as requested here.

A - COMPANY	B - PARTNERSHIP	C - JOINT VENTURE	D - SOLE PROPRIETOR

A. Certificate for Company

I, _____ chairperson of the board of directors _____
 _____, hereby confirm that by resolution of the
 board taken on _____ (date), Mr/Ms _____,
 acting in the capacity of _____, was authorised to sign all
 documents in connection with this tender offer and any contract resulting from it on behalf of
 the company.

Signed

Date

Name

Position

Chairman of the Board of Directors



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

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TRANSNET PORT TERMINAL

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B. Certificate for Partnership

We, the undersigned, being the **key partners** in the business trading as _____

_____ hereby authorise Mr/Ms _____

acting in the capacity of _____, to sign all documents in connection with the tender offer for Contract _____ and any contract resulting from it on our behalf.

Name	Address	Signature	Date

NOTE: This certificate is to be completed and signed by the full number of Partners necessary to commit the Partnership. Attach additional pages if more space is required.



TRANSNET PORT TERMINAL

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C. Certificate for Joint Venture

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise

Mr/Ms _____, an authorised signatory of the company

_____, acting in the capacity of lead

partner, to sign all documents in connection with the tender offer for Contract _____

_____ and any contract resulting from it on our behalf.

This authorisation is evidenced by the attached power of attorney signed by legally authorised signatories of all the partners to the Joint Venture.

Furthermore we attach to this Schedule a copy of the joint venture agreement which incorporates a statement that all partners are liable jointly and severally for the execution of the contract and that the lead partner is authorised to incur liabilities, receive instructions and payments and be responsible for the entire execution of the contract for and on behalf of any and all the partners.

Name of firm	Address	Authorising signature, name (in caps) and capacity



TRANSNET PORT TERMINAL

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D. Certificate for Sole Proprietor

I, _____, hereby confirm that I am the sole owner of the
business trading as _____.

Signed

Date

Name

Position

Sole Proprietor

TRANSNET PORT TERMINAL
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T2.2-10: Record of Addenda to Tender Documents

This schedule as submitted confirms that the following communications received from the *Employer* before the submission of this tender offer, amending the tender documents, have been taken into account in this specific tender offer:

	Date	Title or Details
1		
2		
3		
4		
5		
6		
7		
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9		
10		
11		
12		
13		
14		
15		



TRANSNET PORT TERMINAL

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T2.2-11 Letter/s of Good Standing with the Workmen's Compensation Fund

Attached to this schedule is the Letter/s of Good Standing.

- 1.
- 2.
- 3.
- 4.

Name of Company/Members of Joint Venture:

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TRANSNET PORT TERMINAL

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T2.2-12: Risk Elements

Tenderers to identify and evaluate the potential risk elements associated with the Works and possible mitigation thereof. The risk elements and the mitigation as identified thereof by the Tenderer are to be submitted.

If No Risks are identified "No Risks" must be stated on this schedule.

Tenderers are also to evaluate any risk/s stated by the *Employer* in Contract Data Part C1, and provide possible mitigation thereof.

Tenders to note: Notwithstanding this information, all costs related to risk elements which are at the Contractor's risk are deemed to be included in the tenderer's offered total of the Prices.

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T2.2-13: Availability of Equipment and Other Resources

The Tenderer to submit a list of all Equipment and other resources that will be used to execute the *works* as described in the Works Information.

[illegible]

TRANSNET PORT TERMINAL
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T2.2-14: Schedule of Proposed Subcontractors

The tenderer is required to provide details of all the sub-contractors that will be utilised in the execution of the *works*.

Note to tenderers:

- A tenderer may not be awarded points for B-BBEE status level of contributor if the tender documents indicate that the tenderer intends subcontracting more than 25% of the value of the contract to any other person not qualifying for at least the points that the tenderer qualifies for, unless the intended subcontractor is an EME that has the capability to execute the subcontract.
- A person awarded a contract may not subcontract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level of contributor that the person concerned, unless the contract is subcontracted to an EME that has the capability and ability to execute the contract.

Tenderer to note that after award, any deviations from this list of proposed sub-contractors will be subject to acceptance by the *Project Manager* in terms of the Conditions of Contract.

Provide information of the Sub-contractors below:

Name of Proposed Subcontractor			Address		Nature of work		Amount of Worked	Percentage of work
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships		Military Veterans
	☐	☐	☐	☐	☐	☐		☐

Name of Proposed Subcontractor			Address		Nature of work		Amount of Worked	Percentage of work

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% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans
	☐	☐	☐	☐	☐	☐	☐
Name of Proposed Subcontractor			Address		Nature of work	Amount of Worked	Percentage of work
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans
	☐	☐	☐	☐	☐	☐	☐

Name of Proposed Subcontractor			Address		Nature of work	Amount of Worked	Percentage of work
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans
	☐	☐	☐	☐	☐	☐	☐



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 AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF
 TWELVE MONTHS (12)

STORMWATER & ENVIRONMENTAL SYSTEMS	Site Establishment Requirements	Tender Schedule: T2.2-15

Tenderers are to indicate their site establishment layout, including the following but not limited:

- Attach a copy of site establishment plan.
- Waste management Skips.
- Workplace/ welfare facilities.
- Security measures.
- Materials deliveries & storage.
- Site requirements are subject to employer approval.

Signed		Date	
Name		Position	
Tenderer			

TRANSNET PORT TERMINAL

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T2.2-16: SBD1 Form

SBD1 FORM

PART A

INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR THE BELOW REQUIREMENTS:

BID NUMBER:	TPT/2024/11/0003/84253/RFP	CLOSING DATE:	31 March 2025	CLOSING TIME:	10h00
DESCRIPTION	GEOTECHNICAL INVESTIGATION AND LABORATORY TESTING FOR THE SALDANHA 3RD WAREHOUSE OF TRANSNET SOC LTD (REG 1990/00090/30) OPERATING AS TRANSNET PORT TERMINALS AT PORT OF SALDANHA AT SALDANHA BULK TERMINALS, (HEREINAFTER REFERRED TO AS "TPT")				

BID RESPONSE DOCUMENTS MAY BE SUBMITTED ON THE TRANSNET E-TENDER SUBMISSION PORTAL

Transnet e-Tender Submission Portal can be accessed as follows:

- ☐ Log on to the Transnet eTenders management platform website (<https://www.transnet.net>);
- ☐ Submit bid documents by uploading them into the system against the tender selected.

PRIOR THE BID CLOSING DATE, BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:

AFTER THE BID CLOSING DATE, BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:

CONTACT PERSON	Nontando Mnguni	CONTACT PERSON	Nonduduzo Mahlaba
TELEPHONE NUMBER	077 608 7527	TELEPHONE NUMBER	061 494 8531
FACSIMILE NUMBER	N/A	FACSIMILE NUMBER	N/A
E-MAIL ADDRESS	Nontando.Mnguni@transnet.net	E-MAIL ADDRESS	nonduduzo.mahlaba@transnet.net
LAST DAY OF SENDING IN TENDER CLARIFICATION QUESTIONS		21 March 2025	CLOSING TIME: 16:00pm

SUPPLIER INFORMATION

NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		OR	CENTRAL SUPPLIER	UNIQUE REGISTRATION REFERENCE NUMBER:

TRANSNET PORT TERMINAL

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				DATABASE No:	MAAA:
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX]		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	[TICK APPLICABLE BOX]	
	☐ Yes ☐ No			☐ Yes ☐ No	
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]		ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]	
QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS					
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?				☐ YES ☐ NO	
DOES THE ENTITY HAVE A BRANCH IN THE RSA? NO				☐ YES ☐ NO	
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? ☐ YES ☐ NO					
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? NO				☐ YES ☐ NO	
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? NO				☐ YES ☐ NO	
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 1.3 BELOW.					

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PART B

TERMS AND CONDITIONS FOR BIDDING

1. TAX COMPLIANCE REQUIREMENTS

- 1.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
- 1.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
- 1.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
- 1.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
- 1.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
- 1.6 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

.....

CAPACITY UNDER WHICH THIS BID IS SIGNED:

.....

(Proof of authority must be submitted e.g. company resolution)

DATE:

.....

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T2.2-17: ANNEX G Compulsory Enterprise Questionnaire

The following particulars hereunder must be furnished.

In the case of a Joint Venture, separate enterprise questionnaires in respect of each partner/member must be completed and submitted.

Section 1: Name of enterprise: _____

Section 2: VAT registration number, if any: _____

Section 3: CIDB registration number, if any: _____

Section 4: CSD number: _____

Section 5: Particulars of sole proprietors and partners in partnerships

Name	Identity number	Personal income tax number

* Complete only if sole proprietor or partnership and attach separate page if more than 3 partners

Section 6: Particulars of companies and close corporations

Company registration number _____

Close corporation number _____

Tax reference number: _____

Section 7: The attached SBD4 must be completed for each tender and be attached as a tender requirement.

Section 8: The attached SBD 6 must be completed for each tender and be attached as a requirement.



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The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise:

- i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;
- ii) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;
- iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
- iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and
- v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed

Date

Name

Position

Enterprise
name

SBD 6.1

PREFERENCE POINTS CLAIM FORM

This preference form must form part of all bids invited. It contains general information and serves as a claim for preference points for Specific Goals contribution. Transnet will award preference points to companies who provide valid proof of evidence as per the table of evidence in paragraph 4.1 below.

1. GENERAL CONDITIONS

- 1.1 The following preference point systems are applicable to all bids:
- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
 - the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).
- 1.2 The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable. Despite the stipulated preference point system, Transnet shall use the lowest acceptable bid to determine the applicable preference point system in a situation where all received acceptable bids are received outside the stated preference point system.
- 1.3 Preference points for this bid shall be awarded for:
- (a) Price;
 - (b) B-BBEE Status Level of Contribution; and
 - (c) Any other specific goal determined in the Transnet preferential procurement policy
- 1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	90
B-BBEE Level of contributor – Level 1&2 = 05 30% Sub-Contracting to:BO EMEs &QSE (51% BO) =05	10
Total points for Price and B-BBEE must not exceed	100

- 1.5 Failure on the part of a bidder to submit proof of evidence required for any of the specific



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goals together with the bid will be interpreted to mean that preference points for that specific goal are not claimed.

- 1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

- (a) **"all applicable taxes"** includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;
- (b) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- (c) **"B-BBEE status level of contributor"** means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- (d) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the supply/provision of services, works or goods, through price quotations, advertised competitive bidding processes or proposals;
- (e) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (f) **"EME"** means an Exempted Micro Enterprise as defined by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (g) **"functionality"** means the ability of a bidder to provide goods or services in accordance with specification as set out in the bid documents
- (h) **"Price"** includes all applicable taxes less all unconditional discounts.
- (i) **"Proof of B-BBEE Status Level of Contributor"**
 - i) the B-BBEE status level certificate issued by an authorised body or person;
 - ii) a sworn affidavit as prescribed by the B-BBEE Codes of Good Practice; or
 - iii) any other requirement prescribed in terms of the B-BBEE Act.
- (j) **"QSE"** means a Qualifying Small Enterprise as defined by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (k) **"rand value"** means the total estimated value of a contract in South African currency, calculated at the time of bid invitations, and includes all applicable taxes and excise duties.
- (l) **"Specific goals"** means targeted advancement areas or categories of persons or groups either previously disadvantaged or falling within the scope of the

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Reconstruction and Development Programme identified by Transnet to be given preference in allocation of procurement contracts in line with section 2(1) of the PPPFA.

3. POINTS AWARDED FOR PRICE

3.1 THE 90/10 PREFERENCE POINT SYSTEMS

A maximum of 90 points is allocated for price on the following basis:
 90/10

$$PS = 90 - \frac{Pt - P_{min}}{P_{min}}$$

Where

Ps = Points scored for comparative price of bid under consideration

Pt = Comparative price of bid under consideration

Pmin = Comparative price of lowest acceptable bid

4. EVIDENCE REQUIRED FOR CLAIMING SPECIFIC GOALS

4.1 In terms of Transnet Preferential Procurement Policy (TPPP) and Procurement Manuals, preference points must be awarded to a bidder for providing evidence in accordance with the table below::

Specific Goals	Acceptable Evidence
B-BBEE Status contributor	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
30% Black Women Owned Entities	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
+50% Black Youth Owned Entities	Certified copy of ID Documents of the Owners and B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Entities Owned by People with Disability (PWD)	Certified copy of ID Documents of the Owners / Doctor's note and /or EEA1 form confirming the disability
Entities/Black People living in rural areas	Entity 's Municipal/ESKOM bill or letter from Induna/chief confirming residential address not older than 3 months.
South African Enterprises	CIPC Certificate
EME or QSE 51% Black Owned	B-BBEE Certificate / Sworn-Affidavit / CIPC Certificate
Entities that are 51 % Black Owned	CI B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Promoting exports Orientated for Job creation	Section.....Job Creation Schedule Returnable documents

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Local Content and Local Production	Returnable Local Content and production Annexures
NIPP	NIPP Returnable documents
Creation of new jobs and labour intensification	Section.....Job Creation Schedule Returnable documents
The promotion of supplier development through sub-contracting or JV for a minimum of 30% of the value of a contract to South African Companies which are: I. 30% Black Women, 51% Black Youth and 51% Black people with disabilities II. Entities with a specified minimum B-BBEE level (1 and 2) III. EMEs and/or QSEs who are 51% black-owned	Sub-contracting agreements and Declaration / Joint Venture Agreement and CIPC – B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate as per DTIC guideline
The promotion of enterprises located in a specific province/region/municipal area for work to be done or services to be rendered in that province/region/municipal area	CIPC – B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guidelines and Proof Registered address of entity

4.2 The table below indicates the required proof of B-BBEE status depending on the category of enterprises:

Enterprise	B-BBEE Certificate & Sworn Affidavit
Large	Certificate issued by SANAS accredited verification agency
QSE	Certificate issued by SANAS accredited verification agency Sworn Affidavit signed by the authorised QSE representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership (only black-owned QSEs - 51% to 100% Black owned) [Sworn affidavits must substantially comply with the format that can be obtained on the DTI's website at www.dti.gov.za/economic_empowerment/bee_codes.jsp.]
EME¹	Sworn Affidavit signed by the authorised EME representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership Certificate issued by CIPC (formerly CIPRO) confirming annual turnover and black ownership



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	Certificate issued by SANAS accredited verification agency only if the EME is being measured on the QSE scorecard

- 4.3 A trust, consortium or joint venture (including unincorporated consortia and joint ventures) must submit a consolidated B-BBEE Status Level verification certificate for every separate bid.
- 4.4 Tertiary Institutions and Public Entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.
- 4.5 A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a bidder intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a bidder qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.
- 4.6 A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.
- 4.7 Bidders are to note that the rules pertaining to B-BBEE verification and other B-BBEE requirements may be changed from time to time by regulatory bodies such as National Treasury or the DTI. It is the Bidder's responsibility to ensure that his/her bid complies fully with all B-BBEE requirements at the time of the submission of the bid.

5. BID DECLARATION

- 5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 6.1

- 6.1 B-BBEE Status Level of Contribution: (Maximum of 10 points)

- Level 1 & 2 = 05 points
- 30% Sub-Contracting to: BO EMEs & QSE (51% BO) = 05 points

(Points claimed in respect of paragraph 6.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

- 7.1 Will any portion of the contract be sub-contracted?

(*Tick applicable box*)

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YES	☒	NO	☐

7.1.1 If yes, indicate:

- i) What percentage of the contract will be subcontracted.....%
- ii) The name of the sub-contractor.....
- iii) The B-BBEE status level of the sub-contractor.....
- iv) Whether the sub-contractor is an EME or QSE.

(Tick applicable box)

YES	☐	NO	☐

8. DECLARATION WITH REGARD TO COMPANY/FIRM

8.1 Name of company/firm:.....

8.2 VAT registration number:.....

8.3 Company registration number:.....

8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional Service provider



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☐ Other Service providers, e.g. transporter, etc.

[*TICK APPLICABLE BOX*]

8.7 Total number of years the company/firm has been in business:.....

8.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contribution indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- iv) If a bidder submitted false information regarding its B-BBEE status level of contributor,, which will affect or has affected the evaluation of a bid, or where a bidder has failed to declare any subcontracting arrangements or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have
 - (a) disqualify the person from the bidding process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) if the successful bidder subcontracted a portion of the bid to another person without disclosing it, Transnet reserves the right to penalise the bidder up to 10 percent of the value of the contract;
 - (e) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the audi alteram partem (hear the other side) rule has been applied; and
 - (f) forward the matter for criminal prosecution.

WITNESSES

1.

2.

.....

SIGNATURE(S) OF BIDDERS(S)

DATE:

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest² in the enterprise, employed by the state? **YES/NO**

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of institution	State

² the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

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2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

.....

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract?

YES/NO

2.3.1 If so, furnish particulars:

.....

3 DECLARATION

I, the undersigned, (name)..... in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

3.1 I have read and I understand the contents of this disclosure;

3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;

3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.

3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

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

3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

³ Joint venture or 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.

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- 3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids 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.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of bidder



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T2.2-18 NON-DISCLOSURE AGREEMENT

[..... 2023]



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Note to tenderers: This Non-Disclosure Agreement is to be completed and signed by an authorised signatory:

THIS AGREEMENT is made effective as of day of 20..... by and between:

TRANSNET SOC LTD

(Registration No. 1990/000900/30), a company incorporated and existing under the laws of South Africa, having its principal place of business at Transnet Corporate Centre 138 Eloff Street , Braamfontein , Johannesburg 2000

and

.....
.....

(Registration No.), a private company incorporated and existing under the laws of South Africa having its principal place of business at

.....
.....
.....
.....

WHEREAS

Transnet and the Company wish to exchange Information [as defined below] and it is envisaged that each party may from time to time receive Information relating to the other in respect thereof. In consideration of each party making available to the other such Information, the parties jointly agree that any dealings between them shall be subject to the terms and conditions of this Agreement which themselves will be subject to the parameters of the Tender Document.

IT IS HEREBY AGREED

1. INTERPRETATION



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In this Agreement:

- 1.1 **Agents** mean directors, officers, employees, agents, professional advisers, contractors or sub-contractors, or any Group member;
- 1.2 **Bid or Bid Document** (hereinafter Tender) means Transnet's Request for Information [**RFI**] Request for Proposal [**RFP**] or Request for Quotation [**RFQ**], as the case may be;
- 1.3 **Confidential Information** means any information or other data relating to one party [the **Disclosing Party**] and/or the business carried on or proposed or intended to be carried on by that party and which is made available for the purposes of the Bid to the other party [the **Receiving Party**] or its Agents by the Disclosing Party or its Agents or recorded in agreed minutes following oral disclosure and any other information otherwise made available by the Disclosing Party or its Agents to the Receiving Party or its Agents, whether before, on or after the date of this Agreement, and whether in writing or otherwise, including any information, analysis or specifications derived from, containing or reflecting such information but excluding information which:
 - 1.3.1 is publicly available at the time of its disclosure or becomes publicly available [other than as a result of disclosure by the Receiving Party or any of its Agents contrary to the terms of this Agreement]; or
 - 1.3.2 was lawfully in the possession of the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] free of any restriction as to its use or disclosure prior to its being so disclosed; or
 - 1.3.3 following such disclosure, becomes available to the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] from a source other than the Disclosing Party or its Agents, which source is not bound by any duty of confidentiality owed, directly or indirectly, to the Disclosing Party in relation to such information;
- 1.4 **Group** means any subsidiary, any holding company and any subsidiary of any holding company of either party; and
- 1.5 **Information** means all information in whatever form including, without limitation, any information relating to systems, operations, plans, intentions, market opportunities,



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know-how, trade secrets and business affairs whether in writing, conveyed orally or by machine-readable medium.

2. CONFIDENTIAL INFORMATION

- 2.1 All Confidential Information given by one party to this Agreement [the **Disclosing Party**] to the other party [the **Receiving Party**] will be treated by the Receiving Party as secret and confidential and will not, without the Disclosing Party's written consent, directly or indirectly communicate or disclose [whether in writing or orally or in any other manner] Confidential Information to any other person other than in accordance with the terms of this Agreement.
- 2.2 The Receiving Party will only use the Confidential Information for the sole purpose of technical and commercial discussions between the parties in relation to the Tender or for the subsequent performance of any contract between the parties in relation to the Tender.
- 2.3 Notwithstanding clause 2.1 above, the Receiving Party may disclose Confidential Information:
- 2.3.1 to those of its Agents who strictly need to know the Confidential Information for the sole purpose set out in clause 2.2 above, provided that the Receiving Party shall ensure that such Agents are made aware prior to the disclosure of any part of the Confidential Information that the same is confidential and that they owe a duty of confidence to the Disclosing Party. The Receiving Party shall at all times remain liable for any actions of such Agents that would constitute a breach of this Agreement; or
- 2.3.2 to the extent required by law or the rules of any applicable regulatory authority, subject to clause 2.4 below.
- 2.4 In the event that the Receiving Party is required to disclose any Confidential Information in accordance with clause 2.3.2 above, it shall promptly notify the Disclosing Party and cooperate with the Disclosing Party regarding the form, nature, content and purpose of such disclosure or any action which the Disclosing Party may reasonably take to challenge the validity of such requirement.



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- 2.5 In the event that any Confidential Information shall be copied, disclosed or used otherwise than as permitted under this Agreement then, upon becoming aware of the same, without prejudice to any rights or remedies of the Disclosing Party, the Receiving Party shall as soon as practicable notify the Disclosing Party of such event and if requested take such steps [including the institution of legal proceedings] as shall be necessary to remedy [if capable of remedy] the default and/or to prevent further unauthorised copying, disclosure or use.
- 2.6 All Confidential Information shall remain the property of the Disclosing Party and its disclosure shall not confer on the Receiving Party any rights, including intellectual property rights over the Confidential Information whatsoever, beyond those contained in this Agreement.

3. RECORDS AND RETURN OF INFORMATION

- 3.1 The Receiving Party agrees to ensure proper and secure storage of all Information and any copies thereof.
- 3.2 The Receiving Party shall keep a written record, to be supplied to the Disclosing Party upon request, of the Confidential Information provided and any copies made thereof and, so far as is reasonably practicable, of the location of such Confidential Information and any copies thereof.
- 3.3 The Company shall, within 7 [seven] days of receipt of a written demand from Transnet:
- 3.3.1 return all written Confidential Information [including all copies]; and
 - 3.3.2 expunge or destroy any Confidential Information from any computer, word processor or other device whatsoever into which it was copied, read or programmed by the Company or on its behalf.
- 3.4 The Company shall on request supply a certificate signed by a director as to its full compliance with the requirements of clause 3.3.2 above.

4. ANNOUNCEMENTS

- 4.1 Neither party will make or permit to be made any announcement or disclosure of its prospective interest in the Tender without the prior written consent of the other party.



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- 4.2 Neither party shall make use of the other party's name or any information acquired through its dealings with the other party for publicity or marketing purposes without the prior written consent of the other party.

5. DURATION

The obligations of each party and its Agents under this Agreement shall survive the termination of any discussions or negotiations between the parties regarding the Tender and continue thereafter for a period of 5 [five] years.

6. PRINCIPAL

Each party confirms that it is acting as principal and not as nominee, agent or broker for any other person and that it will be responsible for any costs incurred by it or its advisers in considering or pursuing the Tender and in complying with the terms of this Agreement.

7. ADEQUACY OF DAMAGES

Nothing contained in this Agreement shall be construed as prohibiting the Disclosing Party from pursuing any other remedies available to it, either at law or in equity, for any such threatened or actual breach of this Agreement, including specific performance, recovery of damages or otherwise.

8. PRIVACY AND DATA PROTECTION

- 8.1 The Receiving Party undertakes to comply with South Africa's general privacy protection in terms Section 14 of the Bill of Rights in connection with this Tender and shall procure that its personnel shall observe the provisions of such Act [as applicable] or any amendments and re-enactments thereof and any regulations made pursuant thereto.
- 8.2 The Receiving Party warrants that it and its Agents have the appropriate technical and organisational measures in place against unauthorised or unlawful processing of data relating to the Tender and against accidental loss or destruction of, or damage to such data held or processed by them.



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9. GENERAL

- 9.1 Neither party may assign the benefit of this Agreement, or any interest hereunder, except with the prior written consent of the other, save that Transnet may assign this Agreement at any time to any member of the Transnet Group.
- 9.2 No failure or delay in exercising any right, power or privilege under this Agreement will operate as a waiver of it, nor will any single or partial exercise of it preclude any further exercise or the exercise of any right, power or privilege under this Agreement or otherwise.
- 9.3 The provisions of this Agreement shall be severable in the event that any of its provisions are held by a court of competent jurisdiction or other applicable authority to be invalid, void or otherwise unenforceable, and the remaining provisions shall remain enforceable to the fullest extent permitted by law.
- 9.4 This Agreement may only be modified by a written agreement duly signed by persons authorised on behalf of each party.
- 9.5 Nothing in this Agreement shall constitute the creation of a partnership, joint venture or agency between the parties.
- 9.6 This Agreement will be governed by and construed in accordance with South African law and the parties irrevocably submit to the exclusive jurisdiction of the South African courts.

Signed

Date

Name

Position

Tenderer

T2.2-19: RFP DECLARATION FORM

NAME OF COMPANY:

We _____ do hereby
 certify that:

1. Transnet has supplied and we have received appropriate tender offers to any/all questions (as applicable) which were submitted by ourselves for tender clarification purposes;
2. we have received all information we deemed necessary for the completion of this Tender;
3. at no stage have we received additional information relating to the subject matter of this tender from Transnet sources, other than information formally received from the designated Transnet contact(s) as nominated in the tender documents;
4. we are satisfied, insofar as our company is concerned, that the processes and procedures adopted by Transnet in issuing this tender and the requirements requested from tenderers in responding to this tender have been conducted in a fair and transparent manner; and
5. furthermore, we acknowledge that a direct relationship exists between a family member and/or an owner / member / director / partner / shareholder (unlisted companies) of our company and an employee or board member of the Transnet Group as indicated below: *[Respondent to indicate if this section is not applicable]*

FULL NAME OF OWNER/MEMBER/DIRECTOR/

PARTNER/SHAREHOLDER:

ADDRESS:



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Indicate nature of relationship with Transnet:

[Failure to furnish complete and accurate information in this regard may lead to the disqualification of your response and may preclude a Respondent from doing future business with Transnet]

We declare, to the extent that we are aware or become aware of any relationship between ourselves and Transnet (other than any existing and appropriate business relationship with Transnet) which could unfairly advantage our company in the forthcoming adjudication process, we shall notify Transnet immediately in writing of such circumstances.

6. We accept that any dispute pertaining to this tender will be resolved through the Ombudsman process and will be subject to the Terms of Reference of the Ombudsman. The Ombudsman process must first be exhausted before judicial review of a decision is sought. (Refer "Important Notice to respondents" below).
7. We further accept that Transnet reserves the right to reverse a tender award or decision based on the recommendations of the Ombudsman without having to follow a formal court process to have such award or decision set aside.
8. We have acquainted ourselves and agree with the content of T2.2-22 "Service Provider Integrity Pact".

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For and on behalf of duly authorised thereto
Name:
Signature:
Date:

IMPORTANT NOTICE TO TENDERERS

- Transnet has appointed a Procurement Ombudsman to investigate any material complaint in respect of tenders exceeding R5,000,000.00 (five million S.A. Rand) in value. Should a Tenderer have any material concern regarding an tender process which meets this value threshold, a complaint may be lodged with Transnet's Procurement Ombudsman for further investigation.
- It is incumbent on the Tenderer to familiarise himself/herself with the Terms of Reference for the Transnet Procurement Ombudsman, details of which are available for review at Transnet's website www.transnet.net.
- An official complaint form may be downloaded from this website and submitted, together with any supporting documentation, within the prescribed period, to procurement.ombud@transnet.net
- For transactions below the R5,000,000.00 (five million S.A. Rand) threshold, a complaint may be lodged with the Chief Procurement Officer of the relevant Transnet Operating Division.
- All Tenderers should note that a complaint must be made in good faith. If a complaint is made in bad faith, Transnet reserves the right to place such a tenderer on its List of Excluded Bidders.



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T2.2-20: REQUEST FOR PROPOSAL – BREACH OF LAW

NAME OF COMPANY:

I / We _____ do hereby certify that ***I/we have/have not been*** found guilty during the preceding 5 (five) years of a serious breach of law, including but not limited to a breach of the Competition Act, 89 of 1998, by a court of law, tribunal or other administrative body. The type of breach that the Tenderer is required to disclose excludes relatively minor offences or misdemeanours, e.g. traffic offences.

Where found guilty of such a serious breach, please disclose:

NATURE OF BREACH:

DATE OF BREACH:

Furthermore, I/we acknowledge that Transnet SOC Ltd reserves the right to exclude any Tenderer from the tendering process, should that person or company have been found guilty of a serious breach of law, tribunal or regulatory obligation.

Signed on this _____ day of _____ 20____

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SIGNATURE OF TENDER



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T2.2-21 Certificate of Acquaintance with Tender Documents

NAME OF TENDERING ENTITY:

1. By signing this certificate I/we acknowledge that I/we have made myself/ourselves thoroughly familiar with, and agree with all the conditions governing this RFP. This includes those terms and conditions of the Contract, the Supplier Integrity Pact, Non-Disclosure Agreement etc. contained in any printed form stated to form part of the documents thereof, but not limited to those listed in this clause.
2. I/we furthermore agree that Transnet SOC Ltd shall recognise no claim from me/us for relief based on an allegation that I/we overlooked any tender/contract condition or failed to take it into account for the purpose of calculating my/our offered prices or otherwise.
3. I/we understand that the accompanying Tender will be disqualified if this Certificate is found not to be true and complete in every respect.
4. For the purposes of this Certificate and the accompanying Tender, I/we understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:
 - a) has been requested to submit a Tender in response to this Tender invitation;
 - b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
 - c) provides the same Services as the Tenderer and/or is in the same line of business as the Tenderer
5. The Tenderer has arrived at the accompanying Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive Tendering.
6. In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

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- a) prices;
 - b) geographical area where Services will be rendered [market allocation]
 - c) methods, factors or formulas used to calculate prices;
 - d) the intention or decision to submit or not to submit, a Tender;
 - e) the submission of a tender which does not meet the specifications and conditions of the tender; or
 - f) Tendering with the intention not winning the tender.
7. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Services to which this tender relates.
8. 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 of the awarding of the contract.
9. I/We am/are 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. In addition, Tenderers that submit suspicious tenders may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

Signed on this _____ day of _____ 20____

SIGNATURE OF TENDERER

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T2.2-22 Service Provider Integrity Pact

Important Note: All potential tenderers must read this document and certify in the RFP Declaration Form that they have acquainted themselves with, and agree with the content.

The contract with the successful tenderer will automatically incorporate this Integrity Pact and shall be deemed as part of the final concluded contract.

INTEGRITY PACT

Between

TRANSNET SOC LTD

Registration Number: 1990/000900/30

("Transnet")

and

The Contractor (hereinafter referred to as the "Tenderer/Service Providers/Contractor")

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PREAMBLE

Transnet values full compliance with all relevant laws and regulations, ethical standards and the principles of economical use of resources, fairness and transparency in its relations with its Tenderers/Service Providers/Contractors.

In order to achieve these goals, Transnet and the Tenderer/Service Provider/Contractor hereby enter into this agreement hereinafter referred to as the "Integrity Pact" which will form part of the Tenderer's/Service Provider's/Contractor's application for registration with Transnet as a vendor.

The general purpose of this Integrity Pact is to agree on avoiding all forms of dishonesty, fraud and corruption by following a system that is fair, transparent and free from any undue influence prior to, during and subsequent to the currency of any procurement and/or reverse logistics event and any further contract to be entered into between the Parties, relating to such event.

All Tenderers/Service Providers/Contractor's will be required to sign and comply with undertakings contained in this Integrity Pact, should they want to be registered as a Transnet vendor.

1 OBJECTIVES

- 1.1 Transnet and the Tenderer/Service Provider/Contractor agree to enter into this Integrity Pact, to avoid all forms of dishonesty, fraud and corruption including practices that are anti-competitive in nature, negotiations made in bad faith and under-pricing by following a system that is fair, transparent and free from any influence/unprejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:
 - a) Enable Transnet to obtain the desired contract at a reasonable and competitive price in conformity to the defined specifications of the works, goods and services; and
 - b) Enable Tenderers/Service Providers/Contractors to abstain from bribing or participating in any corrupt practice in order to secure the contract.

2 COMMITMENTS OF TRANSNET

Transnet commits to take all measures necessary to prevent dishonesty, fraud and corruption and to observe the following principles:

- 2.1 Transnet hereby undertakes that no employee of Transnet connected directly or indirectly with the sourcing event and ensuing contract, will demand, take a promise for or accept directly or through intermediaries any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage

from the Tenderer, either for themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the tendering process, Tender evaluation, contracting or implementation process related to any contract.

- 2.2 Transnet will, during the registration and tendering process treat all Tenderers/ Service Providers/Contractor with equity, transparency and fairness. Transnet will in particular, before and during the registration process, provide to all Tenderers/ Service Providers/Contractors the same information and will not provide to any Tenderers/Service Providers/Contractors confidential/additional information through which the Tenderers/Service Providers/Contractors could obtain an advantage in relation to any tendering process.
- 2.3 Transnet further confirms that its employees will not favour any prospective Tenderers/Service Providers/Contractors in any form that could afford an undue advantage to a particular Tenderer during the tendering stage, and will further treat all Tenderers/Service Providers/Contractors participating in the tendering process in a fair manner.
- 2.4 Transnet will exclude from the tender process such employees who have any personal interest in the Tenderers/Service Providers/Contractors participating in the tendering process.

3 OBLIGATIONS OF THE TENDERER / SERVICE PROVIDER

- 3.1 Transnet has a '**Zero Gifts**' Policy. No employee is allowed to accept gifts, favours or benefits.
 - a) Transnet officials and employees **shall not** solicit, give or accept, or from agreeing to solicit, give, accept or receive directly or indirectly, any gift, gratuity, favour, entertainment, loan, or anything of monetary value, from any person or juridical entities in the course of official duties or in connection with any operation being managed by, or any transaction which may be affected by the functions of their office.
 - b) Transnet officials and employees **shall not** solicit or accept gifts of any kind, from vendors, suppliers, customers, potential employees, potential vendors, and suppliers, or any other individual or organisation irrespective of the value.
 - c) Under **no circumstances** should gifts, business courtesies or hospitality packages be accepted from or given to prospective suppliers participating in a tender process at the respective employee's Operating Division, regardless of retail value.
 - d) Gratuities, bribes or kickbacks of any kind must never be solicited, accepted or offered, either directly or indirectly. This includes money, loans, equity, special

privileges, personal favours, benefit or services. Such favours will be considered to constitute corruption.

3.2 The Tenderer/Service Provider/Contractor commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its Tender or during any ensuing contract stage in order to secure the contract or in furtherance to secure it and in particular the Tenderer/Service Provider/Contractor commits to the following:

- a) The Tenderer/Service Provider/Contractor will not, directly or through any other person or firm, offer, promise or give to Transnet or to any of Transnet's employees involved in the tendering process or to any third person any material or other benefit or payment, in order to obtain in exchange an advantage during the tendering process; and
- b) The Tenderer/Service Provider/Contractor will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any employee of Transnet, connected directly or indirectly with the tendering process, or to any person, organisation or third party related to the contract in exchange for any advantage in the tendering, evaluation, contracting and implementation of the contract.

3.3 The Tenderer/Service Provider/Contractor will not collude with other parties interested in the contract to preclude a competitive Tender price, impair the transparency, fairness and progress of the tendering process, Tender evaluation, contracting and implementation of the contract. The Tenderer / Service Provider further commits itself to delivering against all agreed upon conditions as stipulated within the contract.

3.4 The Tenderer/Service Provider/Contractor will not enter into any illegal or dishonest agreement or understanding, whether formal or informal with other Tenderers/Service Providers/Contractors. This applies in particular to certifications, submissions or non-submission of documents or actions that are restrictive or to introduce cartels into the tendering process.

3.5 The Tenderer/Service Provider/Contractor will not commit any criminal offence under the relevant anti-corruption laws of South Africa or any other country. Furthermore, the Tenderer/Service Provider/Contractor will not use for illegitimate purposes or for restrictive purposes or personal gain, or pass on to others, any information provided by Transnet as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

- 3.6 A Tenderer/Service Provider/Contractor of foreign origin shall disclose the name and address of its agents or representatives in South Africa, if any, involved directly or indirectly in the registration or tendering process. Similarly, the Tenderer / Service Provider / Contractor of South African nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the registration or tendering process.
- 3.7 The Tenderer/Service Provider/Contractor will not misrepresent facts or furnish false or forged documents or information in order to influence the tendering process to the advantage of the Tenderer/Service Provider/Contractor or detriment of Transnet or other competitors.
- 3.8 Transnet may require the Tenderer/Service Provider/Contractor to furnish Transnet with a copy of its code of conduct. Such code of conduct must address the compliance programme for the implementation of the code of conduct and reject the use of bribes and other dishonest and unethical conduct.
- 3.9 The Tenderer/Service Provider/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 3.10 The Tenderer/Service Provider/Contractor confirms that they will uphold the ten principles of the United Nations Global Compact (UNGC) in the fields of Human Rights, Labour, Anti-Corruption and the Environment when undertaking business with Transnet as follows:
 - a) Human Rights
 - Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
 - Principle 2: make sure that they are not complicit in human rights abuses.
 - b) Labour
 - Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
 - Principle 4: the elimination of all forms of forced and compulsory labour;
 - Principle 5: the effective abolition of child labour; and
 - Principle 6: the elimination of discrimination in respect of employment and occupation.
 - c) Environment

- Principle 7: Businesses should support a precautionary approach to environmental challenges;
 - Principle 8: undertake initiatives to promote greater environmental responsibility; and
 - Principle 9: encourage the development and diffusion of environmentally friendly technologies.
- d) Anti-Corruption
- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

4 INDEPENDENT TENDERING

- 4.1 For the purposes of that Certificate in relation to any submitted Tender, the Tenderer declares to fully understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:
- a) has been requested to submit a Tender in response to this Tender invitation;
 - b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
 - c) provides the same Goods and Services as the Tenderer and/or is in the same line of business as the Tenderer.
- 4.2 The Tenderer has arrived at his submitted Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive tendering.
- 4.3 In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
- a) prices;
 - b) geographical area where Goods or Services will be rendered [market allocation];
 - c) methods, factors or formulas used to calculate prices;
 - d) the intention or decision to submit or not to submit, a Tender;
 - e) the submission of a Tender which does not meet the specifications and conditions of the RFP; or
 - f) tendering with the intention of not winning the Tender.

- 4.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Goods or Services to which his/her tender relates.
- 4.5 The terms of the Tender as submitted 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 of the awarding of the contract.
- 4.6 Tenderers are 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 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.
- 4.7 Should the Tenderer find any terms or conditions stipulated in any of the relevant documents quoted in the Tender unacceptable, it should indicate which conditions are unacceptable and offer alternatives by written submission on its company letterhead, attached to its submitted Tender. Any such submission shall be subject to review by Transnet's Legal Counsel who shall determine whether the proposed alternative(s) are acceptable or otherwise, as the case may be.

5 DISQUALIFICATION FROM TENDERING PROCESS

- 5.1 If the Tenderer/Service Provider/Contractor has committed a transgression through a violation of section 3 of this Integrity Pact or in any other form such as to put its reliability or credibility as a Tenderer/Service Provider/Contractor into question, Transnet may reject the Tenderer's / Service Provider's / Contractor's application from the registration or tendering process and remove the Tenderer/Service Provider/Contractor from its database, if already registered.
- 5.2 If the Tenderer/Service Provider/Contractor has committed a transgression through a violation of section 3, or any material violation, such as to put its reliability or credibility into question. Transnet may after following due procedures and at its own discretion also exclude the Tenderer/Service Provider /Contractor from future tendering processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity

will be determined by the circumstances of the case, which will include amongst others the number of transgressions, the position of the transgressors within the company hierarchy of the Tenderer/Service Provider/Contractor and the amount of the damage. The exclusion will be imposed for up to a maximum of 10 (ten) years. However, Transnet reserves the right to impose a longer period of exclusion, depending on the gravity of the misconduct.

- 5.3 If the Tenderer/Service Provider/Contractor can prove that it has restored the damage caused by it and has installed a suitable corruption prevention system, or taken other remedial measures as the circumstances of the case may require, Transnet may at its own discretion revoke the exclusion or suspend the imposed penalty.

6 TRANSNET'S LIST OF EXCLUDED TENDERERS (BLACKLIST)

- 6.1 The process of restriction is used to exclude a company/person from conducting future business with Transnet and other organs of state for a specified period. No Tender shall be awarded to a Tenderer whose name (or any of its members, directors, partners or trustees) appear on the Register of Tender Defaulters kept by National Treasury, or who have been placed on National Treasury's List of Restricted Suppliers. Transnet reserves the right to withdraw an award, or cancel a contract concluded with a Tenderer should it be established, at any time, that a tenderer has been restricted with National Treasury by another government institution.
- 6.2 All the stipulations on Transnet's restriction process as laid down in Transnet's Supply Chain Policy and Procurement Procedures Manual (CPM included) are included herein by way of reference. Below follows a condensed summary of this restriction procedure.
- 6.3 On completion of the restriction procedure, Transnet will submit the restricted entity's details (including the identity number of the individuals and registration number of the entity) to National Treasury for placement on National Treasury's Database of Restricted Suppliers for the specified period of exclusion. National Treasury will make the final decision on whether to restrict an entity from doing business with any organ of state for a period not exceeding 10 years and place the entity concerned on the Database of Restricted Suppliers published on its official website.
- 6.4 The decision to restrict is based on one of the grounds for restriction. The standard of proof to commence the restriction process is whether a "*prima facie*" (i.e. on the face of it) case has been established.

- 6.5 Depending on the seriousness of the misconduct and the strategic importance of the Goods/Services, in addition to restricting a company/person from future business, Transnet may decide to terminate some or all existing contracts with the company/person as well.
- 6.6 A Service Provider or Contractor to Transnet may not subcontract any portion of the contract to a blacklisted company.
- 6.7 Grounds for blacklisting include: If any person/Enterprise which has submitted a Tender, concluded a contract, or, in the capacity of agent or subcontractor, has been associated with such Tender or contract:
 - a) Has, in bad faith, withdrawn such Tender after the advertised closing date and time for the receipt of Tenders;
 - b) has, after being notified of the acceptance of his Tender, failed or refused to sign a contract when called upon to do so in terms of any condition forming part of the Tender documents;
 - c) has carried out any contract resulting from such Tender in an unsatisfactory manner or has breached any condition of the contract;
 - d) has offered, promised or given a bribe in relation to the obtaining or execution of the contract;
 - e) has acted in a fraudulent or improper manner or in bad faith towards Transnet or any Government Department or towards any public body, Enterprise or person;
 - f) has made any incorrect statement in a certificate or other communication with regard to the Local Content of his Goods or his B-BBEE status and is unable to prove to the satisfaction of Transnet that:
 - (i) he made the statement in good faith honestly believing it to be correct; and
 - (ii) before making such statement he took all reasonable steps to satisfy himself of its correctness;
 - g) caused Transnet damage, or to incur costs in order to meet the contractor's requirements and which could not be recovered from the contractor;
 - h) has litigated against Transnet in bad faith.

- 6.8 Grounds for blacklisting include a company/person recorded as being a company or person prohibited from doing business with the public sector on National Treasury's database of Restricted Service Providers or Register of Tender Defaulters.
- 6.9 Companies associated with the person/s guilty of misconduct (i.e. entities owned, controlled or managed by such persons), any companies subsequently formed by the person(s) guilty of the misconduct and/or an existing company where such person(s) acquires a controlling stake may be considered for blacklisting. The decision to extend the blacklist to associated companies will be at the sole discretion of Transnet.

7 PREVIOUS TRANSGRESSIONS

- 7.1 The Tenderer/Service Provider/Contractor hereby declares that no previous transgressions resulting in a serious breach of any law, including but not limited to, corruption, fraud, theft, extortion and contraventions of the Competition Act 89 of 1998, which occurred in the last 5 (five) years with any other public sector undertaking, government department or private sector company that could justify its exclusion from its registration on the Tenderer's/Service Provider's/Contractor's database or any tendering process.
- 7.2 If it is found to be that the Tenderer/Service Provider/Contractor made an incorrect statement on this subject, the Tenderer/Service Provider/Contractor can be rejected from the registration process or removed from the Tenderer/Service Provider/Contractor database, if already registered, for such reason (refer to the Breach of Law Returnable Form contained in the document.)

8 SANCTIONS FOR VIOLATIONS

- 8.1 Transnet shall also take all or any one of the following actions, wherever required to:
 - a) Immediately exclude the Tenderer/Service Provider/Contractor from the tendering process or call off the pre-contract negotiations without giving any compensation the Tenderer/Service Provider/Contractor. However, the proceedings with the other Tenderer/Service Provider/Contractor may continue;
 - b) Immediately cancel the contract, if already awarded or signed, without giving any compensation to the Tenderer/Service Provider/Contractor;
 - c) Recover all sums already paid by Transnet;
 - d) Encash the advance bank guarantee and performance bond or warranty bond, if furnished by the Tenderer/Service Provider/Contractor, in order to recover the payments, already made by Transnet, along with interest;

- e) Cancel all or any other contracts with the Tenderer/Service Provider/Contractor; and
- f) Exclude the Tenderer/ Service Provider/Contractor from entering into any Tender with Transnet in future.

9 CONFLICTS OF INTEREST

9.1 A conflict of interest includes, inter alia, a situation in which:

- a) A Transnet employee has a personal financial interest in a tendering / supplying entity; and
- b) A Transnet employee has private interests or personal considerations or has an affiliation or a relationship which affects, or may affect, or may be perceived to affect his / her judgment in action in the best interest of Transnet, or could affect the employee's motivations for acting in a particular manner, or which could result in, or be perceived as favouritism or nepotism.

9.2 A Transnet employee uses his / her position, or privileges or information obtained while acting in the capacity as an employee for:

- a) Private gain or advancement; or
- b) The expectation of private gain, or advancement, or any other advantage accruing to the employee must be declared in a prescribed form.

Thus, conflicts of interest of any Tender committee member or any person involved in the sourcing process must be declared in a prescribed form.

9.3 If a Tenderer/Service Provider/Contractor has or becomes aware of a conflict of interest i.e. a family, business and / or social relationship between its owner(s)/ member(s)/director(s)/partner(s)/shareholder(s) and a Transnet employee/ member of Transnet's Board of Directors in respect of a Tender which will be considered for the Tender process, the Tenderer/Service Provider/ Contractor:

- a) must disclose the interest and its general nature, in the Request for Proposal ("RFX") declaration form; or
- b) must notify Transnet immediately in writing once the circumstances has arisen.

9.4 The Tenderer/Service Provider/Contractor shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any committee member or any person involved in the sourcing process, where this is done, Transnet shall be entitled forthwith to rescind the contract and all other contracts with the Tenderer/Service Provider/Contractor.

10 DISPUTE RESOLUTION

10.1 Transnet recognises that trust and good faith are pivotal to its relationship with its Tenderer / Service Provider / Contractor. When a dispute arises between

Transnet and its Tenderer / Service Provider / Contractor, the parties should use their best endeavours to resolve the dispute in an amicable manner, whenever possible. Litigation in bad faith negates the principles of trust and good faith on which commercial relationships are based. Accordingly, following a blacklisting process as mentioned in paragraph 6 above, Transnet will not do business with a company that litigates against it in bad faith or is involved in any action that reflects bad faith on its part. Litigation in bad faith includes, but is not limited to the following instances:

- a) **Vexatious proceedings:** these are frivolous proceedings which have been instituted without proper grounds;
- b) **Perjury:** where a Tenderer / Service Provider / Contractor make a false statement either in giving evidence or on an affidavit;
- c) **Scurrilous allegations:** where a Tenderer / Service Provider / Contractor makes allegations regarding a senior Transnet employee which are without proper foundation, scandalous, abusive or defamatory; and
- d) **Abuse of court process:** when a Tenderer / Service Provider / Contractor abuses the court process in order to gain a competitive advantage during a Tender process.

11 GENERAL

- 11.1 This Integrity Pact is governed by and interpreted in accordance with the laws of the Republic of South Africa.
- 11.2 The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the law relating to any civil or criminal proceedings.
- 11.3 The validity of this Integrity Pact shall cover all the tendering processes and will be valid for an indefinite period unless cancelled by either Party.
- 11.4 Should one or several provisions of this Integrity Pact turn out to be invalid the remainder of this Integrity Pact remains valid.
- 11.5 Should a Tenderer/Service Provider/Contractor be confronted with dishonest, fraudulent or corruptive behaviour of one or more Transnet employees, Transnet expects its Tenderer/Service Provider/Contractor to report this behaviour directly to a senior Transnet official/employee or alternatively by using Transnet's "Tip-Off Anonymous" hotline number 0800 003 056, whereby your confidentiality is guaranteed.

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The Parties hereby declare that each of them has read and understood the clauses of this Integrity Pact and shall abide by it. To the best of the Parties' knowledge and belief, the information provided in this Integrity Pact is true and correct.

I duly authorised by the tendering entity, hereby certify that the tendering entity are **fully acquainted** with the contents of the Integrity Pact and further **agree to abide by it** in full.

Signature

Date

T2.2-23 : Supplier Code of Conduct

Transnet SOC Limited aims to achieve the best value for money when buying or selling goods and obtaining services. This however must be done in an open and fair manner that supports and drives a competitive economy. Underpinning our process are several acts and policies that any supplier dealing with Transnet must understand and support. These are:

- The Transnet Procurement Policy – A guide for Tenderers.
- Section 217 of the Constitution - the five pillars of Public PSCM (Procurement and Supply Chain Management): fair, equitable, transparent, competitive and cost effective;
- The Public Finance Management Act (PFMA);
- The Broad Based Black Economic Empowerment Act (BBBEE)
- The Prevention and Combating of Corrupt Activities Act (PRECCA); and
- The Construction Industry Development Board Act (CIDB Act).

This code of conduct has been included in this contract to formally appraise Transnet Suppliers of Transnet's expectations regarding behaviour and conduct of its Suppliers.

Prohibition of Bribes, Kickbacks, Unlawful Payments, and Other Corrupt Practices

Transnet is in the process of transforming itself into a self-sustaining State Owned Enterprise, actively competing in the logistics industry. Our aim is to become a world class, profitable, logistics organisation. As such, our transformation is focused on adopting a performance culture and to adopt behaviours that will enable this transformation.

1. Transnet SOC Limited will not participate in corrupt practices. Therefore, it expects its suppliers to act in a similar manner.

- Transnet and its employees will follow the laws of this country and keep accurate business records that reflect actual transactions with, and payments to, our suppliers.
- Employees must not accept or request money or anything of value, directly or indirectly, from suppliers.
- Employees may not receive anything that is calculated to:



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- Illegally influence their judgement or conduct or to ensure the desired outcome of a sourcing activity;
- Win or retain business or to influence any act or decision of any person involved in sourcing decisions; or
- Gain an improper advantage.
- There may be times when a supplier is confronted with fraudulent or corrupt behaviour of Transnet employees. We expect our Suppliers to use our “Tip-offs Anonymous” Hot line to report these acts. (0800 003 056).

2. *Transnet SOC Limited is firmly committed to the ideas of free and competitive enterprise.*

- Suppliers are expected to comply with all applicable laws and regulations regarding fair competition and antitrust practices.
- Transnet does not engage with non-value adding agents or representatives solely for the purpose of increasing BBBEE spend (fronting).

3. *Transnet’s relationship with suppliers requires us to clearly define requirements, to exchange information and share mutual benefits.*

- Generally, suppliers have their own business standards and regulations. Although Transnet cannot control the actions of our suppliers, we will not tolerate any illegal activities. These include, but are not limited to:
 - Misrepresentation of their product (origin of manufacture, specifications, intellectual property rights, etc);
 - Collusion;
 - Failure to disclose accurate information required during the sourcing activity (ownership, financial situation, BBBEE status, etc.);
 - Corrupt activities listed above; and
 - Harassment, intimidation or other aggressive actions towards Transnet employees.



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- Suppliers must be evaluated and approved before any materials, components, products or services are purchased from them. Rigorous due diligence is conducted and the supplier is expected to participate in an honest and straight forward manner.
- Suppliers must record and report facts accurately, honestly and objectively. Financial records must be accurate in all material respects.

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Conflicts of Interest

A conflict of interest arises when personal interests or activities influence (or appear to influence) the ability to act in the best interests of Transnet SOC Limited.

- Doing business with family members.
- Having a financial interest in another company in our industry

Where possible, contracts will be negotiated to include the above in the terms of such contracts. To the extent such terms are not included in contractual obligations and any of the above code is breached, then Transnet reserves its right to review doing business with these suppliers.

I, _____ of _____
(insert name of Director or as per Authority Resolution from Board of Directors) *(insert name of Company)*

hereby acknowledge having read, understood and agree to the terms and conditions set out in the "Transnet Supplier Code of Conduct."

Signed this on day _____ at

Signature

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T2.2-24 Agreement in terms of Protection of Personal Information Act, 4 of 2013 ("POPIA")

1. PREAMBLE AND INTRODUCTION

- 1.1. The rights and obligation of the Parties in terms of the Protection of Personal Information Act, 4 of 2013 ("POPIA") are included as forming part of the terms and conditions of this contract.

2. PROTECTION OF PERSONAL INFORMATION

- 2.1. The following terms shall bear the same meaning as contemplated in Section 1 of the Protection of Person information act, No. of 2013 "(POPIA)":
- consent; data subject; electronic communication; information officer; operator; person; personal information; processing; record; Regulator; responsible party; special information; as well as any terms derived from these terms.
- 2.2. The Operator will process all information by the Transnet in terms of the requirements contemplated in Section 4(1) of the POPIA:
- Accountability; Processing limitation; Purpose specification; Further processing limitation; Information quality; Openness; Security safeguards and Data subject participation.
- 2.3. The Parties acknowledge and agree that, in relation to personal information of Transnet and the information of a third party that will be processed pursuant to this Agreement , the Operator is (... insert name of Tenderer/Contractor) hereinafter Operator and the Data subject is "Transnet". Operator will process personal information only with the knowledge and authorisation of Transnet and will treat personal information and the information of a third party which comes to its knowledge as confidential and will not disclose it, unless so required by law or subject to the exceptions contained in the POPIA.
- 2.4. Transnet reserves all the rights afforded to it by the POPIA in the processing of any of its information as contained in this Agreement and the Operator is required to comply with all prescripts as detailed in the POPIA relating to all information concerning Transnet.
- 2.5. In terms of this Agreement, the Operator acknowledges that it will obtain and have access to personal information of Transnet and the information of a third party and agrees that it shall only process the information disclosed by Transnet in terms of this Agreement and only for the purposes as detailed in this Agreement and in accordance with any applicable law.



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- 2.6. Should there be a need for the Operator to process the personal information and the information of a third party in a way that is not agreed to in this Agreement, the Operator must request consent from Transnet to the processing of its personal information or and the information of a third party in a manner other than that it was collected for, which consent cannot be unreasonably withheld.
- 2.7. Furthermore, the Operator will not otherwise modify, amend or alter any personal information and the information of a third party submitted by Transnet or disclose or permit the disclosure of any personal information and the information of a third party to any third party without prior written consent from Transnet.
- 2.8. The Operator shall, at all times, ensure compliance with any applicable laws put in place and maintain sufficient measures, policies and systems to manage and secure against all forms of risks to any information that may be shared or accessed pursuant to the services offered to Transnet in terms of this Agreement (physically, through a computer or any other form of electronic communication).
- 2.9. The Operator shall notify Transnet in writing of any unauthorised access to personal information and the information of a third party, cybercrimes or suspected cybercrimes, in its knowledge and report such crimes or suspected crimes to the relevant authorities in accordance with applicable laws, after becoming aware of such crimes or suspected crime. The Operator must inform Transnet of the breach as soon as it has occurred to allow Transnet to take all necessary remedial steps to mitigate the extent of the loss or compromise of personal information and the information of a third party and to restore the integrity of the affected personal information as quickly as is possible.
- 2.10. Transnet may, in writing, request the Operator to confirm and/or make available any personal information and the information of a third party in its possession in relation to Transnet and if such personal information has been accessed by third parties and the identity thereof in terms of the POPIA.
- 2.11. Transnet may further request that the Operator correct, delete, destroy, withdraw consent or object to the processing of any personal information and the information of a third party relating to the Transnet or a third party in the Operator's possession in terms of the provision of the POPIA and utilizing Form 2 of the POPIA Regulations.
- 2.12. In signing this addendum that is in terms of the POPIA, the Operator hereby agrees that it has adequate measures in place to provide protection of the personal information and the information of a third party given to it by Transnet in line with the 8 conditions of the POPIA and that it will provide to Transnet satisfactory evidence of these measures whenever called upon to do so by Transnet.



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The Operator is required to provide confirmation that all measures in terms of the POPIA are in place when processing personal information and the information of a third party received from Transnet:

YES	

NO	

2.13. Further, the Operator acknowledges that it will be held liable by Transnet should it fail to process personal information in line with the requirements of the POPIA. The Operator will be subject to any civil or criminal action, administrative fines or other penalty or loss that may arise as a result of the processing of any personal information that Transnet submitted to it.

2.14. Should a Tenderer have any complaints or objections to processing of its personal information, by Transnet, the Tenderer can submit a complaint to the Information Regulator on <https://www.justice.gov.za/infoereg/>, click on contact us, click on complaints.IR@justice.gov.za

3. SOLE AGREEMENT

3.1. The Agreement, constitute the sole agreement between the parties relating to the subject matter referred to in paragraph 1.1 of this and no amendment/variation/change shall be of any force and effect unless reduced to writing and signed by or on behalf of both parties.

Signed at _____ on this _____ day of _____ 2021

Name: _____

Title: _____

Signature: _____

XXXXX (Pty) Ltd

(Operator)

Authorised signatory for and on behalf of Xxxx (Pty) Ltd who warrants that he/she is duly authorised to sign this Agreement.

AS WITNESSES:

1. Name: _____ Signature: _____

2. Name: _____ Signature: _____

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T2.2-25: Insurance provided by the *Contractor*

Clause 84.1 in NEC3 Engineering & Construction Contract (June 2005)(amended June 2006 and April 2013) requires that the *Contractor* provides the insurance stated in the insurance table except any insurance which the *Employer* is to provide as stated in the Contract Data.

Please provide the following details for insurance which the *Contractor* is still to provide. Notwithstanding this information all costs related to insurance are deemed included in the tenderer's rates and prices.

Insurance against (See clause 84.2 of the ECC)	Name of Insurance Company	Cover	Premium
Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract			
Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R5 000 000/R10 000 000.			
Insurance in respect of loss of or damage to own property and equipment.			
(Other)			

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T2.2-26: Form of Intent to Provide a Defects Correction

It is hereby agreed by the Tenderer that a Performance Guarantee drafted **exactly** as provided in the tender documents will be provided by the Guarantor named below, which is a **bank or insurer registered in South Africa**:

Name of Guarantor

(Bank/Insurer)

Address

The Performance Guarantee shall be provided within **2 (Two)** weeks after the Contract Date defined in the contract unless otherwise agreed to by the parties.

Signed

Name

Capacity

On behalf of (name of tenderer)

Date

Confirmed by Guarantor's Authorised Representative

Signature(s)

Name (print)

Capacity

On behalf of Guarantor
(Bank/insurer)

Date



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T2.2- 27: Forecast Rate of Invoicing

Tenderer to submit the forecast rate of invoicing (cash-flow) based on the Tender Price and Tender Programme.

Index of documentation attached to this schedule:

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T2.2-28: Three (3) years audited financial statements

Attached to this schedule is the last three (3) years audited financial statements of the single tenderer/members of the Joint Venture.

NAME OF COMPANY/IES and INDEX OF ATTACHMENTS:

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C1.1: Form of Offer & Acceptance

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of:

SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

The tenderer, identified in the Offer signature block, has

<i>either</i>	examined the documents listed in the Tender Data and addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of Tender.
<i>or</i>	examined the draft contract as listed in the Acceptance section and agreed to provide this Offer.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

The offered total of the Prices exclusive of VAT is	R
Value Added Tax @ 15% is	R
The offered total of the Prices inclusive of VAT is	R
(in words)	

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s)

Name(s)

Capacity

**For the
tenderer:**

(Insert name and address of organisation)

Date



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Name &
signature of
witness

Tenderer's CIDB registration number:



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Acceptance

By signing this part of this Form of Offer and Acceptance, the *Employer* identified below accepts the tenderer's Offer. In consideration thereof, the *Employer* shall pay the *Contractor* the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer's Offer shall form an agreement between the *Employer* and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

Part C1	Agreements and Contract Data, (which includes this Form of Offer and Acceptance)
Part C2	Pricing Data
Part C3	Scope of Work: Works Information
Part C4	Site Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any).



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Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s)

Name(s)

Capacity

**for the
Employer**

Transnet SOC Ltd

(Insert name and address of organisation)

Name &
signature of
witness

Date



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Schedule of Deviations

Note:

1. To be completed by the Employer prior to award of contract. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1		
2		
3		
4		
5		

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification or changes to the terms of the Offer agreed by the tenderer and the Employer during this process of Offer and Acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

	For the tenderer:	For the Employer
Signature	_____	_____
Name	_____	_____
Capacity	_____	_____
On behalf of	(Insert name and address of organisation)	Transnet SOC Ltd
Name & signature of witness	_____	_____
Date	_____	_____



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C1.2 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		B: Priced contract with bill of quantities
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	
		X2: Changes in the law
		X7: Delay damages
		X13: Performance Bond
		X18: Limitation of liability
		Z: Additional conditions of contract
	of the NEC3 Engineering and Construction Contract June 2005 (amended June 2006 and April 2013)	
10.1	The <i>Employer</i> is:	Transnet SOC Ltd (Registration No. 1990/000900/30)
	Address	Registered address: Transnet Corporate Centre 138 Eloff Street Braamfontein Johannesburg 2000
	Having elected its Contractual Address for the purposes of this contract as:	Transnet Port Terminals 2nd Floor, 202 Anton Lembede Street, Durban Central Durban, 4001



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10.1	The <i>Project Manager</i> is: (Name)	Marks Pita
	Address	Transnet Port Terminals, Saldanha Ground Floor Technical Building Saldanha Terminal 7395
	Tel	022 703 4242
	e-mail	marks.pita2@transnet.net
10.1	The <i>Supervisor</i> is: (Name)	TBC
	Address	
	Tel No.	
	e-mail	
11.2(13)	The <i>works</i> are	SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL, TRANSNET PORT TERMINALS (TPT), PORT OF SALDANHA FOR A PERIOD OF TWELVE MONTHS (12)
11.2(14)	The following matters will be included in the Risk Register	No risk identified at this time
11.2(15)	The <i>boundaries of the site</i> are	As stated in Part C4.1."Description of the Site and it surroundings"
11.2(16)	The Site Information is in	Part C4
11.2(19)	The Works Information is in	Part C3
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.
13.1	The <i>language of this contract</i> is	English
13.3	The <i>period for reply</i> is	2 weeks
2	The <i>Contractor's</i> main responsibilities	No additional data is required for this section of the <i>conditions of contract</i>.
3	Time	



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11.2(3) The *completion date* for the **30 July 2026** whole of the *works* is

11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	Condition to be met	key date
		1 Site Establishment.	June 2025
		2 Site clearance, ordering o material.	August 2025
		3 Construction of all project areas (MPT, Tippler, Causeway, Rail Embankment & Stockpile).	June 2026
		4 Commissioning & Hand-over	July 2026
		5 Site De-establishment	July 2026

30.1	The <i>access dates</i> are	Part of the Site	Date
		1 Entire Site	May 2025
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	2 weeks of the Contract Date.	
31.2	The <i>starting date</i> is		June 2025
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	2 weeks.	
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.		

4 Testing and Defects



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42.2	The <i>defects date</i> is	52 (fifty two) weeks after Completion of the whole of the works.
43.2	The <i>defect correction period</i> is	2 weeks
5	Payment	
50.1	The <i>assessment interval</i> is	15th (fifteenth) day of each successive month. monthly on the
51.1	The <i>currency of this contract</i> is	South African Rand. the
51.2	The period within which payments are made is	Payment will be effected on or before the last day of the month following the month during which a valid Tax Invoice and Statement were received.
51.4	The <i>interest rate</i> is	the prime lending rate of Standard Bank of South Africa.
6	Compensation events	
60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are,	the cumulative rainfall (mm) the number of days with rainfall more than 10 mm the number of days with minimum air temperature less than 0 degrees Celsius the number of days with snow lying at 08:00 hours South African Time and these measurements: Wind: the number of day(s) with wind speed in excess of 40 km/hour.
	The place where weather is to be recorded (on the Site) is:	On Site at Saldanha Port Terminal, Port of Saldanha



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The *weather data* are the records of past *weather measurements* for each **Port of Saldanha** calendar month which were recorded at:

and which are available from: **South African Weather Service 012 367 6023 or info3@weathersa.co.za.**

7	Title	No additional data is required for this section of the <i>conditions of contract</i>.
8	Risks and insurance	
80.1	These are additional <i>Employer's</i> risks	No additional risks are accepted by the Employer other than those which are provided for in this contract.
84.1	The <i>Employer</i> provides these insurances from the Insurance Table	
	1 Insurance against:	Loss of or damage to the <i>works</i>, Plant and Materials is as stated in the Insurance policy for Contract Works/ Public Liability.
	Cover / indemnity:	to the extent as stated in the insurance policy for Contract Works / Public Liability
	The deductibles are:	as stated in the insurance policy for Contract Works / Public Liability
	2 Insurance against:	Loss of or damage to property (except the <i>works</i>, Plant and Materials & Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) arising out of or in connection with the performance of the Contract as stated in the insurance policy for Contract Works / Public Liability
	Cover / indemnity	Is to the extent as stated in the insurance policy for Contract Works / Public Liability



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The deductibles are		as stated in the insurance policy for Contract Works / Public Liability
3	Insurance against:	Loss of or damage to Equipment (Temporary Works only) as stated in the insurance policy for contract Works and Public Liability
	Cover / indemnity	Is to the extent as stated in the insurance policy for Contract Works / Public Liability
	The deductibles are:	As stated in the insurance policy for Contract Works / Public Liability
4	Insurance against:	Contract Works SASRIA insurance subject to the terms, exceptions and conditions of the SASRIA coupon
	Cover / indemnity	Cover / indemnity is to the extent provided by the SASRIA coupon
	The deductibles are	The deductibles are, in respect of each and every theft claim, 0,1% of the contract value subject to a minimum of R2,500 and a maximum of R25,000.
	Note:	The deductibles for the insurance as stated above are listed in the document titled "Certificate of Insurance: Transnet (SOC) Limited Principal Controlled Insurance."
84.1	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is The <i>Contractor</i> provides these additional Insurances	
	1	Where the contract requires that the design of any part of the <i>works</i> shall be provided by the <i>Contractor</i> the <i>Contractor</i> shall satisfy the <i>Employer</i> that professional indemnity insurance cover in connection therewith has been affected



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- 2 Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the *works* at premises other than the site, the *Contractor* shall satisfy the *Employer* that such plant & materials, components or other goods for incorporation in the *works* are adequately insured during manufacture and/or fabrication and transportation to the site.**
 - 3 Should the *Employer* have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the *Contractor's* policies of insurance as well as those of any sub-contractor**
 - 4 Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000.**
 - 5 The insurance coverage referred to in 1, 2, 3 and 4 above shall be obtained from an insurer(s) in terms of an insurance policy approved by the *Employer*. The *Contractor* shall arrange with the insurer to submit to the *Project Manager* the original and the duplicate original of the policy or policies of insurance and the receipts for payment of current premiums, together with a certificate from the insurer or insurance broker concerned, confirming that the policy or policies provide the full coverage as required. The original policy will be returned to the *Contractor*.**
-



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84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i>) caused by activity in connection with this contract for any one event is	Whatever the <i>Contractor</i> requires in addition to the amount of insurance taken out by the <i>Employer</i> for the same risk.
84.2	The insurance against loss of or damage to the works, Plant and Materials as stated in the insurance policy for contract works and public liability selected from:	Principal Controlled Insurance policy-Contract works cover
9	Termination	There is no additional Contract Data required for this section of the <i>conditions of contract</i>.
10	Data for main Option clause	
B	Priced contract with Bill of Quantities	No additional data is required for this Option.
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is	Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the <i>Adjudicator</i>, the Chairman of the Association of Arbitrators will appoint an <i>Adjudicator</i>.
W1.2(3)	The <i>Adjudicator nominating body</i> is: If no <i>Adjudicator nominating body</i> is entered, it is:	The Chairman of the Association of Arbitrators (Southern Africa) the Association of Arbitrators (Southern Africa)
W1.4(2)	The <i>tribunal</i> is:	Arbitration
W1.4(5)	The <i>arbitration procedure</i> is	The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)



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The place where arbitration is to be held is **Durban, South Africa**

The person or organisation who will choose an arbitrator

- if the Parties cannot agree a choice or
- if the arbitration procedure does not state who selects an arbitrator, is

The Chairman of the Association of Arbitrators (Southern Africa)

12 Data for secondary Option clauses

X2 Changes in the law **No additional data is required for this option**

X7 Delay damages

X7.1 Delay damages for Completion of the whole of the *works* are **0.1% of the contract value per day**
Capped at 10%.

X13 Performance bond

X13.1 The amount of the performance bond is **10% of the total of the Prices**

X18 Limitation of liability



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X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	An amount being equal to the total Contract Value inclusive of VAT.
X18.2	For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:	The deductible of the relevant insurance policy
X18.3	The <i>Contractor's</i> liability for Defects due to his design which are not listed on the Defects Certificate is limited to:	The cost of correcting the Defect
X18.4	The <i>Contractor's</i> total liability to the <i>Employer</i> for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	The Total of the Prices
X18.5	The <i>end of liability date</i> is	A period being 12 (Twelve) consecutive months after the completion by the Contractor of the whole of the works to the Employer in terms of the Contract. Five years after the defect date for latent defects.

Z *Additional conditions of contract are:*

Z1	Intellectual property	Intellectual property rights (including patents, copyright, trademarks etc.) rest with the party owning them and the Employer indemnifies the Contractor from any liability arising from infringement of such intellectual property rights. [See Clauses 80.1, 83.1 and 83.2]
-



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Z2 Assignment and Waiver

Z2.1 Neither the Employer nor the Contractor may, without the written consent of the other, assign the Contract or any part thereof or any obligation under the Contract or cede any right or benefit thereunder.

Z2.2 No grant by the Contractor or the Employer to the other of any concession, waiver, condonation or allowance is, in respect of any specific event or circumstance other than that in respect of which the grant was made to constitute a waiver of the rights of the grantor in terms of the Contract or an estoppel of the grantor's right to enforce the provisions of the Contract.

Z4 Additional clause relating to Performance Bonds and/or Guarantees

Z4.1 The Performance Guarantee under X13 above shall be an irrevocable, on-demand performance guarantee, to be issued exactly in the form of the Pro Forma documents provided for this purpose under C1.3 (Form of Securities in favour of the Employer by a financial institution reasonably acceptable to the *Employer*.

Z4.2 Defects Correction Bond (Retention Bond) The Contractor gives the Employer a Defects correction bond, provided by a bank with a minimum long term credit rating of A – (Fitch rating or equivalent) which the Project Manager has accepted, to the value of 5% of the Contract value and in the form set out in document C1.3 Sureties in Part 1 Agreements and Contract Data. The bond will be given to the Employer prior to the final delivery, commissioning, testing and handover of the switch gearing system in Substation.



Z5 Additional clauses relating to Joint Venture

Z5.1

Insert the additional core clause 27.5

27.5. In the instance that the *Contractor* is a joint venture, the *Contractor* shall provide the *Employer* with a certified copy of its signed joint venture agreement, and in the instance that the joint venture is an 'Incorporated Joint Venture,' the Memorandum of Incorporation, within 4 (four) weeks of the Contract Date.

The Joint Venture agreement shall contain but not be limited to the following:

- **A brief description of the Contract and the Deliverables;**
- **The name, physical address, communications addresses and domicilium citandi et executandi of each of the constituents and of the Joint Venture;**
- **The constituent's interests;**
- **A schedule of the insurance policies, sureties, indemnities and guarantees which must be taken out by the Joint Venture and by the individual constituents;**
- **Details of an internal dispute resolution procedure;**
- **Written confirmation by all of the constituents:**
 - i. **of their joint and several liabilities to the *Employer* to Provide the Works;**
 - ii. **identification of the lead partner in the joint venture confirming the authority of the lead partner to bind the joint venture through the *Contractor's* representative;**



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iii. Identification of the roles and responsibilities of the constituents to provide the Works.

- Financial requirements for the Joint Venture:

iv. the working capital requirements for the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the constituents from time to time;

v. the names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.

Z5.2

Insert additional core clause 27.6

27.6. The *Contractor* shall not alter its composition or legal status of the Joint Venture without the prior approval of the *Employer*.

Z6 Additional obligations in respect of Termination

Z6.1

The following will be included under core clause 91.1:

In the second main bullet, after the word 'partnership' add 'joint venture whether incorporate or otherwise (including any constituent of the joint venture)' and

Under the second main bullet, insert the following additional bullets after the last sub-bullet:

- commenced business rescue proceedings (R22)
- repudiated this Contract (R23)



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Z6.2	Termination Table	The following will be included under core clause 90.2 Termination Table as follows:
		Amend "A reason other than R1 – R21" to "A reason other than R1 – R23"
Z6.3		Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."
Z7	Right Reserved by the Employer to Conduct Vetting through SSA	
Z7.1		The <i>Employer</i> reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any <i>Contractor</i> who has access to National Key Points for the following without limitations: 1. Confidential – this clearance is based on any information which may be used by malicious, opposing or hostile elements to harm the objectives and functions of an organ of state. 2. Secret – clearance is based on any information which may be used by malicious, opposing or hostile elements to disrupt the objectives and functions of an organ of state. 3. Top Secret – this clearance is based on information which may be used by malicious, opposing or hostile elements to neutralise the objectives and functions of an organ of state.
Z8	Additional Clause Relating to Collusion in the Construction Industry	
Z8.1		The contract award is made without prejudice to any rights the <i>Employer</i> may have to take appropriate action later with regard to any declared tender rigging including blacklisting.

Z9.1

The *Employer* and the *Contractor* are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act.

Z10.1 Anti - Corruption

In the event that the Contractor is alleged to be, or found by any competent court or Tribunal to be involved in any corrupt, unlawful or illegal activities, or is being investigated for any alleged corrupt, unlawful or illegal activity in relation to Transnet or any other party with whom Contractor does business, or if Transnet learns that:

- a. **Improper payments are being or have been made or offered to Transnet officials or any other person by Contractor or those acting on behalf of Contractor with respect to the Services; or**
- b. ***Contractor* or those acting on behalf of *Contractor* has accepted any payment or benefit, regardless of value, as an improper inducement to award, obtain or retain business or otherwise gain or grant an improper business advantage from or to any other person or entity.**

Transnet reserves the right to terminate the aforementioned awarded contract, by giving immediate written notice to the effect that, all or any Agreements it may have with *Contractor* or any and all Awards made *Contractor* for breach of this clause.



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Further in the event of such termination, Contractor shall not be entitled to any further payment, regardless of any activities undertaken or agreements with additional third parties entered into by Contractor prior to such termination; and further.

Contractor shall be liable to Transnet for any actual damages or remedies as provided either in the Agreements that are to be signed or in law.

Z10.2 Indemnity

1) Contractor irrevocably and unconditionally undertakes to indemnify and does hereby keep TPT indemnified and hold TPT harmless against, and, in respect of, all and any loss or damage incurred by itself or any other third- Party as a result of, arising out of or connected with any failure, act or omission or breach of this Agreement by Contractor or any of its employees, security officers, servants, agents, assigns, contractors or sub-contractors, or occurring during or as a result of the provision by the Contractor of the Security Service. Such absolute obligation of Contractor to indemnify TPT on a full indemnity basis against all claims shall including, but not be limited to:

a) liability in respect of any loss or damage to property, whether movable or immovable, belonging to third parties; or other

b) liability in respect of lost property belonging to third parties;

c) liability arising out of any unlawful act committed by or *Contractor* or its employees, security officers, servants, agents, contractors and sub-contractors during the process of rendering a Security Services; or at any other time when a claim



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has been and could be made against the TPT arising out of the acts of or omissions of one or more of such persons;

d) liability in respect of the death, unlawful arrest, injury, illness or disease of any person, or entity should the damage, loss, unlawful arrest, death, injury, illness or disease referred to above be attributable to or arise out of the Security Services that are being or have been rendered by the Contractor, its agents, contractors, sub-contractors in terms of this Agreement.

2) *Contractor* shall at its own expense and with effect from the date of signature hereof, take reasonable precautions for the protection of life and or property that is in any way connected with in whole or any part of this agreement and shall hold TPT harmless against all claims for any loss, demands, proceedings, damages, costs, charges, expenses whatsoever, arising out of this agreement.

3) *Contractor* agrees that it shall intervene in any claim arising and to indemnify and hold TPT harmless from any claim, damage, loss, cost, expense, legal expenses, arising from or attributable to *Contractor* provision of services, its acts, or omissions or those of its agents, employees, sub-contractors, representative/s or other for whom TPT may be / may not be deemed responsible for in terms of the agreement.

C1.2 Contract Data

Part two - Data provided by the *Contractor*

The tendering *Contractor* is advised to read both the NEC3 Engineering and Construction Contract - June 2005 (with amendments June 2006 and April 2013) and the relevant parts of its Guidance Notes (ECC3-GN) in order to understand the implications of this Data which the tenderer is required to complete. An example of the completed Data is provided on pages 156 to 158 of the ECC3 Guidance Notes.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

Clause	Statement	Data
10.1	The <i>Contractor</i> is (Name):	
	Address	
	Tel No.	
	Fax No.	
11.2(8)	The <i>direct fee percentage</i> is	%
	The <i>subcontracted fee percentage</i> is	%
11.2(18)	The <i>working areas</i> are the Site and	
24.1	The <i>Contractor's</i> key persons are:	
	1 Name:	
	Job:	
	Responsibilities:	
	Qualifications:	
	Experience:	
	2 Name:	
	Job	
	Responsibilities:	
	Qualifications:	
	Experience:	



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		CV's (and further key persons data including CVs) are appended to Tender Schedule entitled		
11.2(14)	The following matters will be included in the Risk Register			
31.1	The programme identified in the Contract Data is			
B	Priced contract with bill of quantities			
11.2(21)	The <i>bill of quantities</i> is in			
11.2(31)	The tendered total of the Prices is	(in figures)		
		(in words), excluding VAT		
	Data for Schedules of Cost Components	<i>Note "SCC" means Schedule of Cost Components starting on page 60 of ECC, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC.</i>		
B	Priced contract with bill of quantities	Data for the Shorter Schedule of Cost Components		
41 in SSCC	The percentage for people overheads is:	%		
21 in SSCC	The published list of Equipment is the last edition of the list published by			
	The percentage for adjustment for Equipment in the published list is	% (state plus or minus)		
22 in SSCC	The rates of other Equipment are:	Equipment	Size or capacity	Rate



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61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are	Category of employee		Hourly rate
62 in SSCC	The percentage for design overheads is	%		
63 in SSCC	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:			

APPROVED GUARANTEE ISSUERS

ABSA BANK LIMITED GROUP
BANK OF AMERICA, N.A
BANK OF CHINA LIMITED GROUP
BARCLAYS BANK PLC GROUP
BESA MEMBERS
BNP PARIBAS GROUP
CHINA CONSTRUCTION BANK GROUP
CHINA DEVELOPMENT BANK
CITIBANK GROUP
CREDIT SUISSE GROUP
DEUTSCHE BANK GROUP
FIRSTSTRAND BANK LIMITED GROUP
GOLDMAN SACHS INTERNATIONAL
HSBC HOLDINGS GROUP
INVESTEC BANK LTD
JPMORGAN CHASE BANK GROUP
MORGAN STANLEY
MACQUARIE BANK LIMITED
NEDBANK LTD
SOCIETE GENERALE BANK GROUP
STANDARD BANK GROUP
STANDARD CHARTERED BANK GROUP
AFRICAN BANK LTD
BIDVEST BANK LTD
CAPITEC BANK LTD
DISCOVERY BANK LTD
GRINDROD BANK LTD
SASFIN BANK LTD

ABN AMRO Bank N.V.
BANCO BILBAO VIZCAYA ARGENTARIA S.A
Coöperative Rabobank U.A.
CREDIT AGRICOLE CORPORATE AND INVESTMENT BANK
DANSKE BANK
INDUSTRIAL DEVELOPMENT CORPORATION
ING Bank N.V.
KBC BANK
LANDESBANK BADEN-WUERTTEMBERG
MIZUHO BANK, LTD
NATIONAL AUSTRALIA BANK LIMITED
SKANDINAVISKA ENSKILDA BANKEN
SUMITOMO MITSUI BANKING CORPORATION
SVENSKA HANDELSBANKEN AB

AIG SOUTH AFRICA
CONSTANTIA INSURANCE LTD
CREDIT GUARANTEE INSURANCE CORPORATION
GUARDRISK INSURANCE
HOLLARD INSURANCE COMPANY
INFINITY INSURANCE
LOMBARD INSURANCE GROUP
MUTUAL & FEDERAL
RENASA INSURANCE COMPANY
SANTAM
BRYTE INSURANCE COMPANY LTD



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PERIOD OF TWELVE MONTHS (12)

PART C2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing Instructions	3
C2.2	Bill of Quantities	7
	Total number of pages	7



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Contents

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1.1	<i>How the Contract Prices work and assesses it for progress payment.....</i>	3
1.2	<i>Function of the Bill of Quantities</i>	3
1.3	<i>Guidance before pricing and measuring</i>	3
2	Measurement and Payment	5
2.1	<i>General assumptions</i>	5
2.2	<i>General</i>	6
C2.2:	The Bill of Quantities	7



C2.1: Pricing Instruction: Option B

1 Conditions of Contract

1.1 How the Contract Prices work and assesses it for progress payment

Clause 11 in NEC3 Engineering and Construction Contract, June 2005 (ECC3) Option B states:

Identified and defined terms 11 (21) The *Bill of Quantities* is the *Bill of Quantities* as changed in accordance with this 11.2 *Contract* to accommodate implemented compensation events and for accepted quotations for acceleration.

(22) Defined Cost is the cost of the components in the Shorter Schedule of Cost Components whether Work is *Sub-Contracted* or not excluding the cost of preparing quotations for compensation events.

(28) The Price for Work Done to Date is the total of the quantity of the Work, which the *Contractor* has completed for each item in the *Bill of Quantities* multiplied by the rate and a proportion of each lump sum, which is the proportion of the Work covered by the item, which the *Contractor* has completed.

Completed Work is Work without Defects, which either would delay or be covered by immediately following Work.

(31) The Prices are the lump sums and the amounts obtained by multiplying the rates by the quantities for the items in the *Bill of Quantities*.

This confirms that Option B is a re-measurement *Contract* and the *Bill* comprises only items measured using quantities and rates or stated as lump sums. Value related items are not used. Time related items are items measured using rates where the rate is a unit of time.

1.2 Function of the Bill of Quantities

Clause 55.1 in Option B states, "Information in the *Bill of Quantities* is not *Work Information* or *Site Information*". This confirms that instructions to do Work or how it is to be done are not included in the *Bill*, but in the *Work Information*. This is further confirmed by Clause 20.1, which states, "The *Contractor* provides the Works in accordance with the *Work Information*". Hence, the *Contractor* does not provide the Works in accordance with the *Bill of Quantities*. The *Bill of Quantities* is only a pricing document.

1.3 Guidance before pricing and measuring

Employers preparing tenders or *Contract* documents, and tendering *Contractors* are advised to consult the sections dealing with the *Bill of Quantities* in the NEC3 Engineering and Construction Contract (June 2005) Guidance Notes before preparing the *Bill of Quantities* or before entering rates and lump sums into the *Bill*.

Historically *Bill of Quantities* based *Contracts* in South Africa have been influenced by the different approaches of the civil engineering and building sectors of the industry through their respective discipline based standard forms of *Contract* and methods of measurement. This is particularly apparent in the approach to the Preliminary and General (P&G) *Bill*. On the other hand, because ECC3 caters for a number of disciplines in the same



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Contract, including electrical Works, a different approach not currently found in local methods of measurement to the P&G *Bill* items may have been used.

The NEC approach to the P&G *Bill* assumes use will be made of method related charges for equipment applied to providing the Works based on durations shown in the Accepted Programme, fixed charges for the use of equipment that is required throughout the construction phase, time related charges for people working in a supervisory capacity for the period required, and lump sum charges for other facilities or services not directly related to performing Work items typically included in other parts of the *Bill*.



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2 Measurement and Payment

Abbreviation	Unit
%	percent
h	hour
ha	hectare
kg	kilogram
kl	kilolitre
km	kilometre
km-pass	kilometre-pass
kPa	kilopascal
kW	kilowatt
l	litre
m	metre
mm	millimetre
m ²	square metre
m ² -pass	square metre pass
m ³	cubic metre
m ³ -km	cubic metre-kilometre
MN	meganewton
MN.m	meganewton-metre
MPa	megapascal
No.	number
sum	Lump sum
r/o	Rates only
t	tonne (1000kg)

2.1 General assumptions

Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance has been made in the quantities for waste.

The Prices and rates stated for each item in the Bill of Quantities shall be treated as being fully inclusive of all Work, risks, liabilities, obligations, overheads, profit and everything necessary as incurred or required by the Contractor in carrying out or providing that item.

An item against which no Price is entered will be treated as covered by other Prices or rates in the bill of quantities.

Clause 63.13 in Option B provides that these rates and Prices may be used as a basis for assessment of compensation events instead of Defined Cost.

Where this Contract requires detailed drawings, designs or other information to be provided, and no rates or Prices are included in the Bill specifically for such matters, then the Contractor is deemed to have allowed for all costs associated with such requirements within the tendered rates and Prices in the Bill of Quantities.

An item against which no Price is entered will be treated as covered by other Prices or rates in the Bill of Quantities. If a number of items are grouped together for pricing purposes, this will be treated as a single lump sum.



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The quantities contained in the Bill of Quantities may not be final and do not necessarily represent the actual amount of Work to be done. The quantities of Work assessed and certified for payment by the Project Manager at each assessment date will be used for determining payments due and not the quantities given in the Bill of Quantities.

The short descriptions of the items of payment given in the bill of quantities are only for the purposes of identifying the items. Detail regarding the extent of the work entailed under each item is provided in the Works Information.

2.2 General

The short descriptions given in the *Bill of Quantities* in C2.2 are brief descriptions used to identify the activities for which Prices are required. Detailed descriptions of the activities to be priced are provided in the *Scope of Work*.

For the purpose of the *Bill of Quantities*, the following words shall have the meanings hereby assigned to them:

Unit:	The unit of measurement for each item of Work.
Quantity:	The number of units of Work for each item.
Rate:	The agreed payment per unit of measurement.
Amount:	The product of the quantity and the agreed rate for an item.
Sum:	An agreed lump sum payment amount for an item, the extent of which is described in the <i>Scope of Work</i> , but the quantity of Work, which is not measured in any units.

A rate, sum, and/or Price as applicable, is to be entered against each item in the *Bill of Quantities*. An item against which no Price is entered will be considered to be covered by the other Prices or rates in the *Bill of Quantities*.

The rates, sums and Prices in the *Bill of Quantities* are to be fully inclusive Prices for the Work described under the several items. Such Prices and rates cover all costs and expenses that may be required in and for the execution of the Work described in accordance with the provisions of the *Scope of Work*, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Conditions of *Contract*, as well as overhead charges and profit.

The quantities set out in the *Bills of Quantities* are the estimated quantities of the *Contract Works*, but the *Contractor* will be required to undertake whatever quantities may be directed by the *Supervisor* from time to time. The *Contract Price* for the completed *Contract* shall be computed from the actual quantities of Work done, valued at the relevant unit rates and Prices.

Contractors are to note that no reimbursement of costs for subsistence, typing, printing/copying, communications or computer hardware and/or software will be made and these costs will be deemed included in rates, sums, percentage fees and Prices for normal and additional Works.

All rates and Prices offered shall be in South African Rand and shall be exclusive of VAT or other similar taxes.

The rates and Prices shall not be subject to escalation and shall remain fixed for the duration of the *Contract*.



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C2.2: The Bill of Quantities

Refer to **Annexure A**: Unpriced Bill of Quantities

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		<u>SECTION 0: PRELINARIES & GENERAL</u> <u>Bill No.0: P&G Costs</u> <u>SECTION 1 : CAUSEWAY AREA</u> NOTE Tenderers are to price this Schedule strictly in accordance with the Specifications and SANS 1200, where a conflict arises between these two documents the Specifications shall take precedence. Where a conflict arises between this Schedule and the Specifications, the Specifications shall take precedence. Tenderers shall study the Drawings before pricing this Schedule and the Schedule shall be priced to provide the complete Works. To be read in conjunction with but not limited to the following Project Technical Specification(s) : - Civil and Structural : SANS 1200 C <u>SITE CLEARANCE</u> PSC-8.2.1 <u>Clear and grub</u> a) Unwanted vegetation m² 25000,00 R b) regrade area and remove depressions to ensure m² 25000,00 R c) Grass line existing detention ponds m² 420 R PSD-8.3.1 <u>Site Preparation</u> PSD-8.3.1.2 Clear Temporary stack and stockpile areas m² 200 R Remove topsoil to a nominal depth of 150mm and stockpile on Site m² 400 R Clean out all existing cleaning slabs & drying beds Sum 1 R PSC-8.2.2 <u>Location of Existing Services</u> PSC-8.2.2.a) a) Site survey by ground-penetrating radar and cable detector Sum 1 R PSC-8.2.12 Temporary protection and relocation of unknown existing services PS 1 R PSC-8.2.3 <u>Cleaning of Existing structures</u> PSC-8.2.3.a) a) De-silt, pressure clean and flow test existing concrete channels, pipes and down chutes m 250 R PSC-8.2.3.b) b) Existing Manhole to be cleaned and , repaired and reinstated No 10 R Cut and reshape low points to allow natural drainage m³ 2400 R PSC-8.2.3.c) Transport materials and debris to unspecified site and dump Sum 1 R MISCELLANEOUS 8.2.11 Connecting existing culvert and headwall to conect to pond 15 No 2 R				R
TOTAL CARRIED FORWARD						

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
TOTAL BROUGHT FORWARD						
	SANS 1200 DA	<u>EARTHWORKS</u>				
	8.3.2 (a)	Excavate in all material for V-drain, infiltration channel and settlement ponds and stockpile for re-use	m³	6155,00		R
	8.3.2 (b)	Extra over for	m³	1846,5		R
	8.3.2(b)(1)	Extra-over for intermediate excavation	m³	31		R
	8.3.2(b)(2)	Hard rock excavation (Provisional)				
	8.3.4	Importing of material				
		a) Extra over for importation of materials from commercial sources or from borrow pits	m³	25		R
	8.3.2	Bases Compaction Rip, scarify and compact 150mm thick insitu material to 90% Mod AASHTO for manholes and v drain channel	m3	923,25		R
	SANS 1200 DB	<u>EARTHWORKS (PIPE TRENCHES) -New infiltration channel</u>				
		EXCAVATION Excavate in all materials for new infiltration trench, backfill, compact and dispose all surplus material for side drains not exceeding 1m deep				
	PSD-8.3.2.a)	Over and Up to				
	PSD-8.3.2.b)	0,5 m 1,5 m	m	90		R
		Over and Up to				
		1 m 2 m	m	1150		R
	PSDB-8.3.2.b)	b) Extra-over item a) above for:				
		1) Hard rock excavation (Provisional)	m³	46		R
	PSDB-8.3.2.c)	Excavate unsuitable material from trench bottom and dispose (Provisional)	m³	136		R
	8.3.3	Excavation Ancillaries Make up deficiency in backfill material from necessary excavation on site (Provisional)	m³	30		R
	PSD-8.3.6	<u>Overhaul</u>	m³.km	10000		R
	PSD-8.3.14	Removal of oversized materials	m³			Rate only
	PSDB-8.3.5	<u>Particular items</u>				
V	8.3.4 (a)	Shore trench (Provisional) Protection of restricted trench excavation (Provisional)	m m	850 850		R R
AB	PSDB-8.3.5.a)	a) Services that intersect a trench	No	10		R
TOTAL CARRIED FORWARD						

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
TOTAL BROUGHT FORWARD						
	SANS 1200 LB	NEW INFILTRATION CHANNEL BEDDING (PIPES)				
8.2.1		Provision of bedding from Trench Excavation Available from trench excavation				
8.2.1(a)		a) Selected granular material	m³	2046		R
		b) Selected fill material	m³	2046		R
8.2.2.3		Provision of bedding from commercial sources only with written consent from Client's representative (Provisional)				
8.2.2.3 PSDB 8.3		19 mm crushed stone bedding from commercial sources	m³	307		R
PSLB-8.2.7		supply, handle and install nonwoven polyester geotextile along sides and bottom of the infiltration channel.	m	1240		R
		Increase capacity of detention pond	m³	90		R
PSLE-8.2.13		Concrete Channel Supply and install reinforced concrete stormwater grated 800mm wide V-Drain channel	m	75		R
	SABS 1200 LE	Stormwater drainage				
8.2.1		Supply, handle and lay, spigot & socket type HDPE perforated subsoil pipes on a class B bedding				
		110mm dia D100	m	79,283		R
	SANS 1200 DK	<u>GABIONS AND PITCHING</u>				
PSDK-8.3.8		3mm medium duty Grouted stone pitching on a concrete bed	m²	486		R
8.2.5		Supply and construct scour protection at outlets Grouted Stone Pitching(Medium Duty)	m²	70		R
PI2.4		Closing off of redundant roads	m	20		R
	SANS 1200 MF	SUBBASE <u>Construct subbase course with materials from commercial sources compacted to 95% Mod AASHTO density for:</u>				
		200mm C2 subbase layer for concrete apron slabs	m³	18		R
	SANS 1200 MF	BASE <u>Construct V-Drain with material from commercial sources</u>				
8.3.2		150 mm thick (G2 material compacted to 85% bulk relative density	m³	13,50		R
8.3.5		Imported Materials for Rip and compact 150mm in-situ layer compacted to 95% mod AASHTO density in 150mm layers	m³	13,50		R
PSMF-8.3.13		Tie new V-drain invert with existing culvert invert	m	75		R
TOTAL CARRIED TO SUMMARY						

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		<u>SECTION 2: MULTI-PURPOSE TERMINAL (MPT) AREA</u>				
		NOTE Tenderers are to price this Schedule strictly in accordance with the Specifications and SANS 1200, where a conflict arises between these two documents the Specifications shall take precedence. Where a conflict arises between this Schedule and the Specifications, the Specifications shall take precedence. Tenderers shall study the Drawings before pricing this Schedule and the Schedule shall be priced to provide the complete Works. To be read in conjunction with but not limited to the following Project Technical Specification(s) : - Civil and Structural :				
	SANS 1200 C	<u>SITE CLEARANCE</u>				
	PSC-8.2.1	a) Clear and grub unwanted on site	ha	19,00		R
		b) Temporary stack and stockpile areas	m²	1000,00		R
	8.2.5	c) Take down existing fences	m	1000,00		R
	PSD-8.3.1	<u>Site Preparation</u>				
	PSD-8.3.1.2	Remove topsoil to a nominal depth of 150mm and stockpile on Site	m²	800		R
	PSC-8.2.2	<u>Location of Existing Services</u>				
	PSC-8.2.2.a)	a) Site survey by ground-penetrating radar and cable detector	Sum	1,00		R
	PSC-8.2.3	<u>Cleaning of Existing structures</u>				
		a) Filtered Stormwater from stilling basin to be released to bay with existing SW Pipes.	Sum			
	PSC-8.2.3.a)	c) Clean and clear existing 300mm dia. Stormwater Pipe	m	704,00		R
	PSC-8.2.3.b)	d) Repair existing damaged channel and grade to flow towards new stilling basin SB7	m	772,00		R
	PSC-8.2.3.c)	e) Replace existing channel with heavy duty grids	m	772,00		R
	PSC-8.2.3.e)	g) Reshape and resize existing informal ponds on catchment MC7 as specified on drawing:	No	6,00		R
	PSC 8.2.13	(c) Cleaning out of existing stormwater grid channels after removal of top slot drain for all channel depth ranges	m	1250,00		R
	PSC 8.2.7	Dismantle and remove pipelines (not encased in concrete), electricity transmission lines, cables, etc.				
		(a) Clean and clear existing 300mm dia. Stormwater Pipe	m	19,62		R
		(b) Stormwater pipelines 600mm dia to 900mm diameter existing concrete outlet pipe				
		c) Allow for the careful removal, storage and reinstatement of the existing brick work paving and the repair or replacement thereof if damaged.	m²	3002,88		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	PSC-8.2.5	<u>Remove all redundant underground services from Site</u>				
	PSC-8.2.5.a)	Demolish and remove existing 300 diameter Stormwater pipes	m	772,00		R
	PSC-8.2.5.b)	Demolition of existing manholes 1.0m to 2m deep including excavation and breaking down of concrete, loading, unloading and haulage of all material to an approved Municipal spoil site.	No	20,00		R

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	PSC-8.2.3.d)	Remove and block off the existing separator system	No	1,00		R
	PSC-8.2.5.d)	Block existing channel to the separator	m	13,00		R
	PSC-8.2.6	Temporary protection and relocation of unknown existing services	Prov. Sum	1,00		R
	SANS 1200 D	<u>EARTHWORKS</u>				
	PSD-8.3.2.a	Excavate in all soft and intermediate materials for stormwater channel, sumps and stilling basins backfill, compact and dispose of surplus material to temporary stockpile as described in sub-clause PSD-5.2.2.1.i	m³	839,89		R
	PSD-8.3.2.a	Excavation in soft and intermediate material	m³	251,97		R
	PSD-8.3.2.b	Excavation in hard rock	m³	83,99		R
	SANS 1200 DB	<u>EARTHWORKS</u>				
		<u>Stormwater Drainage</u>				
	PSDB 8.3.2	<u>Excavation and Backfilling for Pipes and Sleeves</u>				
	PSDB-8.3.2.a)	<u>Excavation</u> Excavate in all materials for trench selectively to width up to 1000mm for pipes with a diameter between 200mm and 750 mm, backfill, compact, including dispose surplus/unsuitable material to the following depths Over and up to				
		0.0m to 1.5 m concrete channel	m	95,35		R
		1.5m to 2.0m pipes				
		Class 100D Concrete stormwater pipes	m	1994,52		R
		For side drains as indicated on the drawings:	m	790,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	8.3.2(b)	Extra-over item above for: Hard rock excavation (Provisional)	m³	80,00		R
	8.3.2(c)	Excavate unsuitable material from trench bottom and dispose of (Provisional)	m³	10,00		R
	8.3.3	<u>Excavation Ancillaries</u>				
	8.3.3.1(a)	Make up deficiency in backfill material (Provisional) from other necessary excavations on site	m³	1439,93		R
	PSD-8.3.6	<u>Overhaul</u>	m³.km	9200,00		R
	PSD-8.3.14	<u>Removal of oversized materials</u>	m³			Rate only

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		<u>Particular Items</u>				
	8.3.4 (a)	Shore trench (Provisional)	m	120,00		R
		Protection of restricted trench excavation (Provisional)	m	120,00		R
	8.3.5 (a)	Services that intersect the trench (Provisional) :	no.	40,00		R
	8.3.5 (b)	Other services (Provisional)	m	100,00		R
		Services that adjoin the trench (Provisional)				
	SANS 1200 DK	GABIONS AND PITCHING				
	8.2.5	Grouted Stone Pitching(Medium Duty) (Refer to Drawing for detail)	m2	20,00		R
	PI 2.4	Supply and construct scour protection at outlets	m	50,00		R
		Grouted Stone Pitching(Medium Duty)				
	SANS 1200 G	CONCRETE (STRUCTURAL)				
		SCHEDULED FORMWORK ITEMS				
	8.2.1	Rough				
		<u>Vertical formwork to:</u>				
		Unexposed Surfaces of Basins (walls, aprons, and floor slabs)	m²	2233,09		R
		Box Out Holes/ Form Voids				
	8.2.6 (d)	Large, other than circular, of area over 0.1 square metres, and				
		250mm Dia. Hole for outlet Piping to Ecostrom filter	No.	8,00		R
		750mm Dia. Hole for inlet piping to Eco-Storm filter	No.	8,00		R
		2000 x 300 x 300 mm box outs for in coming channels	No.	16,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	8.2.2	SMOOTH FORMWORK				
	8.2.6 (c)	<u>Smooth formwork to bottom and sides of</u>				
		Outer face of walls	m²	2592,00		R
		Inner face of Walls	m²	2400,00		R
		<u>400 x 1000 deep beams</u>				
		Soffit	m²	118,80		R
		Sides	m²	206,40		R
		In situ slab soffit	m²	2120,00		R
	8,5	JOINTS				
		3.2 x 50mm Saw cut groove joints between floors, cloumns, beams, retaining walls and slabs.	m	492,80		R
	8,3	SCHEDULED REINFORCEMENT ITEMS				
	8.3.1	<u>Steel bars of various diameters</u>				
		High tensile steel bars	t	23,00		R

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		<u>High-tensile welded mesh</u>				
	8.3.2	Mesh reference .193, below screed finishing in hollow core slabs	m2	493,89		R
	CMA	<u>Precast prestressed hollow core slabs</u>				
	Hollow-core Slabs	Prestressed hollow core slabs erected onto walls and beams All in accordance with manufacturers specifications				
		1250kN Piles as shown on drawing 5200157-2-001-S-LA-0001-05	m2	329,60		R
		2560kN Piles (Groups of four) as shown on drawing 5200157-2-001-S-LA-0002-03	m2	160,00		R
		SCHEDULED CONCRETE ITEMS				
		Unreinforced concrete				
	8.4.2	15 Mpa/19mm concrete 50mm thick blinding layer (Stilling Basins 1-8)	m²	1584,10		R
		40 Mpa/19mm Concrete				
		Bases	m³	15,36		R
		Slabs	m³	1475,52		R
		Columns	m³	39,17		R
		Beams	m³	99,30		R
		Walls	m³	582,91		R
		40Mpa concrete U grid channel	m	95,35		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
		Test Cubes				
		Making and testing 150 x 150 x 150mm concrete strength test cube for 8 No. Off stilling basins (Provisional)	No	259,00		R
	1200 GA	Construct structures as indicated on the drawings details:				
	8.1.4	30Mpa concrete strength U Channel	m3	65,00		R
	8.1.2	<u>Supply and lay portal and rectangular culverts</u>				
		Inlet and outlet structures complete. (Refer to Drawing Detail)	ton	13,00		R
	SANS 1200 H	STRUCTURAL STEELWORK				
		SUPPLY AND FABRICATION OF STEELWORK				
	1200H.8.3.1	S - Supply & Fabricate				
	1200H.8.3.2	D - Delivery to Site				
	1200H.8.3.3	I - Installation				
	1200H.8.3.6	CP - Corrosion Protection in accordance with "Client Specification"				
		STEELWORK				
		254 x 254 x 46 steel beams H - Sections with spans of 5m	t	4,00		R

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		D	t	4,00		R
		I	t	4,00		R
		CP	t	4,00		R
		90 x 90 x 6 grating support steelwork fabricated from angle sections				
		S	t	6,06		R
		D	t	6,06		R
		I	t	6,06		R
		CP	t	6,06		R
		Steelwork connections for all stilling basins				
		S	t	0,40		R
		D	t	0,40		R
		I	t	0,40		R
		CP	t	0,40		R
		Fixed steel ladder fabricated for 2,9 m height as per drawing. 5200157-2-001-S-DE-0001-01-00				
		S	No	8,00		R
		D	No	8,00		R
		I	No	8,00		R
		CP	No	8,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
		ACCESS PANEL COVER AND FRAMES				
		32mm Cover Detail as per drawing. 5200157-2-001-S-DE-0001-01-00				
		S	t	12,96		R
		D	t	12,96		R
		I	t	12,96		R
		CP	t	12,96		R
		32mm Cover Frames , as per drawing. 5200157-2-001-S-DE-0001-01-00				
		S	t	3,21		R
		D	t	3,21		R
		I	t	3,21		R
		CP	t	3,21		R
	8.3.7d	Galvanised n Type B60 Gripweld with a nominal bearer bar size 100 x 5.5 rectagrid.				
		S	m²	480,00		R
		D	m²	480,00		R
		I	m²	480,00		R
	8.3.8.a)	Galvanised Type E600 Grating for stilling basins				
		S	m²	4,80		R
		D	m²	4,80		R
		I	m²	4,80		R
		SUNDRIES				
		10mm Vastrap floor plate work				
		S	t	4,48		R
		D	t	4,48		R
		I	t	4,48		R
		CP	t	4,48		R

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)	
	8.3.4	Erection bolts Erection bolts for all the structural steelwork	t	2,85		R	
	SANS 1200 F	PILING (PROVISIONAL) Piling as shown on drawings. The rate must include the following: The depth of the pile determined by a specialist contractor, Specialist services and Dynamic Probe Super Heavy (DPSH) testing to be carried out prior to the installation of piles to determined suitable piles founding depths (Teting elsewhere measured).					
	6.5	Establishment on site for piling	Sum	1,00		R	
	6.6.a	Move equipment and set up 1250kN Piles as shown on drawing 5200157-2-001-S-LA-0001-05	No	16,00		R	
	6.6.b	Move equipment and set up 2560kN Piles as shown on drawing 5200157-2-001-S-LA-0002-03	No	126,00		R	
TOTAL CARRIED FORWARD							
TOTAL BROUGHT FORWARD							
	1200MH	ASPHALT SURFACING					
	8.5.4	2 x 50mm asphalt modified bitumen-salviacim or equivalent	t	50,00		R	
	8.5.5	Variations in quantities of bitumimous binder	l	r/o			
	1200MJ	SEGMENTED PAVING					
	8.2.2	Construction of 800mm G-Block paving complete as indicated on drawings	m2	6200,00		R	
		Sundry items Cutting units to fit edge restraints Key slab thickness to be confirmed on site	No	6,00		R	
	1200 LB	Bedding (pipes)					
	8.2.2.3	Provision of bedding from commercial sources (Provisional)					
	8.2.2.3(a)	Selected granular material	m3	155,00		R	
	SANS 1200 LE	Stormwater drainage					
	8.2.1	Supply and lay concrete pipe culvert: On Class 100D bedding : Diameter 375mm concrete pipe On Class 100D bedding: Diameter 525mm concrete pipe On Class 100D bedding: Diameter 600mm concrete pipe	m m m	319,52 260,89 120,00		R R R	
	8.2.2.b	Supply and install 1500mm precast circular manhole and base with ultra heavy duty cover	no.	8,00		R	
	PSLE-8.2.15	Supply, handle, lay, joint and bed spigot and socket HDPE perforated subsoil pipes	m	59,40		R	
	PSLE 8.2.18	30 MPa concrete stormwater headwall complete as per Detail	No.	6,00		R	
	PSLE 8.2.8	MANHOLES Supply and install precast Rocla maholes complete with base and cover up to 1,5m deep a) Manholes with SABS EN124 D400 heavy duty hinged ductile iron covers and frames for depths: Over and Up to 0,5 m 1,5 m					
			No	18		R	

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	SANS 1200 ME	b) Double Grid Inlet structure complete as per drawing CT990-G705-00 with heavy duty cover and frame:				
	8.3.3	ROADS - SUBBASE Construct Subbase from borrow pits of the specified material. 150mm Existing material or compacted to 93% MOD ASSHTO	m³	238,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	8.3.3.b)	PAVING LAYER WORKS Construct sub-base with material from commercial sources 45Mpa, Jointed unreinforced 400 mm thick concrete slab 200mm thick C2 cement stabilized layer Existing Material to be reinstated and shall consist of at least a G7 natural material compacted to a modified AASHTO density of 93%	m³ m³ m³	925,00 463,00 347,00		R R R
		APRON LAYER-WORKS 30 Mpa, Jointed unreinforced concrete slab. 150mm G2 (Graded crushed stone) Existing material to be reinstated and shall consist of G7 Natural material compacted to a modified AASHTO Density of 93%	m³ m³ m³	9,00 7,00 7,00		R R R
	SANS 1200 MF	STILLING BASIN LAYER WORKS				
	8.3.3	Construct base with material from commercial sources a) 150mm G5 crushed stone base layer, compacted to 95% of apparent relative density	m³	238,00		R
	8.3.3.c)	c) 150mm G7 natural gravel base, compacted to 93% MOD AASHTO.	m³	238,00		R
	8.3.3.d)	d) 150mm C2 cement stabilised base layer compacted to 98% of MOD AASHTO maximum density	m³	475,00		R
	8.3.5	<u>Process base material by the following process:</u>				
	8.3.5.d)	d) Stabilization i) 150mm C2 cement stabilized base layer	m³	238,00		R
	SANS 1200MM 8.2.1	Guardrails Guardrails on posts(Refer to drawing for detail)	m	160,00		R
	SANS 1200 MK	ROADS - KERBING AND CHANNELLING				
	PSMK 8.2.1	Concrete kerbing, edging and channelling Barrier kerb type BK4	m	1550,00		R
	PI 4.1	The constructor to supply and install Ecostorm plus 1500 heavy traffic	No	9,00		R
		Ecstorm plus 1500 replacement filter set	set	9,00		R



ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
TOTAL CARRIED TO SUMMARY						

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		SECTION 3 : RAIL EMBARKMENT AREA				
		NOTE				
		Tenderers are to price this Schedule strictly in accordance with the Specifications and SANS 1200, where a conflict arises between these two documents the Specifications shall take precedence. Where a conflict arises between this Schedule and the Specifications, the Specifications shall take precedence. Tenderers shall study the Drawings before pricing this Schedule and the Schedule shall be priced to provide the complete Works.				
		To be read in conjunction with but not limited to the following Project Technical Specification(s) : -				
		Civil and Structural :				
	SANS 1200 C	<u>SITE CLEARANCE</u>				
	PSC-8.2.1	a) Clear and grub unwanted on site	m²	16736,00		R
		b) Temporary stack and stockpile areas	m²	594,00		R
	PSD-8.3.1	<u>Site Preparation</u>				
	PSD-8.3.1.2	Remove topsoil to a nominal depth of 150mm and stockpile on Site and maintain the following:				
		Subsoil collector drain	m²	2970		R
		Temporary stack areas	m²	594		R
	PSC-8.2.2	<u>Location of Existing Services</u>				
	PSC-8.2.2.a)	a) Site survey by ground-penetrating radar and cable detector	Sum	1,00		R
		Proving of services around Pond 12	m	357,00		R
	PSC-8.2.3	<u>Cleaning of Existing structures</u>				
	PSC-8.2.3.a)	c) Clean and clear existing Stormwater infrastructure	m	250,00		R
	PSC-8.2.3.c)	e) relocate Optic fibre / communication cables	m	111,00		R
	PSC-8.2.5	<u>Remove all redundant underground services from Site</u>				
	PSC-8.2.5.a)	a) relocate 160mm Ø Foul sewer rising main and communications cable is to be relocated with associated manholes	m	86,00		R
	PSC-8.2.5.b)	Demolition of existing manholes 1.0m to 2m deep including excavation and breaking down of concrete, loading, unloading and haulage of all material to an approved Municipal spoil site.	No	2,00		R
	PSC-8.2.3.d)	Remove and block off the existing stormwater pipes	m	775,00		R
	PSC-8.2.5.d)	connect the grid channel to the electric line	m	856,00		R
	SANS 10142	Protect the line that feeds the high mast lights	m	111,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200 D	<u>EARTHWORKS</u>				
	PSD-8.3.2	Restricted excavations				

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	PSD-8.3.2.a	Excavate in all soft and intermediate materials for stormwater channel, subsoil collector drain compact and dispose of surplus material to temporary stockpile as described in sub-clause PSD-5.2.2.1.i	m³	808,38		R
		c) Restricted excavation in all materials for pipe jacking end pits and stormwater pipe route & junctions, compaction to 93% Mod AASHTO density. Inclusive of all benching volumes and haulage.	m³	1948,86		R
	PSD-8.3.2.a	Excavation in soft and intermediate material	m³	242,51		R
	PSD-8.3.2.b	Excavation in hard rock	m³	80,84		R
	SANS 1200 DB	<u>EARTHWORKS</u>				
	PSDB 8.3.2	<u>Excavation and Backfilling for Pipes and Sleeves</u>				
	PSDB-8.3.2.a)	<u>Excavation</u> Excavate in all materials for trenches, backfill, compact and dispose of surplus/ unsuitable material for: For 800m wide concrete U channel as indicated on the drawings:	m	810,00		R
		New subsoil collector drain trench 500mm wide	m	2160,00		R
	8.3.2(b)	Extra-over item above for: Hard rock excavation (Provisional)	m³	34,00		R
	8.3.2(c)	Excavate unsuitable material from trench bottom and dispose of (Provisional)	m³	27,00		R
	8.3.3	<u>Excavation Ancillaries</u> Make up deficiency in backfill material (Provisional)				
	8.3.3.1(a)	from other necessary excavations on site	m³	27,00		R
	PSD-8.3.6	<u>Overhaul</u>	m³.km	9200,00		R
	PSD-8.3.14	<u>Removal of oversized materials</u>	m³			Rate only
		<u>Particular Items</u>				
	8.3.4 (a)	Shore trench (Provisional)	m	338,00		R
		Protection of restricted trench excavation (Provisional)	no	40,00		R
	8.3.5 (a)	Services that intersect the trench (Provisional) :				
		Other services (Provisional)	no.	25,00		R
	8.3.5 (b)	Services that adjoin the trench (Provisional)	m	100,00		R
	SANS 1200 ME	<u>ROADS - SUBBASE</u>				
	8.3.3	Construct the subbase gravel wearing course with material from commercial sources				
		a) 150 mm gravel wearing course layer compacted to 97% of MOD AASHTO maximum density	m³	259,20		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200 MF	<u>Construct base with material from commercial sources</u>				
		a) 50mmblinding base layer, compacted to 95% of apparent relative density	m³	259,20		R
	8.3.3.c)	b) 200mm G2 layer , compacted to 93% MOD AASHTO.	m³	129,60		R
	8.3.3.d)	c) 200mm G5 layer 4% cement stabilization	m³	129,60		R

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	8.3.5	<u>Process base material by the following process:</u>				
	8.3.5.d)	d) Stabilization				
		i) 150mm C2 cement stabilized base layer	m³	7,30		R
	SANS 1200 G	CONCRETE (STRUCTURAL)				
		SCHEDULED CONCRETE ITEMS				
		Unreinforced concrete				
	8.4.2	15 Mpa/19mm concrete 50mm thick blinding layer U Concrete channel	m²	32,40		R
		40 Mpa/19mm Concrete				
		Channel	m³	259,20		R
		Subsoil drain collector	m³	216,00		R
		<u>High-tensile welded mesh</u>				
	8.3.2	Mesh reference .193, below screed finishing in hollow core slabs	m²	1555,20		R
	SANS 1200 GE	PRECAST CONCRETE (STRUCTURAL)				
	PSGE-8.2.8.1 6.5	<u>Supply and lay portal and rectangular culverts</u>				
		SATS Class 1 750x600 culvert inclusive of base	m³	166,00		R
	SANS 1200 LE	Stormwater drainage				
	8.2.1	Supply and lay concrete pipe culvert: On Class 100D bedding: Diameter 750mm concrete pipe	m	127,00		R
	PSLE-8.2.15	Supply, handle, lay, joint and bed spigot and socket 200mm HDPE perforated subsoil pipes	m	2160,00		R
		110mm diameter inspection pipe	No	24,00		R
		450mm HEADWALL				
		Build 230mm wall for the headwall, plaster internal and external for depths:	No	2,00		R
		Over and Up to 2,5 m 3,5 m				
	SANS 1200 LB	BEDDING (PIPES)				
	8.2.10 (d)	Supply and install type A4 bidim geotextile material	m²	8875,44		R
	8.2.10 (d)	Supply and install coarse sand and similar approved	m³	216,00		R
	PSLB-8.2.2.3.c	Supply and install 3mm washed stone or similar approved.	m³	216,00		R
		Increase capacity of detention pond	m³	90,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200 L	MEDIUM PRESSURE PIPELINES				
	PSL-8.2.1	Supply, lay and bed pipes in trenches complete with couplings				
		140mm Diameter uPVC Class 16 water supply line	m	86		R
	PSLE 8.2.8	MANHOLES				
		Supply and install SD 3 maholes complete with base and cover up to 1,5m deep				

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		a) Manholes with SABS EN124 D400 heavy duty hinged ductile iron covers and frames for depths: Over and Up to 0,5 m 1,5 m	No	12		R
		b) Supply and and install new communications manholes, levels to be confirmed on site.	No	2		R
		MISCELLANEOUS				
	8.2.11	Connection to existing sewer line Excavate, break, connect to and re-build the existing connecting manhole	Sum	1,00		R
	SANS 1200LG PSLG 8.2.2	PIPE JACKING Supply of 750mm diameter class 100D concrete pipe on class 100D concrete pipe	m	49,44		R
	PSLG 8.2.3	Jacking of 750mm diameter (internal) reinforced concrete pipes	m	49,44		R
	PSLG 8.2.4	Excavation for jacking through hard rock as defined in SANS 1200D	m3	5,00		R
	PSLG 8.2.9a	Establishment of equipment for the stabilization of unstable areas or grouting of voids where necessary and instructed	sum	Rate only		R
	PSLG 8.2.9b	Operation of equipment for the stabilization of unstable areas or grouting of voids where necessary and instructed	Day	Rate only		R
	PSLG 8.2.9c	Materials used for the stabilization of unstable areas or grouting of voids where necessary and instructed	m3	Rate only		R
	PSLG 8.2.10	Standing time for pipe jacking team and equipment due to disruptions out of the control of the contractor	hr	Rate only		R
		MISCELLANEOUS				
		250mm diameter reinforced concrete piles approximately 5m long installed with Auger to refusal. Set ups.	No.	6,00		R
		250mm diameter reinforced concrete piles approximately 5m long installed with Auger to refusal. Pile length including drilling and placement.	m	30,00		R
		Temporary brick walls at pipe ends	No.	2,00		R
		Pipe markers	No.	2,00		R
		Monitoring of railway tracks and existing nearby structures during construction	Sum	1,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	PSMM-8.6	BOLLARDS				
	PSMM-8.6.1	Supply and install bollards in accordance with details on drawings	No.	40,00		R
	SANS 1200 MK	ROADS - KERBING AND CHANNELLING				
	PSMK 8.2.1	Concrete kerbing, edging and channelling				
		Barrier kerb type BK9	m	73,00		R
	PI 4.1	The constructor to supply and install Ecostorm plus 1000 filtration system to manufactures specification	Sum	1,00		R
	8.3.13	SURFACE FINISHES				



ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	PSDM 8.3	Shaping in erven and verges	m3	16736,00		R
TOTAL CARRIED TO SUMMARY						

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		SECTION 4 : TIPPLER AREA				
		NOTE Tenderers are to price this Schedule strictly in accordance with the Specifications and SANS 1200, where a conflict arises between these two documents the Specifications shall take precedence. Where a conflict arises between this Schedule and the Specifications, the Specifications shall take precedence. Tenderers shall study the Drawings before pricing this Schedule and the Schedule shall be priced to provide the complete Works. To be read in conjunction with but not limited to the following Project Technical Specification(s) : - Civil and Structural :				
	SANS 1200 C	<u>SITE CLEARANCE</u>				
	PSC-8.2.1	Temporary stack and stockpile areas	m²	2070,00		R
		Existing pond infills	m²	200,00		R
		<u>Open Channels</u>				
	PSC-8.2.3.a)	De-silt, pressure clean and flow test existing concrete channels	m	470		R
	PSC-8.2.3	<u>Temporary protection of known underground services:</u>				
		<u>Existing Manholes</u>				
		De-silt, clean and flow-test existing manholes	No.	51		R
		<u>Ponds</u>				
		De-silt, clean and reshape existing detention ponds	No.	2		R
		Grass line existing detention ponds	m²	3300		R
	PSC 8.2.7	<u>Dismantle and remove pipelines (not encased in concrete), electricity transmission lines, cables, etc.</u>				
		(a)De-silt, pressure clean and flow test existing stormwater pipelines	m	450		R
	PSC 8.2.13	(b) Cleaning out of existing stormwater slot drain channels after removal of top slot drain for all channel depth ranges	m	2005		R
	PSC-8.2.3.c)	Transport materials and debris to unspecified site and dump	Sum	1		R
		relocate pond 1 electrical line	m	473,00		R
	8.3.13	<u>SURFACE FINISHES</u>				
	PSDM 8.3	Shaping in erven and verges	m²	2070,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200 D	<u>EARTHWORKS</u>				

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	PSD-8.3.2.a	Excavate in all soft and intermediate materials for trapezoidal channel compact and dispose of surplus material to temporary stockpile as described in sub-clause PSD-5.2.2.1.i	m³	322,11		R
	PSD-8.3.2.a	Excavation in soft and intermediate material	m³	96,63		R
	PSD-8.3.2.b	Excavation in hard rock	m³	32,21		R
	SANS 1200 DB	<u>EARTHWORKS</u>				
	PSDB 8.3.2	<u>Excavation and Backfilling for Pipes and Sleeves</u>				
	PSDB-8.3.2.a)	<u>Excavation</u> Excavate in all materials for trenches, backfill, compact and dispose of surplus/ unsuitable material for: For trapezoidal channel as indicated on the drawings:	m	473,00		R
	8.3.2(b)	Extra-over item above for: Hard rock excavation (Provisional)	m³	34,00		R
	8.3.2(c)	Excavate unsuitable material from trench bottom and dispose of (Provisional)	m³	27,00		R
	8.3.3	<u>Excavation Ancilliaries</u> Make up deficiency in backfill material (Provisional)				
	8.3.3.1(a)	from other necessary excavations on site	m³	27,00		R
	PSD-8.3.6	<u>Overhaul</u>	m³.km	9200,00		R
	PSD-8.3.14	<u>Removal of oversized materials</u>	m³			Rate only
		<u>Particular Items</u>				
	8.3.4 (a)	Shore trench (Provisional)	m	338,00		R
		Protection of restricted trench excavation (Provisional)	no	40,00		R
	8.3.5 (a)	Services that intersect the trench (Provisional) :				
		Other services (Provisional)	no.	25,00		R
	8.3.5 (b)	Services that adjoin the trench (Provisional)	m	100,00		R
	SANS 1200 MM 8.3.3	<u>Layerworks</u> Rip, compact and shape in-situ material to a depth of 150mm for maintance roads, compacted to 95% Mod AASHTO density	m2	600,00		R
	1200 DM	<u>Imported Materials for gravel road see drawings</u>				
	8.3.5	150mm thick wearing course layer to S410 compacted to 95% mod AASHTO density	m3	800,00		R
		Fill material layer B material to S410, compacted in 150mm layers to 93% mod AASHTO density	m3	1700,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200 G	CONCRETE (STRUCTURAL)				
		SCHEDULED CONCRETE ITEMS				
		Unreinforced concrete				
		40 Mpa/19mm Concrete- Trapezoidal channel				

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		Concrete grade 40/19 concrete formwork, finishes, curing and jointing . Finish to be wood-floated finish. All to be included in the rate	m³	135,75		R
		<u>High-tensile welded mesh</u>				
	8.3.2	Mesh reference .193, below screed finishing in hollow core slabs	m2	892,08		R
	SANS 1200 GE	PRECAST CONCRETE (STRUCTURAL)				
	PSGE-8.2.8.1 6.5	<u>Supply and lay portal and rectangular culverts</u>				
		SATS Class 1 750x600 culvert inclusive of base	m3	439,00		R
		SATS Class 1 600x450 culvert inclusive of base	m3	22,00		R
	SANS 1200 LE	Stormwater drainage				
	PSLE 8.2.1	Supply, handle, lay and bed spigot and socket stormwater pipes				
		On Class 100D bedding: Diameter 300mm concrete pipe	m	13,00		R
		On Class 100D bedding: Diameter 375mm concrete pipe	m	55,00		R
		On Class 300D bedding: Diameter 750mm concrete pipe	m	113,00		R
		Construct new pond as specified on drawing:				
		450mm HEADWALL				
		Build 230mm wall for the headwall, plaster internal and external for depths:	No	7,00		R
		Over and Up to 2,5 m 3,5 m				
	SANS 1200 LB	BEDDING (PIPES)				
	8.2.10 (d)	Supply and install 150mm polythene sheeting	m2	8875,44		R
	SANS 1200 L	MEDIUM PRESSURE PIPELINES				
	PSL-8.2.1	Supply, lay and bed pipes in trenches complete with couplings				
		140mm Diameter uPVC Class 16 water supply line	m	86		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200LG PSLG 8.2.2	PIPE JACKING Supply of 750mm diameter class 100D concrete pipe on class 100D concrete pipe	m	56,00		R
	PSLG 8.2.3	Jacking of 750mm diameter (internal) reinforced concrete pipes	m	56,00		R
	PSLG 8.2.4	Excavation for jacking through hard rock as defined in SANS 1200D	m3	5,60		R

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	PSLG 8.2.9a	Establishment of equipment for the stabilization of unstable areas or grouting of voids where necessary and instructed	sum	Rate only		
	PSLG 8.2.9b	Operation of equipment for the stabilization of unstable areas or grouting of voids where necessary and instructed	Day	Rate only		
	PSLG 8.2.9c	Materials used for the stabilization of unstable areas or grouting of voids where necessary and instructed	m3	Rate only		
	PSLG 8.2.10	Standing time for pipe jacking team and equipment due to disruptions out of the control of the contractor	hr	Rate only		
		MISCELLANEOUS				
		250mm diameter reinforced concrete piles approximately 5m long installed with Auger to refusal. Set ups.	No.	6,00		R
		250mm diameter reinforced concrete piles approximately 5m long installed with Auger to refusal. Pile length including drilling and placement.	m	30,00		R
		Temporary brick walls at pipe ends	No.	2,00		R
		Pipe markers	No.	2,00		R
		Monitoring of railway tracks and existing nearby structures during construction	Sum	1,00		R
	SANS 1200LD PSLE 8.2.8	SEWERS MANHOLES				
		Supply and install MH SD 5 maholes complete with base and cover up to 1,5m deep				
		a) Manholes with SABS EN124 D400 heavy duty hinged ductile iron covers and frames for depths:				
		Over and Up to				
		0,5 m 1,5 m	No	12		R
		b) Supply and and install new MH SD3, levels to be confirmed on site.	No	1		R
	PSMM-8.6	BOLLARDS				
	PSMM-8.6.1	Supply and install bollards in accordance with details on drawings	No.	40,00		R
	SANS 1200 MK	ROADS - KERBING AND CHANNELLING				
	PSMK 8.2.1	Concrete kerbing, edging and channelling				
		Barrier kerb type BK9	m	65,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200 MM	ANCILLARY ROADWORKS				
	8.2.1	Guardrails on posts				
	8.2.1	Guardrails on posts				
	8.2.1.a)	a) Galvanized W-Beam guardrails on galvanised steel posts in accordance with the details on drawings	m	190,00		R
	8.2.4	Additional guardrail posts	No	5,00		R
	SANS 10142	Supply galvanised Wired Steel Armoured Cable	m	87,00		R



ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
TOTAL CARRIED TO SUMMARY						

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
		SECTION 5 : STOCKPILE AREA				
		NOTE Tenderers are to price this Schedule strictly in accordance with the Specifications and SANS 1200, where a conflict arises between these two documents the Specifications shall take precedence. Where a conflict arises between this Schedule and the Specifications, the Specifications shall take precedence. Tenderers shall study the Drawings before pricing this Schedule and the Schedule shall be priced to provide the complete Works. To be read in conjunction with but not limited to the following Project Technical Specification(s) : - Civil and Structural :				
	SANS 1200 C	<u>SITE CLEARANCE</u>				
	PSC-8.2.1	Clear and grub sites on items below :- Catchment 4 & 5 Pond 9	m² m²	5,27 250,00		R R
	8.3.1	<u>Clear site for items listed below:-</u> Temporary stack and stockpile areas Remove topsoil to a nominal depth of 150mm and stockpile on Site	m² m²	1000,00 800		R R
	PSC-8.2.3.a)	De-silt, pressure clean and flow test existing :				
	PSC-8.2.3.b)	Stormwater pipes 750mm diameter	m	237		R
		Existing Manholes De-silt, clean and flow-test existing manholes	No.	2		R
		Ponds Reshape and resize existing ponds as specified on drawing: Pond 3, 4, 5, 6 ,7, 8	No.	6		R
	PSC-8.2.3.c)	Transport materials and debris to unspecified site and dump	Sum	1		R
	8.3.13	<u>SURFACE FINISHES</u>				
	PSDM 8.3	Shaping in erven and verges	m²	2700,00		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200 D	<u>EARTHWORKS</u>				

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	PSD-8.3.2.a	Excavate in all soft and intermediate materials within the following ranges: For 1820 x 1820mm wide manholes Exceeding 1.5m deep	m³	264,992		R
	PSD-8.3.2.a	Excavation in soft and intermediate material	m³	79,50		R
	PSD-8.3.2.b	Excavation in hard rock	m³	26,50		R
	SANS 1200 DB	<u>EARTHWORKS</u>				
	PSDB 8.3.2	<u>Excavation and Backfilling for Pipes and Sleeves</u>				
	PSDB-8.3.2.a)	<u>Excavation</u> Excavate in all materials for trenches, backfill, compact and dispose of surplus/ unsuitable material for:				
		375 mm class 100D concrete stormwater pipe ii) Exceeding 1.0 m but not exceeding 2.0 m	m	170,00		R
		400 mm class 100D concrete stormwater pipe ii) Exceeding 1.0 m but not exceeding 2.0 m	m	600,00		R
		600 mm class 100D concrete stormwater pipe ii) Exceeding 2 m but not exceeding 3.5 m	m	1000,00		R
	8.3.2(b)	Extra-over item above for: Hard rock excavation (Provisional)	m³	60,00		R
	8.3.2(c)	Excavate unsuitable material from trench bottom and dispose of (Provisional)	m³	60,00		R
	8.3.3	<u>Excavation Ancilliaries</u> Make up deficiency in backfill material (Provisional) from other necessary excavations on site	m³	120,00		R
	PSD-8.3.6	<u>Overhaul</u>	m³.km	9200,00		R
	PSD-8.3.14	<u>Removal of oversized materials</u>	m³			Rate only
		<u>Particular Items</u>				
	8.3.4 (a)	Shore trench (Provisional)	m	30,00		R
		Protection of restricted trench excavation (Provisional)	no	100,00		R
	8.3.5 (a)	Services that intersect the trench (Provisional) :	no.	25,00		R
	8.3.5 (b)	Other services (Provisional) Services that adjoin the trench (Provisional)	m	100,00		R
	SANS 1200 DK	<u>GABIONS AND PITCHING</u>				
	8.2.5	Supply and construct scour protection at outlets Grouted Stone Pitching(Medium Duty)	m2	180		R
	PI2.4	Closing off of redundant roads	m	20		R
TOTAL CARRIED FORWARD						
TOTAL BROUGHT FORWARD						
	SANS 1200 DM	<u>EARTHWORKS (ROADS, SUBGRADE)</u>				
	PSDM-8.3.3	Treatment of road-bed c) Surface preparation and compaction of in-situ materials to minimum of 95% of MOD AASHTO maximum density (100% for sand) to a minimum depth of 150mm <u>Imported Materials for gravel road</u>	m³	52700,00		R

ITEM	PAY REF	DESCRIPTION	UNIT	QTY	RATE ® (Excl. VAT)	AMOUNT (R) (Excl. VAT)
	8.3.5	300 mm thick wearing course layer to S410 compacted to 95% mod AASHTO density	m³	17391,00		R
	SANS 1200 LE	Stormwater drainage				
	PSLE 8.2.1	<u>Supply, handle, lay and bed spigot and socket stormwater pipes</u>				
		On Class 100D bedding: Diameter 375mm concrete pipe	m	170,00		R
		On Class 100D bedding: Diameter 450mm concrete pipe	m	600,00		R
		On Class 300D bedding: Diameter 600mm concrete pipe	m	1000,00		R
	PSLE-8.2.15	Pond 9				
		Construct new pond as specified on drawing:	sum	1,00		R
		450mm HEADWALL				
		Build 230mm wall for the headwall, plaster internal and external for depths:				
		Over and Up to 2,5 m 3,5 m	No	1,00		R
	SANS 1200 LB	BEDDING (PIPES)				
	8.2.10 (d)	Supply and install 150mm polythene sheeting	m2	8875,44		R
	PSLE 8.2.18	30 MPa concrete stormwater headwall complete as per Detail	No.	7,00		R
	SANS 1200 LD	SEWERS				
	PSLE 8.2.8	MANHOLES				
		Supply and install precast Rocla maholes complete with base and cover up to 1,5m deep				
		a) Manholes with SABS EN124 D400 heavy duty hinged ductile iron covers and frames for depths:				
		Over and Up to 2,5 m 3,5 m	No	25,00		R
	SANS 1200 MK	ROADS - KERBING AND CHANNELLING				
	PSMK 8.2.1	Concrete kerbing, edging and channelling				
		Barrier kerb type BK9	m	100,00		R
	PI 2.6	Erosion Protection Hydroseeding of exposed embankment	m2	1500,00		R
TOTAL CARRIED TO SUMMARY						

Bill of Quantities	
Suammary page	

SECTIONS	TOTAL
SECTION 0: Preliminaries & General	R
SECTION 1: Causeway Areas	R
SECTION 2:Multi-Purpose Terminal (MPT) Area	R
SECTION 3:Rail Embankment Area	R
SECTION 4 Tippler Area	R
SECTION 5:Stockpile Area	R

TOTAL (EXCLUDING VAT)	R

ALLOW VAT @15%	R

TOTAL (INCLUDING VAT)	R



Document reference	Title	No of page
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	<i>Contractor's</i> works	
	Total number of pages	81



Role	Name	Title	Signature	Date
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C3.1 EMPLOYER'S WORKS INFORMATION

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TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)



SECTION 1

1 Description of the works

1.1 Executive overview

The Environmental Authorizations (Records of Decision) was granted by the National Department of Environmental Affairs and Tourism for the expansion of the Iron Ore terminal at the Port of Saldanha citing the specific condition that a Stormwater Management Plan that complies to the Department of Water Affairs and Forestry's (DWAF) is required. Consequently, in 2014, Transnet National Ports Authority (TNPA) appointed an engineering service consultant, Hatch Goba (henceforth the Hatch Report) to perform a Stormwater Management Plan Pre-feasibility study of the for Port of Saldanha. The scope of the Pre-feasibility included Transnet Port Terminal leased areas and concluded that existing stormwater management infrastructure in certain areas of the Terminal are inadequate for 1:50 year flood conditions. The Pre-Feasibility report considered options for the management, treatment and discharge of stormwater within the various study areas to ensure environmental compliance.

Following the Pre-Feasibility study, Transnet Port Terminals appointed Transnet Group Capital (TGC) in 2016 to undertake a Feasibility Study design study to upgrade the stormwater infrastructure in the Port of Saldanha and to execute the recommendations of the SWMP as listed in the ROD. The Feasibility Study included an Environmental Basic Assessment Report (BAR), performed by Nsovo Environmental Consulting in 2017, in line with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014 as amended in April 2017 (the Regulations) to ensure environmental legislative compliance and inform the design. See Environment Management Programme (EMPr) report for more information.

From 2016 to 2021, the Saldanha stormwater concepts and feasibility designs were developed in compliance to the project's environmental BAR, as well as specific Terminal operational and maintenance requirements:

- 1.1.1 The approved stormwater design concept is that of zero discharge - no discharge of stormwater runoff into the sea more than once every 50 years.
- 1.1.2 The exception to the design concept of zero discharge is the Multi-Purpose Terminal (MPT) which will conform to the design concept of controlled discharge – discharge of stormwater is only allowed after passing through an approved filtration system.

The MPT was classified as having a low iron ore pollution concentration and approval was granted by the Department of Environment, Forestry and Fisheries (DEFF) for the controlled discharge through the application of a Coastal Waters Discharge Permit. In addition, two additional environmental licenses; Waste Management License and Water Use License were applied for and obtained from the DEFF and Department of Water and Sanitation for the disposal and storage of stormwater in ponds respectively. The two (2) environmental licenses and one (1) permit took a total of 3 years and 6 months for approval.

In 2022 after restructuring within the business, the TGC designs were handed over to Transnet Port Terminal designers who were tasked to take the Feasibility Study designs to Execution Phase designs. During the Execution design phase, a Design Change Notice (DCN) was issued in July 2022 to address Terminal maintenance challenges and project interface challenges as seen in Annexure F. Detailed designs were completed to a level that is appropriate for construction during the Execution Phase.

The battery limit areas in Transnet Port Terminal’s design scope (TPT areas only) included the following:

- I. Tippler Area
- II. Rail Embankment
- III. Multi-purpose Terminal
- IV. Stockyard
- V. Causeway

Iron Ore Jetty – excluded from the project scope. Terminal to address outside this project

For each of the above-mentioned areas, the engineering scope included the preparation of detailed design drawings, design criteria reports, design reports, stormwater management and maintenance plan and works information. See locality plan (Figure 1) showing all areas of concern.



Figure 1: Locality plan

1.2 Employer's objectives

The current strategy is to grow the iron ore export capacity, the current bulk cargo export and marine repair business in the Port of Saldanha. For the port to sustain current business and to comply with Environmental Legislation, the port operator must ensure that all conditions as stipulated in the environmental approvals for previous port developments / expansions specific to his/her operations are adhered to. The upgrading of the storm water infrastructure within the port therefore is an integral part of the strategic plan for the port expansion and viability.

1.3 Interpretation and terminology

The following abbreviations are used in this works Information:

Table 1

Abbreviation	Meaning given to the abbreviation
AIA	Authorised Inspection Authority
BBBEE	Broad Based Black Economic Empowerment
CEMP	Construction Environmental Management Plan
CD	Compact Disc
CDR	Contractor Documentation Register
CDS	Contractor Documentation Schedule
CSHEO	Contractor's Safety, Health and Environmental Officer
CM	Construction Manager
CWDP	Coastal Waters Discharge Permit
DP	Data Pack
DTI	Department of Trade and Industry
DWG	Drawings
EA	Environmental Authorisation
EO	Environmental Officer
EMP	Environmental Management Plan
HAZOP	Hazard and Operability Study
FEQ	Field Engineering Query
GA	General Arrangement Drawing
HSSP	Health and Safety Surveillance Plan
ID	Personal identification document
ipIP	Industrial Participation
IR	Industrial Relations
IPP	Industrial Participation Policy
IPS	Industrial Participation Secretariat
IRCC	Industrial Relations Co-ordination Committee

JSA	Job Safety Analysis
CIRP	Contractor's Industrial Relations Practitioner
Native	Original electronic file format of documentation
NEMA	National Environmental Management Act
PES	Project Environmental Specifications
NCR	Non-conformance report
PHA	Preliminary Hazard Assessment
PIRM	Project Industrial Relations Manager
PIRPMP	Project Industrial Relations Policy and Management Plan
PLA	Project Labour Agreements
PLP	Project Lifecycle Process
PSIRM	Project Site Industrial Relations Manager
PSPM	Project Safety Program Manager
YPCS	Yard Point Control System
VIS	Vehicle Identification System
PSSM	Project Site Safety Manager
ProgEM	Programme Environmental Manager
ProjEM	Project Environmental Manager
PQP	Project Quality Plan
QCP	Quality Control Plan
QA	Quality Assurance
SANS	South African National Standards
SASRIA	South African Special Risks Insurance Association
SCD	Subsoil Collector Drain
SES	Standard Environmental Specification
SHE	Safety, Health and Environment
SHEC	Safety, Health and Environment Co-ordinator
SIP	Site Induction Programme
SMP	Safety Management Plan
SSRC	Site Safety Review Committee
OC	Degree Celsius
A	Ampere
D	Diameter
ECC	Earth Continuity Conductor
ECSA	Engineering Council of South Africa
FAT	Factory Acceptance Test
Hz	Hertz
km	Kilo meter
kVA	Kilo-Volt Ampere
LV	Low Voltage
m	meter
MCB	Miniature Circuit Breaker
MCC	Motor Control Centre
mm	millimetre
mm ²	millimetre squared
ORS	Owners Requirement Specification
PVC	Polyvinyl Chloride

TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)



SCADA	Supervisory Control and Data Acquisition
SANS	South African National Standards
WML	Waste Management Licence
WUL	Water Use Licence

2 Engineering and the *Contractor's* design

2.1 *Employer's* design

The *Employer* supplies the following:

2.1.1 Works Information

2.1.2 Technical specifications (See section 4.1 for complete list of technical specifications)

3 General Arrangement, Layout and Detail Drawings (See section 5)

The list of drawings for providing the works are listed in section 5 of this Works Information. The *Employer* grants the *Contractor* a license to use the copyright in design data presented to the *Contractor* for the purpose of the *works* ONLY.

3.1 Procedure for submission and acceptance of *Contractor's* design

The *Contractor* shall adhere to the following procedures:

3.1.1 Submit designs in both hard copy and electronic native format to the Project Manager for review and approval.

3.1.2 Contractor may not proceed with these works until written approval is obtained from the Project Manager

3.1.3 The Contractor undertakes design safety reviews with the Project Manager, Safety Manager and other relevant personnel as determined by the Project Manager.

3.2 Review and Acceptance of *Contractor* Documentation

The *Contractor* is to design the following parts of the works, for acceptance by the *Project Manager*:

3.2.1 Designs required to perform dewatering for proper execution of works.

3.2.2 Designs for shoring required during excavations as specified in section 3.1 below.

3.2.3 Other drawings, specifications and reports for equipment that the contractor is responsible for.

3.2.4 Any design alterations that the contractor may formulate to ensure the correct execution of the works unless expressly stated to form part of the design responsibility of the Employer as stated under 2.1 Employer's design above and whether or not specifically stated to form part of the design responsibility of the Contractor under this paragraph 2.2, all residual design responsibility and overall responsibility for the total design solution for the works rests with the Contractor.

3.3 Other requirements of the *Contractor's* design

The *Contractor's* design complies with the relevant SANS standards and Transnet Port Terminals standard specification.

3.4 Use of *Contractor's* design

The *Contractor* grants the *Employer* a licence to use the copyright in all design data presented to the *Employer* in relation to the works for any purpose in connection with the construction, re-construction, refurbishment, repair, maintenance and extension of such licence being capable of transfer to any third party without the consent of the *Contractor*.

The *Contractor* vests in the *Employer* full title guarantee in the intellectual property and copyright in the design data created in relation to the works as follows:

Any design alterations that the contractor may formulate to ensure the correct execution of the works.

3.5 Design of Equipment

The *Contractor* submits his design details for the following categories of his proposed principal Equipment to the *Project Manager* for his information only:

As per works described in this works information and supplied drawings to the true nature and extent of the works.

The following principal Equipment categories deployed for the *Contractor* to provide the works require. Its design to be accepted by the *Project Manager* under ECC Clause 23.1:

3.5.1 Equipment required to be included in the works.

3.5.2 As per works described in this works information and supplied drawings to the true nature and extent of the works.

3.5.3 As-built drawings, operating manuals and maintenance schedules.

3.6 Timetable for Submission of Documents

Refer to the *Contractor* Documentation Schedule (CDS) contained in Annexure 2 for the timetable of submission of as-built drawings, operating manuals and maintenance schedules. This timetable shall also be accurately reflected in the *Contractor's* Documentation Register (CDR). The *Contractor* submits the first issue of the CDR to the *Project Manager* within 7 days of the Award of Contract.

3.7 As Built/Final Documentation

This is defined as Certified 'As Built /Final Accepted' documentation for which no further review is required. The final documentation shall form part of the final *Contractor* Manual(s) or Data Packs.

The *Contractor* shall provide documents that will have an As-Built status are detailed within each Contract or Procurement package in the *Contractor* Documentation Schedule (CDS).

The *Contractor* shall provide the 'As-Built' documentation that forms part of the Operating, Instruction and Maintenance Manuals that were issued and accepted prior to 'As-Built' conditions for inclusion in these types of manuals by the *Project Manager*.

3.8 Maintenance and Operating Manuals and Data Packs

The *Contractor* compiles and delivers the Maintenance and Operating Manuals and Data Packs as prescribed in the Contractor Documentation Schedule (CDS).

These shall be supplied by the *Contractor* as manuals in a loose-leaf A4 hard covered, red, grease- and water-proof 4D-ring binder.

Drawings and charts larger than A4 shall be folded and those greater than A3 shall be enclosed in an A4 plastic pocket of adequate strength.

Manuals shall be well indexed and user friendly. Manuals shall include a summarized Table of Contents and in manuals comprising a number of files/volumes there should be one summarized Table of Contents in each of the files/volumes. The draft Table of Contents shall be submitted for review to the *Project Manager* prior to the compilation and official submittal of the manuals. The technical content of manuals shall be specified by the *Project Manager*.

The originals of all brochures shall be issued to the *Project Manager*. When a general brochure is applicable to a range of equipment, then a specific item, catalogue number or model number shall be stated, which is best achieved by introducing a separate index page, which cross-references the specific item to a tag number.

The address, phone numbers, fax numbers and reference numbers of all *Sub-Contractors* and Suppliers shall be provided.

Where manuals contain drawings that still need to be revised to “As-Built” status, and such manuals are required prior to “As-Built” status, the manual will not be considered to be in its final form until the “As-Built” version of each drawing has been incorporated.

A typical example of what the binder/file(s) shall be marked with on the spine and the front cover is as follows: -

3.8.1 Project Name

3.8.2 Manual Title, e.g. Installation, Maintenance and Operating Manual

3.8.3 FBS No. and Title

3.8.4 Manual Numbering (e.g. Volume 1 of 2, etc.)

3.8.5 Contract Number

3.8.6 Contractor Name

Four hard copies of each manual are to be supplied. One copy of each of the Maintenance and Operation Manuals are to have each page laminated in clear plastic. In addition to the hard copies, the *Contractor* is to provide two electronic copies of each manual in PDF format. Each copy of each manual is to be provided on a separate, clearly marked CD-ROM.

Where it is practical to do so, hard copies of the Maintenance and Operation Manuals may be combined.

Refer also to the Data Packs and Manuals section of the ‘Contractor Document Submittal Requirements’ DOC-STD-0001. Where there is any contradiction between the contents of DOC-STD-0001 and this section of the Works Information, the contents of this section shall apply.

Operating manuals and maintenance schedules shall be supplied for each component supplied under this contract, in particular and without limitation operating manuals and maintenance schedules will be required for:

- Operating manuals for the entire system including but not limited to:
 - Start-up procedures
 - Alarms
 - Safety systems and equipment

- Control systems and architecture.
- Maintenance manuals for structural steel and *Contractor's* specific equipment. The manuals shall be provided in four paper copies carefully bound into four volumes. In addition, two electronic copies in pdf format shall be provided, the electronic copies shall be provided on compact discs.

4 Construction

4.1 Temporary works, Site services & construction constraints

4.1.1 *Employer's* Site entry and security control, permits, and Site regulations.

The Site is located within an operational area of the *Employer* and the *Contractor* shall ensure the safe passage of traffic to and around the Site at all times. This shall entail the provision of flagmen, protective barriers, lanterns, signs, etc. for protection, direction and control of traffic.

The *Contractor* shall organize the work to cause the least possible inconvenience to other construction activities or operations at the Site. Access for Others to adjacent areas shall be maintained at all times.

The Site is located within a designated Secure Area, and accordingly all access into the area will be through a gate with access control.

The *Contractor* shall obtain the necessary entry permits for all staff working within the area in accordance with the access control requirements of the *Employer* and shall issue each personnel member with an appropriate identification card.

All costs incurred in providing construction personnel with ID cards and access permits shall be borne by the *Contractor*.

The site establishment area shall be clearly sign posted and be compliant with the relevant safety regulations and restrictions that might be in place until the *Contractor* has de-established from site and comply with OHS Act 85 of 1993.

The *Contractor* is responsible for the security of the works until completion and hand-over and must make his own arrangements for security and the safekeeping of his property. The *Contractor's* watchmen are allowed on Site for this purpose.

If the working area is situated within a Customs controlled area, the *Contractor* and his people shall observe all Customs regulations.

The fullest collaboration between the *Contractor*, the *Employer's* Operations Manager and the *Project Manager* is essential in regard to the continued operations of the *Employer*.

Housing of the *Contractor's* people on site is not permitted.

All work on, over, under or adjacent to railway lines and near high voltage equipment shall comply with Transnet SOC Limited codes of conduct.

4.1.2 The *Contractor* complies with the following requirements of the *Employer*:

As per paragraph 3.1.1 above.

4.1.3 Restrictions to access on Site, roads, walkways and barricades as per paragraph 3.1.1 above.

People restrictions on Site; hours of work, conduct and records:

The working hours shall be in accordance with the requirements of the Department of Labour or with the agreement of the relevant trade unions. This information relating to working hours shall be supplied to the *Project Manager* prior to commencement of the proposed working hours.

Contractor's staff shall be confined to the working area and defined access routes and shall not be allowed to be present in other areas of the *Employer*. *Contractor* staff found disobeying this instruction will be subject to disciplinary action.

4.1.4 The *Contractor* keeps daily records of his people engaged on the Site and Working Areas (including Subcontractors) with access to such daily records available for inspection by the *Project Manager* at all reasonable times.

4.1.5 Health and safety facilities on Site

At all times during construction the *Contractor* is responsible for the safety of all persons on the Site and on the equipment and shall have the necessary systems and procedures in place to effectively manage this in relation to H & S requirements in addition to those of the OHSA Act and Regulation (85 of 1993, CR 2014).

4.1.6 The *Contractor* complies with the requirements stated under paragraph 2.3 of C3.1 *Employer's* Works Information.

4.1.7 Environmental controls, fauna & flora, dealing with objects of historical interest. The *Contractor* shall perform the works and all construction activities within the Site and Working Areas having due regard for the environment and environmental management practices. As per project's Environmental Management Plan (EMP).

4.1.8 The *Contractor* complies with the CEMP and SES in the construction of the works, all as described in *Employer's* Works Information.

4.1.9 Title to Materials from demolition and excavation

4.1.10 Clause 73.2 states that the *Contractor* has title to Materials from excavation and demolition only as stated in the Works Information.

4.1.11 The *Contractor* has title to all Materials arising from excavation and demolition in the performance of the works. The *Project Manager* shall instruct the *Contractor* how to label, mark, set aside and/or dispose of such Materials for the benefit of the *Employer* in accordance with ECC Clause 73.1.

4.1.12 Co-operating with and obtaining acceptance of others.

During the course of the contract, departments of Transnet and other *Contractors* may be working in the general area surrounding the working area. The *Contractor* must make allowance for the necessity to interface with the activities of others, and to allow for safe access and working conditions.

4.1.13 Trenching and excavation work to obtain strict supervision of local signals department and in certain instance may require preparation work of the signal's *Contractor*. Reroute cables or boxes or decommission certain elements. Local signals to verify existing signal or VIS elements in vicinity. No new signal works required.

4.1.14 At least some of the Site work may take place while the adjacent areas will be in operation. The Contractor shall take all necessary steps for his works not to interfere with operations and to ensure that normal traffic flow of the operational terminal is not obstructed.

4.1.15 The success of the project depends on the effective co-operation of all Contractors on site, and the Contractor, if necessary, must discuss his programme on a day-to-day basis with the Project Manager to ensure effective co-ordination.

4.1.16 Publicity and progress photographs

The *Contractor* treats all information gained through his appointment on this project as strictly confidential. The *Contractor* is not allowed to prepare or present any paper, publish any article in a technical journal, or derive publicity for his business which makes any reference to any aspect of the work on this project unless the *Employer* grants special permission, in writing, for the purpose.

No photographs are to be taken unless the photographer is in possession of a camera permit issued by the TNPA Chief Security Officer, Port of Saldanha. Photographs are to be taken for record purposes only.

The *Contractor* provides a comprehensive photographic record of the progress of the works by taking photographs at weekly intervals. The initial photographs are to be taken at the start of the project, immediately prior to the commencement of any work. As far as possible each set of photographs shall be taken from the same locations as the previous set.

The areas to be photographed and the quantity of photographs in each area will be determined by the *Project Manager*.

Progress photographs of all manufacturing work carried out off-site are also required.

Photographs are to be submitted in JPEG format, with a minimum resolution of 1200 x 800. Each set of photographs must be accompanied by an index showing:

- Contract reference.
- Photograph file reference
- Date of Photograph
- Subject matter

4.1.17 The *Contractor* provides a notice.

4.1.18 The *Contractor* does not advertise the contract or the project to any third party, nor communicate directly with the media (in any jurisdiction) whatsoever without the express written notification and consent of the *Project Manager*.

4.1.19 *Contractor's* Equipment

All Equipment supplied and used by the *Contractor* on Site shall be selected and operated in such a way that design loadings of the particular areas are not exceeded and that damage to all existing surfaces and services are avoided. The *Contractor* will be required to repair, at his own cost and to the satisfaction of the *Project Manager*, any such damage caused by him.

The *Contractor* shall keep daily records of all Equipment used on Site and the Working Areas with access to such daily records available for inspection by the *Project Manager* at all reasonable times.

All Equipment necessary for the works shall be provided and allowed for by the *Contractor*.

4.1.20 The *Contractor* keeps daily records of his Equipment used on Site and the Working Areas (distinguishing between owned and hired Equipment) with access to such daily records available for inspection by the *Project Manager* at all reasonable times.

4.1.21 Equipment provided by the *Employer*.

No Equipment will be provided by the *Employer*.

4.1.22 Site services and facilities:

When required in terms of the delivery methodology, a Site will be made available to the *Contractor* as erection Site and for all his Working Areas.

An electric supply point is available to the *Contractor* at this site, but the *Contractor* is responsible for connecting up and for cabling in the working area.

A potable water supply point is available to the *Contractor* at this site, but the *Contractor* is responsible for connecting up in the working area.

The *Contractor* shall make his own arrangements for the supply of other services such as ablutions, fire protection, lighting and all other services required for undertaking the works. The *Contractor* shall provide, maintain and finally remove proper portable latrines of sufficient number at his cost. Latrines shall be properly constructed and placed in suitable positions and maintained in a clean and sanitary working condition.

Wherever the *Employer* provides facilities for the *Contractor's* use within the Working Areas and the *Contractor* adapts such facilities for use, then the *Contractor* makes good and provides full reinstatement to the land (including all apparatus of the *Employer* and Others in, on or under the land) and surrounding areas to its original standard upon dismantling of such facilities and hand-back to the *Employer*.

4.1.23 Facilities provided by the *Contractor*:

The *Contractor* submits the following drawings to the *Project Manager* for acceptance before commencing with the establishment of the site facilities:

Location drawing showing the area to be occupied by the *Contractor* in relation to the Port infrastructure.

Layout drawing of the proposed facilities.

The *Contractor* must ensure that the working area is well lit at night and that all the fences, obstacles and hazards are marked.

Project Manager's approval must be obtained for the use of any temporary lighting on the Site due to the impact that this may have on surrounding operations.

The *Contractor* must maintain the working area in a neat and tidy condition to the satisfaction of the *Project Manager*.

The *Contractor* must make his own arrangements for the disposal of sewerage and wastewater. Sewerage may not be disposed of on site. Transnet facilities may not be used.

The *Contractor* must make his own arrangements for telecommunication facilities, if required, for his use during the execution of the works.

The *Contractor*, within fourteen days after completion, must completely remove from site all his plant, materials, Equipment, stores and temporary accommodation or any other asset belonging to him and leaves the site in a tidy condition to the satisfaction of the *Project Manager*. No excess or discarded materials, plant or stores may be buried or dumped within the *Employer's* boundaries.

Unless expressly stated as a responsibility of the *Employer*, Site services and facilities, all residual requirements for the provision of facilities and all items of Equipment necessary for the *Contractor* to Provide the works remains the responsibility of the *Contractor*.

4.1.24 Wherever the Contractor provides facilities (either his own or for the Project Manager and/or Supervisor) and all items of Equipment, involving, inter alia, offices, accommodation, laboratories, Materials storage, compound areas etc., within the Working Areas, then the Contractor makes good and provides full reinstatement to the land (including all apparatus of the Employer and Others in, on or under the land) and surrounding areas to its original standard, upon dismantling of such facilities and items of Equipment.

4.1.25 Unless expressly stated as a responsibility of the *Employer*, Site services and facilities, all residual requirements for the provision of facilities and all items of Equipment necessary for the *Contractor* to Provide the works remains the responsibility of the *Contractor*.

4.1.26 Existing premises, inspection of adjoining properties and checking work of Others.

The *Contractor* will be held responsible for any damage to existing structures and services caused by him during the execution of this Contract, fair wear and tear excluded, and shall repair damage to the satisfaction of the *Project Manager* before completion of the works.

For this purpose, a joint inspection with the *Project Manager* and the *Contractor* will be carried out prior to occupation of the *Works* and any existing damage noted. Repair work to damaged existing structures and services may be carried out during the contract period or during the defect correction period if so authorized. The *Contractor* will be required to conduct a photographic site survey of the occupied area showing existing structures and services. This report must be submitted to the *Project Manager* for approval and will be used in assessing the damages to structures and services if applicable. Special site inspection is required to ascertain cables and location of (YPCS) Yard Port Control system and weighbridge cables in area.

4.1.27 The *Contractor* the work of with which the works interfaces in conjunction with the *Project Manager*:

4.1.28 Survey control and setting out of the works.

Immediately after the starting date, and prior to final design, the *Contractor* shall survey the complete site of final operation of the equipment or, if the site of final operation is not completed yet, obtain the necessary site arrangement and interface drawings from the *Project Manager*. This survey serves to confirm dimensions and relative positions of all things, existing or to be supplied by others that will interface with the equipment, for example location of electrical power supply points.

It is the *Contractor's* responsibility to ensure that the equipment supplied in terms of the contract interfaces successfully with all existing infrastructure.

Any deviation from the data supplied by the Employer in the Works Information must be brought under the attention of the Project Manager and discussed and finalized with the *Project Manager* prior to final design of the equipment.

4.1.29 Excavations and associated water control

All excavations deeper than 1.0m below ground level or as otherwise indicated by the Employer's Safety Officer and *Supervisor* in terms of the current Construction Regulations, shall either be fully shored, or the sides shall be battered back to a safe angle as determined by the strength of the soil and approved by the *Supervisor*.

Shallow ground water may be encountered in the excavations. Where this occurs, the *Contractor* is to provide suitable de-watering equipment. The discharge from the dewatering equipment must be controlled in accordance with the requirements of the Standard Environmental Specification and Construction Environmental Management Plan. Discharge shall be into the nearest retention pond or storm water drainage system that drains into a retention pond. No discharge into the sea is not permitted.

4.1.30 Underground services, other existing services, cable and pipe trenches and covers.

The *Contractor* must, in collaboration with the *Supervisor*, ascertain whether or not the service is live. The *Contractor* shall not uplift any such service unless he is instructed to do so.

The *Contractor* shall be held responsible for any damage to existing services, and he shall take all necessary measures to protect them. All excavations to be preceded by proven services. In the event of a service being damaged, the *Contractor* shall immediately notify the *Supervisor*. The *Contractor* shall not repair any such service unless he is instructed to do so.

4.1.31 Where the *Contractor* encounters existing underground services / existing services cables / pipe, the *Contractor* should notify the *Project Manager*.

4.1.32 Control of noise, dust, water and waste

All Site activities must comply with the relevant parts of legislation.

4.1.33 The *Contractor* notifies the *Supervisor* of the elements of the works which are to be covered up.

4.2 Completion, testing, commissioning and correction of Defects

4.2.1 The work to be done by the Completion Date

On or before the Completion Date the Contractor shall have done everything required to Provide the works including the work listed below which is to be done before the

Completion Date and in any case before the dates stated. The *Project Manager* cannot certify Completion until all the work listed below has been done and is also free of Defects, which would have, in his opinion, prevented the *Employer* from using the works and others from doing their work.

4.2.2 Testing and commissioning of works

After completion of the works, the new works shall be thoroughly tested to ensure all systems functions and performs to the desired specifications as per the Technical Specifications and design drawings and that all the works is free from any defects or issues that will prevent the *Employer* from using the works.

4.2.3 Use of the works before Completion has been certified.

In terms of Clause 35.2 in ECC the *Employer* may use any part of the works before Completion has been certified.

4.2.4 The *Contractor* ensures that the *Project Manager* has a full and accurate dossier of As-built documents that represent the status of the completed works (to include Plant within the works) to present to the Employer.

4.2.5 Access given by the *Employer* for correction of Defects.

Clause 43.4 requires that the *Project Manager* arrange for the *Employer* to allow the Contractor access to and use of a part of the works, which has been taken over if needed to correct a Defect. After the works have been put into operation, the Employer may require the Contractor to undertake certain procedures before such access can be granted.

4.2.6 The *Contractor* complies with the following constraints and procedures of the *Employer* where the *Project Manager* arranges access for the *Contractor* after Completion:

Where the *Contractor* has to return to Site after Completion to rectify notified Defects, the Employer may either impose the same Site access / egress restrictions as communicated elsewhere under C3.1 *Employer's* Works Information at the starting date / access date stated under Contract Data - Part One, or as the works are now in use or the *Employer's* occupation of the Site may be incrementally or substantially changed post Completion, there may be further access / egress restrictions stated here at paragraph 3.2.13 of C3.1 *Employer's* Works Information.

5 Plant and Materials Standards and Workmanship

5.1 Standards and Specifications

All work done, and materials supplied, must conform to the requirements of the relevant standards as set out in the following schedules:

5.1.1 National and International Codes and Standards

Table 2

SANS Specifications	
SANS 1200	Code of practice for use with standardized specification for civil engineering construction
SANS 1200 A	General
SANS 1200 C	Site Clearance
SANS 1200 D	Earthworks
SANS 1200 DA	Earthworks (Small Works)
SANS 1200 DB	Earthworks (Pipes trenches)
SANS 1200 DM	Earthworks (roads, sub grade)
SANS 1200 G	Concrete (Structural)
SANS 1200 GE	Precast Concrete
SANS 1200 GM	Concrete (small works)
SANS 1200 L	Medium Pressure Pipelines
SANS 1200 LB	Bedding Pipes
SANS 1200 LC	Cable Ducts
SANS 1200 LG	Pipe Jacking
SANS 1200 LD	Sewers
SANS 1200 LE	Stormwater
SANS 1200 M	Roads General
SANS 1200 ME	Subbase
SANS 1200 MF	Base
SANS 1200 MH	Asphalt surfacing
SANS 1200 MJ	Segmented paving
SANS 1200 MK	Kerbing
SANS 1200 MM	Ancillary roadworks
SANS 927	Precast concrete kerbs, edgings and channels
SANS 731	Road markings Part 1: Single-pack solvent-borne paints
SANS 1091	National colour standard
HE 9/2/8	Corrosion protection
SANS 1083	Aggregates For Concrete
SANS 667	Pre-cast Concrete Pipes
SANS 10144	Detailing of Steel Reinforcement for Concrete
SANS 3000	Railway Safety Management. Requirements for systemic engineering and operational safety standards - Track and associated civil infrastructure and installations

SANS 3001	Civil Engineering Test Methods (various - replacing TMH1 of 1998)
SANS 10142	Code of Practice for the Wiring of Premises
SANS 10100-2:1992	The Structural use of concrete – Part 2: Materials and execution of work
SANS 50197-1	Cement – composition, specifications and conformity criteria. Part 1: Common cements
SANS 1491-1	Portland cement extenders – Part 1 Ground granulated blast furnace slag
SANS 1491-2	Portland cement extenders – Part 2 Fly ash.
SANS 1491-3	Portland cement extenders – Part 3 Condensed Silica Fume
SANS 110	Sealing compounds for the building industry, two-component, polysulphide base
SANS 1023	Preformed Elastomeric Compression Joint Seals

5.1.2 Transnet Standards and General Specifications

Table 2

Transnet Standards and General Specifications	
S406	Specification for the supply of stone
S410	Transnet Specification for Railway earthworks
E10	Specification for Railway Trackwork
E7/1	works on, over, under or adjacent to railway lines & near high voltage equipment
E10/1 to E10/4	Supplementary specifications
SARTSM	Signing for railway crossings (Volume 2)
MTM 2012	Manual for track maintenance 2012
HE 9/2/8	Corrosion protection
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
BS 8110 Part 1	Structural use of Concrete
AASHTO M153	Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
Version 1.2.2.20	Stormwater Filtration System Specification
	Heavy Metals Filtration System Guidelines and Experiences

Where there is any contradiction between the requirements of the Transnet standard specifications and the requirements of this Works Information, the higher level of specification shall apply.

5.1.3 Environmental Standards

The stormwater design is governed by three environmental licenses:

- VI. -Coastal Waters Discharge Permit (CWDP)
- VII. -Water Use License (WUL)
- VIII. -Waste Management License (WML)

The following standards and legislation apply to this project:

- IX. -The Constitution of South Africa (1996)
- X. -National Environmental Management Act (1998)

(1) Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorized by law or cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment.

(3) The measures required in terms of subsection (1) may include measures to—

- (a) investigate, assess and evaluate the impact on the environment.
- (c) cease, modify or control any act, activity or process causing the pollution or degradation.
- (d) contain or prevent the movement of pollutants or the cause of degradation.

- XI. -Environmental Impact Assessment Regulations (2010)
- XII. -Saldanha Bay Municipality Storm Water Management By-Laws (2012)
- XIII. -National Heritage Resources Act (1999)
- XIV. -Integrated Coastal Management Act (2008)
- XV. -National Water Act No 36 of 1998

5.1.4 Use of SANS 1200 Series of Specifications

The SANS 1200 Series of Specifications are applicable to all Civil Engineering and Structural works associated with this Contract.

In case of any conflict in interpretation, ambiguity or discrepancy between any SANS 1200

Specification (whether standard or written as a particular project specification) contained in the

Works Information and the conditions of contract, the conditions of contract take precedence within the ECC3 contract.

In case of any conflict in interpretation, ambiguity or discrepancy between any SANS 1200 Specification (whether standard or written as a particular project specification) contained in this paragraph 4.3 and 4.4 of the *Employer's* Works Information and specific statements contained elsewhere in C3.1 *Employer's* Works Information, the specific statements contained elsewhere.

shall prevail, without prejudice to the *Project Manager's* express duty to resolve any ambiguity or inconsistency in the Works Information under ECC3 Clause 17.1.

5.1.5 Interpretation of SANS terms

Where SANS 10142 and/or SANS 10198 specifications are used within the works Information,

then where the term "Equipment" (or the like) is used with the meaning of installation and items

left behind in the works, then please read this term as "Plant" for ECC3 defined term compliance.

Within SANS 1200 A: GENERAL, the following amendments and interpretations shall apply:

- Where the word or expression "Employer" is used, read "*Employer*".
- Where the word or expression "Contractor" is used, read "*Contractor*".
- Where the word or expression "Engineer" is used, read "*Project Manager*" or "*Supervisor*" as the context requires.
- Where the word or expression "schedule of quantities" is used, this is deleted in entirety.
- Assessment and payment are in accordance with the conditions of contract (and the ECC3 main and secondary options stated therein).

Within SANS 1200 A: GENERAL 2.3 DEFINITIONS, the following apply:

- "Acceptable. Approved (Approval)" is interpreted as either a *Project Manager* or a *Supervisor* communication or instruction in relation to Works Information compliance, consistent with the conditions of contract as the context requires.
- "Adequate" is deleted. The *Project Manager* notifies the *Contractor* where the *Contractor* has not complied with the Works Information.
- Assessment and payment are in accordance with the conditions of contract (and the ECC3 main and secondary options stated therein).

Within SANS 1200 A: GENERAL 2.6 APPROVAL, the following applies:

-“Approval” by either the *Project Manager* and/or the *Supervisor* is without prejudice to ECC3 Clause 14.1 and, inter alia, ECC3 Clauses 13.1, 14.3 and 27.1.

SANS 1200 A: GENERAL 2.8 ITEMS IN SCHEDULE OF QUANTITIES, is deleted in entirety. Assessment and payment are in accordance with the conditions of contract (and the ECC3 main and secondary options stated therein).

SANS 1200 A: GENERAL 3.2 STRUCTURES AND NATURAL MATERIAL ON SITE, applies only to the extent that it is consistent with paragraph 3.1.10 of C3.1 Employer’s Works Information.

Within SANS 1200 A: GENERAL 7.1 PLANT, the following applies:

- Where the word or expression “Plant” is used, read “Equipment”.

SANS 1200 A: GENERAL 7.2 CONTRACTOR’S OFFICES, STORES AND SERVICES, applies but the Project Manager resolves any inconsistency with statements included within paragraph 3.1.11 of C3.1 Employer’s Works Information.

SANS 1200 A: GENERAL 3.1 SURVEY, applies only to the extent that it is consistent with paragraph 3.1.13 of C3.1 Employer’s Works Information.

Within SANS 1200 A: GENERAL 3.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS, the following applies:

- XVI. -Where the word or expression “specification” is used, read “Works Information”.

SANS 1200 A: GENERAL 3.4 PROTECTION OF OVERHEAD AND UNDERGROUND

SERVICES applies only to the extent that it is consistent with the specific statements made elsewhere in C3.1 Employer’s Works Information and in any case and at all times consistent with the *conditions of contract*.

Within SANS 1200 A: GENERAL 5 TESTING, the following applies:

- XVII. -Where the word or expression “Engineer” is used, read “Supervisor”.

SANS 1200 A: GENERAL 8 MEASUREMENT AND PAYMENT, is deleted in entirety. Assessment and payment are in accordance with the conditions of contract (and the ECC3 main and secondary options stated therein).

5.2 Quality Management (Assurance Requirements)

- 5.2.1 The Contractor shall execute the works in accordance with the project specification “General Quality Requirements for Contractors and Suppliers” - QAL-STD-0001 Rev0 included in Annexure A of the Works Information.
- 5.2.2 The Contractor shall submit his Quality Assurance (QA) proposal(s) for the contract. This proposal shall detail the Contractor’s quality management system as it applies to all aspects of supply or service provision including Design, Procurement, Manufacturing, Installation/Erection and Commissioning. Additionally, the Contractor shall include for the provision of suitably qualified quality control staff to manage and carry out inspection on all Supplier/Subcontractor activities in all disciplines included within the Works Information.
- 5.2.3 The Quality Policy is a concise document, approved by the Contractor’s executive management that defines organizational goals and objectives regarding quality, a commitment to meeting stated requirements and an undertaking to drive continuous improvement throughout the organization’s activities. It must be suitable for the organization and provide a framework for stabilizing, communicating, and monitoring performance against agreed quality objectives.
- 5.2.4 The Contractor shall submit a Project Quality Plan (PQP), which shall also contain specific proposals and details regarding Quality Control for the works. The PQP includes Contractor’s statement that outlines strategy, methodology, resources allocation and details about quality control for the works.
- 5.2.5 The PQP is generally in narrative form detailing the Project Specific QA and QC systems and controls required by the Contractor for the specific works. Where the Contractor intends to employ any third-party organizations to execute quality related activities on his behalf, such intentions shall be stipulated in the PQP.
- 5.2.6 The Contractor shall provide a full-time resident quality manager for all aspects of the works including Site activities, with a staff adequate to perform the requirements of his quality plan and quality management system.
- 5.2.7 The nominated individual shall be fully conversant with quality management on major construction projects and the maintenance of an appropriate ISO 9001 Quality Management System.
- 5.2.8 The Contractor shall submit the CV of his quality manager for the Project Manager’s review and approval with a complete proposed organogram clearly indicating reporting levels and the number of resources dedicated to quality assurance and quality control.

5.3 Investigation, Survey and Site Clearance

- 5.3.1 The *Contractor* shall obtain as built information of the site from Transnet (TPT and TNPA) prior to any construction. It is also the responsibility of the *Contractor* to verify all existing services and notify the *Supervisor* if any existing unforeseen services are encountered.
- 5.3.2 The *Contractor* is required to prove and protect existing services prior to construction for the full extent of the site. Please note any new services encountered during investigative *work* is to be brought to the attention of the *Supervisor* on site and marked up on the relevant drawing for as-built purposes. Any alternative provided by the *Contractor* to the *Employer’s* design

which significantly affects the services in the area must be taken into account by the *Contractor* and a method statement provided for the temporary and permanent protection subject to approval by the *Project Manager*. Please note that any alternate designs would require a guarantee of the proposed design for the full intended design life.

- 5.3.3 The *Contractor* shall take special note of any oil pipes that are encountered in the area of the scope of work, these pipes shall not be damaged in any way while completing the new works and be brought to the attention of the *Supervisor* on site. The *Contractor* shall ensure that any new services crossing existing pipelines shall be done according to the required standards with the dedicated cover between the two services.
- 5.3.4 The *Contractor* shall carry out his own pre- and post-construction survey of the site and obtain the *Supervisor's* agreement to the accuracy of data obtained.
- 5.3.5 The *Contractor* shall be responsible for ensuring that works are carried out to the setting out as shown on contract drawings and shall afford the *Supervisor* all facilities for checking as and when required. Such checking, however, shall not relieve the *Contractor* of his responsibilities for the accuracy of his setting out.

5.4 Civil Engineering

5.4.1 Civil Scope of Works

The scope of work for the project includes the construction of all new stormwater infrastructure and upgrading of the existing network as per the design drawings. The areas of focus in the current scope (TPT areas only) include the following in the Port of Saldanha:

- XVIII. Tippler Area (5200157-2-001-C-LA-0002-01)
- XIX. Rail Embankment (5200157-2-001-C-LA-0003-01)
- XX. Multi-purpose Terminal (5200157-2-001-C-LA-0004-01)
- XXI. Stockyard (5200157-2-001-C-LA-0001-01)
- XXII. Causeway (5200157-2-001-C-GA-0005-01)

5.4.2 Site Clearance, Earthworks & Layer works

5.4.2.1 Scope of Work

The scope of works for the site clearance, earthworks and layer works shall include the following:

- XXIII. Clearing of all vegetation on site
- XXIV. Cleaning and clearing of all existing stormwater infrastructure not being demolished or blocked off as per design drawings.
- XXV. Exposing and proofing of existing services on site
- XXVI. Demolition and removal of existing stormwater pipes and manholes as indicated on the design drawings and demolition drawings.
- XXVII. Demolition of all existing herbs along western side of main road to accommodate new grid channel and mountable kerb as per 5200157-2-001-C-LA-0002-01-RM, 5200157-2-001-C-LA-0002-02-RM, 5200157-2-001-C-LA-0002-03-RM, 5200157-2-001-C-LA-0002-04-RM.
- XXVIII. Materials bulk and restricted excavations
- XXIX. Dewatering to ensure the site is dry enough for construction to be completed according to the design specifications and drawings (Contractor responsible for all dewater designs as per section 3.1.29)
- XXX. Shoring (Contractor responsible for all shoring designs as per section 3.1.29)

- XXXI. Earthworks for excavation, layer works, bedding and backfilling of stormwater pipes manholes, infiltration trenches, channels, culverts, Subsoil Collector Drain (SCD), kerb and fillet/channel, concrete panels, pipe jacking, stilling basins, retention ponds, water filtration systems and any other stormwater infrastructure that forms part of the works.
- XXXII. Rip and re-compact in-situ material.
- XXXIII. Construction of G2 base layer
- XXXIV. Construction of G5 subbase layer
- XXXV. Construction of river sand layer and bedding
- XXXVI. Construction of uniformly graded aggregate layer.
- XXXVII. Construction of pea gravel layer
- XXXVIII. Supply and install G-block paving with associated layer works as per 5200157-2-001-C-LA-0004-02
- XXXIX. Pond layer works as per drawing 5200157-2-001-C-DE-0001-01
 - XL. The supply and install of all HDPE geomembranes for ponds as per 5200157-2-001-C-DE-0001-01
 - XLI. Infill and grading of existing pond at Tippler catchment as per drawing 5200157-2-001-C-DE-0002-01
 - XLII. Final landscaping of embankments and ponds
 - XLIII. Grading of all ground surfaces towards stormwater infrastructure to encourage drainage as indicated on drawings.
 - XLIV. The disconnection, redirection, moving and reinstating off all existing services on site as indicated on the design and demolition drawings, or any other service that might be encountered when completing all stormwater works.
 - XLV. Reinstatement of asphalt surfacing and concrete surfacing that were demolished and removed during construction.
 - XLVI. Any road markings and signage needed as a result of reinstatement of asphalt and concrete surfacing.
 - XLVII. Installation of 190m of W-Beam Steel Guardrail with approximately 51 wooden posts along the roadway at the Tippler embankment in accordance with SANS 1350 and SANS 457 (5200157-2-001-C-LA-0002-01).
 - XLVIII. Pipe Jacking activity and all associated works as per SANS 1200 LG in the

Rail Embankment area (5200157-2-001-C-LA-0003-01-RM) and Tippler area (5200157-2-001-C-LA-0002-01-RM) respectively as indicated on the design drawings.

- XLIX. And any other work arising out of or incidental to the above or required of the Contractor for the proper completion of the works.

5.4.2.2 Supporting Specifications

This section, "Site Clearance, Earthworks and Layer works", shall be read in conjunction with the following SANS and Transnet standard specifications.

SANS Specifications

S406	Specification for the supply of stone
SANS 1200 C	Site Clearance
SANS 1200 D	Earthworks
SANS 1200 DB	Earthworks (Pipe Trenches)
SANS 1200 DM	Earthworks (roads, sub grade)
SANS 1200 GM	Concrete (small works)
SANS 1200 M	Roads General
SANS 1200 ME	Subbase
SANS 1200 MF	Base
SANS 1200 MH	Asphalt surfacing
SANS 1200 MJ	Segmented paving
SANS 1200 MK	Kerbing
SANS 1200 MM	Ancillary roadworks
SANS 927	Precast concrete kerbs, edgings and channels
SANS 731	Road markings Part 1: Single-pack solvent-borne paints
SANS 1350	Guardrails for roads - W-section
SANS 457	Wooden poles, droppers, guardrail posts and spacer blocks
SANS 1091	National colour standard

5.2.2.3 Earthworks (SANS 1200 D)

Classification (Sub-clause 3.1)

Notwithstanding the provisions of sub-clause 3.1 of SANS 1200 D, the materials excavated will not be classified for the purposes of measurement and payment. The unit rate for excavation shall cover excavation in all materials other than hard rock.

Spoil site.

All excess material not spoiled to pre-loading areas within the port, shall be spoiled off site at the legal dump site at the earlier vicinity of the site. The *Contractor* is to make provision in his rates to haul and dispose of the spoil to the nearest Dump Site.

Where spoiling to a dedicated area for pre-loading is permitted on Transnet property, this shall be obtained in writing from the relevant Department by the *Project Manager*. The *Contractor* shall be responsible for hauling and levelling the spoil on site at the dedicated pre-load area.

Removal of Topsoil

Topsoil shall be stockpiled such that the stockpile shall not be disturbed during the construction of other services. Only topsoil that will be required for banks must be stripped and stockpiled to dedicated temporary area for re-use.

Removing Unsuitable Material

Any roadbed material which is considered by the *Project Manager* of quality that would be detrimental to the performance of the completed road shall be removed to widths and depths as instructed by the *Project Manager* and shall be disposed of as prescribed. The excavated area shall then be backfilled with approved imported material compacted to the required density.

Exposing existing services

Services are known to exist within the construction area. The *Contractor* must be in possession an Excavation Permit obtained from Transnet, prior to commencing any excavations.

Where services are positively identified and location known, these will be pointed out to the *Contractor* by the *Project Manager*.

The *Contractor* shall commence proof trenching to locate and identify services a minimum of 2 weeks prior to construction, to allow for relocation, protection and or amendments to the design of the works.

The *Contractor* shall plot and identify all services located and record these on the "As-built" copy of the Services Plan.

The *Contractor* shall assist when required where alterations to services are required by providing labour, plant and material to carry out the necessary work as instructed by the *Project Manager*.

Claims for extension of time will not be entertained as a result of locating or protecting existing services that is less than two weeks ahead of construction.

Responsibility for protection of all known services shall rest solely with the *Contractor*, who shall be responsible for all costs which may arise as a result of damage caused to such services or which may arise as a result of his negligence.

5.4.2.4 Materials and Layer works

L. Bulk Excavation

The existing layers excavated for re-use shall be carted to a spoil site to be identified adjacent to the works.

LI. Disposal of material

All vegetation, trees, etc. resulting from site clearance shall be removed off site to the legal Dump Site. Haulage and disposal to this site shall be included in the rates. Burning of materials on site is not permitted.

LII. Preparation of Underlying Layer works

Existing base course material shall be uplifted and stockpiled and/or disposed of, as ordered by the *Supervisor*. The in-situ sand subgrade shall be compacted to 95% Mod AASHTO using large vibrating rollers of at least 10 tonnes.

Where permitted by the *Supervisor*, stockpiled base course material may be re-used for re-construction of the base course. Any shortfall in approved base course material shall be made up by importing class G2 material from commercial sources or making up deficiency by importation of dump rock on approval by the *Supervisor* on site. Compaction of the base course shall be by normal vibratory roller. Compaction densities shall be to a minimum of 98% of modified AASHTO density and be carried out at between -2% and +2% of the optimum moisture content.

The base course shall be kept continuously wet for a period of at least one hour before any concrete is placed. Immediately before the concrete is placed, the excess water shall be broomed off so as to ensure that the base course will still be damp when the concrete is placed, but no puddles of water or deleterious matter shall be left on the base course.

LIII. Construction of Sub-base

Preparation and construction of the stabilized Sub-base shall be in accordance with the project specific and general standards and shall have the basic depths, proportions, tolerances, layouts and compaction as indicated on the drawings. It is specifically designed to provide the foundation base to support the Base layer.

The G5 Sub-base material shall conform to the requirements of SANS 1200 ME shall be imported from a commercial source approved by the *Project Manager*.

LIV. Construction of Base

Preparation and construction of the Base layers shall be in accordance with the project specific and general standards and shall have the basic depths, proportions, tolerances, layouts and compaction as indicated on the drawings. It is specifically designed to provide the foundation base to support the G-Block and/or concrete paneling.

The G2 Base material shall conform to the requirements of SANS 1200 MF shall be imported from a commercial source approved by the Project Manager.

LV. Installation of Edge Restraints

Preparation and construction of the Concrete Edge Restraints on the base layer shall be in accordance with the project specific and general standards to proportions, levels, tolerances, layout as indicated on the drawings. It is specifically designed to provide the foundation and lateral support base for the external edge of G blocks when laid.

Edge Restraints shall be constructed prior to installing G Blocks

LVI. River Sand

The river sand shall be free from substances that may be deleterious to blocks and shall be in accordance with SANS 1200 MJ.

LVII. Laying of G Block Paving

The units as supplied shall be free from cracks that detract from their general appearance. No unit with 15mm exceeding dimension shall be used or with covering more than 3% of the periphery of the surface that intend to be exposed. No unit shall have any protuberance of height exceeding 3mm. The surface texture and colour of the units shall fall within the range of texture and colour represented by the manufactures approved samples. The areas requiring G-block paving are as per the drawing 5200157-2-001-C-LA-0004-02.

LVIII. Construction of Kerbing and channel/fillet

Kerbs and channels shall be of the sections shown on drawings 5200157-2-001-C-DE-0003-03 and 5200157-2-001-C-LA-0004-02 and shall comply with the relevant requirements of SANS 927, when applicable, SANS 1200 MK.

LIX. Construction of Subsoil Collector Drains

Subsoil Collector Drains shall be of the sections shown on drawings 5200157-2-001-C-DE-0003-03.

LX. Construction of grid and trapezoidal channels

Channels shall be of the sections shown on drawings 5200157-2-001-C-DE-0003-02 and 5200157-2-001-C-DE-0002-03 to the and shall comply with the relevant requirements of SANS 927, when applicable, SANS 1200 MK.

LXI. Road markings

The Contractor shall provide all plant required to execute the works. The lines or markings are to be painted with Plascon - Hysheen Road and Runway Paint or similar approved, at an application rate the rate of 0,42 l per m². The colour of paint to be used shall be as specified in the Schedule of Quantities and indicated on the drawing issued. All paint shall conform to SANS 731-1.

The following must be noted by the Contractor in terms of SANS 731-1:

1. The paint shall be a Type 2 Paint
2. The paint shall be suitable for use in a parking area on a segmented concrete surface
3. The paint is not required to be retro reflective
4. Drying time classification shall be Class 1
5. The colours required for the completion of the contract shall be:
 - 5.1 White
 - 5.2 Red
 - 5.3 Golden Yellow (BS381C-356 or CKS 279 – D26)

All the above colours to meet classifications according to SANS 1091

LXII. W-Beam Steel Guardrail

The Contractor shall construct the guardrail in accordance with SANS 1350 and SANS 457 and the project drawing (5200157-2-001-C-LA-0002-01). The 51 wooden posts are to be spaced approximately 3.810m and the W-Beam steel guardrail ends are to be bullnose end wing specification. The road barrier is to be placed at least 0.5m from the road edge.

5.4.3 Stormwater Drainage Works

5.4.3.1 Scope of Work

The scope of work for the construction of stormwater drainage systems for this project shall include for the delivery to site, off-loading and storage on-site, setting out, execution of the

works, testing, commissioning and handing over of new stormwater drainage infrastructure and connecting to and upgrading and repairing of all relevant existing networks as per the designs.

The stormwater drainage works shall include the following:

- LXIII. Locate and prove all existing stormwater infrastructure on site.
- LXIV. Contractor shall plan the construction sequence of the new stormwater infrastructure and how it will tie into existing infrastructure. The order of demolition, construction and connections should be approved by the Supervisor before any construction commences.
- LXV. Excavation, layer works, bedding and backfilling of stormwater infrastructure.
- LXVI. Supply and install new class 100D concrete pipes.
- LXVII. Supply and install new 200mm UPVC pipes from stilling basin to filtration system and connection manhole as detailed on 5200157-2-001-C-LA-0004-01-01.
- LXVIII. Supply and install new perforated UPVC pipes in SCD for the Rail Embankment area as per drawings 5200157-2-001-C-DE-0003-03
- LXIX. Supply install new perforated UPVC pipes for the Causeway area as per 5200157-2-001-C-LA-0005-01, 5200157-2-001-C-LA-0005-02 and 5200157-2-001-C-LA-0005-03
- LXX. Supply, install and connect 140mm Class 16 uPVC pipe to redirect rising sewer main around Pond 12 to sewer pump 3. See layout drawings 5200157-2-001-C-LA-0003-01-RM, 5200157-2-001-C-LA-0003-02-RM and 5200157-2-001-C-LA-0003-03-RM for more information.
- LXXI. Supply, install, construct, connect and redirect communications lines and manholes around Pond 12. See layout drawings 5200157-2-001-C-LA-0003-01-RM, 5200157-2-001-C-LA-0003-02-RM and 5200157-2-001-C-LA-0003-03-RM for more information.
- LXXII. Supply, install, construct, connect and redirect electrical lines using Wire Steel Armored cable (WSA) around Pond 1 as per SANS 10142. See layout drawings 5200157-2-001-C-LA-0002-01-RM, 5200157-2-001-C-LA-0002-02-RM, 5200157-2-001-C-LA-0002-03-RM and 5200157-2-001-C-LA-0002-04-RM.

- LXXIII. Construct new stormwater manholes and catchpits and the connection of new and existing infrastructure to the manhole as per the design drawings.
- LXXIV. Construct new stormwater channels and tie-ins.
- LXXV. Construct new subsoil collector drains. See layout drawings 5200157-2-001-C-LA-0003-01-RM, 5200157-2-001-C-LA-0003-02-RM and 5200157-2-001-C-LA-0003-03-RM for more information. Track work shall comply to Manual for Track Maintenance 2012.
- LXXVI. Supply, install and construct of new precast SATS Class 1 portal culverts and precast bases as per 5200157-2-001-C-LA-0002-01-RM, 5200157-2-001-C-LA-0002-02-RM, 5200157-2-001-C-LA-0002-03-RM, 5200157-2-001-C-LA-0002-04-RM, 5200157-2-001-C-LA-0003-01-RM, 5200157-2-001-C-LA-0003-02-RM and 5200157-2-001-C-LA-0003-03-RM.
- LXXVII. Supply, install and construct new grid channel along main road as per as per 5200157-2-001-C-LA-0002-01-RM, 5200157-2-001-C-LA-0002-02-RM, 5200157-2-001-C-LA-0002-03-RM, 5200157-2-001-C-LA-0002-04-RM.
- LXXVIII. Construction of new mountable kerb on edge of Main Road to new rail embankment MH1.
- LXXIX. Excavation, layer works, backfilling and placement of geomembranes for retention ponds as per the design drawings
- LXXX. Excavation, layer works, backfilling and placement of geo-textiles for infiltration trenches as per 5200157-2-001-C-LA-0005-01, 5200157-2-001-C-LA-0005-02 and 5200157-2-001-C-LA-0005-03
- LXXXI. Excavation, layer works, backfilling and construction of stilling basins as per 5200157-2-001-C-LA-0004-01-01 and 5200157-2-001-C-LA-0004-01-02
- LXXXII. Excavation, layer works, backfilling, supply, installation and connection of new filtration systems for stilling basins as per 5200157-2-001-C-LA-0004-01-01 and 5200157-2-001-C-LA-0004-01-02
- LXXXIII. Pipe jacking for proper completion of all stormwater drainage works as per 5200157-2-001-C-LA-0002-01-RM, 5200157-2-001-C-LA-0002-02-RM, 5200157-2-001-C-LA-0002-03-RM, 5200157-2-001-C-LA-0002-04-RM, 5200157-2-001-C-LA-0003-01-RM, 5200157-2-001-C-LA-0003-02-RM and 5200157-2-001-C-LA-0003-03-RM.
- LXXXIV. Cleaning, clearing, repairing and reinstating of all existing stormwater infrastructure including, but not limited to, pipes, culverts, channels, manholes, down chutes and ponds as per the designs.
- LXXXV. Reinstating and connection of new infrastructure to existing infrastructure as shown on design drawings.

LXXXVI. Blocking off of existing manholes, pipes and outlets as per drawing.

And any other work arising out of or incidental to the above, or required of the *Contractor* for the proper completion of the works.

5.4.3.2 Supporting Documents

This section, "Stormwater Drainage", shall be read in conjunction with the following SANS and Transnet standard specifications.

SANS 1200 DB	Earthworks (Pipe Trenches)
SANS 1200 LB	Bedding (Pipes)
SANS 1200 MK	Kerbing
SANS 1200 L	Medium Pressure Pipelines
SANS 1200 LB	Bedding Pipes
SANS 1200 LC	Cable Ducts
SANS 1200 LG	Pipe Jacking
SANS 1200 LD	Sewers
SANS 1200 LE	Stormwater
SANS 927	Precast concrete kerbs, edgings and channels
SANS 667	Pre-cast Concrete Pipes
MTM, 2012	Manual for Track Maintenance
Version 1.2.2.20	Stormwater Filtration System Specification
	Heavy Metals Filtration System Guidelines and Experiences

5.4.3.3 Materials

The supply and delivery to site of all storm water pipes shall conform to specifications of SANS 677.

5.4.3.4 Brickwork Manholes and Catch Pit's

The construction of the brickwork manholes and Catch Pit's shall conform the specifications and

requirements detailed in the drawings 5200157-2-001-C-DE-0001-02, 5200157-2-001-C-DE-0001-03.

All brickwork shall be built in manhole bond i.e. stretchers only on the inside face, using cement.

mortar as specified. Bricks shall be well soaked before use and the previous course shall be wetted before bricks are laid thereon.

All joints on the internal face (and the external face above ground) shall be half round recessed.

and shall be well rubbed with a standard jointing tool of suitable size to ensure that the entire exposed surface on the joint presents a smooth and polished appearance.

Intersecting walls shall be properly toothed with each other, and all angles levelled and plumbed.

Should cement bricks be utilized, then all internal surfaces shall be plastered with a 12mm thick.

3:1 cement sand mortar mix.

When brick built' manholes are constructed in wet ground, the external surfaces shall be rendered.

with 12mm thick 3:1 cement sand mortar mix.

5.4.3.5 Pipe crossings

Where pipes cross with a vertical height difference of less than 150mm, a polystyrene block. spacer shall be placed between the pipes.

The fill material around the pipes shall be thoroughly moistened and compacted.

The *Contractor* will be held responsible for any damage to pipes resulting from the construction.

of a pipe crossing.

5.4.3.6 Plant

The *Contractor* shall ensure that only plant suitable for working in the confined limits of the site of works and able to obtain the required specification of layer works is used.

5.4.3.7 On-site Storage

The *Contractor* shall be allocated a storage area on site and shall be responsible for all materials stored on site until such time that the water main has been tested and handed over to the *Employer*.

Pipes should be stored on level ground that is free from stones and sharp objects and should be so stacked (in a stack of cross formation) that the load on each pipe is uniform throughout its length.

Socketed pipes should be stacked that the sockets are at different ends in each alternate layer and protrude from the stack.

The height of the stack should not exceed 1m, and pipes of different diameters and class should not be stacked together. Protective packing should not be removed until immediately before use.

5.4.3.8 Cut pipe ends.

Ends may be cut on site using the appropriate cutting machinery. Reinforcement exposed by such cutting is to be protected with 20mm thick cement mortar as well as corrosion protection specified in section 4.5.8 of this document.

5.4.3.9 Pipe Laying and Jointing

Pipes that have been exposed for several hours to direct sunlight and have become hot should not be laid until they have cooled to a temperature of approximately 25°C.

Rubber ring jointing may be carried out in the trench. The pipeline should be laid directly on to the prepared bedding in the trench, and bricks or other hard bodies must not be placed under the pipeline for either temporary or permanent support. Rubber rings used must be those supplied by the pipe or fitting manufacturer. All spigots must be checked to ensure that they are free from burrs, and spigots, sockets and rings must be cleaned with a dry cloth. The pipe end must be chamfered to an angle of approximately 15° and the depth of entry must be marked on the spigot. This mark must be so positioned as to allow a 6mm clearance between the spigot and the bottom of the socket. A thin film of a lubricant recommended by the manufacturer should be applied to each rubber ring and each spigot.

5.4.3.10 Pipe Jacking

The scope of work includes pipe jacking as denoted on the drawings and any other work arising out of or incidental to the above or required of the *Contractor* for the proper completion of the works.

LXXXVII. Supporting Specifications

This section, "Pipe Jacking", shall be read in conjunction with the following SANS specifications.

SANS	
SANS 1200 DA	Earthworks (small works)
SANS 1200 DB	Earthworks (Pipe trenches)



SANS 1200 LG	Pipe jacking
SANS 667	Concrete Non-pressure Pipes

LXXXVIII. Materials and Workmanship

Pipes for Jacking

Pipes for jacking shall be SC Type reinforced concrete manufactured in accordance with SANS 677: All pipe joints shall be sealed. The actual diameter of the pipes shall not be less than the nominal diameter given on the drawings or stated in the schedule.

In addition to withstanding the specified two (or three), edge bearing test-load, the pipes shall be capable of withstanding, without damage during jacking, the maximum longitudinal force to be transmitted by the *Contractor's* jacks and method of installation.

The design of the pipes shall be determined by the *Contractor* to suit the proposed method of construction but shall not be less than the class of pipe or type of pipe stated on the drawings or determined by the Engineer. The pipes shall incorporate extended modified Ogee type joints which shall be seated by means of a rubber ring. On the longer pipe jacks it may be necessary to use a rebated butt joint to withstand the higher jack forces. However, the decision of type of joint to use is that of the *Contractor*. Irrespective of joint type used the *Contractor* must adhere to the joint sealing details given below.

At least one hole shall be formed in the crown of each pipe to allow for the injection of both a lubricant, if required, and a final grout. The final layout of grout holes is the *Contractor's* responsibility.

The *Contractor* must ensure that the pipes shown on the drawings and mentioned in the documents can be jacked the full distance mentioned in the Scope of Work.

LXXXIX. Intermediate Jacking Pipes

In circumstances where it is desirable to use jacking pipes intermediate between manholes or junctions the number and type of such intermediate jacking pipes is to be determined by the *Contractor*. The joint between pairs of intermediate jacking pipes shall be protected externally by a cylindrical mild steel sleeve of wall thickness at least 8mm, which shall overlap the pipes on either side of the joint for a distance of at least 150mm. The joint is to allow a substantial and permanent caulked seal within the joint.

Full details of the intermediate jacking pits and the junction box constructed as a closure between the ends of the jacked pipes are to be submitted with the tender.

Joints and Seals

It is the *Contractor's* choice as to type of joint used in the pipes to be jacked. However, applied forces used to jack the pipes must be uniformly distributed around the joint to avoid

damaging the joint. Pipes that are delivered to site with damaged joints must be rejected by the *Contractor*.

A seal is required at each joint to minimize ingress of water. Ingress of water into the jacked pipes stemming from the joints should not exceed 5 liters per minute in total. The chipboard packing used to distribute stresses on the joints should be raked out to a depth of 25mm on the inside all round and sealed with a durable flexible sealing agent such as bituseal, thioflex or similar approved.

XC. Construction

Authority to Jack Pipelines under Roads and Railway Lines

The *Employer* will obtain permission from the relevant authorities for jacking under roads and railway lines. However, the *Contractor* is to confirm that such permission has been granted before commencing work.

XCI. Competence

Jacking and excavation shall be supervised and undertaken by persons fully conversant with this work.

XCII. Contractor Solely Responsible

No approval of any material or plant and its operation or of any construction procedure to be used will imply any relaxation of the requirements governing the quality of the materials or of the finished work or relieve the *Contractor* of his responsibilities under the Contract.

XCIII. Recording Movements

General

The *Contractor* shall take movement measurements correct to 1,0mm of any change in the line and level of roads, rail tracks and rail formation level before the start of the contract and at such intervals as directed by the Engineer for a period up to 12 months after issue of the Completion Certificate. However, no more than 15 sets of reading will be required in this period. A copy of these measurement records shall be made available to the Engineer. Appropriately constructed and marked benchmarks and measurement-stations as directed by the *Engineer* shall be established.

XCIV. Working under/above services

The *Contractor* shall prove all existing services for the fulfillment of the jacking activity. The Contractor shall bear full responsibility for any consequential damage to persons and property resulting from jacking activity.

XCV. Working under Roadways

The *Contractor* shall bear full responsibility for any consequential damage to persons and property resulting from subsidence.

XCVI. Working under Railway Lines

The relevant clauses of the Wayleave agreement and specifically those related to pipe jacking / directional drilling shall be complied with. Wayleave to also have co-signature of approval by local signal personnel.

Before jacking under railway lines, the *Contractor* shall take elevation readings at the top (Crest) of the fill embankment, or the toe of cuttings, and at the toe of the ballast as well as on top of each railway line along the centre line of the pipe jack and at intervals of 1 500 mm apart up to a distance of 9m from the pipe centre line. The profile of the railway embankment must be measured and recorded from toe to toe (of the embankment) before pipe jacking starts.

The intervals at which movement readings are to be taken over a period of 12 months is the same as mentioned above for roads.

XCVII. Remedial Measures

All remedial measures will be carried out and completed to the standards set by the various controlling authorities.

Roads – remedial measures plus time related professional costs needed to reinstate roads and fill embankments will be the *Contractor's* liability.

Remedial measures are those relating to the need to put right settlement and movement of road surfaces, formation layers or fill embankments including providing all road safety markers, traffic control, or signs and all associated needs of the road authority to allow remedial work to proceed without danger to workers or traffic. The *Contractor* must arrange all matters regarding remedial work with the road authority. In most instances these measures will comprise jacking up concrete roads using grout and re-grading to original elevation formation layers and premix surfacing as well as mending drainage fixtures where these have been damaged. All the remedial work will be directed by the Engineer to his satisfaction and approval.

Railways – remedial measures plus time related professional costs needed to reinstate railway lines and fill embankments will be the *Contractor's* liability.

Remedial measures are those relating to the cost of realigning railway lines, re-grading of ballast, and stabilizing fill embankments. All the remedial work will be directed by the *Engineer* to his satisfaction and approval.

XCVIII. Excavation

General Except as required in terms of 5.2.5 SANS 1200 LG 1983 the provisions of SANS 1200 DA shall apply.

XCIX. Thrust Pits

Claims arising out of any accidents or incidents in or adjacent to these access pits will not be considered by the Employer.

Stormwater control measures around these pits are also necessary to prevent water ingress into the pits. Provision must be made by the *Contractor* to keep both thrust and reception pits free of seepage and stormwater.

Thrust pits will in general only be permitted at positions indicated on the drawings or where manholes or junctions are required. Jacking pits shall be of sufficient size to accommodate the jacking operation and any manhole structure to be constructed upon completion of the jacking. The approximate dimensions of the pits shall be agreed with the Engineer before work commences. The *Contractor* will be required to design and construct all thrust blocks, bases and other temporary works required to maintain the stability of the pits and shall demolish and remove these upon completion of the jacking operation and the *Contractor* shall take into account all such limiting factors when preparing his/her tender.

C. General

A lead pipe with a rebated front end over which the trailing end of the shield is fitted should be the first concrete pipe used. This should minimize overbreak. No material may be removed in advance of the leading edge of the shield in unstable or loose materials.

As the pipe is advanced, excavation is to take place within the lead pipe under the full-time supervision of a responsible foreman to ensure that the end of the shield is always fully plugged with earth at a safe angle of repose within the pipe. The *Contractor* shall ensure that there is not uncontrolled flow of sand, mud or earth into the pipe which could result in impeding excavation personnel or the formation of cavities above or around the sleeve pipe. If at any stage during the jacking operation such conditions arise the *Contractor* shall immediately plug the pipe and stabilize the material before proceeding with further work.

Should it be necessary, the *Contractor* shall allow for stabilizing the soil by dewatering, chemical grouting, or any other approved means. The design of the shield shall be such as to permit the face to be completely or partially closed by boarding or similar to control material flow from the face.

During weekend or holiday stoppages the *Contractor* must make sure that a plug of soil is left in the shield.

Continuous Jacking

In order to minimize problems due to the build-up of skin friction on a static pipe, the pipes are to be jacked continuously unless agreed to otherwise with the Engineer, allowing for overnight stoppage.

Jacking Procedure

Each jack shall be fitted with a pressure gauge suitably calibrated such that the actual jacking forces can be read at any time.

Suitable packing of hard materials shall be inserted between the abutting vertical ends of the pipes in order to transfer the jacking force. The packing shall constitute a complete circle and be sufficiently wide to transfer the applied load.

A suitable adjustable shield is to be fitted to the front of the lead pipe. The shield is to incorporate cutting edges which can be varied by control jacks to maintain the pipe online and level.

Pipe jacking may generally be carried out either upgrade or downgrade to suit the *Contractor's* requirements subject to the approval of the Engineer, and provided that provision is made by the *Contractor* for the necessary drainage required.

Lubrication of Structure during Jacking

To ease pipe friction, the Contractor shall make provision for the injection of bentonite or other approved lubricant.

Backfilling

Both thrust and reception pits must be backfilled using the removed material. Backfill compaction rates must not be less than 90 percent Modified AASHTO with the top 1,5m of backfill being compacted to a minimum 92% Modified AASHTO. The backfill must be built up to at least 500mm above the natural ground level to prevent stormwater pounding around the excavation pits.

Grouting and Plugging

In soft material the grout shall consist of cement/bentonite with a compressive strength of 5MPa at 28 days. In hard material and rock the grout shall consist of cement/sand with a compressive strength of 25 MPa at 28 days.

Markers

On completion of the backfill the Contractor must place a marker concrete post (pre-stressed lintel) into the ground directly above the centre line of the pipe at the entrance. The post must stick 1,0m above the ground and at least be buried 1,5m in the ground. The top 0,5m of the post must be painted bright red.

Measurement

Throughout the jacking operation the Contractor is requested to take and record the following measurements.

A plot of pressure (kN/m²) and total force (kN) originating from the combined force of all hydraulic jacks used to move pipes versus accumulative length of jacked pipe. As soon as a lubricant is used it must be recorded on the plot. If heavy ground water seepage is noted this must also be recorded on the plot. A time scale in days should also be used in conjunction with jacked length of pipe. It is also important to record start up force required to move pipes after a delay, i.e. after weekend.

The dimensions of the thrust block used must be recorded as well as the accumulative thrust force on the block (kN) together with lateral movement of the thrust block (mm).

Subsoil Collector Drain

The placement of the Subsoil Collector Drain must be confirmed on site and should not affect the rail formation.

5.4.3.11 Sewer, Comms and Electrical service relocation

Electrical and Comms Service relocation

Unless otherwise directed by the Supervisor, the ducts shall be laid as shown on the standard drawings of the Standard Specification.

All electrical cable ducts are to be laid approximately 800mm below finished road level and the pipes must protrude 500mm beyond the edge of the hardened roadway or stormwater drain. Both ends of each duct must be sealed with an end cap. The position of each duct crossing shall be indicated on site using suitable markers.

Draw wires must be provided in each duct and duct ends must be sealed with suitable stoppers. A double strand copper wire of at least 2,8mm² cross section that will serve as a screen and is to be installed approximately 200mm above all ducts over its entire length.

Electrical and Comms manholes

All brickwork shall be built in manhole bond i.e. stretchers only on the inside face, using cement mortar as specified. Bricks shall be well soaked before use and the previous course shall be wetted before bricks are laid thereon. All joints on the internal face (and the external face above ground) shall be half round recessed and shall be well rubbed with a standard jointing tool of suitable size to ensure that the entire exposed surface on the joint presents a smooth and polished appearance. Intersecting walls shall be properly toothed with each other, and all angles levelled and plumbed. Should cement bricks be utilized, then all internal surfaces shall be plastered with a 12mm thick 3:1 cement sand mortar mix.

When brick-built manholes are constructed in wet ground, the external surfaces shall be rendered with 12mm thick 3:1 cement sand mortar mix.

Where area adjacent to rail will be concrete surfaced the equivalent length will require signal cable pipes with manholes or possibly shared with electrical manholes. 3 x 120mm flex tubes required especially at level crossing areas if no alternate route for signal cable exist.

Sewer Main Service relocation

Scope of works for sewer relocation:

- To accommodate the location of Pond 12, the rising sewer main leading to pump 3 as indicated on the Rail Embankment drawings will need to be relocated.
- Construction of sewer manholes
- Tie into existing sewer main network.

Sewer Manhole

This section, "Sewer Main Service Relocation", shall be read in conjunction with the following SANS standard specifications.

Table 3 – Sewer/Effluent SANS standard specifications

SANS	
SANS 1200 DB	Earthworks (Pipe trenches)
SANS 1200 LB	Bedding (Pipes)
SANS 1200 LD	Sewer/Effluent Drainage

Materials

Class 16 uPVC pipes to the diameter and length as stated on the drawings are to be used for sewer/effluent reticulation from downpipes and also the sewer/effluent network.

Construction of Sewer Manholes

Brickwork Manholes

All brickwork shall be built in manhole bond i.e. stretchers only on the inside face, using cement mortar as specified. Bricks shall be well soaked before use and the previous course shall be wetted before bricks are laid thereon. All joints on the internal face (and the external face above ground) shall be half round recessed and shall be well rubbed with a standard jointing tool of suitable size to ensure that the entire exposed surface on the joint presents a smooth and polished appearance. Intersecting walls shall be properly toothed with each other, and all angles levelled and plumbed. Should cement bricks be utilized, then all internal surfaces shall be plastered with a 12mm thick 3:1 cement sand mortar mix.

When brick built' manholes are constructed in wet ground, the external surfaces shall be rendered with 12mm thick 3:1 cement sand mortar mix.

Pipe crossings.

Where pipes cross one another with a vertical height difference of less than 150mm, a polystyrene block must be placed between them, and the fill material around the pipes thoroughly moistened and compacted. The *Contractor* will be held responsible for any damage to pipes resulting from the construction of a pipe crossing.

Cut pipe ends.

All ends may be cut on site.

5.4.4 Concrete Works

5.4.4.1 Scope of Work

The scope of work for concrete works shall include the delivery to site of all materials necessary to complete the works, off-loading on site, storage on-site, setting out, construction, installation, testing, commissioning and handover.

The works includes for the following:

- CI. Earthworks, excavation, dewatering, preparation of base and foundations
- CII. Reinforcement and formwork
- CIII. Casting of concrete
- CIV. Construction of concrete panels
- CV. Construction of all manhole bases for pipework and culverts
- CVI. Construction of concrete cover slabs for manholes: sewer, stormwater electrical and communication
- CVII. Construction of new V-drain as per 5200157-2-001-C-LA-0005-02
- CVIII. Construction of concrete stormwater channels, 473m of trapezoidal channels (5200157-2-001-C-DE-0002-02-RM), channel tie into Pond 4 (approximately 10m), grid channels (5200157-2-001-C-DE-0003-02-RM) and any other stormwater infrastructure to complete the works as per the designs.
- CIX. Construction of concrete encasement of all pipework as per the design drawings and notes
- CX. Construction of headwall and scour protection for each pond as per design drawings.
- CXI. Construction of all bases, walls and covers of new stilling basins as per structural drawings.
- CXII. Supply and install new filtration system precast circular manholes, bases and covers as per 5200157-2-001-C-LA-0004-01, 5200157-2-001-C-LA-0004-02 and 5200157-2-001-C-DE-0004-01
- CXIII. Supply and installation of cascade chutes to extend to existing trapezoidal channel approximately 6m as per 5200157-2-001-C-LA-0002.
- CXIV. Repair of existing grid channels, covering grids and concrete channels (Contractor to perform inspection on the condition of all existing channels and covers and to be agreed by the Supervisor)

And any other work arising out of or incidental to the above, or required of the *Contractor* for the proper completion of the works.

Particular Specifications

The following specifications shall apply:

NB: All in situ concrete work (mass and reinforced) shall comply with SANS Specification 1200G ("8 Measurement and Payment" is not applicable) supplemented by the clauses in this section. Where SANS Specification 1200G and the clauses in this section are in conflict the clauses in this section shall take precedence.

In addition, the "Model Preambles for Trades" as recommended and published by the Association of South African Quantity Surveyors, 1999 Edition, shall be read in conjunction with and shall apply to all items in the Bill of Quantities not covered by the 'SANS Standardized Specifications' SANS 1200 Series

Where the term "plain concrete" appears in SANS Specification 1200G it shall be read as "mass concrete".

SANS Specifications	
SANS 1200 G	Concrete Structural
SANS 2001: CC1	Construction works: Concrete Works (Structural)
SANS 1083:1994	Aggregates from natural sources
SANS 10100-2:1992	The Structural use of concrete – Part 2: Materials and execution of work
SANS 50197-1	Cement – composition, specifications, and conformity criteria. Part 1: Common cements
SANS 1491-1	Portland cement extenders – Part 1 Ground granulated blast furnace slag
SANS 1491-2	Portland cement extenders – Part 2 Fly ash.
SANS 1491-3	Portland cement extenders – Part 3 Condensed Silica Fume
SANS 110	Sealing compounds for the building industry, two component, polysulphide base

SANS 1023	Preformed Elastomeric Compression Joint Seals
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
BS 8110 Part 1	Structural use of Concrete
AASHTO M153	Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

Cementitious Binders

Coastal Zone

As the works are within one kilometer from the sea, one or more of the following cementitious.

binders shall be used in all concrete applications.

- CXV. Blast furnace cement, Type III/A, certified as containing not less than 40% and not more than 50% milled granulated blast furnace slag (MGBS), or A blend of Type 1 Portland cement with not less than 40% and not more than 50% MGBS. MGBS shall comply with SANS 1491 Part 1., or
- CXVI. Fly ash cement Type II/B-V or Portland fly ash cement Type II/B-W certified as containing not less than 25% and not more than 30% fly ash shall comply with SANS 1491 Part 2.

Total Salts, sulphates and acids in cement stabilised layers

Pavement layers stabilized with cement may be damaged by salt crystallization, sulphate attack and acid, all of which can lead to a complete loss of cementation and/or excessive heaving and cracking. The following recommendations are applicable before stabilization:

Total salts (conductivity):

Base and subbase: 0.15 S/m (max) at 25degrees Celsius.

Selected subgrade: 0.40 S/m (max) at 25degrees Celsius

Sulphates (all layers)

- a) The maximum acid-soluble sulphate content of materials to be stabilized with cement or lime should not exceed 0.25% calculated as SO₃ if the PI exceeds 8 or the percentage passing the 2µm exceeds 12. A maximum of 1% is permissible for materials with lower PIs and clay content.

- b) The maximum water-soluble sulphate content of all materials within 500mm of any stabilized layers should not exceed 2.5g/l of SO₃. If a 2:1 water: soil ratio is used, a limit of 2g/l should be used.

Acid (all layers):

A minimum pH of 6.0 is required for all materials to be stabilized with cement or lime and the stabilized layer must not be closer than 500mm to acidic materials with a Ph of less than about 6.

Cement

-Common cements, complying with SANS 50197-1 shall be used for all concrete work. On no account shall masonry cements be used for concrete work, even if the strength designations are the same as for common cements.

-The Supervisor for test purposes may require samples of cement from anyone, or from every consignment. Cement in any consignment from which a sample may have been taken for testing shall not be used until it has been approved. Allowance must be made for possible delay in that tests may take 10 days to carry out.

-Bags of cement shall be stacked in a waterproof, solidly constructed shed with a central door and a floor rendered damp-proof with a tarpaulin. The bags of cement shall be closely stacked (but not against walls) in order to reduce air circulation in such a manner that the cement is used in the order in which it was received, i.e. first in first out.

Alkali Reactive Concrete

Alkali Reactive Aggregates shall not be used in this project. The equivalent Na₂O content of the concrete shall not exceed 2,0 kg/m³ where % Na₂O equivalent = % Na₂O + (0,658 x %K₂O)

Aggregates

Fine and coarse aggregate shall comply with the relevant clauses of SANS 1083.

Where aggregates have constituents, which in the opinion of the *Project Manager*, may give rise to damage due to alkali-aggregate reactions, the provisions of 6.3.3.3 shall be applicable.

Evidence of compliance of the aggregates with the requirements of 6.3.3.1 & 6.3.3.2 shall be furnished as early as practical. No aggregate shall be delivered for use in the works until approval is given. Sand (fine aggregate):

The fine aggregates shall comply with the requirements of SANS Specification 1083. Other aggregates may be approved if they have a satisfactory history and / or test results.

No aggregate may be used until it has been approved. Samples having a mass of 25kg. (16.5 liters) of the proposed aggregate to be used may be required by the Supervisor for test purposes. Samples having a mass of 25kg shall be forwarded every 3 months during concreting work and also if the source of supply is changed. Allowance must be made for possible delay in that the tests may take 14 days to carry out.

Admixtures

Admixtures containing chlorides will not be permitted in reinforced concrete. Where applicable,

and as indicated on the drawings, water-retaining structures shall have 'Penetron Admix' as an

additive to the concrete mix to 0.8% of cement content by weight by a certified Penetron batching plant or similar approved.

Cover Blocks

Cover blocks used to ensure the cover to reinforcement shall be made of cement mortar.

Cover blocks shall be dense and have a minimum 28 day crushing strength of 50 Mpa and shall be cured in water for at least 14 days before being used.

Cover/spacer blocks made of plastic will not be permitted.

Concrete Quality

Prior to the start of any concrete work on site, the *Contractor* shall submit a quality assurance plan which will ensure compliance with specification and provide acceptable documentary evidence that all specified operations have been carried out satisfactorily.

Where the minimum dimension to be placed during a single pour is larger than 600mm, and the

cement content of the reinforced concrete exceeds the following:

CXVII. Cement Types I and II/ * S : 400 kg/m³

CXVIII. Cement Types II/B-V and II/B-W : 450 kg/m³

The *Project Manager* may require that measures be instituted to reduce heat development in the

concrete.

Unreinforced concrete

Class A Concrete:

Filling to cavity of hollow walls.

Unreinforced concrete cast against excavated surfaces

15 Mpa/19mm Concrete

Surface blinding under footings and bases.

Reinforced concrete

40 MPa/19mm Concrete:

Bases.

Foundation beams.

Surface beds cast in panels on waterproofing.

Walls in foundations (Provisional).

Columns in foundations (Provisional).

Unless otherwise specified or detailed on the drawings.

Batching

All cementitious binders shall be matched by full sack or by mass batching with approved precision.

weighing equipment. All aggregates shall be precisely measured by mass using approved precision weigh-batching, equipment, unless otherwise approved by the *Project Manager*.

Should any variation in the composition of the aggregate become apparent, the *Project Manager*

shall be notified and a further sample of aggregate submitted immediately for his approval.

Concrete Placing

The *Project Manager* shall approve the size, shape and depth of any excavation before concrete is.

placed. Unless otherwise approved by the *Project Manager*, no concrete shall be placed until the fixed. Reinforcement has been accepted and confirmed in writing by a Release Certificate signed off by:

- The Supervisor
- The Surveyor - It shall be the responsibility of the *Contractor* to call the Surveyor prior to pouring concrete to verify and confirm all levels, co-ordinates and alignment of the structure to be cast.

No concrete shall be placed unless both the above signatories appear on the Pour Release Certificate.

Construction Joints

Unless otherwise shown on the drawings, the exact position of horizontal construction joints shall.

be marked on the formwork by means of grout checks in order to obtain truly horizontal joints.

Stub columns, stub walls and stays on footings shall be cast integrally with the footing and not afterwards, even where another class of concrete is being used. Joint lines shall be so arranged that they coincide with features of the finished work.

Where new concrete is to be cast against a hardened concrete surface, neat cement slurry mixed to a creamy consistency shall be brushed onto the cleaned concrete surface.

Contraction joints shall be smooth and shall have one coat of lime wash or PVA applied to the older surface prior to casting the fresher concrete.

Slip Joints between Concrete and Brickwork

Slip joints shall be provided between brickwork and concrete slabs and beams by levelling up and towelling smooth the bearing surfaces of brickwork with 3:1 cement mortar and covering the bearings before the concrete is based, with two layers of one side smooth tempered hardboard, with the smooth sides in contact.

The ends and sides of beams and edges of concrete slabs shall be separated from the brickwork with 13mm thick bitumen impregnated soft board or expanded polyethylene strips placed vertically against the brickwork before the concrete is cast.

Similar slip joints shall be provided between brickwork and concrete lintels cast in situ, but without soft board or expanded polyethylene strips at ends.

Movement Joints

All movement joints are to be filled in with approved bitumen impregnated soft board or expanded polyethylene strip unless otherwise specified or detailed on drawings. Descriptions (prices) of movement joints shall be deemed to include formwork.

Grouting

25 MPa non-shrink cementitious grout:

Bedding approximately 25mm thick under base plate including chamfered edges all round.

Curing Compound

Unless otherwise directed by the *Project Manager*, the curing compound shall be:

An approved trafficable, resin-based, white pigmented, membrane forming for slopes flatter than 1:1.

An approved clear, aesthetically acceptable, membrane forming for all other concrete surfaces, including beam and slab soffits.

The curing compound shall comply with specification ASTM C309, except that the maximum permissible water loss in the test shall be 0,40 kg/m².

Alternatively, the curing compound shall be acceptable if the treated concrete retains 90% or

more of its mixing water when subject to the test set out in BS 8110 Part 1 – Chapter 6.6

Curing Compound Application

The total application rate of the curing compound shall be the greater of the supplier's specification or 0,90 l/m². On textured concrete surfaces, the total application rate shall be 0,90 l/m².

In cases of concrete surfaces with run-off problems, it may be necessary to apply more than one coat of membrane forming curing compound to obtain the specified total or cumulative application rate.

Curing in accordance with SABS 1200 G shall commence on all concrete surfaces as soon as it is practical in the opinion of the *Supervisor*.

On unformed surfaces the curing compound shall be applied after finishing and as soon as the free water on the surface has disappeared and no water sheen is visible, but not so late that the liquid curing compound will be absorbed into the concrete.

On formed surfaces, the exposed concrete shall be wet with water immediately after the forms are removed and kept moist until the curing compound is applied.

Application of the curing compound shall begin once the concrete has reached a uniformly damp appearance with no free water on the surface.

Application of the compound may be done by hand or power spray.

The compound shall be applied at a uniform rate with two applications at right angles to each other to ensure complete coverage.

Pigmented compounds, without a thixotropic agent, shall be adequately stirred to assure even distribution of the pigment during application.

Unless otherwise directed by the *Supervisor*, the initial 24 hour curing of concrete surfaces not covered by formwork shall be carried out by ponding, covering with constantly wetted sand or mats, or continuous spraying in accordance with SABS 1200 G when the following climatic conditions occur:

Wind velocity greater than 5 m/s.

and/or

Ambient temperature is above 25 °C.

and/or

The relative humidity is below 60 %.

If plastic shrinkage occurs, the concrete, while still plastic, shall be re-vibrated, floated and recoated with curing compound as if no curing has previously taken place.

Curing Period

The curing period for concrete containing only CEM 1 shall be 7 days.

The curing period for concrete containing CEM 1 plus cement extenders (MGBS, FA) shall be 10 days. The curing period will start on completion of the concrete pour and for formed surfaces shall include the time for which forms are still in place after the pour.

Concrete Records

The *Contractor* shall maintain the following daily records for every part of the concrete structure and shall make these available at all times during the progress of the work for inspection by the Supervisor or *Project Manager*.

- The date and time during which concrete was placed.
- Identification of the part of the structure in which the concrete was placed.
- The mixed proportions and specified strength
- The type and brand of cement
- The slump of the concrete
- The identifying marks of test cubes made.

- Curing procedure applied to concrete placed.
- The times when shuttering was stripped, and props removed.
- The date of dispatch of the cubes to the testing laboratory
- The test results.

The records shall be delivered to the *Project Manager* each week except in the case of substandard concrete, when the *Project Manager* shall be informed immediately.

Tolerances

Deviations shall be within the limits listed in SANS 1200 G for degree of accuracy II unless otherwise specified.

Testing and Monitoring

Frequency of sampling and testing shall be as specified in SANS 1200 G.

- If the quantity of concrete from which samples were taken exceeds 40 m³, it shall be subject to the testing of a minimum of 3 sets of samples per day from each grade of concrete placed in each independent structure.
- If the quantity of concrete from which samples were taken is less than 40 m³, it shall be subject to the testing of a minimum of 2 sets of samples per day from each grade of concrete placed in each independent structure.

Cost of tests

The costs of making, storing and testing of concrete test cubes as required under clause 7 'Tests' of SANS 1200 G shall include the cost of providing cube molds necessary for the purpose, for testing costs and for submitting reports on the tests to the Project Manager. The testing shall be undertaken by an independent firm or institution nominated by the Contractor to the approval of the Project Manager (Test cubes are measured separately)

If the quantity of concrete from which samples were taken exceeds 40 m³, it shall be subject to the testing of a minimum of 3 sets of samples per day from each grade of concrete placed in each independent structure.

If the quantity of concrete from which samples were taken is less than 40 m³, it shall be subject to the testing of a minimum of 2 sets of samples per day from each grade of concrete placed in each independent structure.

If the Contractor disputes the results of the tests on concrete cubes, the concrete represented by the cubes will be considered acceptable if the Contractor, at his own cost, proves to the satisfaction of the Project Manager that the estimated actual strength of cores taken from the structure, determined in accordance with SANS Standard Method SM 856, is not less than the specified strength.

If the strength of the concrete fails to meet the acceptance criteria stipulated, the Project Manager may in his sole discretion and in addition to the options listed in SANS 1200 G:

- Accept the concrete subject to approved remedial measures being undertaken by the Contractor; or
- Permit the concrete to remain subject to the payment of a penalty.

The penalty referred to will be determined as follows:

$$\text{Penalty} = V \times R \times F$$

Where?

V = Volume (in the opinion of the Project Manager) of concrete of unsatisfactory strength represented by the test result.

R = Relevant scheduled rate

$$F = 1 - \sqrt{\frac{\text{Average strength of unsatisfactory concrete}}{\text{Specified strength} + 6 \text{ MPa}}}$$

Where the relevant scheduled rate (R) includes the cost of formwork or

$$F = 1 - \frac{\text{Average strength of unsatisfactory concrete}}{\text{Specified strength} + 6 \text{ MPa}}$$

Where the relevant scheduled rate (R) excludes the cost of formwork or where no formwork was involved.

1.1. Formwork

Descriptions of formwork shall be deemed to include use and waste only (except where described as left in or permanent), for fitting together in the required forms, wedging, plumbing and fixing to true angles and surfaces as necessary to ensure easy release during stripping and for reconditioning as necessary before re-use.

Formwork to sides of bases, pile caps, ground beams, etc. have been measured provisionally and will only be paid for where it is specifically prescribed by the Technical Officer for design reasons. Formwork necessitated by irregularity or collapse of excavated faces will not be measured and the cost thereof shall be deemed to be included in the allowance for taking the risk of collapse of the sides of the excavations, provision for which is made in Earthworks.

Formwork

All exposed concrete corners shall be provided with 20mm x 20mm chamfers.

Rough formwork (degree of accuracy ii)

Rough Formwork to Sides:

Strip footings.

Bases.

Walls in foundations.

Outer face of walls flushes with perimeter of concrete structure.

Rectangular columns in foundations.

Edges not exceeding 300mm high.

Rough Formwork to Circular Columns

Smooth formwork (degree of accuracy ii)

Smooth Formwork to sides:

Inner face of shaft walls.

Edges not exceeding 300mm high.

Movement joints etc.

Expansion joints with soft board between vertical concrete surfaces:

12mm Joints not exceeding 300mm high.

Saw cut joints:

3.2 x 50mm and 6.4 x 20mm saw cut joints in two operations in top of concrete.

Seal with Sikaflex-11FC, or similar approved, on backing chord. Installation to manufacturer's specification

Horizontal toggle construction joints through concrete including thick cement slurry to one face.

Reinforcement

High tensile steel reinforcement to structural concrete work:

In various diameters and lengths

Mild steel reinforcement to structural concrete work

In various diameters and lengths

High tensile steel reinforcement to structural concrete work

Fabric reinforcement:

Fabric reinforcement type as specified on structural drawings.

Sleeve Pieces and Ties

Where it is necessary to leave plugs or holes in beams, slabs or any other reinforced concrete, all such plugs or holes must be situated in positions approved by the Supervisor before concreting. Where it is necessary to carry pipes, bolts, wires or any other fittings through reinforced concrete members, approved pipe sleeves must be provided and placed in position before concreting.

Where waste, ventilation water, heating or other pipes under 100mm diameter pass through concrete slabs and beams, galvanized mild steel sleeve pieces or diameters shown or required shall be cast into such concrete slabs and beams.

Chases shall be formed in edges of slabs or slots shall be formed in the slabs, or sizes required, where two or more pipes pass through together.

All necessary bolts, plugs, brackets, cramps, etc. shall be cast into the concrete as the work proceeds.

Where brickwork abuts against concrete, the brickwork is to be tied to the concrete with galvanized hoop-iron ties 1.6m thick by 32mm wide and approximately 600mm long to every third course of brickwork with one end of each tie cast approximately 150mm deep into the concrete. Where such fixing is impossible, i.e. where steel formwork is used, the ties are to be gun-nailed against concrete with steel nails to less than 38mm long.

Forming key to concrete for plaster, mosaic tiles and other finishes

Where rough formwork has been used, surfaces of concrete to receive plaster, mosaic tiles and other finishes, shall, immediately after the formwork has been removed, be well wetted and wire brushed whilst the concrete is still green and then brushed over with 2:1 cement

grout to form a key for the finish, all to the approval of the Supervisor. The shushing is to be allowed to set hard before the finish is applied.

Where smooth formwork is used, surfaces of the concrete to receive plaster, mosaic tiles and other finishes shall be hacked, on the distinct understanding that hacking of concrete shall be at no extra cost to the employer.

Surfaces of concrete receiving plaster or other finishes shall not be plastered or finished until the Supervisor has signified his opinion in writing that the surfaces are suitable to receive plaster or other finishes.

Where brickwork abuts against concrete, the brickwork is to be tied to the concrete with galvanized hoop-iron ties 1.6mm thick by 32mm wide and approximately 600mm long to every third course of brickwork with one end of each tie cast approximately 150mm deep into the concrete. Where such fixing is impossible, i.e. where steel formwork is used, the ties are to be gun-nailed against concrete with steel nails to less than 38mm long.

Bagged Finish to Concrete

Concrete surfaces to receive bagged finish shall be prepared by removing sharp projections and making good defects with 3:1 cement mortar. Finish by rubbing over the whole area with wet rough sacking and cement grout to obtain an even surface.

Power Floated Finish

Power floated finish to floors etc. means that surfaces shall be floated c\mechanically to a smooth and even finish before the concrete has set. Small areas inaccessible to the machine are to be floated by hand. Under no circumstances is cement mortar to be added while floating the concrete.

“No Fines” Concrete

“No-fines” concrete, for grading flat concrete roofs and the like to falls, shall be in the proportion of 12 parts 19 iron cubical stone to 1 part cement mixed with 20 liters water per bag of cement and be laid to falls of not less than 15mm per linear meter for mastic asphalt and not less than 20mm per linear meter for sheet roof covering. For heavy load applications special mix designs may be required.

(a) Fillets against up stands:

Form triangular fillets, size 100 x 100mm, in corners with walls, kerbs, etc. neatly mitred at angles, stopped where necessary and finished smooth ready to receive waterproofing.

(b) To raised floor, bases, etc.:

No-fines" concrete for raised floors, bases, etc. shall be in the proportions specified. Finished smooth with 3:1 sand/ cement screed to receive waterproofing.

Precast Concrete

Materials

Cement, water, aggregates and reinforcement shall be as described under: CONCRETE, FORMWORK AND REINFORCEMENT.

Concrete

Concrete shall be as described under: CONCRETE, FORMWORK AND REINFORCEMENT and, unless otherwise specified. Class E concrete shall be used but with coarse aggregate of an appropriate size.

Smooth Finish

Where described as "finished smooth from the mould" such surfaces shall have a layer of fine stuff composed of 1:4 (1 part cement and 4 parts clean fine sand by volume) packed against the faces of the mould before placing the concrete backing. The concrete backing shall be disposed into the moulds in a wet state (not dry pressed) while the facing is still wet.

Projections shall be rubbed off the faces shall be of even colour and free from blemishes, cracks and other imperfections. Salient angles shall be arras rounded.



5.5 Steel Work

5.5.1 Governing Codes and Standards

SANS Specifications	
SANS 10094	The use of high strength friction grip bolts and nuts
SANS 135	ISO metric bolts, screws and nuts (hexagon and square) (coarse thread free fit series)
SANS 136	ISO metric precision hexagon-head bolts and screws, and hexagon nuts (coarse thread medium fit series)
SANS 435	Mild steel rivet

BS Specifications	
BS-EN 287 Part 1	Approval testing of welders/fusion welding
BS-EN 288 Part 3	Specification and approval of welding procedures for metallic materials
BS 5135	Metal arc welding of carbon and carbon manganese steels
BS 4360/SANS 50025	Weldable structural steel
BS 2573 Part 1	Classification, stress calculations and design of structures
BS 3923	Methods for ultrasonic examination of welds
BS 2600	Radiographic examination of fusion welded butt joints in steel

Other Specifications	
ANSI/AWS D1.1	Structural Welding Code - Steel
DIN 1026	Metric channels
ISO R657	Angles

5.5.2 Structural Steelwork

The design of all structural steelwork shall be such as to provide a robust and rigid structure requiring the minimum of maintenance and providing a long service life.

In the design of steel structures, due cognizance shall be taken of environmental and wind load conditions as specified in the main specification.

Due to the highly corrosive conditions experienced in South African Ports, the permissible stresses shall not exceed those set out in British Standard No. 2573. The minimum thickness of steel for load bearing members shall be 15mm for gussets, 10mm for angles, tees, plates and flats and 9mm for webs of channels and joists. Punching of holes over and above that permitted in BS 2573, shall not be permitted. Other structural steel shall be of not less than 6 mm thickness.

The design of mobile structures shall be such that the induced von Mises stress (effective stress in triaxial loading) will not exceed 90% of the elastic limit strength of the steel when the equipment is travelling at maximum speed and colliding with either other stationary equipment or fixed stop blocks. In calculating von Mises stresses, due cognizance must be taken of stress concentrations. If the elastic limit strength of the steel is not known, it will be determined by using a 0.5% strain offset on the stress-strain curve of the material.

Where applicable, the design may be in bolted, riveted or welded box construction except that no site welding will be permitted in the final erection at the port except with the approval of TNPA.

Alternatively, a welded hollow section lattice type structure will be acceptable, subject to the following requirements:

- The members must be structural sections made from BS 4360/SANS 50025 grade S355JR / 43C weldable structural steel - welded for sizes up to and including 110mm outside diameter (BS 1775 HFW) - seamless for sizes over 110mm outside diameter (BS 1775 HFS).
- Tube wall thickness must not be less than 6mm.
- All joints must be completely seal welded in accordance with BS 5135. Special care must be taken to prevent the ingress of moisture into hollow section members by ensuring that each member is airtight.
- Bolted or screwed attachments which require drilled holes through a hollow section will not be permitted.
- Non-hollow structural sections and plate used on the structure, in conjunction with the hollow section framework, must comply with the relevant requirements of this specification.

All steel sections shall be manufactured in accordance with the following standards: -

Weldable structural steel	:	BS 4360/SANS 50025
I and H sections	:	BS 4 Part 1
Metric channels	:	DIN 1026
Structural steel, hot rolled sections	:	BS 4 Part 1
Angles	:	ISO - R657
Hot finished hollow sections	:	BS 4848 Part 2
Cold formed sections	:	BS 6363
Forgings	:	BS 29
Steel castings	:	BS 3100
Cast iron	:	BS 1452

All steel plates and rolled steel sections used in the construction of the structures shall be of steel made by the open-hearth process (acid or basic) and shall comply in every respect with BS 4360, "A" quality Structural Steel for Bridges and General Building Construction, Grade 43A or Grade 50B or SANS 50025 grade S355JR, where sections sizes allow. That is, the percentage of phosphorous and Sulphur shall not exceed 0,06.

The above is laid down as a standard, but tenders will also be considered for rolled steel not conforming strictly to the above standard. Full particulars of the guaranteed properties of the steel tendered for should in this case be furnished, i.e. chemical composition, tensile strength, yield point, reduction in area, bend tests, etc.

Forgings and drop forgings shall be free from flaws and surface defects of any kind and be accurately finished to the prescribed dimensions.

Steel castings shall be sound, clean and free from all defects and distortion of any kind and should, except where otherwise specified, conform with the conditions and tests specified in B.S. No. 3100/Latest Edition, for grades A, B and C according to requirements. They shall be thoroughly annealed and all working parts and bearing surfaces shall be machined and turned accurately with correct finish.

Cast iron used throughout must be close grained, tough and free from all defects, and shall conform to the conditions and tests specified in B.S. 1452/Latest Edition, for grades 12 to 14 according to requirements.

This applies to functional components only. A lower grade is acceptable for portal and machinery house ballast. Tenderers to state grade of cast iron proposed.

The dimensional and out-of-square tolerance as specified in the above Standards shall also apply to built-up components. Edge preparations, welding techniques, straight beds and material fit-up shall be considered when welded joints are designed.

The shape of all members and connections must allow easy accessibility for maintenance painting of all surfaces. No members shall comprise a double member which cannot be painted and maintained.

Structural details must be so designed as to eliminate or seal off any cavities or pockets where water or condensation could collect and promote corrosion. Horizontal members with upstanding flanges require special drainage.

All hollow sections shall be completely closed and airtight, and all welding is to be of such size and quality as to ensure complete airtightness. No tapping or drilling of holes into sealed sections will be permitted.

5.5.3 Welding

All the provisions of BS 5135 shall be complied with as far as applicable.

Design of weld joints shall be such that crevices, overlaps, pockets, arc strikes, and dead ends do not exist.

All joints shall be completely seal welded in accordance with BS 5135. Special care must be taken to prevent the ingress of moisture into the tubular members by ensuring that each such tubular member is airtight. "Stitch" welding will not be permitted. Only continuous welding will be accepted.

Weld cracks, undercut, or pock marks will not be accepted.

All welds on the load bearing frame structure, containers, piping, pipeline flanges, etc., shall be continuous and shall be visually inspected for cracks and other discontinuities.

Welds on the main chords must be tested ultrasonically in accordance with BS 3923 or x-rayed in accordance with BS 2600 and those on minor joints by the dye-penetrant method. The equipment required for these tests must be supplied by the Contractor and the testing done at his cost.

Steel, except in minor details, which has been partially heated, shall be properly annealed. (Electrically welded structural members accepted.)

All brackets, clamps, lugs, straps, suspenders, etc. required for attaching mechanical and electrical equipment must be welded on prior to erection and special precautions must be taken not to damage welds or puncture tubes during erection.

The welding of all rails shall be done by an approved method.

Welding shall only be carried out by a coded welder according to SANS 10044, BS-EN 287 Part 1 and BS-EN 288 Part 3 or ANSI/AWS D1.1.

All parts to be welded shall be thoroughly cleaned and dried before welding. The welding will only be done in dry surroundings and all steps taken to prevent hydrogen embrittlement.

Where materials of different compositions are joined by welding, especially carbon steel to chrome steel, the filler welding method and post welding treatment shall be such that embrittlement and other degradation of both steel and filler is prevented.

It must be ensured that welded joints are ductile.

5.5.4 Fasteners

All bolts, nuts and rivets shall be manufactured in accordance with the following standards:

-

Commercial bolts and nuts Grade 4.6 : SANS 135

Precision bolts and nuts Grade 8.8 : SANS 136

Friction Grip Bolts and nuts Grade General : SANS 10094

Rivets : SANS 435

All friction grip fasteners shall be hot dip galvanized, including high tensile bolts (and their nuts and washers), structural rivets and Huck bolts.

All holding down bolts and nuts and brackets, as well as all fixing bolts, studs, nuts and washers shall be of stainless steel. Fixing rivets shall be of either stainless steel or brass.

Bolts and set screws shall be locked in an approved manner and shall not be stressed in tightening to beyond the recommended loads.

The quality of friction grip bolts, nuts and washers, bolt lengths, sizes of holes, tightening standards, surface condition of clamped components, shop and site assembling, and acceptance inspection of friction grip joints shall comply with the latest edition of SANS 10094. Certificates shall be supplied for all bolts of grade 8.8 and 10.9.

All bolt and rivet holes must be accurate to size and location, the centres of holes shall not be placed nearer the edge of a plate than 1,5 diameters with an extra allowance of 3mm for sheared edges. All holes in the structural work shall be drilled or otherwise punched to a diameter not exceeding 1,5mm less than the diameter of the finished hole on the die side, and afterward reamed out to the exact size.

Where possible the adjoining parts forming a connection shall be drilled or reamed together, with holes not exceeding 1,5 mm diameter the rivet or bolt for which it is made. No rough or broken edge shall be left around any of the holes.

For turned and fitted bolts, the holes shall be accurately drilled or reamed; the diameter of the hole shall not exceed the finished diameter of the bolt by more than 0,25mm.

The holes, after assembly of the parts, shall be true throughout the thickness of all the parts and perpendicular to the axis of the member.

Rivets shall be cup-headed or countersunk as required, unless otherwise specified. No rivet head shall contain less metal than does a length of the rivet equal to 1,25 times its diameter. All loose and defective rivets shall be cut and replaced by sound ones; also, others when required for the purpose of examining the work. Rivets shall be driven with pressure tools whenever possible and pneumatic hammers shall be used in preference to hand driving.

All field rivets must be supplied with shanks of suitable length for pneumatic riveting.

Bolts shall be of such a length as to accommodate a full nut when tightening up, and project at least two thread pitches beyond the nut. Excessive projection of threads beyond the nuts should be avoided.

All bolts having countersunk heads shall have strong feathers forged on the neck and head to prevent turning and the bolt holes shall be cut to receive same. All nuts and bolts (excluding countersunk bolts) shall be furnished with circular washers of sufficient thickness, the outside diameter being at least twice the nominal diameter of the bolt, and washers fitted correctly.

Where bolt heads or nuts are seated on beveled surfaces of beams or channel flanges, beveled washers must be inserted.

5.5.5 Joints and Mating Surfaces of Members

Mating surfaces of members to be joined by high tensile steel bolts in friction grip shall be cleaned and primed as specified for the rest of the steelwork. Mating surfaces shall lay flat against each other to eliminate gaps which may allow ingress of water. After joining, the edges shall be sealed with an approved brand of Butyl/ Rubber sealing compound by means of a suitable caulking gun or shall be seal welded.

Other joints shall be formed by one of the following methods:

The mating surfaces of members shall be blast cleaned, primed and protected prior to sub-assembly by the liberal application of caulking compound. While the compound is still wet, the members shall be bolted together and caulking compound which is squeezed out shall be completely removed.

The mating surfaces shall be protected with the full corrosion protection system as specified, the surfaces joined together and the joint so formed shall be sealed with butyl rubber sealer.

After being cleaned and primed the surface shall be joined together and the joint so formed shall be seal welded.

The primer coating on mating surfaces must be applied not more than 4 hours after cleaning and the edges must be sealed within 3 weeks of assembly of the part.

5.5.6 Fabricated Parts

All fabricated parts shall be properly fitted during assembly to result in properly aligned equipment having a neat appearance. Fabrications of load bearing members shall have no abrupt changes in cross section and regions of severe stress concentration. All sharp corners accessible by personnel during erection or operation shall be ground, rounded, or removed by other methods. Burrs, welding spatter and stubs of welding wire shall be removed.

5.5.7 Ballast or Counter Mass

Tenderers must include for the supply of all necessary ballast or counter mass.

These must preferably be of cast iron and be removable for maintenance of structural steelwork.

Concrete ballast is not recommended but will be accepted provided the Tenderer satisfies Transnet that it will not cause corrosion of any steel parts.

Fastenings used for removable pieces must be of non-corrosive material.

Ballast must be in suitable shapes to be secured in position against movement but in sizes easily removable for maintenance.

Lifting hooks or eyes of non-corrosive material and of adequate strength must be provided in the removable ballast pieces.

Concrete ballast must be reinforced so as to prevent cracking or breaking and must be coated with an approved corrosion protection system for concrete.

5.5.8 CORROSION PROTECTION (SPECIFICATION HE9/2/8 - [Version 16] - July 2002)

a) Scope

Structural steelwork in coastal area (within 10km from coast):

Structural steelwork is to be protected against corrosion as follows:

This specification covers requirements for protective coating of iron and steel structures, electrical motors, gear boxes etc. against corrosion and must be read in conjunction with the main specification as well as the following (latest editions): -

- SANS 10064 "Preparation of steel surfaces for coating"
- SABS 121 "Hot-dip (galvanized) zinc coatings"
- SANS 1091 "National colour standards for paint"
- BS 5493 "Code of practice for protective coating of iron and steel"

structures against corrosion"

b) Types of Corrosion Protection to BE USED

- The coatings specified in this specification are chosen according to BS 5439, Table 3, part 9, to ensure that the condition of the surface will be at least RE2 on the European scale of degree of rust, after 10 years in an environment of frequent salt spray, chemicals and polluted coastal atmosphere. During the 10 years, the normal maintenance painting will be done.
- The paint manufacturer shall guarantee the paint for at least 10 years.
- Should a tenderer wish to offer coating systems other than those specified, as an alternative, he shall submit full technical details and a list comparing all appropriate details of the alternatives proposed, with the original specified.
- Tenderers must ensure that the different coats they offer in their tenders are compatible with each other.
- The coating of proprietary items must be done according to Clause 3.
- All galvanized components including bolts and nuts but excluding walkway gratings, must be painted with the specified system, unless otherwise approved.
- The following coating systems must be used unless otherwise specified in the main specification: -

Substrate	Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
3CR12 steel	1	Surface tolerant epoxy primer	DULUX /SIGMA Sigmacover primer INTERNATIONAL (PLASCON) Intergard 269 STONCOR (CHEMRITE COATINGS) Carboline 193 Primer	65-75

	2	Two component recoatable, polyurethane finish (Gloss)	DULUX / SIGMA Sigmadur gloss INTERNATIONAL (PLASCON) Interthane 990 STONCOR (CHEMRITE COATINGS) Carboline 134	65-75
Galvanized Steel	1	Surface tolerant epoxy primer	DULUX /SIGMA- Sigmacover primer INTERNATIONAL (PLASCON) Intergard 269 STONCOR (CHEMRITE COATINGS) Carboline 193 Primer	65-75
	2	Two component recoatable, polyurethane finish (Gloss)	DULUX /SIGMA- Sigmadur gloss INTERNATIONAL (PLASCON) Interthane 990 STONCOR (CHEMRITE COATINGS) Carboline 134	65-75
Mild steel	1	Two component self-curing inorganic zinc ethyl silicate OR two component zinc rich polyamide cured epoxy primer	♦ DULUX /SIGMA- Sigma MC60 OR Sigma-cover primer INTERNATIONAL (PLASCON) Interzinc 233 OR Interzinc 52 or 53 STONCOR (CHEMRITE COATINGS) Carbo Zinc 11 OR Carbo-line 658 Primer	65-75
	2	Flexible recoatable high build	DULUX/SIGMA – Sigmacover CM MIO INTERNATIONAL	125-150

		polyamide cured MIO epoxy.	(PLASCON) Interseal 010 MIO STONCOR (CHEMRITE COATINGS) Carboline 190 HB M.I.O. or Carboline 193 M.I.O.	
	3	Two component recoatable, polyurethane finish (Gloss)	DULUX/SIGMA Sigmadur gloss INTERNATIONAL (PLASCON) Interthane 990 STONCOR (CHEMRITE COATINGS) Carboline 134	65-75

- The paint manufacturer's recommendations for the application of the different coating systems, curing time before handling or application of subsequent coats, health and safety recommendations etc. must be carefully adhered to.
- Paint contractors must have a quality management system which must be submitted to the Engineer for approval before commencement of the work.
- Galvanizing shall be done to SANS 121 heavy duty hot dip galvanizing to a thickness of at least 85µm. Electroplated components in zinc or cadmium are not acceptable.
- All mounting bolts, nuts, washers and brackets as well as all fixing bolts, studs nuts and washers shall be of stainless steel. Fixing rivets shall be of either stainless steel or brass.
- High tensile bolts for friction grip joints must be hot dip galvanized and painted. High tensile bolts must be certificated after galvanizing.
- The full paint system shall be applied to all surfaces which are to be covered with wear pads, linings etc.
- For steelwork which will be transported over long distances and erected on site the two pack epoxy primers are preferred.

c) Surface Preparation

- All steel surfaces shall be detergent washed and fresh water rinsed to remove all oil, grease and surface contaminants before shot blasting.
- Sharp edges shall be radiused and major roughness of welds shall be removed by

grinding. Welding spatter and flux shall be removed.

- Components manufactured from hot rolled steel sections and steel plate shall be blast cleaned to base metal in accordance with SANS 10064 grade SA2½ - very thorough blast cleaning, to remove all mill scale, rust, weld spatter etc.
- "Sharp" chilled iron shot, chilled iron grit, or granular abrasive slag is to be used to produce a proper degree of surface roughness.
- Blast profile shall be determined by micrometer profile gauge, Keane-Tator surface profile comparator or Testex press-o-film.
- The profile height shall be between 40 and 50µm at any point.
- Good quality blast cleaning and spray-painting equipment shall be used. Air used for spraying and blast cleaning shall be free from all traces of oil, water and salinity. Water and oil traps must be fitted to all equipment.
- Wheel abrading equipment shall not be used unless an angular profile the same as clause 4.3.3 is achieved.
- When wet blasting is done the primer shall be applied before oxidization starts or surface contamination occurs.
- Components manufactured from 3CR12 steel shall be lightly abraded. The components shall then be passivized by using a mixture of 10 - 15% nitric acid in water which is rinsed off after 10 - 15 minutes. The surface shall be neutralized to pH 7 before it is coated.
- Hot-dip galvanized components, galvanized bolts and nuts etc. shall be lightly abraded with a galvanizing pre-cleaner. The components shall then be washed with detergent and water and washed down with clean water until a water break free surface is achieved. Allow to dry thoroughly.

d) Joints and Mating Surfaces of Members

- Mating (faying) surfaces of members which have to be joined by high tensile steel bolts in friction grip shall be cleaned according to Clause 4 and painted with primer only.

CXIX. After being assembled joints so formed shall be seal welded and painted or after the intermediate coat was applied the edges shall be sealed with an approved brand of paintable flexible sealant or mastic (e.g. Butyl rubber, polyurethane sealer or two component epoxy), by means of a suitable caulking gun.

CXX. All rivets, bolts, welds, sharp edges etc. must be covered with a "stripe coat" of the primer or intermediate coat specified to ensure the correct dry film

thickness on sharp edges, as well as sealing of bolt threads to head etc.

- CXXI. All other mating surfaces must be sealed with an approved brand of flexible Butyl rubber, paintable Silicone, polyurethane sealer or two component epoxy sealer, and joined while still wet. All excess compounds must be completely removed.

e) Painting Procedures

- CXXII. Directly before the application of paint, the area to be painted shall be degreased with a suitable degreaser and left to dry.
- CXXIII. Paint shall only be applied under the following conditions: -
- CXXIV. There is adequate light.
- CXXV. The steel temperature is between 5 and 50°C and at least 3°C above the dew point of the air.
- CXXVI. The relative humidity of the air is between the limits specified by the paint supplier.
- CXXVII. Wind does not interfere with the method used and sand and dust cannot be blown onto wet paint.
- CXXVIII. Steelwork shall be supported on trestles, at least 900 mm off the ground for painting purposes.
- CXXIX. An adequate number of test readings shall be taken per square meter in order to determine the dry film thickness.
- CXXX. The paintwork shall be acceptable if the average of the test readings taken falls within or exceeds the ranges given.
- CXXXI. Paintwork shall not be acceptable if any single test reading is less than the specified minimum thickness.
- CXXXII. An ultrasonic or electronic magnetic flux thickness measurement gauge shall be used, but in case of dispute, destructive testing shall be applied. The painted steelwork shall present a clean, neat appearance of uniform colour and gloss as applicable to the paint used. Each coat of paint shall be applied as a continuous, even film of uniform thickness. More than one application of paint may be required to achieve the dry film thicknesses specified or to obliterate the colour of the previous coating.
- CXXXIII. The use of thinners or solvents at any stage of the work is prohibited, unless specified by the paint manufacturer.

CXXXIV. Precautions shall be taken to prevent coatings from being applied to equipment nameplates, instrument glasses, signs etc.

f) Colour Codes

Equipment shall be painted in the following final colours: -

Area	Colour	Code [SABS and International No's]	No. 1091
a) Hand levers, hand wheels, oiling points, handrails on walkways, ladders	Golden Yellow (High Gloss)	SABS B49 BS 381C-356	1091
b) Informatory signs and notices (not symbolic safety signs for which see SABS 1186)	White on Emerald Green (High Gloss)	White on SABS E14 BS 381C- 228	1091
Area	Colour	Code [SABS and International No's]	No. 1091
Pipelines			
a) Reclaim water piping	Aluminum		
a) Slurry pipelines	Dark admiralty grey	SABS G12	1091-
b) Fire protection piping	Signal red	SABS A11	1091-
c) Wash water drainpipes	Light grey	SABS G29	1091-
d) Instrument air	White with Strong blue band	White and SABS F11	1091-
e) Plant air	White with Flag blue band	White and SABS FO4	1091-

f) Potable water	Grass green	SABS 1091-D14

Colour bands for pipes shall be 75 mm wide for pipe sizes up to 150 mm diameter and 100 mm wide for 150 mm and above. The colour bands shall be applied to the pipe flanges, valves, junctions, walls or structures etc. in such a manner that the pipe may be easily identifiable. On straight sections the maximum spacing shall be 100 x the pipe diameter.

g) Field Touch-up Painting

- Damaged and unpainted areas, fasteners, welds, etc. shall be cleaned by wire brushing with hand tool or power tool in a manner which will minimize damage to sound paint. Grinding will not be allowed. Rust spots shall be cleaned to bright metal. Thick edges of old paint abutting on bare metal surfaces shall be feathered by scraping and sanding.
- Where welding is required on areas already coated with the coating system, the coat should be stepped back for ± 30 mm around the weld area.
- The paint shall be applied to match the original coats in accordance with the manufacturer's recommendations for the specific paint system.
- Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.
- Areas of damaged galvanizing shall be repaired with an approved cold galvanizing product or metal sprayed by the wire spraying process with Zinc, and then touched up with the specific paint system.

h) General

- All walkways, floors, maintenance platforms etc. must be painted with a durable, nonskid coating of the appropriate colour.
- Expose machined surfaces must be coated with a strippable corrosion inhibitor (e.g. Tectyl).
- Where different materials will be in contact with each other, and galvanic corrosion can occur the contact areas of the materials must be isolated from each other, or the joints made waterproof to prevent ingress of moisture.

i) Maintenance Painting of Structures

Areas which are only lightly corroded must be cleaned by means of high-pressure water blasting or wire brushing by power tool and the following system applied: -

Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
1	Surface tolerant two pack epoxy primer with aluminum pigments	Dulux/SIGMA Aluprimer STONCOR (CHEMRITE COATINGS) Carbomastic 15 INTERNATIONAL (PLASCON) Intergard 468	125-150
2	Same as first coat OR micaceous iron oxide (MIO) epoxy	DULUX/SIGMA – Sigmacover CM MIO INTERNATIONAL (PLASCON) Interseal 010 MIO STONCOR (CHEMRITE COATINGS) Carboline 190 HB M.I.O. or Carboline 193 M.I.O.	125-150
3	Two component recoatable, polyurethane finish (Gloss)	DULUX/SIGMA Sigmadur gloss INTERNATIONAL (PLASCON) Interthane 990 STONCOR (CHEMRITE COATINGS) Carboline 134	65-75

CXXXV. Alternatively, the Noxyde paint system can be used, consisting of two to three coats of water based Noxyde paint to achieve a DFT of 350 to 400 microns. Where the Noxyde system is used on areas other than slightly corroded structural areas, the following additional requirements must be observed:

- Very smooth surfaces (e.g. 3CR12, stainless steel or hot-dip galvanized components, bolts, nuts and fittings, and HT bolts): Parts must be thoroughly degreased using OptiDegreaser, washed down with potable water, and immediately when dry, a single coat of OptiPrimeAqua applied.
- Paintable flexible sealant/mastic: Only sealant approved by the paint manufacturer may be used, and an initial coat of OptiPrimeAqua applied over it before the further coats of Noxyde are applied.
- Bolted/riveted connections: After blasting or and/or cleaning as required, apply a coat of OptiPrimeAqua and an additional stripe coat of Noxyde, in contrasting colour, to all bolt/nut and plate edges and crevices.

CXXXVI. The adhesion of old coatings must be verified by doing a crosscut adhesion test on selected areas.

CXXXVII. The compatibility of the new paint system on the old coating must be tested and guaranteed in writing by the paint supplier.

CXXXVIII. The work and coating system must be guaranteed for a minimum of 12 months.

CXXXIX. All heavily corroded areas must be shot blasted to minimum SA2, and the three-coat system indicated in clause 2.6 applied.

CXL. Areas where the old coating is still sound need only be high pressure cleaned with a suitable solvent and coated with one of the primers suggested in clause 10.2 (as tie coat) and then with one of the topcoats suggested in clause 2.6 to get the appropriate colour and finish. The minimum dry film thickness of this tie coat must be 75 microns and topcoat must be 50 microns, but the previous coating colour shall be completely obliterated to present a uniform colour.

CXLI. Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.

CXLII. Repairs to the insides of all the enclosed sections of the booms as well as the insides of the crane legs, sill beams, cross beams, pylon cross bracing members etc. shall be done as above but the topcoat need not be applied.

6 Management and start-up

6.1 Management Meetings

Regular meetings of a general nature may be convened and chaired by the Project Manager as follows:

Table 4

Title and purpose	Approximate time & interval	Location	Attendance by:
Project Progress Meetings (Report on the progress)	Bi-weekly (once every fortnight)	Transnet Port Terminal-Saldanha	Project Manager, <i>Contractor's</i> representatives and other appropriate individuals as required by the <i>Project Manager</i> .

Safety Action Meetings (Discuss urgent safety issues within the project)	On urgent basis as requested by the <i>Project Manager</i> to address particular issues.	Transnet Port Terminal-Saldanha	<i>Project Manager, Contractor's</i> representatives and other appropriate individuals as required by the <i>Project Manager</i> .
Risk Assessment Meetings (Discuss risk issues within the project.)	On urgent basis as requested by the <i>Project Manager</i> to address particular issues.	Transnet Port Terminal-Saldanha	<i>Project Manager, Contractor's</i> representatives and other appropriate individuals as required by the <i>Project Manager</i> .

CXLIII. It is the *Employer's* specific intention that the Parties and their agents use the techniques of partnering to manage the contract by holding meetings designed to pro-actively and jointly manage the administration of the contract with the objective of minimising the adverse effects of risks and surprises for both Parties.

CXLIV. The *Contractor* attends management meetings at the *Project Manager's* request. These meetings are to be held fortnightly or as regularly as may be determined by the *Project Manager*. At these meetings the *Contractor* presents all relevant data including safety, health and environmental issues, progress, quality plans, Sub-Contractor management, as may be required.

CXLV. Meetings of a specialist nature may be convened as specified elsewhere in this Works Information, or if not so specified, be convened by persons at times and locations to suit the Parties, the nature and the progress of the works. Within five days of the meeting the person convening the meeting shall submit records of the meeting to the *Project Manager*.

CXLVI. All meetings shall be recorded, preparing meeting minutes and circulated by the person who convened the meeting. Such minutes (or register) shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

CXLVII.

6.1.1 Documentation Control

- Transnet uses a document controlling system to track, record and control documentation circulated.
- All formal communication should be submitted to TPT Document Controller.

- This include among others, circulation of minutes, drawings, claims etc.
- TPT Document Controller shall work with the *Contractor's* Document Controller (if available).

6.1.2 Safety Risk Management

- The *Contractor* must submit a safety file to TPT SHEQ department for approval after appointment.
- The *Contractor* may not commence with Work onsite unless the safety file has been approved by TPT SHEQ.
- The *Contractor* shall submit a Method Statement to TPT for approval with all the necessary holding points.
- The *Contractor* shall compile a risk assessment before executing any task. The assessment must be shared with the *Project Manager's* assigned person onsite who is monitoring the construction activities.

6.1.3 Environmental Constraints and Management

The *Contractor* shall ensure that the execution of the works complies with all the environmental standards and regulations. The TPT SHEQ Manager shall work closely with the project team and the *Contractor* to ensure that all environmental standards and regulations are well understood by everybody.

6.1.4 Quality Assurance Requirements

CXLVIII. The *Contractor* shall not undertake any work in advance before review and acceptance of the Quality Control Plan and/or without the written consent of Transnet.

CXLIX. Pre-inspection meetings may be held at the discretion of Transnet. In such cases, the content of the agenda shall include, but not be limited to, the following:

- Documentation: Method of Submission reviews etc.
- Quality Control Plan: Agreement of inspection, witness, review and hold points, Agreement of contacts for notification, etc.
- Code Data book / QC Dossier: Agreement to contents and format.
- QC Procedures: Agreement to Scope.
- AIA: Authorised Inspection Authority requirements.
- Communications: Responsible persons.
- Non-destructive Testing: Personnel qualification, method and extend required.

Definition: Inspection means all activities such as measuring, examining, testing, gauging one or more characteristics of material or service and comparing these with specified requirements to determine conformity.

The *Contractor* shall as a minimum, carry out the inspections as detailed in the Quality Control Plan and maintain the required records for verification by Transnet Project

Manager or delegated Transnet *representing* the *Employer*. Signing-off of the Quality Control Plan progressively by all relevant parties is a mandatory requirement following the indicated inspection activity.

Non-Conformities: Non-Conformity is defined as a deficiency in characteristic, documentation or procedure which renders the quality of an item, work or service unacceptable or indeterminate in accordance with specified requirements. Such Non-Conformities shall be identified by the *Contractor / Project Manager*.

All proposed re-working or repair shall, together with the relevant procedures, shall be firstly reviewed by the *Project Manager* or any other assigned *Employer's* representative.

The *Contractor* shall maintain a register of his NCR's and shall submit this register to the *Employer* monthly. The *Employer* reserves the right to request copies of NCR's for review of deviation and disposition.

The *Contractor* develops and maintains a comprehensive register of documents that will be generated throughout the contract including all quality related documents as part of its Quality Plan.

The *Project Manager* will indicate those documents required to be submitted for either information, review or acceptance and the *Contractor* will indicate such requirements within his register of documents.

The Quality Plan means the *Contractor's* statement, which outlines strategy, methodology, resources allocation, QA and Quality Control co-ordination activities to ensure that the works meet the standards stated in the Works Information.

6.1.5 Programming Constraints

The indicative timelines for the project are as follows:

- The *Contractor* and the *Employer* shall agree on the programme for the execution of the project. The *Project Manager* shall compile a programme and present to the *Contractor*. In relation to the programme drawn by the *Project Manager*, the *Contractor* should provide a programme and use standard NEC Scope Document programme clauses in the template.
- The *Contractor's* Programs is evaluated by the *Project Manager* to assess the *Contractor's* ability to plan his portion of the project to the extent necessary for the high degree of mutual co-ordination demanded by the Project.

- The *Contractor* submits a program within 1 weeks of the date on which he was notified of having been awarded the contract / order.
- The *Contractor* shows on his Accepted Programme and all subsequently revised programmes schedules showing the critical path or paths and all necessary logic diagrams demonstrating sequence of operations.

6.1.5.1 Progress Reporting:

- The *Contractor* updates the program and supplies the progress reports to show actual and expected progress compared to the latest agreed Contract Program. Progress information may be verified by the *Project Manager* at any stage.
- The methodology to define work content in the progress curves needs to be agreed to between the *Contractor* and *Employer* within 5 days of Contract Award.
- The work content needs to be specifically designed to suit the type of work and to effectively indicate actual progress against planned progress.
- Progress reports are submitted in line with the requirements as specified in the table below.

Table 5: Progress Reporting Requirements

Item	Description	Frequency
1.	General Planning Report and revised network if logic has changed since the previous report.	Weekly
2.	Critical Activities Report. (Look ahead)	Bi-Weekly
3.	Milestone Report.	Bi-Weekly
4.	Updated Bar Charts.	Bi-Weekly
5.	Updated Program Graphs.	Bi-Weekly
6.	Progress S-Curves.	Bi-Weekly
7.	Expediting Report	Bi-Weekly
8.	Milestones of Deliverables	Bi-Weekly

- The *Contractor* uses the latest version Microsoft Projects (MS Project), Primavera or other applicable project software for his programme submissions or a similar programme software package equivalent to the latest version of the project software subjected to and with the prior written notification and acceptance by the *Project Manager*.

5.1.5.2 Reporting and Monitoring:

- The *Contractor* completes an assessment of all activities in progress and to completion to determine percentage complete, forecast completion dates, deviations from the Accepted Programme and proposes remedial actions to rectify deviations.

6.1.6 Contract Change Management

- At the Contract kick off meeting, the *Contractor* will be provided with the format of the standard forms to be used for communication of Contract change management.
- All change management processes shall be document accordingly.

6.6.7 Procurement Code of Conduct

Transnet aims to achieve the best value for money when buying or selling goods and obtaining services. This however must be done in an open and fair manner that supports and drives a competitive economy.

6.1.8 The Contractor's Invoices

- The *Contractor* is paid by electronic bank transfer within the period stated in the Contract Data.
- The *Contractor* provides the *Employer* with his correct banking information to make the transfer.
- All payments are provisional and subject to audit.
- The *Contractor* preserves its records for such a period as the Department of Internal Revenue may require, but in any event for not less than five years.
- When the *Project Manager* certifies payment following an assessment date, the *Contractor* complies with the *Employer's* procedure for invoice and statement submission.
- Timing and procedure for submitting invoices will be presented at the kick-off meeting following award.
- The invoice and statement must correspond to the *Project Manager's* assessment of the amount due to the *Contractor* as stated in the payment certificate.
- All other procurement related issues will be handled by the procurement department.

6.1.9 Manpower

- *Contractor* shall ensure that suitably qualified and certified persons are allocated to tasks.
- *Contractor* does not employ or bring a Sub-contractor onto the Site and/or Working Areas without the prior approval of the *Project Manager*.
- Where the *Contractor* employs a Sub-contractor who constructs or installs part of the works or who supplies Plant and Materials for incorporation into the works which involves a Sub-contractor operating on the Site and/or Working Areas, then the *Contractor* ensures that any such Sub-contractor complies with all the safety, risk and quality requirements as stipulated in this documents and as required by the *Employer*.

6.1.10 Plant and Materials

- The *Contractor* shall supply training and maintenance schedules in the data books submitted. These schedules will be added to SAP to ensure that effective



maintenance is performed. This will entail monthly inspection and planned maintenance repairs when needed

7 List of Drawings

7.1 Drawings issued by the Employer

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

Description		
Drawing No.	Revision	Description
CIVIL DRAWINGS		
5200157-2-001-C-LA-0001-01	01	STOCKYARD AREA GENERAL LAYOUT
5200157-2-001-C-LA-0001-02	01	STOCKYARD AREA STORMWATER LAYOUT
5200157-2-001-C-LA-0001-03	01	STOCKYARD AREA DEMOLITION LAYOUT
5200157-2-001-C-SE-0001-01	01	STOCKYARD AREA STORMWATER LONG SECTIONS SHEET 1 OF 3
5200157-2-001-C-SE-0001-02	01	STOCKYARD AREA STORMWATER LONG SECTIONS SHEET 2 OF 3
5200157-2-001-C-SE-0001-03	01	STOCKYARD AREA STORMWATER LONG SECTIONS SHEET 3 OF 3
5200157-2-001-C-DE-0001-01	01	STOCKYARD AREA POND DETAILS
5200157-2-001-C-DE-0001-02	01	TYPICAL STORMWATER MANHOLE DETAILS
5200157-2-001-C-DE-0001-03	01	TYPICAL STORMWATER GRID INLET & CATCHPIT DETAILS
5200157-2-001-C-DE-0001-04	01	TYPICAL STORMWATER HEADWALL, SCOUR AND CONCRETE ENCASEMENT DETAILS
5200157-2-001-C-LA-0002-01	01	TIPPLER STORMWATER LAYOUT AND KEY PLAN
5200157-2-001-C-LA-0002-02	01	TIPPLER LAYOUT DETAIL SHEET 1 OF 3
5200157-2-001-C-LA-0002-03	01	TIPPLER LAYOUT DETAIL SHEET 2 OF 3
5200157-2-001-C-LA-0002-04	01	TIPPLER LAYOUT DETAIL SHEET 3 OF 3
5200157-2-001-C-SE-0002-01	01	TIPPLER STORMWATER LONGSECTION SHEET 1 OF 4
5200157-2-001-C-SE-0002-02	01	TIPPLER STORMWATER LONGSECTION SHEET 2 OF 4
5200157-2-001-C-SE-0002-03	01	TIPPLER STORMWATER LONGSECTION SHEET 3 OF 4
5200157-2-001-C-SE-0002-04	01	TIPPLER STORMWATER LONGSECTION SHEET 4 OF 4
5200157-2-001-C-DE-0002-01	01	TIPPLER POND 1, 2 & 4 DETAIL
5200157-2-001-C-DE-0002-02	01	TYPICAL GRID CHANNEL, MOUNTABLE KERB, SUBSOIL COLLECTOR DRAIN (SCD) AND TRAPEZOIDAL CHANNEL DETAIL
5200157-2-001-C-LA-0003-01	01	RAIL EMBANKMENT GENERAL LAYOUT
5200157-2-001-C-LA-0003-02	01	RAIL EMBANKMENT STORMWATER LAYOUT SHEET 1 OF 3

5200157-2-001-C-LA-0003-03	01	RAIL EMBANKMENT STORMWATER LAYOUT SHEET 2 OF 3
5200157-2-001-C-LA-0003-04	01	RAIL EMBANKMENT STORMWATER LAYOUT SHEET 3 OF 3
5200157-2-001-C-SE-0003-01	01	RAIL EMBANKMENT LONGSECTION SHEET 1 OF 6
5200157-2-001-C-SE-0003-02	01	RAIL EMBANKMENT LONGSECTION SHEET 2 OF 6
5200157-2-001-C-SE-0003-03	01	RAIL EMBANKMENT LONGSECTION SHEET 3 OF 6
5200157-2-001-C-SE-0003-04	01	RAIL EMBANKMENT LONGSECTION SHEET 4 OF 6
5200157-2-001-C-SE-0003-05	01	RAIL EMBANKMENT LONGSECTION SHEET 5 OF 6
5200157-2-001-C-SE-0003-06	01	RAIL EMBANKMENT LONGSECTION SHEET 6 OF 6
5200157-2-001-C-DE-0003-01	01	RAIL EMBANKMENT POND 12 & 6 CROSS SECTION DETAIL
5200157-2-001-C-DE-0003-02	01	RAIL EMBANKMENT GRID CHANNEL AND MANHOLE DETAIL
5200157-2-001-C-DE-0003-03	01	RAIL EMBANKMENT KERB DETAIL AND SUBSOIL COLLECTOR DRAIN
5200157-2-001-C-LA-0004-01	01	MULTIPURPOSE TERMINAL STORMWATER LAYOUT & KEY PLAN
5200157-2-001-C-LA-0004-02	01	MULTIPURPOSE TERMINAL DETAILED LAYOUT
5200157-2-001-C-LA-0004-03	01	MULTIPURPOSE TERMINAL DEMOLITION LAYOUT
5200157-2-001-C-SE-0004-01	01	MULTIPURPOSE TERMINAL STORMWATER LONG SECTIONS SHEET 1 OF 3
5200157-2-001-C-SE-0004-02	01	MULTIPURPOSE TERMINAL STORMWATER LONG SECTIONS SHEET 2 OF 3
5200157-2-001-C-SE-0004-03	01	MULTIPURPOSE TERMINAL STORMWATER LONG SECTIONS SHEET 3 OF 3
5200157-2-001-C-DE-0004-01	01	MULTIPURPOSE TERMINAL STILLING BASIN DETAILS
5200157-2-001-C-GA-0005-01	01	CAUSEWAY GENERAL ARRANGEMENT
5200157-2-001-C-LA-0005-01	01	CAUSEWAY PLAN LAYOUT CATCHMENT AREA 1
5200157-2-001-C-LA-0005-02	01	CAUSEWAY PLAN LAYOUT CATCHMENT AREA 2
5200157-2-001-C-LA-0005-03	01	CAUSEWAY PLAN LAYOUT CATCHMENT AREA 3 & 4
STRUCTURAL DRAWINGS		
5200157-2-001-S-DE-0001-01-00	00	STILLING BASIN LADDER AND ACCESS DETAILS
5200157-2-001-S-GA-0001-01-00	00	STILLIN BASINS 1-8 GENERAL ARRANGEMENTS
5200157-2-001-S-DE-0002-01-00	00	STILLIN BASIN SECTIONS AND DETAILS 2 OF 2
5200157-2-001-S-SE-0001-01-00	00	STILLIN BASIN SECTIONS AND DETAILS 1 OF 2
5200157-2-001-S-LA-0001-01-00	00	STILLIN BASINS 1-8 LAYOUTS
5200157-2-001-S-RD-0001-01-00	00	MPT STILLING BASIN WALLS REINFORCEMENT DETAILS

5200157-2-001-S-RD-0002-01-00	00	MPT STILLING BASIN TOP SLAB REINFORCEMENT DETAILS
5200157-2-001-S-RD-0003-01-00	00	MPT STILLING BASIN BEAMS AND COLUMNS REINFORCEMENT DETAILS
5200157-2-001-S-RD-0004-01-00	00	MPT STILLING BASIN FOUNDATION SLAB REINFORCEMENT DETAILS



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description

Saldanha Bay is located approximately 100 km north of Cape Town on the West Coast, with The Port situated on the northern shore of Saldanha Bay. Access to the site is by means of a security entrance situated on the western most boundary of the Naval Base.

The area along the northern coast of the Bay is characterised by a gently undulating coastal plain with sandy soil and sparse vegetation typical of the West Coast.

Low hills are located to the north and west surrounding the Bay with Malgaskop at 173m above mean sea level located to the west, Karringberg at 175m above mean sea level located to the East and Potsberg on the Langebaan Peninsula at 192.8m above mean sea level located to the south. Granite outcrops frequent this coastal area and surrounding environment.

The Saldanha Port Terminal is with the Port of Saldanha. The Port of Saldanha is surrounded by four (3) nearby towns namely: Saldanha, Vredenburg & Langebaan. The existing infrastructure in the Port consists of various buildings, internal access roads, operational railway lines, subsurface cables, storm water drains, water mains, subsurface electrical cables and light masts.

The Saldanha Terminal consists of the Multi-Purpose Terminal (MPT) and the Iron Ore Terminal (IOT). The site for this specific *works* consist of five (5) locations within the Saldanha Terminal namely:

- Multi-Purpose Terminal (MPT) Area
- Tippler Area
- Causeway Area
- Rail Embankment Area
- Stockpile Area



TRANSNET PORT TERMINAL

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1.2. Existing buildings, structures, and plant & machinery on the Site

The buildings around the MPT site includes, 1st and 2nd warehouses, RO Plant, Sampling Plant, Corporate Building and three Security Guardhouses. The site is accessible via Haul Road through Gates 201, 202, and 203. Notable infrastructure within the site is the rail-line and the two conveyor belts (across the Haul road).

The buildings around the Iron Ore Terminal (IOT) includes the Technical Building and the Admin Executive Building. Notable infrastructure around the Tippler & Stockyard Areas includes the two tipplers and the four Stacker Reclaimers.

The diagram below, shows the 5 projects locations within the terminal



1.3. Subsoil information

Geotechnical & Hydro technical Studies were conducted in the project site:

Refer to **ANNEXURE A for the Geotechnical Report**

ANNEXURE B for the Hydro technical Report



TRANSNET PORT TERMINAL

CONTRACT NUMBER: TPT/2024/11/0003/84253/RFP

DESCRIPTION OF SERVICES: SUPPLY OF MATERIAL AND THE CONSTRUCTION OF STORM WATER & ENVIRONMENTAL SYSTEMS AT SALDANHA TERMINAL AT THE TRANSNET PORT TERMINALS (TPT), BULK TERMINAL SALDANHA (BTS) FOR A PERIOD OF TWELVE MONTHS (12)

1.4. Hidden services

The site consist of an extensive network of services including but not limited to stormwater, water reticulation, sewer services, communication lines, electrical lines, oil lines and Reverse Osmosis water lines. While as built information is provided. it is also the responsibility of the Contractor to verify all existing services and notify the Supervisor if any existing unforeseen services are encountered.

The Contractor is required to prove and protect existing services prior to construction for the full extent of the site. Please note any new services encountered during investigative work is to be brought to the attention of the Supervisor or Project Manager on site and marked up on the relevant drawing for as-built purposes. Any alternative provided by the Contractor to the Employer's design which significantly affects the services in the area must be taken into account by the Contractor and a method statement provided for the temporary and permanent protection subject to approval by the Project Manager. Please note that any alternate designs would require a guarantee of the proposed design for the full intended design life.

The Contractor shall take special note of any oil pipes that are encountered in the area of the scope of work, these pipes shall not be damaged in any way while completing the new works and be brought to the attention of the Supervisor on site. The Contactor shall ensure that any new services crossing existing pipelines shall be done according to the required standards with the dedicated cover between the two services.

1.5. Other reports and publicly available information

Other reports available:

Geo-Hydrology Report

Geotechnical Report

Any other reports can be requested through the Project Manager and supplied if available.



TRANSNET CAPITAL PROJECTS

PORT OF SALDANHA

Geotechnical Investigation Report for Stormwater Management System, Port of Saldanha



Prepared by			
Reviewed by			
Date of Issue			

PORT OF SALDANHA

**GEOTECHNICAL INVESTIGATION REPORT FOR
STORMWATER MANAGEMENT SYSTEM, PORT OF SALDANHA**

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B – INSPECTION PIT LOGS

C – BOREHOLE LOGS (from previous investigations)

D – DCP TEST RESULTS

E – LABORATORY TEST RESULTS

F – PHOTOS

1. INTRODUCTION

1.1 SCOPE OF WORKS

Transnet Ports and Terminals (TPT) in Saldanha is currently proposing the upgrading of the stormwater systems at the Port of Saldanha. The Stormwater Master Plan for the Port of Saldanha covers the areas owned by the National Ports Authority of South Africa and includes the Small Craft Harbour and the Iron Ore Terminal, but excludes the Breakwater. The area covered in this report has been divided into 5 major catchments which are further sub-divided into 21 smaller sub-catchments. The catchments are defined by their physical characteristics including existing drainage system boundaries as well as by the operational activities.

Proposed new development comprise, amongst others, the following infrastructure components at the five areas (Tippler, Stockpile, Multipurpose, Rail Embankment and Causeway Area)

- In all the areas
 - Evaporation ponds
 - Retaining ponds
- At the Ore Jetty and Causeway area, a Water Treatment Plant comprising:
 - Sludge storage tank;
 - Dewatering building;
 - Cloth filter;
 - Clariflocculator;
 - pH correction; and
 - Receiving tank.
- At the Multipurpose and Stockpile area
 - Upgrade to an existing access road;
 - New pavements for the Multipurpose Area.

The objective of the investigation was to investigate founding conditions of the site (within the limits afforded by the method of investigation) in terms of the following:

- Providing an overview of the geology of the site;
- Describing the soil and rock profiles encountered;
- Evaluating engineering properties of materials found; and

- Presenting findings, geotechnical considerations and general recommendations that may have an influence on the design and construction of the proposed structures.

This geotechnical report presents the factual data, analysis of the results of the investigations as well as conclusions and recommendations relevant to development of the site.

1.2 DELIVERABLES IN TERMS OF APPOINTMENT

The scope of work can be briefly summarised as follows:

- Carry out field investigation which includes soil profiling and sampling in accordance with relevant specifications for geotechnical investigations
- Determine the nature, distribution and relevant engineering properties of the soil and rock strata underlying the site in order to advise on the geotechnical characteristics of the materials on site, with specific reference to founding conditions for various structures and suitability of the near surface soils for use in road layer works construction.
- Present all the relevant information in a written geotechnical ground investigation report.

1.3 AVAILABLE INFORMATION

At the time of the investigation the following information was available:

- 1:250 000 scale geological map of Cape Town 3318. Geological Survey, printed by the Government Printer, Pretoria, 1990.
- The 1:250 000 scale soil land type map of Cape Town 2628 (Soil and Research Institute, 1985).
- Transnet Capital Projects Port of Saldanha Stormwater Master Plan: Report H340361-0000-10-236-0001.
- Rotary Core borehole information from previous investigations in the area.
- Aerial photographs, sourced from Google Earth®
- Various layout plans were received from

All the abovementioned information has been used in the initial planning and execution phases of this geotechnical investigation.

2. THE SITE

2.1 SITE LOCALITY

Saldanha Bay is located approximately 100 km north of Cape Town on the West Coast. The Port is located on the northern shore of Saldanha Bay. The area along the northern coast of the Bay is characterised by a gently undulating coastal plain with sandy soil and sparse vegetation typical of the West Coast.

Low hills are located to the north and west surrounding the Bay with Malgaskop at 173m above mean sea level located to the west, Karringberg at 175m above mean sea level located to the East and Potsberg on the Langebaan Peninsula at 192.8m above mean sea level located to the south. Granite outcrops frequent this coastal area and surrounding environment, see Figure 1 below:



Figure 1: Aerial view of the Port of Saldanha

The geotechnical study was carried out at the Tippler area, Stockpile Yard, Rail Embankment, Multipurpose Area as well as the Causeway Area as shown in **Drawing 1226551** in Appendix A.

In general, the areas under investigation are generally flat and existing infrastructure consist of various buildings, internal access roads. Several subsurface cables, storm

water drains, water mains, several subsurface electrical cables and light masts were found to be present. Currently access to the site is by means of the security entrance situated on the western most boundary of the Naval Base.

The extent of the proposed developments in relation to the existing infrastructure is shown on the site plan given in Appendix A of the report.

2.2 CLIMATE

Saldanha normally receives about 249mm of rain per year and because it receives most of its rainfall during winter it has a Mediterranean climate. It receives the lowest rainfall (1mm) in February and the highest (49mm) in June. The average midday temperatures for Saldanha range from 16.4°C in July to 25.1°C in February. The region is the coldest during June when the mercury drops to 8°C on average during the night.

The region where the proposed site is situated is classified as having a climatic N-value (after Weinert, 1980) of less than 5, which indicates a more humid part of the country. Chemical weathering is predominant in this part of the country.

3. NATURE OF THE INVESTIGATION

3.1 DESKTOP STUDY

The investigation for the above site included a desktop study of all the previous works carried out on the site and included a review of the following reports:

- i) The Geology of the Cape Town area by J.N. Theron, P.G. Gresse, H.P. Siegfried and J.Rogers (Explanation of Sheet 3318)
- ii) Engineering Geology of Southern Africa; Post-Gondwana Deposits, Volume 4, November 1985 by A.B.A. Brink
- iii) Port of Saldanha: Construction of New Berthing Facility; Interpretative Geotechnical Report by Transnet Geotechnical Service, dated November 2007
- iv) Port of Saldanha: Construction of New Stockpile Areas; Geotechnical Report by Transnet Projects Geotechnical Services, dated January 2007

- v) Port of Saldanha: Geotechnical Investigation for the Proposed Extensions to the General Cargo Berths; Quay Wall Report by Protekon Design Services, dated July 1995
- vi) Port of Saldanha: Paving at the Multi-Purpose Terminal; Geotechnical Report by Transnet Geotechnical Services, dated April 2011
- vii) Transnet Saldanha Iron Ore Expansion Tippler 3 Geotechnical Report: Package C002 by AECOM, dated March 2015

Several boreholes, which were found to be relevant to our site have been extracted from the above reports and are included in Appendix C of this report.

3.2 SITE INVESTIGATION

The geotechnical investigations were conducted in February 2017 and comprised test pitting and soil sampling. The site investigation comprised excavation of thirty (30 No) test pits with a tractor loader backhoe (TLB) and conducting fifty seven (57 No) Dynamic Cone Penetrometer Test (DCP).

Test pits were excavated to determine the subsurface soil conditions. The test pits were excavated with a TLB up to a depth that varied between 1,5m and 3,5m or refusal on hard material. Thirty (30 No) test pits were excavated. Coordinates of the test pits were determined using a hand-held GPS on the South African grid with WGS84 coordinate system (Lo 35).

A two-person team carried out the test pitting in order to comply with accepted safety requirements as reflected in the South African Code of Practice (SAICE: 2007). The test pits were profiled by an engineering geologist according to the method proposed in SANS 633 (2009). The excavations were loosely backfilled after completion of soil profiling and sampling.

The test pits were set out and profiled by a team of engineering geologists/ geotechnical engineers in accordance with South African standards (Standards South Africa. South African. National Standard. Profiling, Percussion Borehole and Core Logging in Southern Africa SANS 633:2012.). The Test pit logs are included in Appendix B.

Representative samples were recovered and sent to the SANAS-accredited Engineering Materials Laboratory for testing. Testing included the determination of the Foundation

Indicators (comprising grading analyses – both sieve and hydrometer analyses – and Atterberg Limits), chemical tests (pH and Conductivity) as well as the determination of the compaction characteristics i.e. maximum dry densities (MDD) and optimum moisture contents (OMC) as well as determination of the California Bearing Ratio (CBR).

Hand held Dynamic cone penetration (DCP) tests were carried out at each test pit position. The tests were done to determine the in situ strength of the near surface soils and were done to either refusal or a maximum depth of 3,0m. Two DCP tests were conducted at each test pit, one test on the surface and another one at the base of the pit. The penetration (in mm) to advance the cone for every five blows was recorded. The DCP results are included in Appendix D.

The positions of the test pits are listed below in Table 1 with the detailed test pit logs attached in Appendix B.

Table 1: Test Pit Summary

Test Pit No	Coordinates (UTM WGS84, ZONE 35J)		Depth (m)	Remarks
	Easting	Northing		
TIPPLER AREA				
TTP-01	17°59'57.7"	32°59'56.3"	2,20	Refusal on bedrock
TTP-02	17°59'56.7"	32°59'57.0"	2,00	Refusal on bedrock
TTP-03	17°59'56.6"	32°59'58.1"	1,80	End of hole
TTP-04	17°59'55.9"	32°59'59.0"	1,62	End of hole
STOCKPILE YARD				
STP-01	18°00'07.6"	33°00'07.5"	1,10	End of hole
STP-02	18°00'11.9"	33°00'09.4"	1,30	End of hole
STP-03	18°00'09.5"	33°00'17.3"	1,20	Refusal on Hardpan Calcrete
STP-04	18°00'08.3"	33°00'21.4"	0,90	Refusal on Hardpan Calcrete
STP-05	18°00'03.0"	33°00'29.2"	1,30	End of hole
STP-06	17°59'57.4"	33°00'27.9"	1,40	End of hole
STP-07	17°59'48.0"	33°00'27.7"	1,10	Refusal on boulders

Test Pit No	Coordinates (UTM WGS84, ZONE 35J)		Depth (m)	Remarks
	Easting	Northing		
MULTIPURPOSE AREA				
MTP-01	17°59'25.0"	33°00'48.2"	1,40	End of hole
MTP-02	17°59'28.0"	33°00'46.5"	1,00	End of hole
MTP-03	17°59'32.2"	33°00'46.1"	1,20	End of hole
MTP-04	17°59'32.2"	33°00'51.6"	1,20	End of hole
MTP-05	17°59'28.8"	33°00'59.5"	0,60	Refusal on boulders
MTP-06	17°59'26.1"	33°01'05.5"	1,10	End of hole
MTP-07	17°59'23.3"	33°01'11.9"	0,90	Refusal on boulders
RAIL EMBANKMENT				
RTP-01	17°59'42.4"	33°00'27.1"	1,20	End of hole
RTP-02			1,20	End of hole
RTP-03	17°59'39.8"	33°00'32.8"	1,30	End of hole
RTP-04	17°59'40.0"	33°00'34.6"	0,80	Refusal on boulders
RTP-05	17°59'36.7"	33°00'39.6"	1,20	End of hole
RTP-06	17°59'35.7"	33°00'44.0"	1,30	End of hole
CAUSEWAY AREA				
CTP-01	17°59'20.2"	33°01'19.0"	1,30	End of hole
CTP-02	17°59'16.3"	33°01'27.2"	1,20	End of hole
CTP-03	17°59'13.8"	33°01'28.5"	0,60	Refusal on boulders
CTP-04	17°59'13.5"	33°01'29.2"	1,00	Refusal on boulders
CTP-05	17°59'10.5"	33°01'33.0"	1,40	Refusal on boulders
CTP-06	17°59'10.1"	33°01'33.7"	1,50	End of hole

4. SITE GEOLOGY

According to the 1:250 000 scale geological map, Sheet 3318 Cape Town, The Port of Saldanha is typically underlain at depth by granite of the Cape Granite Suite, that have weathered to varying degrees. Residual soil derived from the in situ weathering of the bedrock is evident in most areas above the bedrock. Younger, typically unconsolidated,

transported sediments overlie the bedrock strata; these are typically calcrete and limestone and calcified parabolic sand of Quaternary in age and consist of the Langebaan Formation which was deposited as a coastal spit (aeolianites and channel fill deposits) along the shoreline, the Harbour Beds that occur inland of the coastal sand dunes, the recent surface beach deposits along the shoreline.

5. GEOTECHNICAL EVALUATION OF SITE CONDITIONS

The evaluation given below is based on existing ground levels at the time of the fieldwork. It is recognised that final surface levels may be different to the present levels, but these details were not known at the time of the investigation.

The ground profiles encountered at each of the respective structures are described separately below.

5.1 TIPPLER AREA

The summarised findings of the respective test pits are presented in Table 2 below. Four (4No) test pits were excavated at tippler area site. Information from three (3No) boreholes (BH7, BH8 and BHE3) from previous investigations was also used in evaluating the profile of this area.

The geological profile at the tippler area position may be summarised as follows:

- Topsoil;
- Fill;
- Marine Deposits; and
- Pedogenic Layer.

Topsoil

The topsoil is classified as dry, reddish brown, intact gravelly sand. It has an average thickness of 0,1m. The topsoil was profiled as generally having a loose to medium dense consistency in the test pit.

Fill

The fill is classified as dry, dark grey, cream brown and reddish brown, sandy grave gravelly sand to sandy gravel, domestic waste (plastics and bottles) and bricks. It has an

average thickness of 0,80 m. The fill was profiled as generally having loose to medium dense consistency in the test pits.

Quaternary Deposits

The marine deposits were encountered in all the test pits at the site. They comprise a cream brown, off white to grey fine sand to gravelly sand with occasional shell fragments. This layer has loose to medium dense consistency. The marine deposits reach a depth up to 10,3m in BH7.

Pedogenic layer

The pedogenic layer (calcrete) generally underlies the marine deposits and was encountered in TTP-01 on this site. This layer comprises a horizon of off-white to cream, very soft rock, hardpan calcrete. From the boreholes the calcrete reaches depths of 7,5m (BH8) and a maximum depth of 15,0m (BHE3).

Table 2: Test pit summary –Tippler area

Test Pit No	Topsoil (m)	Fill (m)	Residual Layer(m)	Bedrock(m)
TTP-01	0-0,10	0,10-0,60	0,60-2,10	2,10-2,20
TTP-02	0-0,10	0,10-1,00	1,00-2,00-	
TTP-03	0-0,08	0,08-1,20	1,20-1,80-	
TTP-04	0-0,06	0,06-0,71	0,71-1,62	

5.2 STOCKPILE YARD

The summarised findings of the respective test pits are presented in Table 3 below. Seven (7 No) test pits were excavated at stockpile yard area site. Information from seven (7No) boreholes (BH1P3, BH1P4, BH1P6, BH9, BH10, BH21 and IOS9) from previous investigations was also used in evaluating the profile of this area.

The geological profile at the stockpile yard position may be summarised as follows:

- Topsoil;
- Fill;
- Marine Deposits; and
- Pedogenic Layer.

Topsoil

The topsoil is classified as dry, reddish brown, intact, silty fine sand to gravelly sand. It has an average thickness of 0,1m. The topsoil was profiled as generally having a loose to medium dense consistency in the test pits.

Fill

The fill at this site is classified as dry, dark grey, cream brown and reddish brown, sandy gravel to gravelly sand and boulders, domestic waste (plastics and bottles) and bricks. The fill was profiled as generally having a dense consistency in the test pits. Some of this fill is subbase layer. The gravels in the fill are iron rich. The fill extends to depth of 5,60 m in borehole IOS9.

Quaternary Deposits

The marine deposits comprise a cream brown, light olive green, light yellowish brown fine sand with occasional shell fragments. This layer has loose to very loose consistency. The marine deposits extends to depth of 19,95m (BH21).

Pedogenic layer

The pedogenic layer (calcrete) generally underlies the marine deposits and was encountered in STP-03 and STP-04 on this site. This layer comprises a horizon of of-white to cream, very soft rock, hardpan calcrete.

Table 3: Test pit summary –Stockpile Yard Area

Test Pit No	Topsoil (m)	Fill (m)	Marine Deposits(m)	Hardpan Calcrete(m)
STP-01		0-0,77	0,77-1,10	
STP-02		0-1,30		
STP-03		0-1,10		1,10-1,20-
STP-04		0-0,80		0,80-0,90
STP-05	0-0,12	0,12-0,57	0,57-1,30	
STP-06	0-0,12	0,12-1,40		
STP-07	0-0,20	0,20-1,10		

5.3 MULTIPURPOSE AREA

The summarised findings of the respective test pits are presented in Table 4 below. Seven (7 No) test pits were excavated at multipurpose site. Information from four (4

No) boreholes (BH1, BH2, BH3 and BH4) from previous investigations was also used in evaluating the profile of this area.

The geological profile at the multipurpose position may be summarised as follows:

- Topsoil;
- Fill; and
- Marine Deposits.

Topsoil

The topsoil is classified as dry, reddish brown, intact, silty fine sand to gravelly sand. It has an average thickness of 0,13m. The topsoil was profiled as generally having a loose to medium dense consistency in the test pits.

Fill

The fill at this site is classified as dry to slightly moist, light creamish white to light olive green, grey and orange brown sandy gravel to gravelly sand, cobbles, boulders, domestic waste (plastics and bottles). The fill was profiled as generally having a medium dense consistency in the test pits.

Quaternary Deposits

The marine deposits comprise a cream white, light olive green, light yellowish brown gravelly sand with occasional shell fragments. This layer has loose to medium dense consistency. This material extends to depths up to 18,70 m on the boreholes.

Table 4: Test pit summary –Multipurpose Area

Test Pit No	Topsoil (m)	Fill (m)	Marine Deposits(m)
MTP-01	0-0,30		0,30-1,40
MTP-02	0-0,05	0.05-1,00	
MTP-03	0-0,04	0.05-0,82	0,82-1,20
MTP-04	0-0,05	0.05-1,20	
MTP-05	0-0,10	0,10-0,60	0,57-1,30
MTP-06	0-0,06	0,06-1,10	
MTP-07	0-0,29	0,29-0,90	

5.4 RAIL EMBANKMENT AREA

The summarised findings of the respective test pits are presented in Table 5 below. Six (6 No) test pits were excavated at this site.

The geological profile at the rail embankment position may be summarised as follows:

- Topsoil; and
- Fill.

Topsoil

The topsoil is classified as dry, reddish brown, intact, silty fine sand to gravelly sand. The topsoil was profiled as generally having a loose to medium dense consistency in the test pits.

Fill

The fill at this site is classified as dry, light creamish white, green brown to mottled cream, yellowish brown, sandy gravel to gravelly sand, cobbles and boulders. The fill was profiled as generally having a medium dense consistency in the test pits.

Table 5: Test pit summary –Railway embankment Area

Test Pit No	Topsoil (m)	Fill (m)
RTP-01	0-0,03	0.03-1,20
RTP-02	0-0,04	0.04-1,20
RTP-03	0-0,02	0.02-1,30
RTP-04	0-0,10	0.10-0,80
RTP-05	0-0,20	0,20-1,20
RTP-06	0-0,11	0,11-1,30

5.5 CAUSEWAY AREA

The summarised findings of the respective test pits are presented in Table 6 below. The site includes the following proposed structures:

- Sludge storage tank;
- Dewatering building;
- Cloth filter;
- Clariflocculator;
- pH correction; and

- Receiving tank

Six (6 No) test pits and eight were excavated at this site. Information from four (4 No) onshore boreholes from previous investigations was also used in evaluating the profile of this area.

The geological profile at the causeway area position may be summarised as follows:

- Topsoil;
- Fill; and
- Concrete Paving.

Topsoil

The topsoil is classified as dry, reddish brown, intact, silty fine sand to gravelly sand. The topsoil was profiled as generally having a loose to very loose consistency in the test pits.

Fill

The fill at this site is highly variable and is classified as dry, light creamish white, yellowish brown, sandy gravel to gravelly sand, cobbles and boulders. The fill was profiled as generally having a medium dense consistency in the test pits. A subbase layer was intersected at CTP-06. This fill extends to depth of about 10,5m in the boreholes (AUR.B01A and AUR.B01B).

Paving

This layer was encountered in test pit CTP-06 at the site and comprised of dry, black, dense, asphalt paving with fine gravel.

Table 6: Test pit summary –Causeway Area

Test Pit No	Topsoil (m)	Fill (m)	Paving
CTP-01	0-0,10	0.10-1,30	
CTP-02	0-0,30	0.30-1,20	
CTP-03		0-0,60	
CTP-04		0-1,00	
CTP-05		0-1,40	
CTP-06		0,02-1,50	0-0,02

6. LABORATORY TESTING

6.1 LABORATORY TEST RESULTS

Representative samples were collected for laboratory testing at selected test pit positions and submitted for foundation indicator tests. The test results are attached in Appendix E and summarised in Table 7 below.

Table 7: Laboratory results summary

TP No. (sample depth below NGL [m])	Soil Origin	GM	PI	MDD (kg/m3)	OMC (%)	SWELL (%)	CBR Values at % MOD AASHTO				COLTO / TRH 14	pH	Conductivity (mS/m)
							93%	95%	98%	100%			
TIPPLER POSITION													
TTP1 (0.60-1.30)	Marine Deposits	1.33	NP	1685	8.6	0	11	13	15	16	G8	8.59	
TTP2 (0.20-0.25)	Fill	1.53	NP	1923	8.6	0	22	25	30	34	G6	8.63	0.151
TTP3 (1.20-1.80)	Marine Deposits	1.65	NP	1688	8.8	0	10	13	19	25	G8	8.56	

TP No. (sample depth below NGL [m])	Soil Origin	GM	PI	MDD (kg/m3)	OMC (%)	SWELL (%)	CBR Values at % MOD AASHTO				COLTO / TRH 14	pH	Conductivity (mS/m)
							93%	95%	98%	100%			
MULTIPURPOSE AREA													
MTP1 (0-0.30)	Topsoil	1.84	NP									8.22	0.022
MTP1 (0.30-1.40)	Marine Deposits	1.40	NP	1729	8.5	0	14	15	17	19	G8	9.75	0.087
MTP2 (0.20-0.44)	Fill	1.22	6.9	2010	6.9	0	3	4	5	5	G10	8.51	
MTP2 (0.44-1.00)	Fill	1.76	NP	1887	8.6	0	24	30	44	54	G6	8.63	
MTP3 (0.17-0.34)	Fill	2.07	NP	2090	6.4	0	40	52	80	100	G4	8.20	0.356
MTP3 (0.34-0.62)	Fill	1.24	NP	1931	7.7	0	2	3	4	4	G10	8.56	1.88
MTP4 (0.23-1.20)	Fill	1.40	NP	1923	8.6	0	23	29	42	53	G6	8.93	0.187
MTP6 (0.16-1.10)	Fill	1.35	NP	1975	7.3	0	40	50	69	82	G5	8.36	1.695
CAUSEWAY AREA													
CTP1 (0.10-1.00)	Fill	1.38	NP	2039	7.4	0	38	42	50	58	G6	9.73	0.144

TP No. (sample depth below NGL [m])	Soil Origin	GM	PI	MDD (kg/m3)	OMC (%)	SWELL (%)	CBR Values at % MOD AASHTO				COLTO / TRH 14	pH	Conductivity (mS/m)
							93%	95%	98%	100%			
CTP2 (0.90-1.20)	Fill	1.29	NP	1966	6.8	0	22	27	39	49	G6	8.55	0.937
CTP4 (0.63-1.00)	Fill	1.48	NP	2090	7.1	0	20	27	44	60	G6		
CTP5 (0.34-0.64)	Fill	1.33	NP	1945	8.6	0	22	27	39	50	G6		
CTP6 (0.34-0.64)	Fill	2.23	NP	2039	7.4	0	39	45	58	69	G5		
STOCKPILE YARD AREA													
STP1 (0.90-1.10)	Marine Deposits	1.07	NP	1719	9.2	0	14	15	18	20	G8	9.86	0.0113
STP2 (0.10-0.50)	Fill	1.71	NP	2175	7.1	0	14	15	18	20	G8	8.21	
STP2 (0.79-1.00)	Fill	1.85	NP									8.67	0.0123
STP2 (1.00-1.30)	Fill	1.00	NP									9.99	0.0026
STP3 (0-0.15)	Fill	2.05	5.8									8.23	0.0125
STP3 (0.15-0.37)	Fill	1.33	NP									9.38	0.0813

TP No. (sample depth below NGL [m])	Soil Origin	GM	PI	MDD (kg/m3)	OMC (%)	SWELL (%)	CBR Values at % MOD AASHTO				COLTO / TRH 14	pH	Conductivity (mS/m)
							93%	95%	98%	100%			
STP3 (0.37-1.20)	Fill	1.68	NP									10.62	0.0124
STP4 (0-0.40)	Fill	1.54	5.8	2606	6.1	0	36	45	60	75	G10	8.52	
STP4 (0.40-0.80)	Fill	1.75	NP									9.43	0.258
STP5 (0.57-1.30)	Fill	1.22	NP	1638	9.3	0	14	15	18	19	G8	9.74	0.083
STP6 (0.18-1.40)	Fill	1.55	NP	2040	7.6	0	25	27	30	33	G6	8.44	
STP7 (0.20-0.46)	Fill	1.43	NP									8.36	0.051
STP7 (0.46-0.80)	Fill	1.47	NP	1786	8.8	0	20	26	40	50	G6	8.44	0.011
RAIL EMBANKMENT AREA													
RTP1 (0.13-0.30)	Fill	1.58	NP	2175	7.1	0	22	45	70	100	G5	8.42	0.091
RTP2 (0.28-0.59)	Fill	1.32	NP	1935	7.2	0	19	25	36	50	G6	10.40	0.473
RT.2 (0.59-1.20)	Fill	1.30	NP	1933	7.3	0	19	22	26	30	G7	8.56	

TP No. (sample depth below NGL [m])	Soil Origin	GM	PI	MDD (kg/m3)	OMC (%)	SWELL (%)	CBR Values at % MOD AASHTO				COLTO / TRH 14	pH	Conductivity (mS/m)
							93%	95%	98%	100%			
RTP3 (0.70-1.30)	Fill	1.45	NP	1939	8.6	0	24	27	33	37	G10	9.88	0.113
RTP5 (0.20-0.49)	Fill	1.40	NP	1946	7.2	0	18	25	41	60	G6	9.66	0.446
RTP6 (0.11-0.88)	Fill	1.28	NP	1948	8.6	0	28	32	41	50	G6	8.52	

GM – Grading Modulus

GM- Liquid Limit

PI – Plasticity Index

UC – Unified Classification

MDD. – Maximum Dry Density

OMC – Optimum Moisture Content

6.2 SUMMARY OF LABORATORY TEST RESULTS

6.2.1 TIPPLER POSITION

The **marine deposits** and **fill** on this site generally consists of silty sand. The layer has a very high (1,33 to 1,65) grading modulus. The fine fractions of this material also exhibit no liquid limit and linear shrinkage, indicating that the material has no plasticity characteristics. The material has a low potential expansiveness, according to the method proposed by Van der Merwe (1973).

The **marine deposits** have a low (1685kg/m^3 to 1688kg/m^3) maximum dry density and moderate optimum moisture content values. The CBR swell values are very low and the tests yielded relatively low to moderate CBR values at densities typically specified in the field (93% to 95%). The material is classified as G8 material according to the TRH 14 guidelines (CSIR: 1987). The material is considered to be suitable for the construction of selected subgrade layer material and in moderate stiffness engineered fills (**G8**).

The **fill** has a moderate (1923 kg/m^3) maximum dry density and moderate (8,6%) optimum moisture content value. The CBR swell values are very low the tests yielded high CBR values and considered to be suitable for the construction of an engineered fill of subbase layer material and in moderate stiffness of engineered fills (**G6**).

Based on Evans guideline (1977) a soil pH less than 6 indicates serious corrosion potential. The **marine deposits** and **fill** have high pH and low corrosive values hence the materials are considered to be non-corrosive.

6.2.2 MULTIPURPOSE PURPOSE AREA

The **marine deposits** and **fill** on this site generally consists of silty sand. The layer has a very high (1,4 to 2,07) grading modulus. The fine fractions of this material also exhibit no liquid limit and linear shrinkage, indicating that the material has no plasticity characteristics. The material has a low potential expansiveness, according to the method proposed by Van der Merwe (1973).

The **marine deposits** have a low (1729kg/m^3) maximum dry density and moderate optimum moisture (8,5%) content values. The CBR swell values are very low and the tests yielded relatively low to moderate CBR values at densities typically specified in the field (93% to 95%). The material is classified as G8 material according to the TRH

14 guidelines (CSIR: 1987). The material is considered to be suitable for the construction of selected subgrade layer material and in moderate stiffness engineered fills (**G8**).

The **fill** has a moderate (1887 kg/m^3) to high (2090 kg/m^3) maximum dry density and low (6,4%) to moderate (8,6%) optimum moisture content value. The CBR swell values are very low the tests yielded high CBR values at densities typically specified in the field (93% to 95%). The material is classified as G4, G5, G6, G8 and G10 according to the TRH 14 guidelines (CSIR: 1987). Where it was encountered as (**G4**) the material is considered to be suitable for the construction of an engineered fill of base layer material and in high stiffness of engineered fills. The material is considered to be suitable for the construction of an engineered fill of subbase layer material and in moderate stiffness of engineered fills (**G5 & G6**). Where encountered as (**G8**) this material is considered to be suitable for the construction of selected subgrade layer material and in moderate stiffness engineered fills. Furthermore where the layer is encountered as (**G10**) material it is also suitable for use in construction of subgrade layer material and in low stiffness engineered fills.

Based on Evans guideline (1977) a soil pH less than 6 indicates serious corrosion potential. The **marine deposits** and **fill** have high pH and corrosive values hence the materials are considered to be non-corrosive.

6.2.3 CAUSEWAY AREA

The **fill** on this site generally consists of silty sand. The layer has a very high (1,29 to 2,23) grading modulus. The fine fractions of this material also exhibit no liquid limit and linear shrinkage, indicating that the material has no plasticity characteristics. The material has a low potential expansiveness, according to the method proposed by Van der Merwe (1973).

The **fill** has a moderate (1945 kg/m^3) to high (2090 kg/m^3) maximum dry density and low (6,8%) to moderate (8,6%) optimum moisture content values. The CBR swell values are very low the tests yielded high CBR values at densities typically specified in the field (93% to 95%). The material is classified as G6 according to the TRH 14 guidelines (CSIR: 1987). The material is considered to be suitable for the construction of an engineered fill of subbase layer material and in moderate stiffness of engineered fills (**G5 & G6**).

The **marine deposits** and **fill** have high pH and low corrosive values hence the materials are considered to be non-corrosive.

6.2.4 STOCKPILE YARD AREA

The **marine deposits** and **fill** on this site generally consists of silty sand. The layer has a high to very high (1,07 to 2,05) grading modulus. The fine fractions of this material also exhibit no liquid limit and linear shrinkage, indicating that the material has no plasticity characteristics. The material has a low potential expansiveness, according to the method proposed by Van der Merwe (1973).

The **marine deposits** have a low (1719kg/m³) maximum dry density and moderate optimum moisture (9,2%) content values. The CBR swell values are very low and the tests yielded relatively low to moderate CBR values at densities typically specified in the field (93% to 95%). The material is classified as G8 material according to the TRH 14 guidelines (CSIR: 1987). The material is considered to be suitable for the construction of selected subgrade layer material and in moderate stiffness engineered fills (**G8**).

The **fill** has a very low (1638 kg/m³) to very high (2606 kg/m³) maximum dry density and low (6,1%) to moderate (9,3%) optimum moisture content value. The CBR swell values are very low, the tests yielded moderate to high CBR values at densities typically specified in the field (93% to 95%). The material is classified as G6 and G8 according to the TRH 14 guidelines (CSIR: 1987). The material is considered to be suitable for the construction of an engineered fill of subbase layer material and in moderate stiffness of engineered fills (**G6**). Where encountered as (**G8**) this material is considered to be suitable for the construction of selected subgrade layer material and in moderate stiffness engineered fills.

Based on Evans guideline (1977) a soil pH less than 6 indicates serious corrosion potential. The **marine deposits** and **fill** have high pH and corrosive values hence the materials are considered to be non-corrosive.

6.2.5 RAILWAY EMBANKMENT AREA

The **fill** on this site generally consists of silty sand. The layer has a very high (1,28 to 1,58) grading modulus. The fine fractions of this material also exhibit no liquid limit and linear shrinkage, indicating that the material has no plasticity characteristics. The

material has a low potential expansiveness, according to the method proposed by Van der Merwe (1973).

The **fill** has a moderate (1933 kg/m³) to very high (2175 kg/m³) maximum dry density and low (7,1%) to moderate (8,6%) optimum moisture content value. The CBR swell values are very low the tests yielded low to high CBR values at densities typically specified in the field (93% to 95%). The material is classified as G5, G6, G7 and G10 according to the TRH 14 guidelines (CSIR: 1987). The material is considered to be suitable for the construction of an engineered fill of subbase layer material and in moderate stiffness of engineered fills (**G5 & G6**). Where it was encountered as (**G7**) the material is also considered suitable for the construction of an engineered fill of selected subgrade layer material and in moderate stiffness of engineered fills. Furthermore where the layer is encountered as (**G10**) material it is also suitable for use in construction of subgrade layer material and in low stiffness engineered fills.

Based on Evans guideline (1977) a soil pH less than 6 indicates serious corrosion potential. The **marine deposits** and **fill** have high pH and corrosive values hence the materials are considered to be non-corrosive.

6.3 DYNAMIC CONE PENETROMETER TEST RESULTS

The dynamic cone penetration (DCP) test is conducted by driving a 20 mm diameter, 60° cone into the ground by an 8 kg hammer. The hammer is lifted by hand and dropped a distance of 575 mm and the results are expressed as the penetration rate (PR) in mm per blow.

Table 8 below shows the summarised results of from the DCP tests. Further information and graphs relating to the DCP results are attached in Appendix D.

The results of the DCP field tests have been used to evaluate in situ strength or CBR values of the near surface subsoils. Cognisance of the moisture content, potential gravels and/or boulders in the subsoil profile should be taken into account when using these DCP-derived CBR values. The results of the DCP tests are given in Appendix D and should be referred to for specific details. The tables below summarises all the DCP test results in terms of the average in-situ CBR values with depth for tests conducted from surface and at reduced levels. The tables present the average CBR obtained from

the in-situ DCP test values at specific depth intervals with different colours denoting the different layers as specified in the COLTO Specifications. Below all the tables, a legend specifying the various colours according to the CBR values obtained is presented. The summary of the tables does not include the laboratory results which means it does not take certain parameters such as the plasticity index into account.

Table 8 Summary of average in situ CBR values (%) along the Tippler Area

Depth (mm)	TTP1A	TTP2A	TTP3A	TTP4A	TTP1B	TTP2B	TTP3B	TTP4B
0-200	95	87	100	87	15	84	7	87
200-400		100		100	11		18	100
400-600					92		34	
600-800							24	
800-1000							18	
1000-1200							19	
1200-1400							48	

Table 9 Summary of average in situ CBR values (%) along the Causeway Area

Depth (mm)	CTP1A	CTP2.1A	CTP2.2A	CTP3A	CTP4A	CTP5.1A	CTP5.2A	CTP1B	CTP2B
0-200	32	100	58	92	92	79	100	0	86
200-400	6	75						4	26
400-600	72	49						10	9
600-800	72	47						12	5
800-1000	53	100						13	100
1000-1200	62	100						80	100
1200-1400		100							
1400-1600		100							

Table 10 Summary of average in situ CBR values (%) along the Multipurpose Area

Depth (mm)	MTP1A	MTP2A	MTP3A	MTP4A	MTP5.1A	MTP1B	MTP2B	MTP4B
0-200	100	100	100	89	16	0	94	0
200-400	97	100		95	95	7		88
400-600	100			63		14		100
600-800	100			55		25		
800-1000	100			24		75		
1000-1200	100			18		100		
1200-1400	100			12		100		
1400-1600	100			14		100		

Table 11 Summary of average in situ CBR values (%) along the Causeway Area

Depth (mm)	RTP1A	RTP2A	RTP3A	RTP4A	RTP5A	RTP6A	RTP6B	RTP1B	RTP2B	RTP3B	RTP5B	RTP6B
0-200	47	100	60	29	89	94	82	14	0	16	0	0
200-400	100		100	98				61	23	16	12	6
400-600				88				71	82	16	8	20
600-800								82	99	67	10	62
800-1000								35	64	100	9	92
1000-1200								37	70		8	88
1200-1400								59			71	46
1400-1600								29				74

Table 12 Summary of average in situ CBR values (%) along the Stockpile Yard Area

Depth (mm)	STP1A	STP2A	STP4A	STP5A	STP6A	STP7A	STP1B	STP2B	STP5B	STP6B
0-200	99	93	100	94	100	34	10	0	0	0
200-400	100					100	30	7	6	5
400-600							46	26	14	27
600-800							57	57	19	7
800-1000							84	67	21	6
1000-1200							76	69	23	5
1200-1400							70	68	30	70
1400-1600							58	63	25	

7. GEOTECHNICAL EVALUATION OF SITE CONDITIONS

7.1 EXCAVATION CLASSIFICATION

Excavation procedures likely to be encountered on the site have been evaluated in terms of the SANS 1200D - Earthworks classification system. In terms of this classification system, *soft and boulder excavation* conditions are expected to occur to beyond a depth of 1,00m generally in the sandy/gravel/boulder fill horizons. Depending on the depth of excavations, allowances for possibly working beneath the water table (if encountered) should be made and overbreak of excavation sides may occur and should be taken into account.

7.2 SOIL PERMEABILITY (LINING FOR PONDS)

Representative samples were collected for laboratory testing at selected test pit positions and submitted for permeability tests in order to measure the ease in which water can flow through a soil volume of the different soil types tested. The test results are attached in Appendix E and summarised in Table 13 below.

Table 13: Permeability results for the various sites

Area	Soil Type	Permeability (cm/s)
Tippler Area	Fine sand to sandy gravel	$1,45 \times 10^{-3}$ to $4,45 \times 10^{-4}$
Causeway Area	Fine sand	$1,50 \times 10^{-4}$ to $2,89 \times 10^{-4}$
Stockyard Pile Area	Fine sand to gravelly sand	$1,63 \times 10^{-3}$ to $1,34 \times 10^{-6}$

In a classification of soils according to their coefficients of permeability, Terzaghi and Peck (1967), the abovementioned subsoil horizons are general of low to moderate permeability (k between $1,45 \times 10^{-3}$ and $1,34 \times 10^{-6}$ m/sec).

Leakage from a pond depends on the permeability of the material that lines the pond. The permeability of soil present at the pond site (in-situ soil) is important in determining the type of pond liner that is required, particularly as it might be able to be used to line the pond.

Due to the low and moderate permeabilities of the in-situ soils on site, it is highly advisable that the following solutions be used:

- Concrete linings be used on site, or
- Clayey materials be imported onto the site,
- Re-use of existing material is only advised if the materials are stabilised with cement and well compacted to decrease the soils permeability and void ratio (in the case of gravelly fills).

7.3 MATERIAL SUITABILITY

The variable **fill** material that covers the sites typically classifies as G4 trough to G10 quality materials in terms of the COLTO and TRH14 classification. The in-situ moisture content of the soils is typically dry of optimum moisture content and only locally close to/or wet of the optimum moisture content. Therefore, depending on the type of material used, wetting and/or drying may be required as part of the in-situ pavement foundation preparation and re-use of the soils in layerworks. The laboratory results indicate typical optimum moisture content values from 5,6% to 9,2%.

The **marine deposits** are classified as G8 material according to the TRH 14 guidelines and are considered to be suitable for the construction of selected subgrade layer material and in moderate stiffness engineered fills.

7.4 GENERAL FOUNDING CONDITIONS

An evaluation of the founding conditions has been carried out based on assumptions as the foundation information was unknown at the time of writing this report. Various settlement calculations have been done and depending on the type of structure (lightly to heavy load), the depth of the foundation level and foundation type, the results can be summarized as follows:

- In the vicinity of the **Sludge storage tank**, using a bearing pressure of approximately 100kPa with a circular footings size of 15,2m diameter, and a founding depth of 5,50m below NGL, total settlements in the order of 21mm are to be expected.
- Using a footing size of 1,5m by 1,5m founded at 1,5m from NGL, and using a bearing pressure of 100kPa for the **Dewatering Building**, total settlement was calculated to be in the order of 4mm

- For the ***Cloth filter*** using a footing size of 1,5m by 1,5m founded at 2,0m from NGL, and using a bearing pressure of 100kPa for the Dewatering Building, total settlement was calculated to be in the order of 4,0mm
- In the vicinity of the ***Clariflocculator***, using a bearing pressure of approximately 100kPa with a circular footings size of 8,0m diameter, and a founding depth of 5,0m below NGL, total settlements in the order of 16,0 mm are to be expected.
- Using a footing size of 1,5m by 1,5m founded at 1,5m from NGL, and using a bearing pressure of 100kPa for the ***pH Correction & Rapid Mixing structure***, total settlement was calculated to be in the order of 4mm
- At the proposed ***Receiving tank***, using a bearing pressure of approximately 100kPa with a circular footings size of 16,5m diameter, and a founding depth of 0,50m below NGL, total settlements in the order of 24mm are to be expected.
- Using a footing size of 1,5m by 1,5m founded at 1,5m from NGL, and using a bearing pressure of 100kPa for the ***Chemical dosing storage***, total settlement was calculated to be in the order of 4mm

GENERAL FOUNDING RECOMMENDATIONS FOR LIGHT STRUCTURES

Although allowable bearing pressures of between 100kPa and >250kPa is achievable in the fill for shallow foundations, these soils in its in-situ state are considered unsuitable as a founding medium for the proposed structures due to the variable consistency of the soils. Due to heavy anticipated loading of some of the structures, settlement problems are anticipated if founding within these soils.

The choice of the most suitable founding solution is dictated by various factors. The main geotechnical factors to be considered are:-

- The variable subsoil conditions in terms of bearing and settlement in both the fill and the marine deposits.
- The structural loads, required tolerances and sensitivity of the structure to settlement (at the time of preparation of this report, the particular load cases and required tolerances of the structure were not available).

In order to reduce settlement and improve the allowable bearing capacity it is recommended that the sludge drying facility and the tanker bay facility should be founded on an engineered soil raft using conventional footings (strip or pad footings).

This will involve the removal of the fill/marine soils below the footings to a depth and width of at least 1,5 times the foundation width. The in-situ soil at the base of the excavation should then be compacted to at least 95% Mod AASHTO. The removed material should be placed in compacted layers not exceeding 150mm to 95% Mod AASHTO density at the optimum moisture content up to the desired founding levels. A bearing capacity of at least 100kPa is achievable within the soil raft.

For the heavier loaded and settlement sensitive structures a piled foundation solution is advisable. Precast piles (designed to carry the load in friction) driven into the very dense sandy Harbour Beds are likely to be the most suitable pile type.

The above values should only be used for conceptual design and must be revised when the actual foundation configuration and loads are known. As part of the design of the foundations, calculations for bearing capacity failure must also be conducted. The settlement of a foundation is almost always the governing criteria and it is therefore proposed that the bearing capacity evaluation be conducted for the actual foundation configurations loads.

7.5 FOUNDATION OF TANKS

The structures can be founded at a depth of 0,5m below the ground level. The preparation of the foundation involves the following:

- Strip and spoil the upper 150mm of topsoil in an area 2m wider than the footprint of the water tank. Roots and organic material in the footprint of the structures must also be removed.
- Remove the in-situ material in and 1 m wider than the footprint of the water tank to a depth of 0,5m. Excavations must be battered at 60° to ensure stability of the excavation slopes.
- Compact the base of the excavation to 93% Mod AASHTO density to a minimum depth of 150mm.

Excavations for the individual footings can then proceed, ensuring that all loose material is removed in the base of the excavations.

It is furthermore recommended that the remainder of the excavation be backfilled to 200mm above natural ground level with compacted material (minimum of 93% Mod AASHTO density). An impervious barrier (e.g. concrete slab) must be created at this

level to prevent saturation of the soil profile from spillage or leaking pipes. The barrier must be sloped to drain away from the structure.

7.6 ROCK MATTRESS

Depending on the settlement sensitivity of the structures founded on shallow footings, a rock mattress compacted by a 5-10t vibratory compactor will eliminate differential settlement. The rock fill is to be compacted in 300-500mm thick layers.

7.7 WATER INGRESS INTO SOIL BELOW STRUCTURES

Water could enter the soil from surface runoff during the rainfall and due to leaking pipes and overtopping of the ponds. This can reduce bearing capacity by 40% and cause differential settlement. In view of this an impervious barrier (concrete slab below the water ponds) should be installed.

7.8 DRAINAGE MEASURES

Drainage of the site is required to avoid ponding of water close to the structure. All water bearing services should be of a high quality and flexible to accommodate some movement without damage. Water must be kept away from the foundations. The following drainage precaution must be adhered to:

- No accumulation of surface water is permitted and the entire development must be properly drained;
- A 1m apron must be constructed around each building to keep surface runoff away from foundations;
- Waterborne sewerage reticulation must be installed. All water services should be sleeved;

All trenches and excavation works must be properly backfilled and compacted in order to prevent them from functioning as French drains. Backfilling should be done at optimum moisture content, in 150mm thick layers to at least 90% of modified AASHTO density.

8. PAVEMENT DESIGN AT THE MULTIPURPOSE TERMINAL AREA

8.1 EXCAVATION CLASSIFICATION

Excavation procedures likely to be encountered on site have been evaluated in terms of the SANS 1200D - Earthworks classification. In terms of this classification system, *soft excavation* conditions are expected to occur to variable depths of 0.15m and 1.55m. Below this, *boulder and/or hard rock excavation* should be allowed for in the stabilised structural road layers and/or hardpan calcrete. Blasting may be required in the harder layers.

Depending on the depth of excavations, allowances for possibly working beneath the water table should be made and over break of excavation sides may occur and should be taken into account.

8.2 EVALUATION FOR EARTHWORKS

The results of the fieldwork and laboratory testing indicate that the near surface soil conditions on the site are variable in terms of consistency and composition. To a large extent, most of the variability will be removed by the preparatory earthworks for the multi-purpose terminal paving i.e. assuming the level of the paving will be similar to the existing ground levels.

The soil conditions of test pit MTP1 are considered to be the controlling conditions for the paving design. An in situ CBR of 10% has been taken to represent the strength of the in-situ subgrade. The nature of the subgrade soils are such that after excavation of the overlying soils, in-situ compaction will be required. In this regard, the in-situ surface should be ripped to a depth of 150mm and the moisture content modified to within 2% of the optimum moisture content. Thereafter it should be compacted to a minimum density of 93% Mod AASHTO density.

The excavated soils are expected to comprise the surface layer of sandy gravel (crusher run), the 150mm thick layer of stabilized sand (in the vicinity of MTP1), and the underlying silty sand and gravelly (mainly calcrete) sand. None of the soils meet the requirements for the subbase layer required below the paving and would therefore be spoiled.

8.3 DESIGN PREMISE

The information that was provided on which the paving design has been based is as follows:

- *None of the vehicles that will be using the paved area will be carrying any*
- *load, ie unloaded static and dynamic loading conditions will apply.*
- *Forklift, the 42 tonner is the heaviest with a gross weight of 58 tons.*
- *Front end loader 26,4 tons.*
- *Haulers 24,4 tons.*

In light of the limited information provided by the Owner, several assumptions were made. These are described below and should be agreed upon by the Owner before commencing with the construction.

- *20 year design life, 20 of each vehicle movement per day over any given area of the pavement*
- *Dynamic loading factors to account for braking and cornering*
- *Existing buried services on the site will either be relocated prior to construction or alternatively, are of sufficient depth not to be damaged by compaction of the subgrade at an approximate depth of 0,5m below the level of the final paving surface. Compaction of any relocated service trench backfills within the area of the paving is to be the same as the adjacent soil mass after the in situ compaction of the subgrade to prevent uneven support of the paving and paving layers*
- *The final level of the paving will be similar to the existing ground levels*
- *The wheel loads on the forklift (unloaded) are the critical wheel loads and have been used in the analysis*
- *A static load of 140kN occurs on each side of the rear axle which, when the dynamic factors are applied, gives a critical design load of 238kN*
- *A tyre pressure of 1MPa*
- *Paving will comprise unreinforced, cast in situ C32/40 concrete, cast in panels with provision made for load transfer and surface water drainage.*
- *No mention was made of loads due to stacking and/or storage and therefore only vehicle loads have been taken into account*

8.4 PAVING DESIGN

Using the principle of Material Equivalence Factors, various pavement options can be determined. These are described as follows:

8.4.1 OPTION 1

200mm thick cast in situ 30MPa concrete on
150mm G2 (graded crushed stone) on
Compacted in situ subgrade

8.4.2 OPTION 2

80mm thick, 200 by 100mm in plain, interlocking concrete blocks on
30mm bedding sand on
200mm C1 (cement stabilized G2 graded crushed stone) on
150mm G2 (graded crushed stone) on
Compacted in situ subgrade

8.4.3 OPTION 3

50mm asphalt (modified bitumen, Salviacim or equivalent) on
150mm G2 (graded crushed stone) on
300mm (2 layers 150mm thick) C1 on
Compacted in situ subgrade

In all cases, the in situ preparation of the subgrade beneath the pavement layers is to comprise rip to 150mm, modify the moisture content to within 2% of the optimum moisture content, and compact to a minimum density of 95% Mod AASHTO effort. The G2 graded crushed stone layer should be compacted to a minimum of 88% of bulk relative density, the C1 base to 98% Mod AASHTO density and the C1 subbase to 96% Mod AASHTO density.

8.5 PAVING DESIGN AT THE STOCKPILE AREA

The condition of the existing road in the Stockpile area generally indicates that the Surfacing material has become thin. The subsoils in this area are mainly indicated in test pits STP3 and STP4.

STP3 can be summarised as follows:

20mm Surfacing
130mm Base / Subbase (Gravel)

180mm Selected Fill (Silty Sand)
730mm Selected Fill / Subgrade (Sandy Gravel)
In-situ Hardpan Calcrete

STP4 can be summarised as follows:

20mm Surfacing
80mm Base / Subbase (Gravel)
300mm Subbase / Selected Fill (Sand Gravel)
400mm Selected Fill / Subgrade (Gravel and small Boulders)
In-situ Hardpan Calcrete

As seen from the two test pits the road design has slight variations and the upgrade would have to take this factor into account.

The **TRH4** and **South African mechanistic paving design procedure** were followed for the asphalt pavement design of the road. The typical pavement design for “Pavement Class” ES1, with failure defined at a 20mm rut would be as follows:

40mm Asphalt Surfacing
150mm G3 Base Course
150mm G5 Subbase
150mm G7 Selected Layer
150mm G9 Selected / Subgrade Layer
300mm Pioneer Layer (*Optional dependant on the in situ conditions)

The existing road would therefore have to be upgraded to include, at a minimum, a thicker surfacing (40mm) and base (150mm) layer.

9. CONCLUSION

In general, this geotechnical ground investigation report covers all geotechnical aspects with regard to the proposed infrastructure developments at the Saldahna storm water developments. The report covers in detail the nature, distribution and relevant engineering properties of the soil and rock strata underlying the site with specific reference to founding conditions for proposed structures and pavement layers for roads.

It should be noted that the information presented in the report and summarised in the tables have been taken from the proposed geotechnical fieldwork and results of the laboratory tests. A certain amount of interpretation was necessary in the generalisation of the results during the evaluation of the various structures sites, along the boundary wall and access roads.

During construction, site conditions should be constantly monitored to ensure that the actual conditions are not at variance with the generalisations made in the report. Should variations be found, these areas would be treated on an ad hoc basis at the time.

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APPENDICES

APPENDIX A

SITE PLANS

APPENDIX B

INSPECTION PIT LOGS

APPENDIX C

BOREHOLE LOGS (from previous investigations)

APPENDIX D

DCP RESULTS

APPENDIX E

LABORATORY TEST RESULTS

APPENDIX F

PHOTOS

Specialist Geohydrology Impact Assessment for the proposed upgrade of Storm Water and Environmental Systems in the Port of Saldanha, Western Cape

January 2019



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EXECUTIVE SUMMARY

Nsovo Environmental Consulting has appointed Sustainable Drop Projects (Pty) Ltd (SDP) to undertake a geohydrological assessment as part of Environmental Impact Assessment (EIA) studies in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014 as amended that Nsovo Environmental Consulting is undertaking on behalf of Transnet SOC Limited for the proposed upgrade of storm water and environmental systems in the Port of Saldanha within the jurisdiction of Saldanha Local Municipality in the Western Cape Province.

The primary objective of the proposed upgrade is to implement relevant recommendations of the Storm Water Master Plan (SWMP) and ensure that it aligns and fully complies with the requirements of South African Legislation as well as world best practices. The proposed scope of work entails the following key activities:

- The development of two new storm water retention/evaporation ponds;
- Introduction of infiltration channels where necessary;
- The resizing and reshaping of thirteen (13) existing storm water retention ponds;
- The development of a waste water treatment facility;
- Caisson collection reservoir and pumping system
- The upgrade of storm water management infrastructure; and
- The cleaning of existing storm water management systems

The methodology employed for this specialist geohydrological baseline and impact assessments were as follows:

- Available studies undertaken at the Port of Saldanha as well as the wider region were reviewed to determine baseline information available and to determine gaps in information;
- A site visit was conducted on 2 May 2018 to help to provide a better understanding of the dominant geohydrological processes at the site as well as help provide input for geohydrology assessments.
- The existing groundwater resources potentially affected by the proposed Project were described and mapped, including groundwater levels, groundwater quality, hydrological linkages with other surface and groundwater resources and existing users of groundwater resources in the area;
- The potential hydrogeological impacts were assessed and an impact report (this report) drafted to inform the Environmental Impact Assessment Report.

The likely impact during the upgrade of the infrastructure on the resources underlying the site was identified as follows:

- Hydrocarbon contamination: Downward migration of leaked and / or spilled fuel, oil and grease into the underlying aquifer system;
- Hazardous waste/chemicals contamination: Downward migration of contaminants from onsite waste storage areas and /or chemical storage areas into the underlying aquifer system;
- Organic and bacterial (microbiological) contamination: Downward migration of contaminant from leaking and / or spilling temporary on-site sewage facilities into the underlying aquifer system.

It was recommended that the following mitigation measures would be sufficient:

- Place drip trays under stationary machinery, only re-fuel machines at the temporary fuelling station, install temporary structures to trap fuel spills at the temporary fuelling station.
- Immediately clean oil and fuel spills and dispose of contaminated material (soil, etc.) at licensed disposal sites only.
- Equip the site with sufficient ablution facilities. Secure chemical toilets to ensure that they do not blow over in windy conditions.

- 
- Do not make uncontrolled releases of any pollutants, including sediment, sewage, cement, fuel, oil, chemicals, hazardous substances, waste water, etc., into the environment.
 - Compile a procedure for the storage, handling and transport of different hazardous materials and ensure that it is strictly adhered to.

The potential impacts during the operational phase were identified as follows:

- Fuel and oil leaks from the vehicle transporting the iron ore
- Storm water with iron ore dust in the retention ponds which could percolate into the groundwater resources and the shore/sea in the vicinity of the site.

It is considered that under normal design operational conditions, such releases are highly unlikely.

It is expected that without mitigation, the quantity of potential non-radioactive contaminants used and/or stored, and spilled and/or leaked at the sites, will be low and therefore insufficient to extensively contaminate the primary aquifers. With mitigation, the intensity is reduced to **low**.

The essential mitigation measures recommended are as follows:

- Proper maintenance plan for the retention pond system to ensure effective operation
- Use existing ablution and waste water treatment facilities at the Site.
- Do not make uncontrolled releases of any pollutants, including, radioactive substances, sewage, fuel, oil, chemicals, hazardous substances, waste water, etc., into the environment.
- Ensure vehicles and equipment are in good working order and drivers and operators are trained.
- Ensure that good housekeeping rules are applied.

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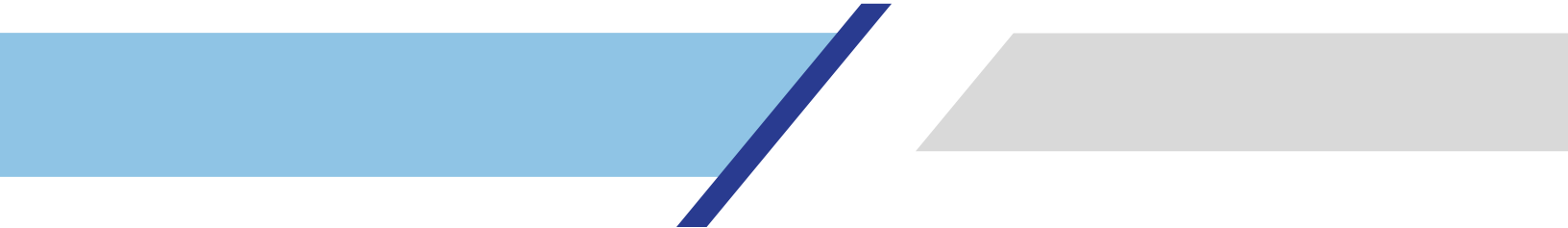


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GLOSSARY OF TERMS

Aquifer: A geological formation that has structures or textures that hold water or permit appreciable water movement [from the National Water Act, 1998 (Act No. 36 of 1998)]. Also defined as the saturated zone of a geological formation beneath the water table, capable of supplying economic and usable volumes of groundwater to borehole(s) and / or springs.

Aquifer system: A heterogeneous body of interlayered permeable and less permeable material that act as a water-yielding hydraulic unit covering a region.

Borehole: Includes a well, excavation, or any other artificially constructed or improved groundwater cavity which can be used for the purpose of intercepting, collecting or storing water from an aquifer; observing or collecting data and information on water in an aquifer; or recharging an aquifer [from the National Water Act, 1998 (Act No. 36 of 1998)].

Catchment: The area from which any rainfall will drain into the watercourse, contributing to the runoff at a particular point in a river system, synonymous with the term river basin.

Conceptual model: A simplified, schematic representation of each site, which includes sources, pathways and receptors, as well as the main process characteristics of the geohydrological system. An idealisation of the geohydrological system at the sites on which the numerical model is based. The conceptual model also includes assumptions on the hydrostratigraphy, material properties, dimensionality, and governing processes.

Confined aquifer: An aquifer in which the groundwater is under pressure significantly greater than atmospheric, and its upper limit is the bottom of a bed of distinctly lower hydraulic conductivity than that of the material in which the confined groundwater occurs.

Contamination: The introduction of any substance into the groundwater system by the action of humans. The degradation of natural water quality as a result of man's activities, regardless of whether or not contaminant concentrations reach levels that cause significant degradation of water quality and restrict its use.

Ecosystem: An organic community of plants, animals and bacteria and the physical and chemical environment they inhabit.

Electrical conductivity: A measurement of the ease with which water conducts electricity. Distilled water conducts electricity poorly, while sea water, with its very high salt content, is a very good conductor of electricity.

Ephemeral: Refers to watercourses that are generally storm-driven and in which flow occurs less than 20 % of the time; these watercourses have a limited (if any) baseflow component with no groundwater discharge.

Fault: A zone of displacement in rock formations resulting from tensional forces or compression in the earth's crust.

Formation: A general term used to describe a sequence of rock layers.

Fracture: Cracks, joints or breaks in the rock that can enhance water movement.

Geohydrology: The study of the properties, circulation and distribution of groundwater, in practise used interchangeably with hydrogeology; but in theory hydrogeology is the study of geology from the perspective of its role and influence in hydrology, while geohydrology is the study of hydrology from the perspective of the influence on geology.

Greywacke: A dark coarse-grained sandstone containing more than 15 percent clay.

Groundwater flow: The movement of water through openings and pore spaces in rocks below the water table, i.e. in the saturated zone. Groundwater naturally drains from higher-lying areas to low-lying areas such as rivers, lakes and the oceans. The rate of flow depends on the slope (gradient) of the water table and the transmissivity of the geological formations.

Groundwater resource: All groundwater available for beneficial use, including humans, aquatic ecosystems and the greater environment.

Groundwater: Water found in the subsurface in the saturated zone below the water table or piezometric surface, i.e. the water table marks the upper surface of groundwater systems.

Hornfels: A dark, fine-grained metamorphic rock consisting largely of quartz, mica, and particular feldspars.



Hydraulic conductivity: Measure of the ease with which water will pass through porous material; defined as the rate of flow through a cross-section of one square metre under a unit hydraulic gradient at right angles to the direction of flow (in m/d).

Hydraulic gradient: Change in hydraulic head per unit of horizontal distance in a given direction, i.e. the difference in hydraulic head divided by the distance along the groundwater flow path. Groundwater flows from points of high elevation and pressure to points of low elevation and pressure.

Intergranular aquifer: Groundwater contained in intergranular interstices of sedimentary and weathered formations.

Major aquifer system: Highly permeable formations, usually with a known or probable presence of significant fracturing, may be highly productive and able to support large abstractions for public supply and other purposes; water quality is generally very good.

Numerical modelling: The analysis of geohydrological processes using computer models.

Owner Controlled Area: A restricted area surrounding the reactor units to which only authorised personnel have access.

Piper diagram: The Piper diagram not only shows graphically the nature of a given water sample, but also dictates the relationship to other samples. For example, by classifying samples on the Piper diagram, geologic units with chemically similar water can be identified, and the evolution in water chemistry along the flow path defined. Two data points are plotted on the cation and anion triangles and are then combined into a quadrilateral field that shows the overall chemical property of the water sample.

Quaternary catchment: A fourth order catchment in a hierarchal classification system in which a primary catchment is the major unit.

Recent: Time period covering the last 10 000 years of the Earth's geological history

Recharge: The addition of water to the zone of saturation, either by the downward percolation of precipitation or surface water and / or the lateral migration of groundwater from adjacent aquifers.

Saturated zone: The subsurface zone below the water table where interstices are filled with water under pressure greater than that of the atmosphere.

Semi-confined aquifer: An aquifer that is partly confined by layers of lower permeability material through which recharge and discharge may occur; also referred to as a leaky aquifer.

Sole source aquifer: An aquifer that is needed to supply 50 % or more of the domestic water for a given area, and for which there are no reasonably available alternative water sources should the aquifer be impacted upon or depleted.

Spring: A point where groundwater emerges, usually as a result of topographical, lithological and / or structural control.

Storativity: The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head. It is a volume of water per volume of aquifer released as a result of a change in head. For a confined aquifer, the storage coefficient is equal to the product of the specific storage and aquifer thickness. This is a measure of the water stored and released in an aquifer and is used to quantify the safe yield of an aquifer system.

Transmissivity: Transmissivity is the rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient. It is expressed as the product of the average hydraulic conductivity and thickness of the saturated portion of an aquifer. Transmissivity is used to calculate the yield of a borehole, determine the safe yield of an aquifer system and predict groundwater movement.

Unconfined aquifer: An aquifer with no confining layer between the water table and the ground surface where the water table is free to fluctuate.

Water Management Area: An area that is established as a management unit in the national water resource strategy within which a catchment management agency will conduct the protection, use, development, conservation, management and control of water resources [from the National Water Act, 1998 (Act No. 36 of 1998)].



Water table: The upper surface of the saturated zone of an unconfined aquifer at which pore pressure is at atmospheric pressure, the depth to which may fluctuate seasonally.

Wellfield: An area containing more than one pumping borehole that provides water to a public water supply system or single owner (i.e. Municipality).

Wellpoint: A shallow, small diameter hole used to abstract groundwater from a primary aquifer.

Wetland: Land that 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 circumstances supports or would support vegetation typically adapted to life in saturated soil [from the National Water Act, 1998 (Act No. 36 of 1998)].

LIST OF ACRONYMS AND ABBREVIATIONS

3D:	Three dimensional
DWA:	Department of Water Affairs (now Department of Water and Sanitation)
DWAF:	Department of Water Affairs and Forestry (now Department of Water and Sanitation)
DWS:	Department of Water and Sanitation
EC:	Electrical conductivity, measured as milli-Siemens per metre (mS/m)
EIA:	Environmental Impact Assessment
GRAII	Groundwater Resource Assessment II Project
GRU:	Groundwater Resource Unit
K:	Hydraulic conductivity, measured as m/d
L/s:	litres per second
m/d:	metres per day
m³/a:	cubic metres per annum
Ma	million years
mamsl:	metres above mean sea level
MAP:	Mean annual precipitation
mbgl:	metres below ground level
mg/ℓ:	milligrams per litre
Mm³/a:	million cubic metres per annum
mS/m:	milli-Siemens per metre
SDP	Sustainable Drop Projects (Pty) Ltd
SSR	Site Safety Report
S_y:	Specific yield
SFPs:	spent fuel pools
T:	Transmissivity, commonly reported in units of m ² /d

1. INTRODUCTION

Nsovo Environmental Consulting has appointed Sustainable Drop Projects (Pty) Ltd (SDP) to undertake a geohydrological assessment as part of Environmental Impact Assessment (EIA) studies in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment Regulations of December 2014 as amended that Nsovo Environmental Consulting is undertaking on behalf of Transnet SOC Limited for the proposed upgrade of storm water and environmental systems in the Port of Saldanha within the jurisdiction of Saldanha Local Municipality in the Western Cape Province. See **Figure 1-1** for locality.

The proposed development entails the upgrade of the existing storm water infrastructure at the Port in order to improve the storm water infrastructure systems. Various storm water management infrastructures have been constructed within the Port. The Storm Water Master Plan (SWMP), 2013, for the Port of Saldanha indicates that the existing storm water management infrastructure of certain areas in the Port is inadequate for 1:50 year flood line conditions, therefore, if the infrastructure is not upgraded and/or replaced, uncontrolled discharge into the bay and municipal system will be imminent. Consequently, Transnet proposes to undertake the upgrading of the storm water and environmental systems within the Port.

1.1 Project Description

The primary objective of the proposed upgrade is to implement relevant recommendations of the Storm Water Master Plan (SWMP) and ensure that it aligns and fully complies with the requirements of South African Legislation as well as world best practices. Subsequently, Transnet proposes to upgrade the storm water and environmental systems in the Port with the view to prevent future uncontrolled discharges into the marine environment and the municipal sewage system. This requires that all surface water runoff from contaminated areas within the Port is contained and iron ore dust and other pollutants are removed either by settlement of sediments and/or treatment to bring the effluent pollutants concentrations to within allowable concentrations before the runoff enters the natural environment. Storm water management infrastructure including surfaces, channels, ponds, berms and infiltration trenches need to be installed and/or altered for this purpose. The proposed scope of work entails the following key activities:

- The development of two new storm water retention/evaporation ponds;
- Introduction of infiltration channels where necessary;
- Incorporation of proprietary filter systems at the Multi-purpose Terminal with the capacity to filter heavy metals out of the stormwater
- The resizing and reshaping of thirteen (13) existing storm water retention ponds;
- The development of a waste water treatment facility;
- Caisson collection reservoir and pumping system
- The upgrade of storm water management infrastructure; and
- The cleaning of existing storm water management systems.

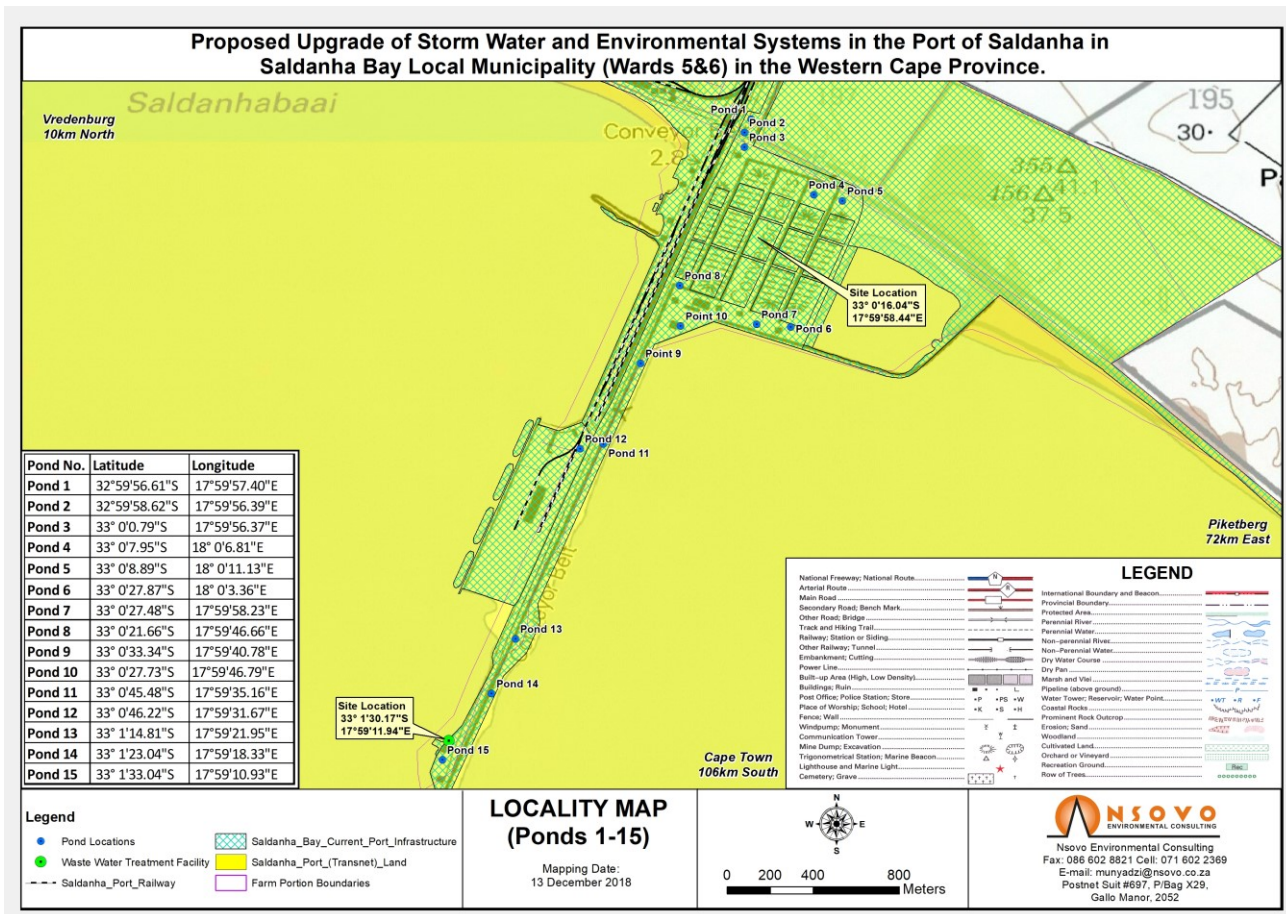


Figure 1-1: Locality of the Project Site

1.2 Terms of Reference

The following scope of work was provided:

- Describe the existing baseline characteristics of the project site and place this in a regional context (study area);
- Identify and assess potential impacts of the project, including impacts associated with the proposed developments including the resizing and reshaping of the existing ponds, the development of the two new ponds and operation phases, using SDP's prescribed impact rating methodology;
- Identify and describe potential cumulative impacts of the proposed Project in relation to proposed and existing developments in the surrounding area;
- Recommend mitigation measures to avoid and/or minimise impacts and/or optimise benefits associated with the proposed project; and
- Recommend and draft a monitoring campaign, if applicable.

1.3 Deliverables

The main deliverable will be an impact assessment report. The report will consist of the following components:

- Baseline description:** a description of the environment of the study area in its current state, relevant to the geohydrology of the Project site; and
- Impact assessment:** an assessment of how the proposed Project will alter the status quo as described in the baseline description, and recommended measures to mitigate and monitor impacts.

1.4 Methodology

The methodology employed for this specialist geohydrological baseline and impact assessments were as follows:

- Available studies undertaken at the Port of Saldanha as well as the wider region were reviewed to determine baseline information available and to determine gaps in information;
- A detailed hydrocensus was conducted on and around the site to a distance of about two kilometres so as to obtain a representative population of the boreholes in the area.
- A site visit was conducted on 2 May 2018 to help to provide a better understanding of the dominant geohydrological processes at the site as well as help provide input for geohydrology assessments.
- The existing groundwater resources potentially affected by the proposed Project were described and mapped, including groundwater levels, groundwater quality, hydrological linkages with other surface and groundwater resources and existing users of groundwater resources in the area;
- The potential hydrogeological impacts were assessed and an impact report (this report) drafted to inform the Environmental Impact Assessment Report.

1.5 Project Team

The geohydrological project team for the hydrogeology assessment comprised:

Paulo Kagoda. Hydrogeologist. Paulo has 13 years of experience in hydrogeology, impact assessments, water and wastewater treatment, project management, quality control and reporting. He has carried out numerous specialist groundwater studies and water supply projects in southern Africa. Paulo was the project manager and compiled this report.

Pramod K. Sinha. (Pr. Eng) Senior Hydrogeologist, Pramod has 36 years of experience in water resources planning and management in India, Botswana and South Africa. He specialises in groundwater modelling and has generated numerous flow and transport models for industry and government. Pramod was responsible for overseeing the assessment process as part of his quality control role and reviewed this report.

1.6 Information Sources

The information collected and used in this study can be summarised as follows:

- Draft Basic Assessment Report for the Proposed Upgrade of Storm Water and Environmental Systems in the Port of Saldanha within Saldanha Bay Local Municipality in the Western Cape Province provided by the client (Nsovo Environmental Consulting)
- The Saldanha Port Stormwater Master Plan of 2013 provided by the Client (Nsovo Environmental Consulting)
- Port of Saldanha locality mapping provided by the Client (Nsovo Environmental Consulting)
- KML file with locations of the 15 ponds provided by the Client (Nsovo Environmental Consulting)
- Existing and New Capacities of the 15 ponds provided by the Client (Nsovo Environmental Consulting)
- Aerial photography (Google Earth)
- Rainfall and Evaporation data obtained from the Water Research Commission (WR2012 Study)

1.7 Impact Assessment Methodology

The impact assessment has been carried out using the guidelines as supplied by Nsovo Environmental Consulting.

1.7.1 Status of Impact

The impacts are assessed as either having a:

- negative effect (i.e. at a 'cost' to the environment),
- positive effect (i.e. a 'benefit' to the environment), or
- Neutral effect on the environment.

1.7.2 Extent of the Impact

- (1) Site (site only),
- (2) Local (site boundary and immediate surrounds),
- (3) Regional (within the City of Johannesburg),
- (4) National, or
- (5) International

1.7.3 Duration of the Impact

The length that the impact will last for is described as either:

- (1) immediate (<1 year)
- (2) short term (1-5 years),
- (3) medium term (5-15 years),
- (4) long term (ceases after the operational life span of the project),
- (5) Permanent.

1.7.4 Magnitude of the Impact

The intensity or severity of the impacts is indicated as either:

- (0) none,
- (2) Minor,
- (4) Low,
- (6) Moderate (environmental functions altered but continue),
- (8) High (environmental functions temporarily cease), or
- (10) Very high / Unsure (environmental functions permanently cease).

1.7.5 Probability of Occurrence

The likelihood of the impact actually occurring is indicated as either:

- (0) None (the impact will not occur),
- (1) improbable (probability very low due to design or experience)
- (2) low probability (unlikely to occur),
- (3) medium probability (distinct probability that the impact will occur),
- (4) high probability (most likely to occur), or

(5) Definite.

1.7.6 Significance of the Impact

Based on the information contained in the subsection 1.8.1 to 1.8.5 above, the potential impacts are assigned a significance rating (S). This rating is formulated by adding the sum of the numbers assigned to extent (E), duration (D) and magnitude (M) and multiplying this sum by the probability (P) of the impact.

$$S = (E + D + M)P \quad \text{Equation 1.1}$$

Based on the value of the significance ratings obtained using equation 1.1 above, the following is applicable

(<30) low (i.e. where this impact would not have a direct influence on the decision to develop in the area),

(30-60) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),

(>60) high (i.e. where the impact must have an influence on the decision process to develop in the area).

1.8 Legal Framework

The National Water Act (No 36 of 1998) (NWA) is the principal legal instrument relating to water resource management in South Africa and contains comprehensive provisions for the protection, use, development, conservation, management and control of the country's water resources. In addition, the management of water as a renewable resource must be carried out within the framework of environmental legislation, i.e. the National Environmental Management Act, (NEMA), Act 107 of 1998, under Regulations R324 to 327, of 07 April 2014.

A key aspect of the National Water Policy is Integrated Water Resources Management (IWRM). This recognises that water resources can only be successfully managed if the natural, social, economic and political environments in which water occurs and is used are taken into consideration. IWRM aims to strike a balance between the use of water resources for livelihoods and conservation of the resource whilst promoting social equity, environmental sustainability and economic growth and efficiency.

In addition to the National Water Act (No 36 of 1998) and the National Environmental Management Act, (NEMA), Act 107 of 1998, the following legislation and guidelines/quality standards are applicable to geohydrological investigations and assessments.

- National Water Resource Strategy (NWRS, 1st Ed., September 2004);
- Department of Environmental Affairs and Development Planning's (DEA&DP) Guideline for Involving Hydrogeologists in EIA Processes (June 2005) (Saayman, 2005);
- Department of Water Affairs and Forestry's (DWAF) Integrated Water Resource Management: Guidelines for Groundwater Management in Water Management Areas in South Africa (DWAF, 2004)
- Saldanha Bay Municipality By-Law relating to Water and Sanitation Services, Chapter IV, section 61
- National Environmental Management: Integrated Coastal Management Act 24 of 2008.

2. GEOHYDROLOGY BASELINE

2.1 Physiography and Climate

The Project site is located on the northern shore of Saldanha Bay. Saldanha Bay is located approximately 100 km north of Cape Town on the West Coast. (**Figure 1-1**) and is located within the jurisdiction of Saldanha Bay Local Municipality which is under the West Coast District Municipality. Access to the Project site is via the Saldanha Bay Road. The residential properties located around the study area are community households which are dominated by medium to low density residential developments which include Saldanha and Vredenburg which are located approximately 9km and 12km from the Port respectively, while the industrial and commercial related activities in the local municipality cut across a wide array of sectors including agriculture, community services, construction, general government services, finance, manufacturing, transport and trade.

The Project site falls within quaternary catchment G10M and in the Berg-Olifants Water Management Area (**Figure 2-1**). The site has a Mediterranean climate characterised by dry summers and wet winters. The nearest South African Weather Service (SAWS) rainfall station to the Port of Saldanha is the Saldanha Bay (Customs) station – Station No. SAWS 0060780. The average annual rainfall recorded at this station from 1900 to 2007 is 268.9 mm/a (See Appendix 1 for the historical monthly data). This station falls within Rain Zone G1D (WRC, 2015). Evaporation data was obtained from Evaporation Zone 23B, Evaporation Station G1E005 (WRC, 2015).

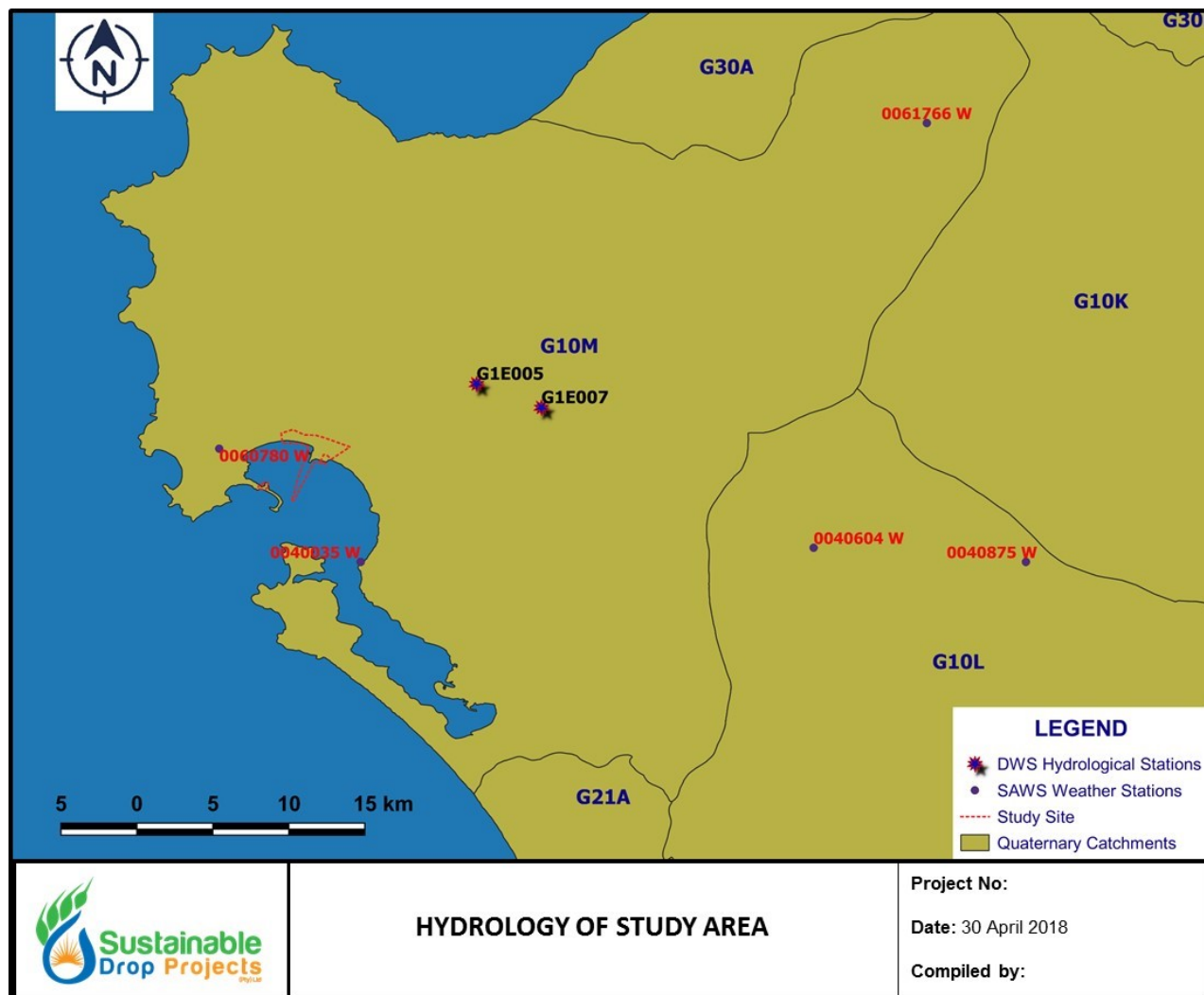


Figure 2-1: Hydrology of the Study Area

Table 2-1: Monthly Rainfall and Evaporation Distribution for Saldanha Bay (for the period 1900-2007)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	Monthly rainfall data (mm)												
Min	0.0	0.0	0.0	0.0	0.0	3.8	6.4	0.0	0.0	0.0	0.0	0.0	174.0
Avg	7.04	7.03	9.42	22.39	47.58	61.96	57.23	49.36	26.87	13.6	7.4	2.6	268.9
Max	76.80	61.00	80.00	90.10	299.70	302.30	401.80	164.00	75.80	66.0	27.0	11.5	455.4
	Monthly evaporation data (mm)												
Average	270.9	223.5	206.6	126.7	71.8	47.0	45.8	64.1	100.0	155.6	216.8	265.7	1795

2.2 Geology

2.2.1. Regional Geology

In the Western Cape Province, where the study site is located, the oldest rocks are gneisses and granites of the Mokolian Namaqua-Natal Metamorphic Province (approximately 1100 million years old) exposed north of Vredendal. These rocks are overlain by the Gariep Supergroup rocks, which are approximately 650 million years old, and similar-aged rocks of the Malmesbury Group. The Kaaimans and Cango Groups occur in the southwestern and southern parts of the province, respectively. The Malmesbury and Kaaimans Groups are intruded by the 550–510 million-year-old Cape Granite Suite. The slightly younger Vanrhynsdorp Group occurs in the northwestern part and the Klipheuwel Group in the southwestern part of the province (Ngcofe and Cole, 2014).

2.2.2. Site Geology

The unconsolidated to semi-consolidated sediments underlying the Project site belong to the Sandveld Group, which is subdivided into the Elandsfontyn, Varswater, Velddrif, Langebaan, Springfontyn and Witzand formations. The lithostratigraphy of the Sandveld Group is summarised in **Table 2-2** (Johnson et al., 2006) and the surface geology is shown in **Figure 2-2**. The sediment thickness varies considerably and reaches a maximum thickness of between 30 and 80 m (Theron, 1992).

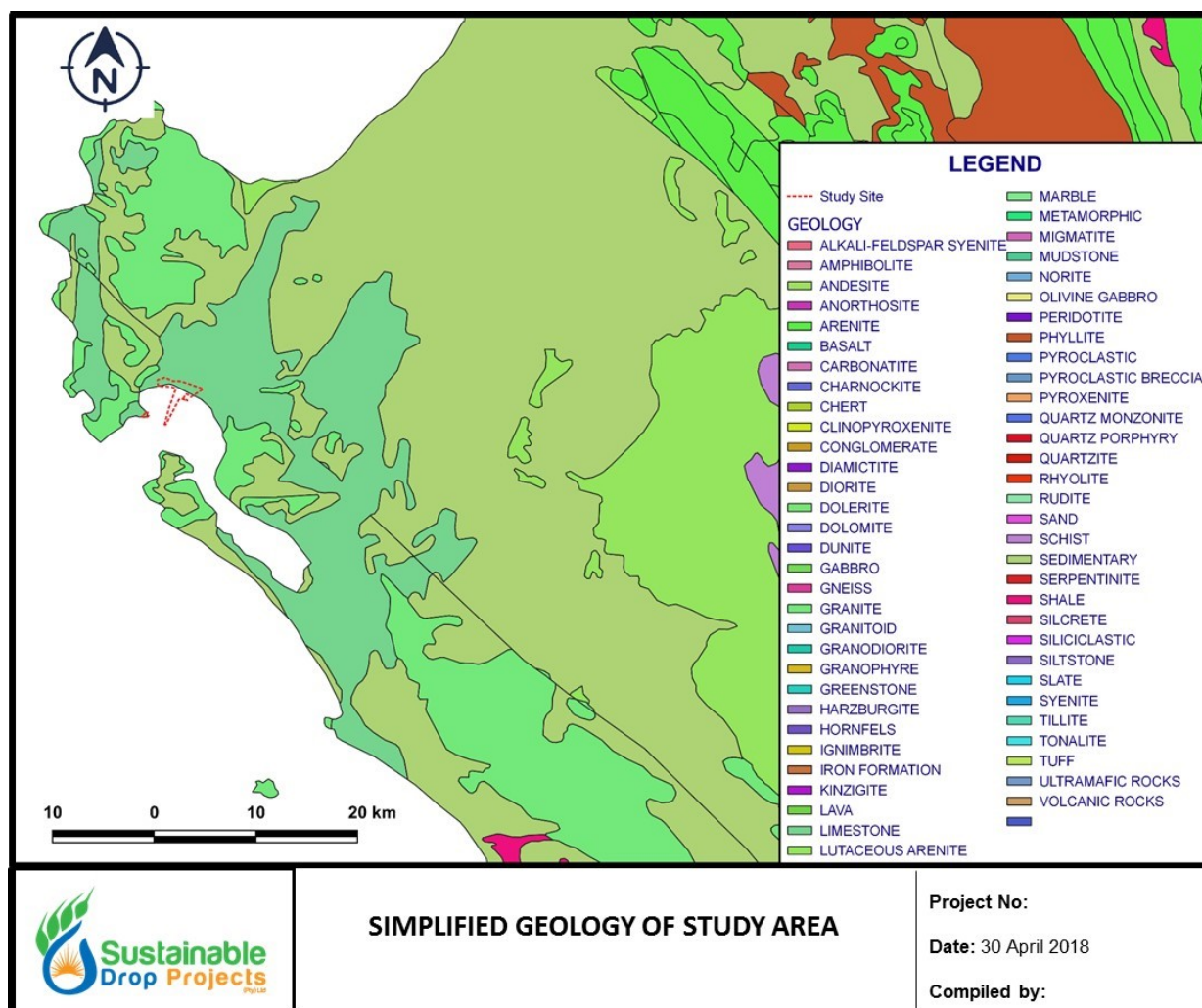


Figure 2-2: Simplified Geology of the Geohydrological Study Site

Table 2-2: Summary of the Sandveld Group Lithostratigraphy (after Johnson et al., 2006)

Formation	Member	Origin	Type	Description	Epoch	Age (Ma)
Witzand		Aeolian	SAND	Fine- to medium-grained, whitish grey to slightly reddish, calcareous, cross-stratified, dune snails, echinoid spicules, forams and comminuted sea shells	Holocene	0.01 to 0
Springfontyn		Aeolian	SAND	Fine- to medium-grained, quartzitic sand, muddy and peaty in places	Pleistocene to Holocene	1.8 to 0.01
Langebaan		Aeolian	CALCAREOUS SANDSTONE	Cross-bedded, fine- to medium-grained, with calcrete layers	Late Pliocene to Late Pleistocene	2 to 0.2
Velddrif		Shallow marine	GRAVEL and SAND	Shelly and pebbly, cross-bedding	Plio-Pleistocene to Late Pleistocene	1.8 to 0.2
Varswater	Muishond Fontein	Estuarine / shallow-marine	SAND	Phosphatic, quartz-sand	Miocene Pliocene	to 23 to 5
	Langeberg	Estuarine / shallow-marine	SAND	Non-phosphatic, carbonaceous clay and lignite lenses	Miocene Pliocene	to 23 to 5
	Konings Vlei	Shallow-marine	GRAVEL	Pebbles and cobbles	Miocene Pliocene	to 23 to 5
	Langeenheid	Estuarine	SAND	Argillaceous (clayey sand / silt)	Middle Miocene	14
Elandsfontyn		Fluvial	SAND and GRAVEL	Angular clasts, carbonaceous clay and lignite lenses	Early to Middle Miocene	23 to 14

The sediments of the Sandveld Group are underlain by meta-sediments belonging to the Tygerberg Formation of the Malmesbury Group. The Tygerberg Formation consists mainly of alternating greyish, medium to fine grained greywacke and phyllitic shale. Where intruded by the Cape Granite Suite (not present on-site) and narrow dolerite dykes (present on-site), the sediments are baked to massive bluish-grey hornfels along their contacts. These dykes, as well as faults in the vicinity of the site, have been delineated by the Council for Geoscience. The bedrock at the site consists of a steeply dipping, interlaminated and bedded succession of greywacke, siltstone and mudstone, with occasional shale interbeds of the Malmesbury Group. Gradational sequences and contacts are characteristic and the beds grade mainly from coarse to fine grained in upward-fining successions. The degree and depth of weathering varies considerably across the site. Unweathered greywacke is present within 6 m of the bedrock surface, while weathering of mudstone and siltstone extends to 26 metres below ground level in some places. The bedrock is brecciated along fault zones and is intensely jointed and often sheared along such fault planes. Quartz veins, pyrite and clay gouge are ubiquitous in the joints and faults, especially where the wall-rocks of the faults are brecciated.

2.3 Geohydrology

2.3.1. Aquifer Types

Groundwater in and around the Project area occurs in the unconfined Langebaan Road Aquifer that is located between the lower Berg River and Saldanha Bay. The geomorphological origins of Saldanha Bay are related to deep fluvial incision of bedrock by a "proto-Berg" river during Miocene or pre-Miocene times, as revealed by marine geological and geophysical investigations in Saldanha Bay (De la Cruz, 1978).

2.3.2. Aquifer Parameters

Hydraulic conductivity values vary over more than 10 orders of magnitude in nature (Calver, 2001). Typical hydraulic conductivity values are:

- For an unconsolidated silty sand to gravel – 0.01 to 10,000 m/d (Freeze and Cherry, 1979)
- For fluvial deposits (alluvium) – 0.1 to 1000 m/d (Hiscock, 2005)
- For lacustrine silt and clay – 10^{-8} to 10^{-4} m/d (Hiscock, 2005).

A numerical model DWAF (2008) setup to model the Langebaan Road Aquifer found satisfactory model performance with hydraulic conductivity set at 10 m/d. It must be noted, however, that the study assumed homogeneity throughout the aquifer. Previously Timmerman (1985a) had provided estimates for transmissivity (T) (hydraulic conductivity x thickness) of the sand deposits on the area from hydraulic testing but these are considered unreliable owing to numerous issues that Timmerman (1985a) reported affected the process. These included:

- Gravel packs seldom being placed in the correct positions, hence the possibility that unknown units are targeted in the pumping
- Incorrect well and screen design causing sand infiltration into the holes and sand blocking screens artificially reducing the hydraulic conductivity of the formation surrounding the hole.

2.3.3. Hydrocensus Survey

A detailed hydrocensus was conducted on and around the site to a distance of about five kilometres so as to obtain a representative population of the boreholes in the area. During the hydrocensus, all available details of boreholes were collected. Of the 32 within the five kilometer radius (**Appendix 2**), five are within the study site and are discussed to some detail in 2.3.4. Available information was collected on the use of the boreholes in the

area, the water levels and yields of boreholes, etc. The information can be used to assess the risk which potential groundwater pollution poses to groundwater users.

2.3.4. Depth to Groundwater

According to the WR2012 study, the average water level for the Southwestern Cape Coastal Sandveld where the site is located is about 9.72m below surface. However, within the site, there are geosites whose details were extracted from the National Groundwater Archive and are presented here in **Figure 2-3** and **Table 2-3**.

The difference in depth to groundwater levels suggest that the boreholes on site are accessing a perched water aquifer, perhaps above the calcrete geology typically found in the area.

Table 2-3: Static Water Levels readings for boreholes within the Study site

Borehole Id. No.	Location	Longitude	Static Water Level (mbgl)	Date
BG00171 ¹	-33.00008	18.001	7.92	1 April 2012
			7.55	14 January 2015
BG00172 ¹	-33.00018	18.00099	4.47	30 March 2012
			4.21	14 January 2015
BG00173 ¹	-33.00014	18.00107	3.96	26 March 2012
BG00174 ¹	-33.00008	18.001	4.31	28 March 2012
3318AA00235 ² (DWA No. G1N0389)	-33.00206	18.00394	2.98	2 November 2004
			3.08	7 December 2004
			3.20	11 January 2005

¹ Reference in the National Groundwater Archive provided as "Specialist Hydrogeological study, Crude Oil tank farm, Saldanha" dated 5/2/2012

² Reference in the National Groundwater Archive provided as "Internal Documentation"



Figure 2-3: Geosites Location within the Study Area

In addition to the static water levels data presented in **Table 2-3** above, monitoring data for borehole with a NGA ID reference of 3318AA00235 (also identified by DWS as hydrological Station No. G1N0389) for the period 7 September 2004 to 27 February 2018 was obtained and this presented in **Figure 2-4** and in Appendix 2. There is no indication of significantly declining water levels prior to November 2016. Seasonal trends are evident, as is the short duration influence of pumping. The likely explanation for continued fall in water levels after November 2016 could be the impact of the drought conditions faced by the Western Cape province that have led to a reduction in aquifer recharge.

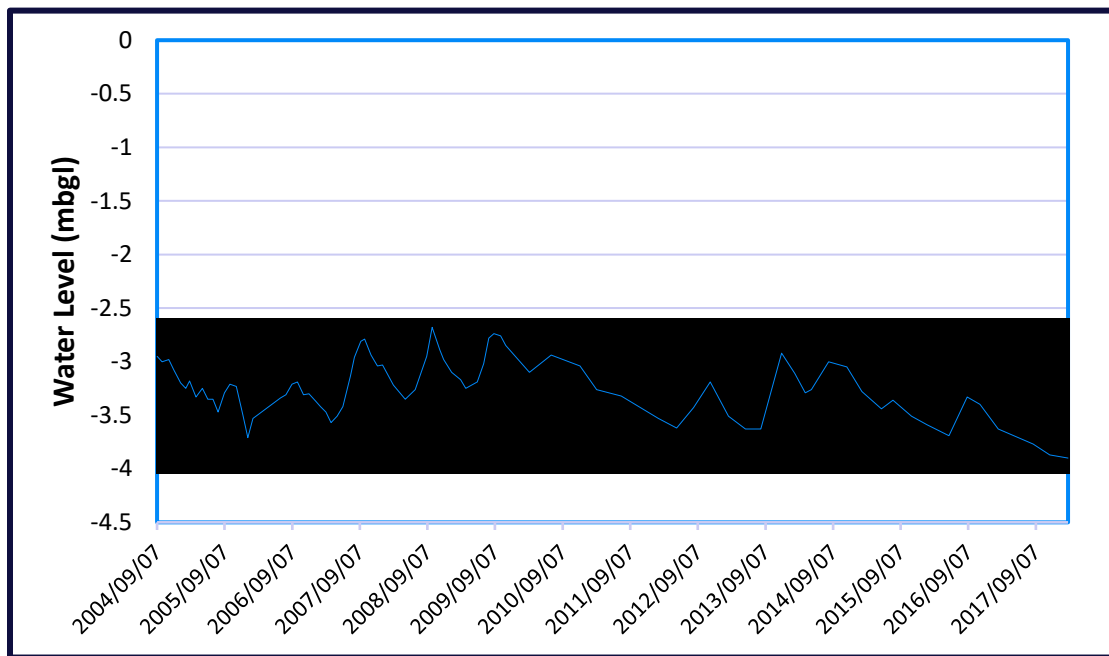


Figure 2-4: Groundwater level fluctuation in Monitoring Borehole DWA G1N0389 on the study site

Also observed is that the water table depths vary seasonally with higher levels seeming following the wet season as reflected in **Figure 2-5**.

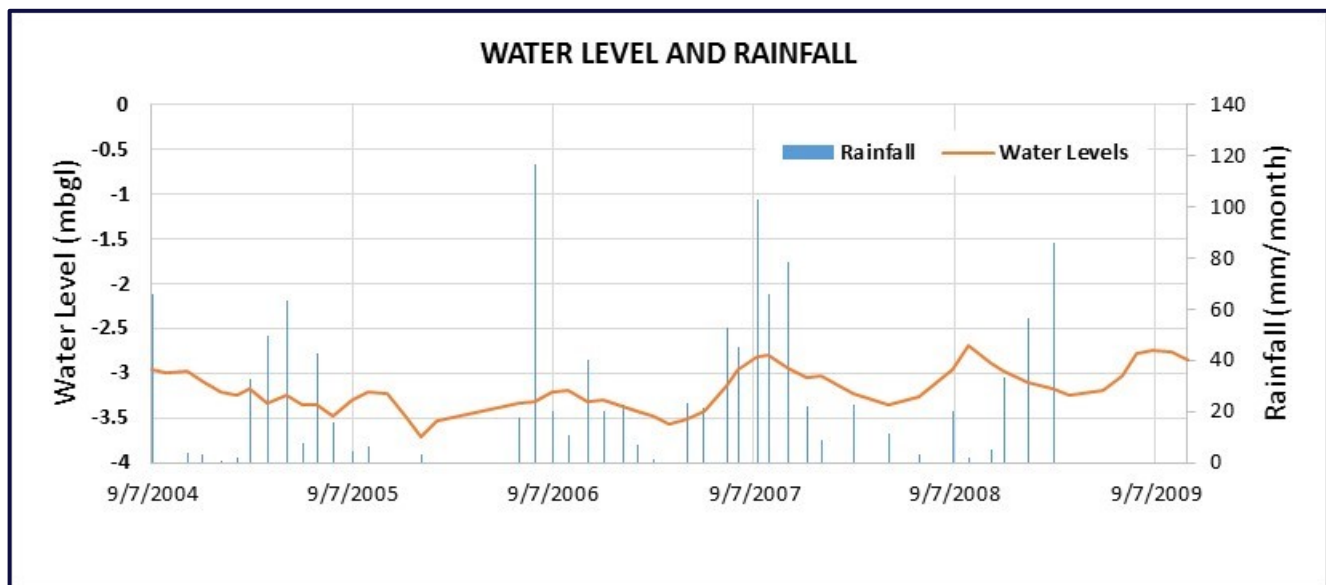


Figure 2-5: Groundwater Fluctuations vs Rainfall Seasonal Pattern

2.3.5. Aquifer Recharge

Estimates of recharge (as a percentage of rainfall) in the vicinity of the site have previously been made by Timmerman (1985b) who, based on a 15% recharge rate estimate from rainfall, set the short-term yield of Langerbaan Road Aquifer System at $19.5 \times 10^6 \text{ m}^3/\text{a}$ and the long-term yield at $30 \times 10^6 \text{ m}^3/\text{a}$.

In a re-evaluation conducted by CSIR, the recharge rate was estimated at 8% recharge from rainfall (Weaver *et al.*, 1997).

Woodford and Fortuin (2003) used a GRID-based GIS modelling technique to estimate effective annual recharge, which relates to an average effective recharge of 3.9% of annual rainfall. The GRAII and Water Balance Model

(DWAF, 2007) methods all generate recharge estimates that are approximately 5% of the rainfall, and at a maximum at 8% (DWAF, 2007).

A number of references including DWAF (2008) indicate that groundwater flows in a south-westerly direction across the site towards the coast and Saldanha Bay.

2.3.6. Borehole Yields and Groundwater Use

While the primary water resource is the Berg River; groundwater still plays a significant role as a water supply source. Data regarding water use is available from GRAII. Water use, summed for each type of use, for quaternary catchment G10M is given in **Table 2-4** below.

Table 2-4: Groundwater Use in Quaternary Catchment G10M

Catchment	Groundwater Use (Million m ³ /a)						
	Total	Rural	Municipal	Agric. Irrigation	Agric. Livestock	Mining	Industry
G10M	1.999	0.007	0.0837	0.0000	0.4073	0.0000	1.5010

The closest municipal abstraction of groundwater occurs approximately 30 kilometres to the north east of the sites close to Langebaanweg.

2.3.7. Aquifer Classification and Vulnerability

Using the Aquifer Classification according to the Aquifer Classification Map of South Africa (Parsons and Conrad, 1999), the aquifer at the site is classified as a poor aquifer system with low vulnerability and low susceptibility to contamination. For more on the classification, the maps are included as **Appendix 3**.

2.3.8. Groundwater Quality

The electrical conductivity (EC) of water is a physical property which is widely used as an alternative to the chemical measuring of total dissolved solids (TDS), to determine water quality. Pure water has a low conductivity and an increase in conductivity generally reflects a decrease in water quality. The EC of groundwater in the area is generally between 150 and 300 mS/cm (Hohls et. al., 2002). According to WRC (1998) this represents saline conditions and is unacceptable for long-term drinking purposes.

2.4 Conceptual Geohydrological Model

A conceptual geohydrological model is a descriptive representation of a groundwater system that incorporates an interpretation of the geological and hydrological conditions. It consolidates the current understanding of the key processes of the groundwater system, including the influence of stresses, and assists in the understanding of possible future changes. The main concepts were introduced in the Subsections 2.3.1 to 2.3.7 above, and are summarised below:

- There is no downstream use of groundwater.
- Groundwater at the site is near/at the end of its flow path.
- Depth to the groundwater table within the study site has been recorded as high as 3.08 metres below ground level all the way to just above 8 metres below ground level. This may impose a depth limitation as far as the resizing the existing ponds is concerned.
- The receiving environment/downstream receptor of any contamination will be the shore zone/sea.

- Groundwater flow is from inland, across the Project site, in a south-westerly direction towards the coast, where it discharges into the ocean
- Natural groundwater quality is marginally saline.
- Hydraulic conductivity values of 10 m/d have been used to model the Langerbaan Road Aquifer System (assuming homogeneity across the aquifer) with satisfactory performance.

3. IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION

The assessment of potential impacts on the groundwater resources discussed below is relevant to the proposed upgrade.

3.1. Construction Phase

During the upgrade of the stormwater system which is understood to include development of two new storm water retention ponds, resizing and reshaping of thirteen (13) existing storm water retention ponds, the groundwater, development of a waste water treatment facility, etc. as detailed in project description above, resources underlying the site may potentially be impacted as follows:

- Hydrocarbon contamination: Downward migration of leaked and/or spilled fuel, oil and grease into the underlying aquifer system;
- Hazardous waste/chemicals contamination: Downward migration of contaminants from onsite waste storage areas and/or chemical storage areas into the underlying aquifer system;
- Organic and bacterial (microbiological) contamination: Downward migration of contaminant from leaking and / or spilling temporary on-site sewage facilities into the underlying aquifer system.

With respect to hydrocarbon, hazardous waste, chemicals and organic and bacterial (microbiological) contamination of the aquifer, the intensity is assessed to be low on account of the existing housekeeping practice as observed during the site visit and the low storm water volumes that result in some of the retention ponds being empty especially during the summer months as supported by the Climatic Water Balance Assessment (Appendix 4) and classification for the site. Consequently, the natural quality of groundwater at the sites should not be notably degraded. It is presently not known what types of hazardous substances may be, stored, transported or disposed of, or otherwise managed, at the site during construction. However, typical examples, associated with construction, of such potential contaminants are paints and solvents, vehicle wastes (e.g. used motor oil, etc.), mercury-containing wastes (e.g. thermometers, switches, fluorescent lighting, etc.), caustics and cleaning agents and batteries.

It is expected that without mitigation, the quantity of potential contaminants used and / or stored, and spilled and/or leaked at the sites, will be low and therefore insufficient to extensively contaminate the primary aquifer. With mitigation, the intensity reduces to **low (Table 3-1)**.

Table 3-1: Potential groundwater contamination caused by construction activities

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Geo- hydrology	No	Negative	2	2	6	2	20 (<30 = Low)
	Yes	Negative	1	2	2	1	5 (<30 = Low)

Corrective Actions	- Place drip trays under stationary machinery, only re-fuel machines at the temporary fuelling station, install temporary structures to trap fuel spills at the temporary fuelling station. - Immediately clean oil and fuel spills and dispose of contaminated material (soil, etc.) at licensed sites only. - Equip the site with sufficient ablution facilities. Secure chemical toilets to ensure that they do not blow over in windy conditions. - Do not make uncontrolled releases of any pollutants, including sediment, sewage, cement, fuel, oil, chemicals, hazardous substances, waste water, etc., into the environment. - Compile a procedure for the storage, handling and transport of different hazardous materials and ensure that it is strictly adhered to. - Ensure vehicles and equipment are in good working order and drivers and operators are trained with respect to actions to be taken in the case of a fuel spill or leak. - Ensure that good housekeeping rules are applied.

3.2. Operations Phase

The potential impacts during the operational phase are as follows:

- Fuel and oil leaks from the vehicle transporting the iron ore
- Storm water with iron ore dust in the retention ponds which could percolate into the groundwater resources and the shore/sea in the vicinity of the site.

However, under normal design operational conditions, such releases are highly unlikely.

It is expected that without mitigation, the quantity of potential non-radioactive contaminants used and/or stored, and spilled and / or leaked at the sites, will be insufficient to extensively contaminate the primary aquifers. With mitigation, the intensity is reduced to **Low (Table 3-2)**.

Table 3-2: Potential groundwater contamination caused by operational activities

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Geo-hydrology	No	Negative	2	2	6	2	20 (<30 = Low)
	Yes	Negative	1	2	2	1	5 (<30 = Low)
Corrective Actions	- Proper maintenance plan for the retention pond system to ensure effective operation - Use existing ablution and waste water treatment facilities at the Site. - Do not make uncontrolled releases of any pollutants, including sediment, sewage, cement, fuel, oil, chemicals, hazardous substances, waste water, etc., into the environment. - Ensure vehicles and equipment are in good working order and drivers and operators are trained. - Ensure that good housekeeping rules are applied.						

3.3. Fatal Flaws (Statement of Acceptability)

The geohydrological specialist study indicates that there are no groundwater related fatal flaws with respect to upgrading the stormwater and environmental systems.

3.4. No Go Option

In case the proposed upgrade is not implemented, the existing storm water system status quo will continue with no change in groundwater contamination risk.

3.5. Groundwater Monitoring

Groundwater monitoring with the existing boreholes at the study site is recommended on account of the observed static water levels in boreholes on site being higher than 5 metres below ground level especially if the resizing that is proposed for some of the existing ponds will make them deeper thus increasing the opportunity for percolation of storm water into the shore/sea.

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APPENDICES

APPENDIX 1: RAINFALL DATA

SAWS Station No. 0060780

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1900										29	9.5	6
1901	76.8	18.9	6.3	13.7	74.8	20.6	53.9	21.2	11.8	5.4	37.4	4.4
1902	6.3	8.2	11.6	29.8	65.8	52.8	52.8	67.7	72.3	21.3	5.9	2.6
1903	22.9	1.9	8.9	38.4	66.3	110	19.7	53.4	37.2	35.4	2	2.6
1904	15.9	2.3	3.5	58.2	31.8	88.1	38.8	99.9	29.6	28.3	14.3	8.2
1905	3.6	2.5	9.8	2.3	58.4	75.8	29.9	44.6	31.3	19.8	6.7	2.5
1906	5.7	0	14.8	9.3	33.9	46.7	13.9	53	13	9	4.6	14
1907	6.1	2.5	13.8	24.4	72.1	20.9	6.4	11.4	28.3	23.6	9.6	9.2
1908	8.9	4.2	5.5	44.6	5	34.5	30.3	48	15.9	11.7	9.4	4
1909	2.3	0	22.6	7.4	23	21.1	23.2	86.1	11.1	29.3	1.6	20
1910	0	8.7	8.6	17.2	52.2	68.5	86.8	48	21.6	14.5	12.1	14
1911	5.4	5.7	6.9	5.8	32.2	24.5	61.9	37.3	41.2	16.6	7.9	15
1912	0	5.7	9	18.2	71.1	54	26.2	38.9	46.6	6.2	19.8	2.4
1913	2.3	4.8	2.1	25.6	52.1	58.7	69.9	70	26.4	21.3	18.3	11
1914	14.9	4.1	4.5	23.2	12.8	80.7	84.3	95.4	49.5	2.7	14.9	2.5
1915	1.6	4	10.3	46.4	37.1	46.9	97.7	28.9	28.1	9.8	14.7	3.1
1916	9	2.4	8.7	9.4	57	75.4	63.4	83.5	27	8.7	2.9	6.1
1917	2.9	1.4	4	19.1	55.8	98.4	121	21.1	11.6	11.8	12.8	4.9
1918	0	6.3	9.4	6.2	66.2	62.7	55.4	####	26	35.6	11.9	4.8
1919	7.3	2.9	2.2	11.3	10.9	41.7	51.7	34.9	35.7	7.2	6.1	0
1920	0	3.2	1.2	9.8	71.1	111	78.9	72.3	60.3	20.4	7.4	9.6
1921	11.7	15.5	4.2	18.3	3.3	226	62.4	90.2	20.1	17.3	2.9	12
1922	34	2.5	5.7	17.8	35.3	156	41.1	88.1	4.3	11.3	2.5	1.7
1923	5.4	0	7.1	24.6	128	119	66.1	65	27.9	14.3	40.4	3.5
1924	4.1	1.7	5.2	11.2	10.5	82.2	40.3	86.5	23.9	25.4	32.3	2.5
1925	3.8	1.7	0	3.7	37.3	188	83.7	12.7	21.5	24.7	22.9	5.3
1926	3.9	14.9	3.1	8.8	53.9	11	73.9	36.1	15.1	32.1	9.6	0
1927	4	9.7	4.6	13.8	47.4	42.1	33.6	69.2	10.8	4.9	14.6	11
1928	9.3	0	7.8	3.7	0	84.1	26.2	50.4	22.7	4.7	7.2	18
1929	1.3	2.7	6.3	25.8	67.5	35.9	52.1	39.8	20.6	8.8	7.5	14
1930	6.8	7.4	5.4	13.4	2.8	14	37	43	69.2	9.1	22.8	4.1
1931	0	12.4	1.5	41	54.9	23.6	22.5	80.4	33.7	17.7	1.3	5.4
1932	6.3	32.4	3.6	3.9	122	82.9	42.8	40	36.7	10.6	3.7	6
1933	7.7	13.2	6.9	6	40.7	105	94.9	63	10.5	17.2	6.6	2.6
1934	4.9	2.8	11	7.8	62.1	28.8	39.8	62.9	31.5	21.5	19	0
1935	0	2.2	10.4	35.9	63.1	47.3	73.3	40.6	26.4	8.8	17.2	4.6
1936	18.4	6.4	9.1	2.5	42.3	17.6	48.3	54.1	40.2	4.5	5.9	11
1937	2.6	0	25.5	21.9	31.8	78.9	94.8	21.8	8.5	11.5	3.7	0
1938	8	2.8	5	30.2	47.5	31.6	36.9	32.9	36.8	10.1	0	16
1939	0	12.9	1.9	14.3	59.1	23.6	43.2	65.3	10.2	8.4	8.4	0.9
1940	0	22.9	12.4	51.2	34.3	59.8	22.6	10.9	29.4	14.1	24.4	6.6
1941	0.3	3.3	0.3	48.5	89.5	75.6	53.2	46.2	41.5	27.3	6	14
1942	1.7	0	0	7.1	49.1	135	20	46.5	29.2	11.6	0	15
1943	23.8	12.7	16.8	3.8	28.9	34	52.7	60.2	26.1	23.1	10.2	0

1944	13	0	3.8	15	68.3	128	60	56.7	7.6	10.7	12	15
1945	0	0	0	12.7	108	87.4	41.1	38.8	0	9.8	2.8	7.7
1946	2.5	1.8	16	27.7	69.9	18.6	31.6	24.6	75.8	13.7	7.8	5.6
1947	1.3	0.5	20	11.8	15.5	19	83.6	31.7	26.9	24.3	3.3	0
1948	2.5	4.8	23.4	23.7	34.5	33.6	69.6	8.4	49.9	9.1	0.5	2.8
1949	9.2	0	2	20.3	26.9	50.3	32.1	50	45.2	7.9	9.2	5.1
1950	5.6	0.3	8.6	61.8	12.5	25.5	107	10.9	36.8	18.2	18.3	34
1951	7.6	1	3.8	39.1	17.8	90.1	26.6	15.3	23.6	23.9	15.2	1.3
1952	3.9	6.8	6.2	16	56.7	67.4	51.6	43.6	26.5	4.1	55.1	2.3
1953	0	3	19.8	85.4	57.8	24.3	61.2	64.1	11.2	2.3	65.3	11
1954	12.4	4.7	5.3	27.3	189	41.7	402	151	7.4	28.4	2.8	5.6
1955	0	35.5	8.4	17.9	24	30.6	181	104	25.4	29.7	24.4	19
1956	8.1	4.1	20.3	21.1	54.2	302	169	36	13	27.5	0	14
1957	4.6	44.7	6.5	14	300	119	76	62.5	16.5	59.7	5.7	4.1
1958	3.9	61	7.6	44.5	52.1	26	16	36	26.7	19.1	11.4	0
1959	1	12.7	11.4	86.4	116	17.1	33	21.5	8.9	10.2	0	1.3
1960	0	4.2	4.8	29.5	40.6	40	17.8	45.7	17.8	9.5	0	96
1961	4.1	0.8	5.1	11	44.2	43.5	67.8	56.9	42.3	21.6	0	5.1
1962	6.4	9.3	7.6	26.4	36.8	172	42.7	87.5	19	121	21.6	0
1963	2.5	0	17.8	6.4	5.1	40	77.5	159	19.5	27.9	52.3	2.5
1964	0	13	0	10.8	22.6	72.1	56.9	37	16	15	31.8	0
1965	2	52.1	40.6	20.1	18.5	36.1	32	25.5	15.8	13.3	0	34
1966	7.6	0	33.4	8.2	40.6	77.5	54	20.7	68.3	5.8	4.2	6.4
1967	25.4	0	0	13.2	41.4	82.7	52.1	38.1	15.8	20.2	45.7	0
1968	8	2.1	0	17.5	55	38.3	84.7	21.5	2.3	27	5.7	2.8
1969	14	5.3	6.5	20.9	0	39.8	17.8	37.4	23.6	36	3	0
1970	0	11.6	1	0	50.3	54.5	60.2	53.8	28.9	11	0.5	5.7
1971	1.5	0	6.5	1.1	25.3	48.6	37.3	61.5	15.2	9.2	0.5	0.4
1972	8.5	4.5	4	25.9	26	54.5	13	36.6	16	3.5	0	28
1973	0	4.5	15.3	2.5	25.7	10.7	51.5	20.5	12.3	5.5	3	26
1974	0	0	9	2.6	47.5	73.5	14.8	164	10.9	23	9.6	1.2
1975	3.5	4	4	18	63.5	22	31.5	32	5.5	23	4	0
1976	0	0	22	18.4	26.5	118	62.6	30.5	22.3	0	30.5	13
1977	14.5	2.5	6.5	48.2	88.2	79.4	117	55.5	21	4	32.5	6
1978	7.9	10.2	8.3	8.2	15.2	3.8	6.5	58	35.7	25.5	8	22
1979	11.2	9.1	2.4	3.2	31.1	49.7	12.9	44.9	17.5	33.2	4.6	0.2
1980	22.8	6.5	0	27.2	76	76.4	19.6	19.3	9	21.7	103	26
1981	34.1	0	33	18.3	9.6	53.2	93.1	62.5	34.5	7	7.4	0.8
1982	22	0	20.5	32.5	37.7	60	43.2	35.5	4.5	9.5	7	23
1983	7	33	18.5	5.5	81	54	40.8	10	26.7	20	2	6
1984	3.5	0.5	8	14.1	92.4	31.5	29.5	15	40.1	42.5	0	9.9
1985	14	8.5	80	40	28.5	59	63	43	39	1.4	1.1	0
1986	20	0	9.5	14.5	18.1	66.2	64.4	48.1	36	11	4	1
1987	2.9	5.5	4.5	25.5	60.3	35.2	87.1	72.5	34.7	2.5	5.2	10
1988	0	0	10.4	86.3	8.2	43.1	35.1	77	35.8	2.4	4	2.5

1989	0.6	11.1	32.7	27	47.8	25.5	61.2	39.2	44.8	25.5	26.3	4
1990	10	2	0	71.2	57.7	65.3	87.8	19.6	6.8	0	8	7.7
1991	1	6	7.5	14	28.7	64.2	125	15.1	67.8	34.2	11.2	6.8
1992	2	14.5	4.5	23.2	40.1	75.2	38.6	18.2	25.2	32.7	9.7	2.5
1993	0	2	4	90.1	60.7	38.5	77.3	61.1	3.6	5	0	12
1994	0	0	0	19.2	17.6	157	41.1	9.6	68.5	14	0	0
1995	8.5	1.2	14.5	0	11.5	52.9	76		10.3	26.5	3	7
1996	5.5	29.9	7	19	12.5	64.5	23	81.5	47.5	12	12.5	12
1997	1.6	0.9	11.5	22	23.5	72.3	11.5	29	5.2	3.8	41	4
1998	7.4	0	1.5	2.5	37.4	36.5	37.7	18	2.5	6	30.2	13
1999	0	0	0	13	27	29.5	45.5	0	60	0	7.7	5
2000	2.5	0	0	0	15	18	51.5	19.5	69	4.1	19.2	5.2
2001	7.1	1.5	0	36	67.5	29	145	58.8	38.2	10	8.1	0
2002	0.7	5.5	12.5	28	46.5	35.6	63	75.8	14.5	14	7.7	8.1
2003	9.7	0	22.5	4.5	20.5	4.8	16	110	25	8.8	3	7.5
2004	27.5	0	13.8	24	0	68	55	34	19	66	0	4.2
2005	3.5	0.2	2.3	32.5	49.5	63.5	7.5	43	16	4.4	6.5	0
2006	0	3	0	18	117	20	11	40.5	20	22.5	7	1.5
2007	0	23.5	21.5	53	45	103	66	78.5	22	8.7	22.5	12
2008	3.6	20	2	4.9	33.6	56.6	85.7					

APPENDIX 2: HYDROCENSUS SURVEY RESULTS AND GROUNDWATER LEVELS DATA

- 2-1 Hydrocensus Survey Results**
- 2-2 DWA Hydrological Station No. G1N0389**

Table A-1: DWS Monitoring Boreholes within a 5km radius of Study Site

Geosite Identifier	Latitude	Longitude	Farm Name	Province
3218CC00371	-32.98827	18.02823	YZERVARKENSRUG	Western Cape
3218CC00360	-32.98055	18.01395	YZERVARKENSRUG	Western Cape
3218CC00361	-32.9861	18.0109	YZERVARKENSRUG	Western Cape
3218CC00362	-32.98749	18.01645	YZERVARKENSRUG	Western Cape
3218CC00363	-32.98721	18.01479	YZERVARKENSRUG	Western Cape
3218CC00352	-32.98083	18.01645	YZERVARKENSRUG	Western Cape
3218CC00353	-32.98249	18.01673	YZERVARKENSRUG	Western Cape
3218CC00354	-32.98249	18.01729	YZERVARKENSRUG	Western Cape
3218CC00359	-32.99666	18.02701	YZERVARKENSRUG	Western Cape
3218CC00348	-32.98749	18.02923	YZERVARKENSRUG	Western Cape
3218CC00349	-32.98749	18.0284	YZERVARKENSRUG	Western Cape
3218CC00350	-32.98777	18.02756	YZERVARKENSRUG	Western Cape
3218CC00351	-32.98305	18.02784	YZERVARKENSRUG	Western Cape
46113	-32.98103	17.96632	FARM	Western Cape
3218CC00345	-32.98999	18.03284	YZERVARKENSRUG	Western Cape
3218CC00346	-32.9911	18.03173	YZERVARKENSRUG	Western Cape
3218CC00347	-32.9911	18.03284	YZERVARKENSRUG	Western Cape
BG00171	-33.00008	18.001	OS FONTEIN	Western Cape
BG00172	-33.00018	18.00099	OS FONTEIN	Western Cape
BG00173	-33.00014	18.00107	OS FONTEIN	
BG00174	-33.00008	18.001	OS FONTEIN	Western Cape
3318AA00159	-33.01425	18.03285	OS FONTEIN PTN TIEKOSKLIP	Western Cape
3318AA00235	-33.00206	18.00394	ELANDSFONTEIN	Western Cape
3318AA00269	-33.01168	18.04163	OS FONTEIN PTN TIEKOSKLIP	Western Cape
BG00001	-32.9823	17.96882	FARM	Western Cape
3218CC00372	-32.99127	18.02823	YZERVARKENSRUG	Western Cape
3218CC00373	-32.99127	18.02923	YZERVARKENSRUG	Western Cape
3218CC00374	-32.98427	18.02723	YZERVARKENSRUG	Western Cape
3218CC00375	-32.98727	18.01623	YZERVARKENSRUG	Western Cape
3218CC00364	-32.99694	18.02729	YZERVARKENSRUG	Western Cape
3218CC00365	-32.99666	18.02701	YZERVARKENSRUG	Western Cape
3218CC00366	-32.99694	18.02701	YZERVARKENSRUG PTN SALDANHA STEEL PLANT	Western Cape

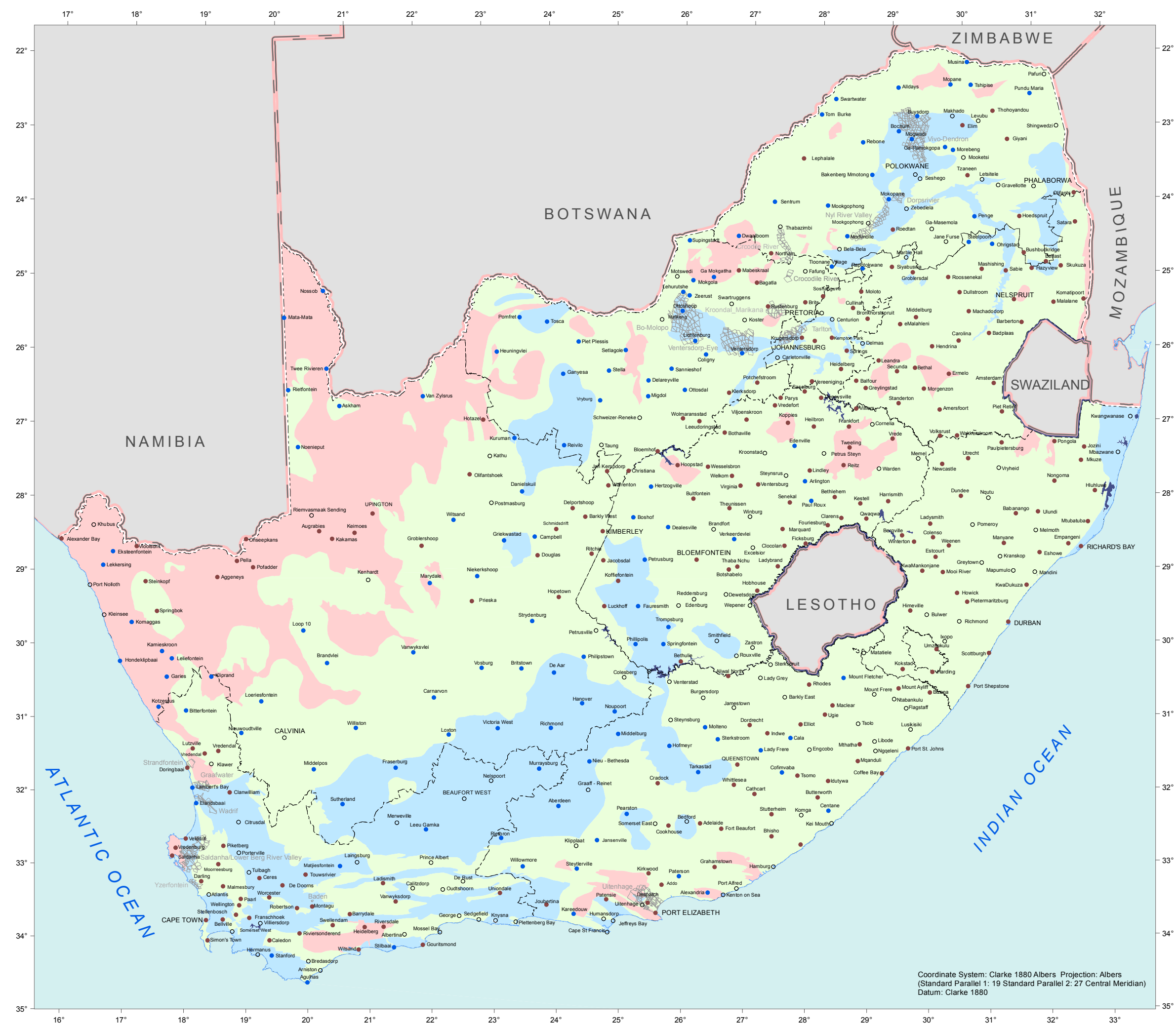
Table A-2: Water Levels data for DWA Hydrological Station No. G1N0389

Measurement Date	Water Level (Reference Level is Ground Surface)
9/7/2004	-2.95
10/4/2004	-3
11/9/2004	-2.98
12/7/2004	-3.08
1/11/2005	-3.2
2/8/2005	-3.25
3/2/2005	-3.18
4/5/2005	-3.33
5/10/2005	-3.25
6/7/2005	-3.35
7/5/2005	-3.35
8/2/2005	-3.47
9/6/2005	-3.29
10/5/2005	-3.21
11/8/2005	-3.23
12/13/2005	-3.49
1/10/2006	-3.71
2/7/2006	-3.53
7/6/2006	-3.34
8/3/2006	-3.31
9/6/2006	-3.21
10/5/2006	-3.19
11/7/2006	-3.31
12/6/2006	-3.3
1/11/2007	-3.37
2/6/2007	-3.42
3/7/2007	-3.47
4/4/2007	-3.57
5/8/2007	-3.51
6/7/2007	-3.42
7/19/2007	-3.13
8/8/2007	-2.96
9/12/2007	-2.81
10/3/2007	-2.79
11/6/2007	-2.94
12/12/2007	-3.04
1/8/2008	-3.03
3/6/2008	-3.22
5/9/2008	-3.35
7/2/2008	-3.26
9/2/2008	-2.95

10/1/2008	-2.68
11/12/2008	-2.89
12/3/2008	-2.98
1/16/2009	-3.1
3/4/2009	-3.17
4/1/2009	-3.25
6/3/2009	-3.19
7/7/2009	-3.02
8/4/2009	-2.78
9/1/2009	-2.74
10/7/2009	-2.76
11/3/2009	-2.85
3/12/2010	-3.1
7/7/2010	-2.94
12/9/2010	-3.04
3/10/2011	-3.26
7/20/2011	-3.32
2/7/2012	-3.53
5/15/2012	-3.62
8/14/2012	-3.43
11/13/2012	-3.19
2/19/2013	-3.51
5/21/2013	-3.63
8/13/2013	-3.63
12/3/2013	-2.92
2/11/2014	-3.11
4/10/2014	-3.29
5/13/2014	-3.26
8/14/2014	-3
11/20/2014	-3.05
2/10/2015	-3.28
5/26/2015	-3.44
7/28/2015	-3.36
11/4/2015	-3.51
1/28/2016	-3.59
5/25/2016	-3.69
9/1/2016	-3.33
11/8/2016	-3.4
2/15/2017	-3.63
8/22/2017	-3.77
11/21/2017	-3.87
2/27/2018	-3.9

APPENDIX 3: AQUIFER CLASSIFICATION MAPS OF SOUTH AFRICA

APPENDIX 4: CLIMATIC WATER BALANCE ASSESSMENT REPORT



Aquifer Classification of South Africa



Background:
Implementation of the Reconstruction and Development Programme (RDP) in South Africa has highlighted the importance of groundwater resources in the country as the role they will play in satisfying the targets of the RDP. As a result, exploration, development and protection of aquifers is receiving unprecedented attention. Provision of the appropriate information to national water resource managers and planners is a critical part of the process which aims to provide a further twelve million people with adequate access to potable water.

Data Sources:
This map is based on the Borehole Prospects map provided by JR Vegter, Hydrogeological Consultant and AJ Seymour, DWA.

Description:
This map indicates the aquifer classification system of South Africa. Blue represents the major aquifer region which is a high-yielding system of good water quality. Green represents the minor aquifer region which is a moderately-yielding aquifer system of variable water quality. Pink represents the poor aquifer region which is a low to negligible yielding aquifer system of moderate to poor water quality.

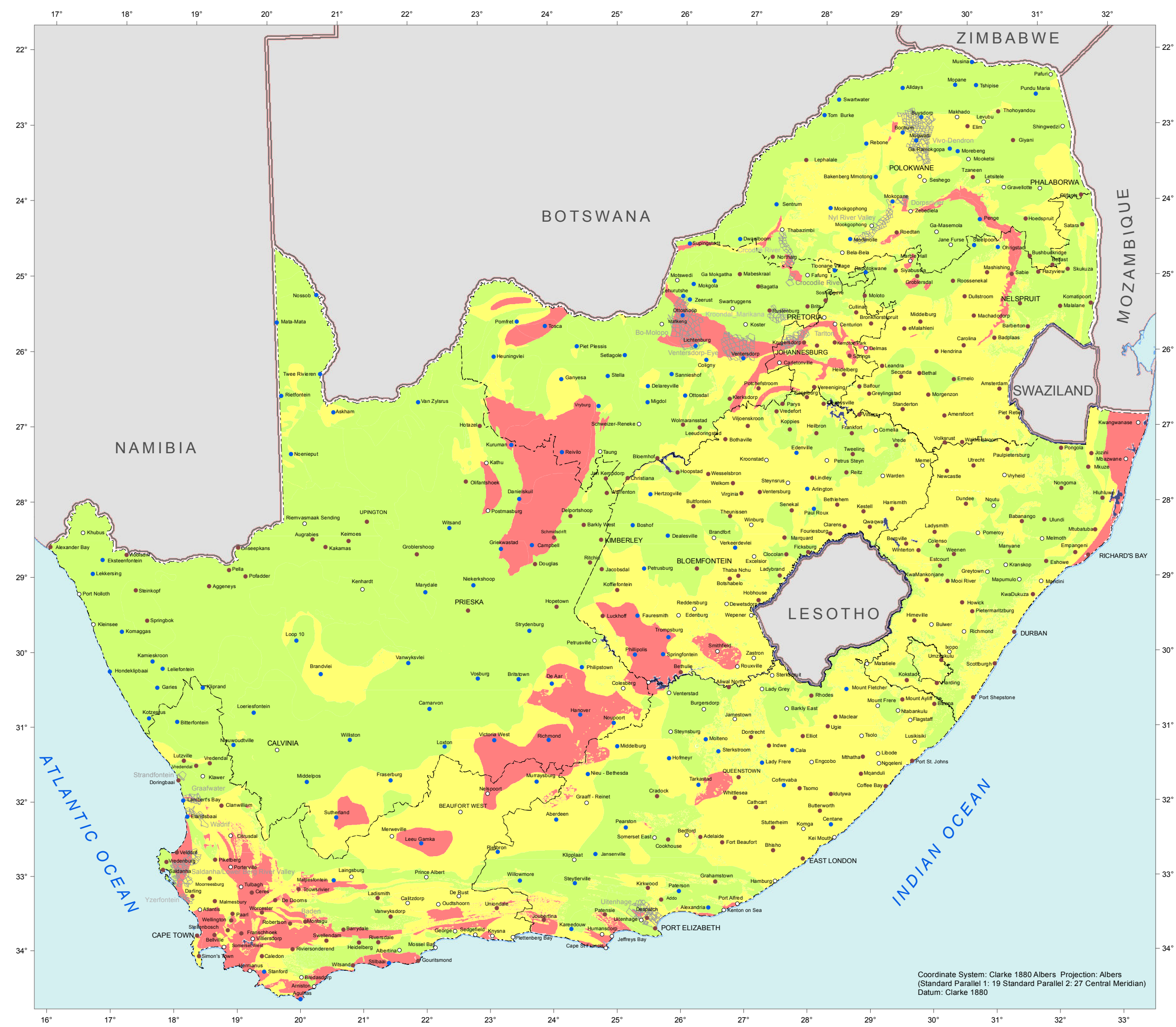
LEGEND

- Water Source**
 - Groundwater
 - Combination (Ground and surface water)
 - Surface water
- DURBAN Major towns/Cities**
- Aquifer Classification**
 - Pink Poor
 - Green Minor
 - Blue Major
- Province**
- International boundaries**
- Dams**
- Special aquifer regions**

Coordinate System: Clarke 1880 Albers Projection: Albers
(Standard Parallel 1: 19 Standard Parallel 2: 27 Central Meridian)
Datum: Clarke 1880

Original Map Compilation: Andiswa Matoti, Julian Conrad and Susan Jones, CSIR, 22 March 1999.

Recompiled: August 2012
Directorate: Hydrological Services
Sub-Directorate: Groundwater Information



Aquifer Vulnerability of South Africa



Background:
Implementation of the Reconstruction and Development Programme (RDP) in South Africa has highlighted the importance of groundwater resources in the country as the role they will play in satisfying the targets of the RDP. As a result, exploration, development and protection of aquifers is receiving unprecedented attention. Provision of the appropriate information to national water resource managers and planners is a critical part of the process which aims to provide a further twelve million people with adequate access to potable water.

Data Sources:
This map is based on the Borehole Prospects map provided by JR Vegter, Hydrogeological Consultant and AJ Seymour, DWA.

Description:
This map indicates the tendency or likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer. Green represents the least vulnerable region that is only vulnerable to conservative pollutants in the long term when continuously discharged or leached. Yellow represents the moderately vulnerable region which is vulnerable to some pollutants, but only when continuously discharged or leached. Red represents the most vulnerable aquifer region, which is vulnerable to many pollutants except those strongly absorbed or readily transformed in many pollution scenarios.

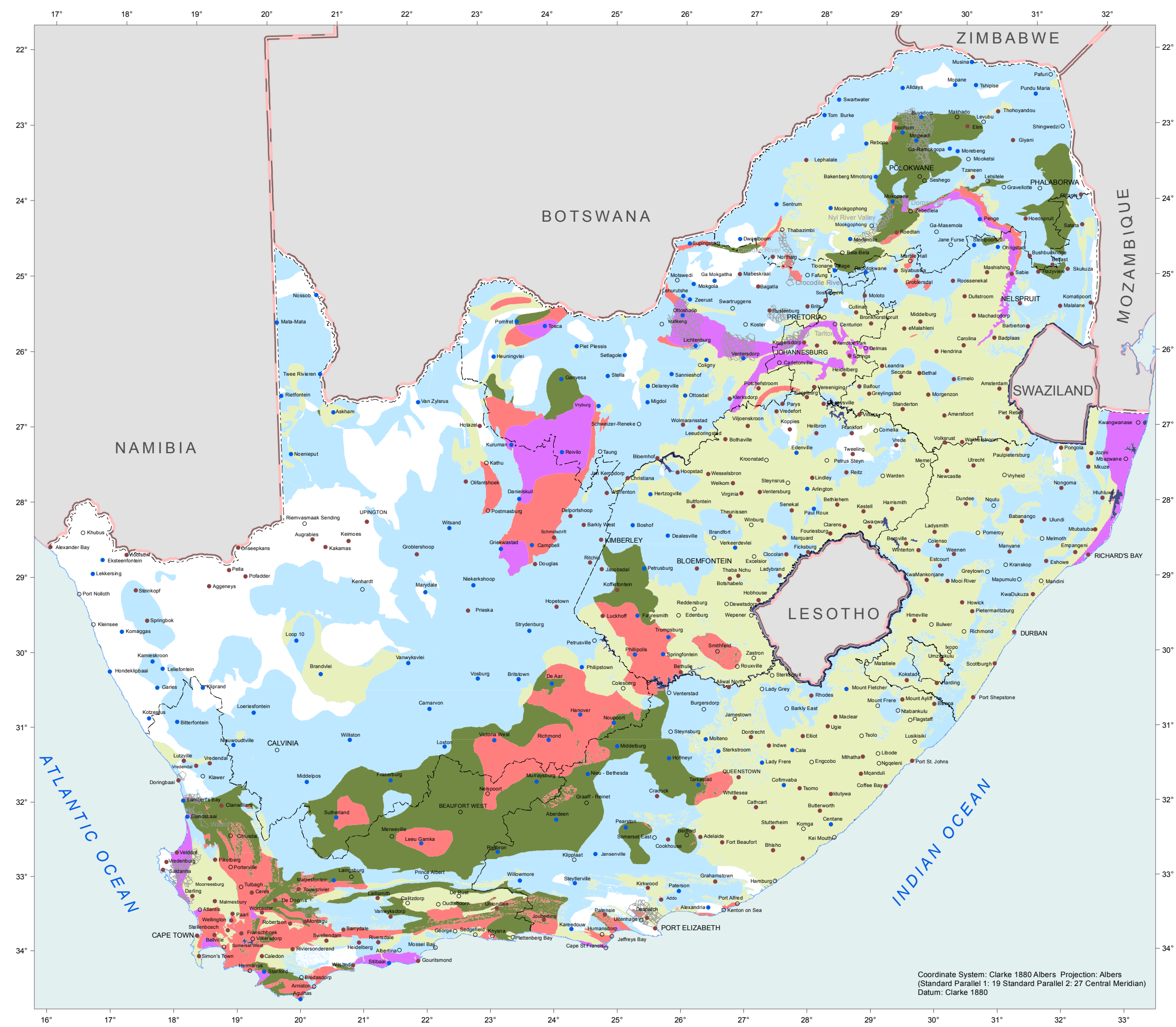
LEGEND

- Water Source**
 - Groundwater
 - Combination (Ground and surface water)
 - Surface water
- DURBAN Major Towns/Cities**
- Vulnerability Ratings**
 - Least
 - Moderate
 - Most
- Province**
- International boundary**
- Dams**
- Special aquifer regions**

Original Map Compilation: Andiswa Matoti, Julian Conrad and Susan Jones, CSIR, 22 March 1999.

Recompiled: July 2013
Directorate: Hydrological Services
Sub-Directorate: Groundwater Information

Coordinate System: Clarke 1880 Albers Projection: Albers
(Standard Parallel 1: 19 Standard Parallel 2: 27 Central Meridian)
Datum: Clarke 1880



Aquifer Susceptibility of South Africa



Background:
Implementation of the Reconstruction and Development Programme (RDP) in South Africa has highlighted the importance of groundwater resources in the country as the role they will play in satisfying the targets of the RDP. As a result, exploration, development and protection of aquifers is receiving unprecedented attention. Provision of the appropriate information to national water resource managers and planners is a critical part of the process which aims to provide a further twelve million people with adequate access to potable water.

Data Sources:
This map is based on the Borehole Prospects map provided by JR Vegter, Hydrogeological Consultant and AJ Seymour, DWA.

Description:
This map indicates the qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities and includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification.

Susceptibility Matrix				
AQUIFER CLASSIFICATION				
VULNERABILITY		Poor	Minor	Major
	Least	1 Low	2 Low	3 Medium
	Moderate	2 Low	4 Medium	6 High
		3 Medium	6 High	9 High

LEGEND

- Water Source**
- Groundwater
 - Combination (Ground and surface water)
 - Surface water
- Province**
- International boundary
 - Dams
 - Special aquifer regions
- DURBAN** Major Towns/Cities

Original Map Compilation: Andiswa Matoti, Julian Conrad and Susan Jones, CSIR, 22 March 1999.

Recompiled: June 2013
Directorate: Hydrological Services
Sub-Directorate: Geohydrological Information



Climatic Water Balance Assessment for the proposed Upgrade of Storm Water and Environmental Systems in the Port of Saldanha, Western Cape

March 2018



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Report Name	Climatic Water Balance Assessment for the proposed Upgrade of Storm Water and Environmental Systems in the Port of Saldanha, Western Cape
Submitted to	Nsovo Environmental Consulting
Report Writer	Paulo Kagoda



Climatic Water Balance

It is a simple calculation that assists in deciding whether leachate management is required or not. It therefore provides a conservative means of determining whether or not significant leachate generation will occur. The Climatic Water Balance (B) is calculated using only the two climatic components of the full water balance, namely Rainfall (R) and Evaporation (E).

The Climatic Water Balance is defined by: $B = R - E$

Where:

B is the Climatic Water Balance in mm of water

R is the rainfall in mm of water

E is the evaporation from a soil surface in mm of water.

This is calculated for the wet season of the wettest year on record wettest. This is a six month period from May to October. The data used are the precipitation and S-pan evaporation obtained from the latest edition of the Department of Water and Sanitation's evaporation and precipitation records.

The most representative/closest weather station was G1E007 "Langebaan @ Langebaan Road" whose location details are presented in Table 1 below.

Station	Latitude	Longitude
G1E007 Langebaan @ Langebaan Road	-32.97096	18.15770

The factor of 0.88 used to convert S-pan evaporation to soil evaporation

1. For wettest year (2001) $B = 322.1 - (0.88 \times 482.6) = -102.59$
2. (1984) $B = 299.8 - (0.88 \times 474.9) = -118.12$
3. (1987) $B = 294.5 - (0.88 \times 495.6) = -141.63$
4. (1986) $B = 278.6 - (0.88 \times 516.2) = -175.66$
5. (1999) $B = 269.9 - (0.88 \times 555.6) = -219.03$
6. (1989) $B = 259.7 - (0.88 \times 469.3) = -153.24$

As the results are well into the negative on at least 6 occasions, B is unlikely to be positive in more than 1 year in 5, on average. Any site situated in the climate represented by the above statistics would be classified B-.

The site is classified as B- (climatic water balance).

