

TRANSNET NATIONAL PORTS AUTHORITY

an Operating Division **TRANSNET SOC LTD**

[Registration Number 1990/000900/30]

TENDER

**SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH
A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS.**

RFP NUMBER	: TNPA/2025/02/0002/89478/RFP
ISSUE DATE	: 30 July 2026
COMPULSORY BRIEFING	: 07 August 2026
CLOSING DATE	: 18 September 2026
CLOSING TIME	: 16:00
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 are requested from persons, companies, close corporations or enterprises [hereinafter referred to as a Tenderer].

It is estimated that tenderers must have a CIDB grading of 9CE.

The CIDB Standard for Indirect Targeting for Enterprise Development through Construction works Contracts, published in Gazette Notice No.36190 of 25 February 2013 is applicable to this project.

The CIDB Standard for Developing Skills through Infrastructure Projects (skills development) achieved through setting of Contract Skills Development Goals (CSDG), published in Gazette Notice No.36190 of 25 February 2013 is applicable to this project.

DESCRIPTION	SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS.
TENDER DOWNLOADING	This Tender may be downloaded directly from the National Treasury eTenders 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 virtually on Microsoft Teams on 07 August 2026, at 11:00am [10 O'clock] for a period of ± two (2) hours. The Compulsory Tender Clarification Meeting will start punctually, and information will not be repeated for the benefit of Tenderers arriving late. <u>SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS COMPULSORY BRIEFING SESSION Meeting-Join Microsoft Teams</u>



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DESCRIPTION OF THE WORKS: SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS.

	A non-compulsory site visit/walk will take place on the following days: • 11 August 2026 for Eastern Region, Port of Richards Bay at 11:00am • 14 August 2026 for Central Region Port of Cape Town at 10:00am • 17 August 2026 for Western Region Port of PE at 10:00am • 19 August 2026 for Western Region Port of Mossel Bay at 10:00am 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. The Certificate of Attendance in the form set out in the Returnable Schedule T2.2-02 hereto must be completed and submitted with your Tender as proof of attendance is required for a compulsory tender briefing. Returnable Schedule T2.2-02, signed by the Employer's representative will be shared with tenderers after the Compulsory Tender Clarification Meeting. Tenderers failing to attend the compulsory tender briefing will be disqualified.
CLOSING DATE	16:00 on 18 September 2026 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 digitization strategy where suppliers can view advertised tenders, register their information, log their intent to respond to tenders and upload their tender 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 tenderer 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 tender;
- Submit tender documents by uploading them into the system against each tender selected.
- **Tenderers are required to ensure that electronic tender 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 tenderers as a result of the technical challenges. Please do not wait for the last hour to submit. A Tenderer can upload 30mb per upload and multiple uploads are permitted.**
- **Tenderers must ensure that the filenames of the documents intended for upload do not contain special characters, e.g. #, %, etc. The use of special characters will result in document upload failure. Only alphabetical/ numerical characters may be used.**

- b) Each tenderer must register its own profile using its company details and use the corresponding registered profile to log an intent to tender as well as submitting any tender.
- c) Transnet will **NOT** accept a tender or will disqualify a tenderer who submits a tender in the Transnet e-tender submission through another tenderers'/Company's profile. In other words, each tenderer must register the intent to tender and submit its tender through its own profile under the same company name that will eventually bid for the tender. No company shall submit



a tender on behalf of another company regardless of the company being a subsidiary or holding company.

- d) In a case of a Joint Venture, any of the parties/companies to the Joint Venture may use its registered profile to submit a tender on behalf of the Joint Venture.
- e) Tender offers 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.
- f) Submissions must not contain documents relating to any Tender other than that shown on the submission.

3. CONFIDENTIALITY

All information related to this Tender 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 the 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;



- 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. In an event that a tenderer will be using other tenderers' documents to be considered for evaluation, a signed agreement between the two parties to confirm the relationship i.e subcontracting agreement or an intent to subcontract should be submitted.
- 4.11. 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 Tender with the possible consequence of being disadvantaged or disqualified as a result thereof.
- 4.12. Transnet reserves the right to exclude any Tenderers from the tender process who have 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 **[clause 12 on T2.2-26]**, **[Breach of Law]** whether or not they have been found guilty of a serious breach of law during the past 5 [five] years.
- 4.13. 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.*



- 4.14. Transnet reserves the right to verify the references submitted by the highest-ranked bidder(s) to confirm the validity and authenticity of the experience claimed. Where a referenced organisation cannot be contacted using the details provided, Transnet will make at least three (3) documented attempts. Should these attempts be unsuccessful, Transnet will notify the bidder and allow a period of forty-eight (48) hours for the bidder to facilitate contact with the relevant referee. Transnet may also undertake reasonable due diligence measures to verify the credibility of the referee. If the experience cannot be verified to the satisfaction of Transnet, the points awarded for the relevant evaluation criterion may be withdrawn, which may result in a revision of the bidder's overall ranking.
- 4.15. Where any information submitted (including, but not limited to, reference letters) is found to be false, misleading, and/or fraudulent, Transnet reserves the right to take appropriate action, including the application of sanctions as provided for in clauses 5.1 and 5.2 of the Service Provider Integrity Pact
- 4.16. 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 Proposals. In particular, please note that Transnet reserves the right to:
- 4.17.1 modify the Tender's Services;
 - 4.17.2 award a contract in connection with this Proposal at any time after the Tender's closing date;
 - 4.17.3 award a contract for only a portion of the proposed Services which are reflected in the scope of this Tender;
 - 4.17.4 split the award of the contract between more than one Tenderer, as may be explicitly articulated in the conditions or objective criteria to this Tender;
- 4.17. All tenderers must not submit information relating to 3rd parties as part of their bid submission unless there is an agreement between the bidder and the 3rd party, for the bidder to submit such information, or the bidders have formed a JV/Consortiums or the information is relating to a subcontractor.



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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.

6. NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE

Tenderers 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/>. Tenderers 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

SECTION 1: SBD1 FORM

PART A

INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS NATIONAL PORTS AUTHORITY, A DIVISION TRANSNET SOC LTD

BID NUMBER:	TNPA/2025/02/0002/89478/RFP	ISSUE DATE:	30 July 2026	CLOSING DATE:	18 September 2026	CLOSING TIME:	16:00

DESCRIPTION: SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS.

BID RESPONSE DOCUMENTS SUBMISSION INSTRUCTIONS

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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 tenderer 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 tender;
- Submit tender documents by uploading them into the system against each tender selected.

BIDDING PROCEDURE/TECHNICAL ENQUIRIES MAY BE DIRECTED TO:

CONTACT PERSON	Sindisiwe Mveli
TELEPHONE NUMBER	N/A
FACSIMILE NUMBER	N/A
E-MAIL ADDRESS	tnpatenderenquiries3@transnet.net

SUPPLIER INFORMATION: NB Contact details below will be used to make contact with the tenderer. Return of other contact details anywhere else in the tender document will NOT be used to contact the tenderer.

NAME OF TENDERER			
POSTAL ADDRESS			
STREET ADDRESS			
TELEPHONE NUMBER	CODE	NUMBER	
CELLPHONE NUMBER			
FACSIMILE NUMBER	CODE	NUMBER	
E-MAIL ADDRESS			
VAT REGISTRATION NUMBER			

IT IS A CONDITION OF THIS BID THAT THE TAX MATTERS OF THE SUCCESSFUL RESPONDENTS BE IN ORDER, OR THAT SATISFACTORY ARRANGEMENTS HAVE BEEN MADE WITH SOUTH AFRICAN REVENUE SERVICE (SARS) TO MEET THE RESPONDENTS TAX OBLIGATIONS.

	TCS PIN		OR	CSD No	
SUPPLIER COMPLIANCE STATUS	☐ Yes ☐ No		BBEEE STATUS LEVEL SWORN AFFIDAVIT		

If Yes, Who was the Certificate issued by?			
AN ACCOUNTING OFFICER AS CONTEMPLATED IN THE CLOSE CORPORATION ACT (CCA) AND NAME THE APPLICABLE IN THE TICK BOX	☐	AN ACCOUNTING OFFICER AS CONTEMPLATED IN THE CLOSE CORPORATION ACT (CCA)	
	☐	A VERIFICATION AGENCY ACCREDITED BY THE SOUTH AFRICAN ACCREDITATION SYSTEM (SANAS)	
	☐	A REGISTERED AUDITOR NAME:	
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT MUST BE SUBMITTED FOR PURPOSES OF COMPLIANCE WITH THE B-BBEE ACT]			
1 ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	2 ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES, ANSWER QUESTIONNAIRE BELOW]
Signature of the Tenderer		Date:	
QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS			
IS THE TENDERER A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?		☐ YES ☐ NO	
DOES THE TENDERER HAVE A BRANCH IN THE RSA?		☐ YES ☐ NO	
DOES THE TENDERER HAVE A PERMANENT ESTABLISHMENT IN THE RSA?		☐ YES ☐ NO	
DOES THE TENDERER HAVE ANY SOURCE OF INCOME IN THE RSA?		☐ 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.			

Tenderer's Signature

Date & Company Stamp

PART B TERMS AND CONDITIONS FOR TENDERING

1. TAX COMPLIANCE REQUIREMENTS

- 1.1 TENDERERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
- 1.2 TENDERERS 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 TENDERERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
- 1.5 IN TENDERS WHERE UNINCORPORATED 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 TENDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
- 1.7 TENDERERS 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. ONLY FOREIGN SUPPLIERS WITH NO LOCAL REGISTERED ENTITY NEED NOT REGISTER ON THE CSD. THE CSD CAN BE ACCESSED AT [HTTPS://SECURE.CSD.GOV.ZA/](https://secure.csd.gov.za/).

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

SIGNATURE OF TENDERER:

.....

CAPACITY UNDER WHICH THIS TENDER IS SIGNED:

.....

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

DATE: _____



TRANSNET NATIONAL PORTS AUTHORITY

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T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annexure C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts published in Board Notice 423 of 2019 in Government Gazette No 42622 of 8 August 2019.

The Standard Conditions of Tender make several references to Tender data for details 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)
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) C1.3 Form of Securities Part C2: Pricing data C2.1 Pricing instructions C2.2 Bill of Quantities 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: Procurement Lead Name: Sindisiwe Mweli Address: Transnet National Ports Authority 150 Commissioner Street Third Floor Johannesburg 2001

Tel No. N/A

E – mail TNPAtenderenquiries3@transnet.net

C.2.1 Only those tenderers who satisfy the following eligibility criteria are eligible to submit tenders:

1. Stage One

1.1 Eligibility with regards to attendance at the compulsory clarification meeting:

An authorised representative of the tendering entity or a representative of a tendering entity that intends to form a Joint Venture (JV) must attend the compulsory clarification meeting in terms of C2.7.

1.2 Eligibility in terms of the Construction Industry Development Board

a) Only those tenderers who are registered with the CIDB or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, designation of **9 CE** class of construction work, are eligible to have their tenders evaluated.

b) Joint Venture (JV)

Joint ventures are eligible to submit tenders subject to the following:

1. every member of the joint venture is registered with the CIDB;
2. the lead partner has a contractor grading designation of not lower than one level below the required class of construction works under consideration and possesses the required recognition status; and
3. the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a **9 CE** class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations
4. The tenderer shall provide a copy of its signed joint venture agreement

- c) The contractor shall achieve in the performance of the contract the Contract Skills Development Goals (CSDG) established in the CIDB Standard for Developing Skills through Infrastructure Contracts (published in GN 43495 of 3 July 2020).
- d) The CIDB Standard for Indirect Targeting for Enterprise Development through Construction works Contracts, published in Gazette Notice No.36190 of 25 February 2013 is applicable to this project. The CPG stipulated for this contract is 30%.

1.3 Eligibility with regards to Professional registrations of personnel.

Tenderers are required to submit valid registration certificates with the relevant Built Environment Council for each of the resources stated below. **Note:** All certificates will be evaluated by reference to the relevant Built Environment Professional councils' web page. Notwithstanding copies of Professional Registrations provided with the Tender, Registrations are required to be valid on the council web site *at the time of evaluation*, failing which the tender will not be evaluated further.

<u>Pre-Qualification Criteria</u>	Description	Criteria
Key Personnel and Qualifications	Professional Construction Project Manager	Valid Pr. CPM registration with SACPCMP
	Professional Construction Manager – CM1	Valid Pr. CM registration with SACPCMP
	Construction Health and Safety Manager	Valid CHSM or CHSA registration with SACPCMP
	Construction Health and Safety Officer – HSO 1	Valid CHSO registration with SACPCMP
	Professional Engineering Technician (Civil)	Valid Pr. Techni Eng registration with ECSA.

1.4: Submission of a signed and completed Form of Offer

1.5: Submission of a completed Bill of Quantities

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



2. Stage Two - 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 for 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.

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 will not be evaluated further.

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

Tenderers are to note that **T2.2-01 certificate of attendance**, signed by the Employer's authorised representative will be circulated at the briefing session.

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:

Identification details:

The tender documents must be uploaded with:

- Name of Tenderer:
- Contact person and details:
- The Tender Number:
- The Tender Description

Documents must be marked for the attention of:
Employer's Agent: Sindisiwe Mveli

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: **16:00** on the **18 September 2026**

Location: The Transnet eSupplier website/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 have 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**], **CIPC B-BBEE Certificate** 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. A valid CIDB certificate in the correct designated grading;
4. Proof of registration on the Central Supplier Database;
5. 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.
6. Proof of Professional registrations of personnel:
 - Professional Construction Project Manager (Pr. CPM) – Valid SACPCMP Registered
 - Professional Construction Manager (Pr. CM) - Valid SACPCMP Registered
 - Construction Health and Safety Manager - Valid CHSM or CHSA registration with SACPCMP
 - Construction Health and Safety Officer - Valid CHSO registration with SACPCMP
 - Professional Engineering Technician (Civil) – Valid registration with ECSA. **(NB: Registrations in the "Candidate" category will not be accepted).**

Please note: The Contractor must that all personnel as 'Key Persons' in Data Part Two holds and maintain valid professional registration with South African Council for the Project and Construction Management Professions (SACPCMP).

Refer to Section T2.1 for List of Returnable Documents

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

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.

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

Functionality Criteria

The functionality criteria and maximum score in respect of each of the criteria are as follows:

Functionality shall be scored independently by not less than 2 (two) evaluators and averaged in accordance with the following schedules:

Functionality criteria	Sub-criteria	Sub-criteria Points	Max. no. of Points
Management and CVs of Key Persons Refer to T2.2-04 Management and CVs of Key Persons for the complete Evaluation Schedule	Professional Construction Project Manager x 1	5	30
	Professional Construction Manager (CM 1) x 1	5	
	Software Engineer x 1	9	
	Professional Engineering Technician (Civil) x 1	4	
	Network Architect Specialist x 1	7	
Project Organisation and Staffing Refer to T2.2-05 Project Organogram complete Evaluation Schedule	Comprehensive and detailed Project Organogram .	5	5
Health and Safety Management Refer to T2.2-06 Health and Safety Management for the complete Evaluation Schedule	Safety and Health Policy signed by the Chief Executive Officer (CEO) or Delegated Authority	2	8
	Roles & Responsibilities	2	
	Project Specific Baseline Risk Assessment (RA)	4	
Environmental Management	Environmental Management Plan	1	5
	Environmental Policy	1	

Functionality criteria	Sub-criteria	Sub-criteria Points	Max. no. of Points
Refer to T2.2-07 Environmental Management Safety Management for the complete Evaluation Schedule	Environmental Officer Qualification	1	
	Environmental Officer Experience	1	
	List of projects where construction environmental management duties have been executed	1	
Previous Experience Refer to T2.2-08 Previous Experience for the complete Evaluation Schedule	Reference Letters or Completion Certificates	10	10
Approach Paper Refer to T2.2-09 Approach Paper for the complete Evaluation Schedule	The Tenderer submits an approach paper which responds to the scope of work and outlines the proposed approach / methodology. The approach paper should articulate what the Tenderer will provide in achieving the stated objectives for the project and demonstrate alignment to the Programme as contained under T2.2-08. which should include details contained in the project programme. Tenderers also display a clear understanding of the project and show a concise method statement for all activities incorporating best practice.	Installation of the Water Meters = 2	12
		Installation of the Electricity Meters = 2	
		Private WCN and Linking Water Meters = 2	
		Installation of the LAN and Linking Electricity Meters = 2	

Functionality criteria	Sub-criteria	Sub-criteria Points	Max. no. of Points
		Linking the WCN to the LAN and Billing Servers = 2	
		Management Software Details and Management of Data on the server including integrating the Port systems for Central Remote Viewing = 2	
Functional Specification Refer to T2.2-10: Evaluation Schedule: Functional Specification of the Utility Management Software	Functional Specification of the Utility Management Software to be Supplied	14	14
Programme Refer to T2.2-11 Programme for the complete Evaluation Schedule	Programme	10	10
Quality Management	Quality Policy	1	6
	Project Quality Plan for the Contract	2	

Functionality criteria	Sub-criteria	Sub-criteria Points	Max. no. of Points
Refer to T2.2-12: Quality Management for the complete Evaluation Schedule	Quality Control Plan (QCP's)	3	
	• Installation and commissioning of Smart Water Meters • Installation and commissioning of Smart Electricity Meters • Design and installation of the Operational Technology (OT) Network (i.e. Fiber Optic Network, Wireless Network) and Utility Management Software		
			100
The Threshold is 60%			

TRANSNET NATIONAL PORTS AUTHORITY

TENDER NUMBER: TNPA/2025/02/0002/89478/RFP

DESCRIPTION OF THE WORKS: SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS

- T2.2-04 Management & CVs of Key Persons
- T2.2-05 Project Organogram
- T2.2-06 Health and Safety Requirements
- T2.2-07 Environmental Management
- T2.2-08 Previous Experience
- T2.2-09 Approach Paper
- T2.2-10 Functional Specification of the Utility Management Software
- T2.2-11 Programme
- T2.2-12 Quality Management

Each evaluation criteria will be assessed in terms of scores of 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 (2).



- C.3.11. Only tenders that achieve the minimum qualifying score for functionality will be evaluated further in accordance with the 80/20 or 90/10 preference points systems as described in Preferential Procurement Regulations - 2022.

80 tender evaluation points for price will be allocated where the financial value of the lowest acceptable tender received has a value equal to or below R50 million, inclusive of all applicable taxes,

or

90 tender evaluation points for price will be allocated where the financial value of the lowest acceptable tenders received has a value above R50 million, inclusive of all applicable taxes.

Thresholds	Minimum Threshold
Technical	60

Evaluation Criteria	Final Weighted Scores
Price	80/90
Specific goals - Scorecard	20/10
TOTAL SCORE:	100

Up to 20 or 10 tender evaluation points for preference 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:

Specific Goals	Number of points (80/20 system)	Number of points (90/10 system)
B-BBEE Status Level of Contributor 1 or 2	08	04
The promotion of supplier development through subcontracting for a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs black-owned	12	06
Non-compliant and/or B-BBEE Level 3-8 contributors	00	00

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 Status Level of Contributor 1 or 2	B-BBEE Certificate / Sworn - Affidavit / CIPC B-BBEE Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guidelines.
The promotion of supplier development through subcontracting for a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs black-owned	• Sub-contracting agreement(s). • Subcontractors' CIPC B-BBEE Certificate/ Sworn Affidavit/ B-BBEE Certificate as per DTIC guidelines

The maximum points for this tender are allocated as follows:

DESCRIPTION	POINTS	
PRICE	80	90
B-BBEE Status Level of Contributor 1 or 2	8	4
The promotion of supplier development through subcontracting for a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs black-owned	12	6
Total points for Price and Specific Goals shall not exceed:	100	

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



C.3.13 Tender offers will only be accepted if:

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;
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 has 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 undergoing a process of being restricted by Transnet or other state institution that Transnet may be aware of,
 - b) has no legal capacity to enter into the contract,
 - c) 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,
 - d) does not comply with the legal requirements, if any, stated in the tender data and
 - e) is not undergoing a process of being restricted by Transnet or other state institution that Transnet may be aware of,
 - f) is not in good standing with Transnet National Ports Authority due to a poor track record of past performance with Transnet SOC Ltd and or Transnet National Ports Authority;
 - g) In relation to the proposed contract, a due diligence exercise to validate the



bidder's proposal that demonstrates that it 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;

- h) has the legal capacity to enter into the contract,
- i) complies with the legal requirements, if any, stated in the tender data,
- j) is able, in the option of the employer to perform the contract free of conflicts of interest.
- k) has its members, directors, partners:
 - under restrictions as contemplated in the Integrity Pact (Form T 2.2-28),
 - subject of a process of restriction by Transnet or other state institution that Transnet may be aware of and there is a clear, uncontrived and/or overwhelming evidence and/or facts in relation to the alleged wrongdoing on the basis of which the restriction process has been initiated;

C.3.17 The number of paper copies of the signed contract to be provided by the Employer is 1 (one).

Annexure B

Standard Conditions of Tender

C.1 General

C.1.1 Actions

C.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

C.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

C.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

C.1.3 Interpretation

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the tender data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

- a) **conflict of interest** means any situation in which:
 - i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfill his or her duties impartially;
 - ii) an individual or tenderer is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
 - iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.
- b) **comparative offer** means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration;

- c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;
- d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels;

C.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

C.1.5 Cancellation and Re-Invitation of Tenders

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if-

- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation;
- b) funds are no longer available to cover the total envisaged expenditure; or
- c) no acceptable tenders are received.
- d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same manner in which the original tender invitation was advertised

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

C.1.6 Procurement procedures

C.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

C.1.6.3.2 Option 2

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

C.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

C.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

C.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

C.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.

C.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

C.2.10 Pricing the tender offer

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable fourteen (14) days before the closing time stated in the tender data.

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

C.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked "financial proposal" and place the remaining returnable documents in an envelope marked "technical proposal". Each envelope shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

C.2.14 Information and data to be completed in all respects

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

C.2.15 Closing time

C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

C.2.16 Tender offer validity

C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).

C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: *Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.*

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

C.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

C.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

C.2.20 Submit securities, bonds and policies

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

C.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

C.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the tender data.

C.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

C.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

- a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
- b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

C.3.4 Opening of tender submissions

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where

applicable, the total of his prices, number of points claimed for its BBEE status level and time for completion for the main tender offer only.

C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on BBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

C.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

- a) complies with the requirements of these Conditions of Tender,
- b) has been properly and fully completed and signed, and
- c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

- a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
- c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

C.3.9 Arithmetical errors, omissions and discrepancies

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

- a) the gross misplacement of the decimal point in any unit rate;
- b) omissions made in completing the pricing schedule or bills of quantities; or
- c) arithmetic errors in:
 - (i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
 - (ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project.

Conditions of tender are by definition the document that establishes a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	
Requirement	Qualitative interpretation of goal
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.

Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

- a) Open and record tender offers received
- b) Determine whether or not tender offers are complete
- c) Determine whether or not tender offers are responsive
- d) Evaluate tender offers
- e) Determine if there are any grounds for disqualification
- f) Determine acceptability of preferred tenderer
- g) Prepare a tender evaluation report
- h) Confirm the recommendation contained in the tender evaluation report

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

C.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
- b) 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;
- c) has the legal capacity to enter into the contract;
- d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing;
- e) complies with the legal requirements, if any, stated in the tender data; and
- f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

- a) addenda issued during the tender period,
- b) inclusion of some of the returnable documents and
- c) other revisions agreed between the employer and the successful tenderer.

C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

C.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

C.3.16 Registration of the award

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the cidb Register of Projects.

C.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

"HOW TO" GUIDE FOR BIDDERS

REGISTER ON ETENDER PORTAL

ACCESS TENDERS

NB: Do not wait for the last minute to register or to bid for a tender. Ensure you complete your process at least 1 day (24hours) before the closing date

Go to Google Chrome 

In the address bar type: <https://transnetetenders.azurewebsites.net>



https://transnetetender.b2clogin.com/transnetetender.onmicrosoft.com/b2c_1_signupsignin/oauth2/v2.0/authorize?client



Sign in with your email address

[Forgot your password?](#)

[Sign in](#)

[Don't have an account? → Sign up now](#)

If not already registered, click on Sign up now.

Ensure that the email you use to sign in is the same as the email that you received from the tender invite on the email, otherwise you will not see the tender

Cancel



Email Address

Send verification code

New Password

Confirm New Password

Given Name

Organization Name

Surname

Central Supplier Database Number

Company Registration Number

Country/Region

Country/Region

Secondary Email Address

State/Province

Street Address

Postal Code

Display Name

Create

Complete all fields, before selecting “Send verification code” and confirm that all information is correct.

VERY IMPORTANT: Each field needs to be completed and not to be left blank

If you do not have a central Supplier Database number, enter the same company registration number in that field.

Send verification code

After completing all fields, select "Send verification code". The code will be sent to your email.

< Cancel



Verification code has been sent to your inbox. Please copy it to the input box below.

abc@gmail.com

Verification Code

Copy the code as received on the email and paste it in the Verification code field
Then click on Verify code

Verify code

Send new code

Forgot your password?

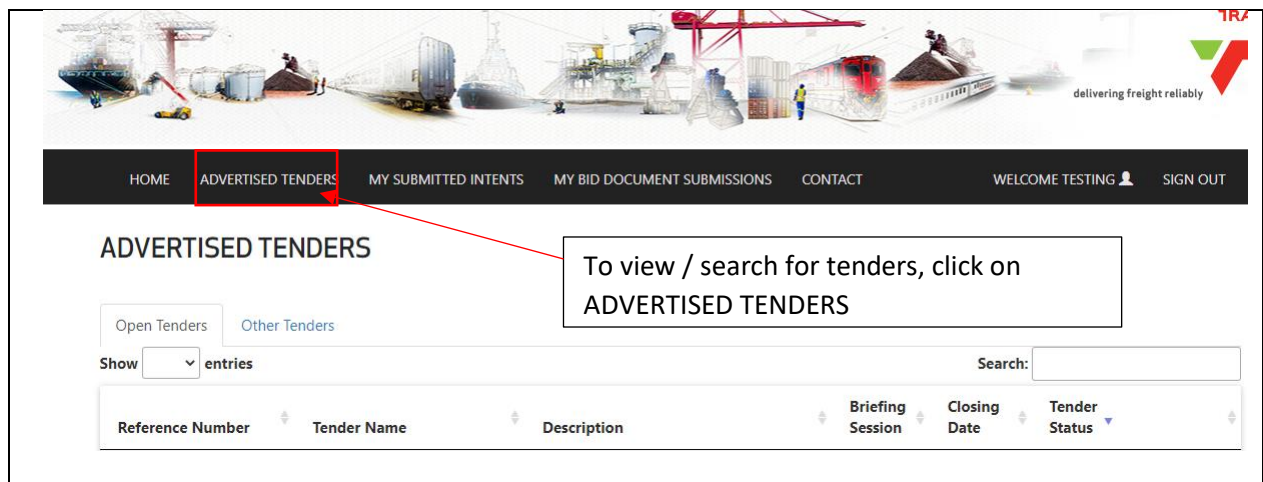
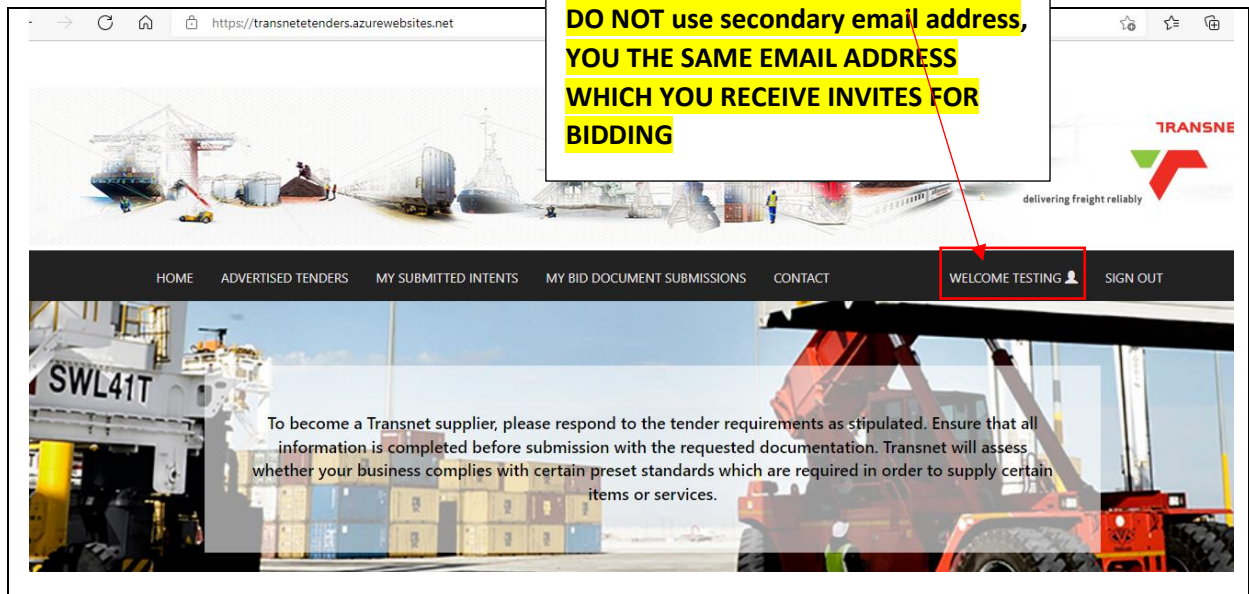
Sign in

Don't have an account? [Sign up now](#)

Then click on Sign in

Once registered and signed in, the home screen will have “WELCOME (Registered user)”

DO NOT use secondary email address, YOU THE SAME EMAIL ADDRESS WHICH YOU RECEIVE INVITES FOR BIDDING



Tender Invitation For Tender Ref # TE/2022/04/0697/RFQ - Message (HTML)

File Message Help Tell me what you want to do

Delete Archive Reply Reply All Forward Share to Teams ATM signed To Manager Team Email Move Tags Editing Read Aloud Translate Zoom Send to OneNote Viva Insights

Tender Invitation For Tender Ref # TE/2022/04/0697/RFQ

SRV-TCC-Etender
To noreply@transnet.net

This message was sent with Low importance.

Dear Suppliers,
You have been invited to bid and respond to the following tender:

Name Of Tender : TE22-SRX-1FG-02068
Description : STOP; TOP BUNK, OD 19.5 X HT 6.5 MM
Tender Number : TE/2022/04/0697/RFQ

Access to this tender will be granted by using this email when you sign up/sign in. To access the tender information

Kind Regards,
Transnet eTenders

When a bidder receives an email to quote, the bidder needs to register with the email address of the recipient that received the email. If already registered, sign in.

NOTE: The details on this email is intended for guidance only and not to be used on the live system

HOME ADVERTISED TENDERS MY SUBMITTED INTENTS MY BID DOCUMENT SUBMISSIONS CONTACT WELCOME TESTING SIGN OUT

ADVERTISED TENDERS

Open Tenders Other Tenders

Show entries Search:

Reference Number	Tender Name	Description	Briefing Session	Closing Date	Tender Status	
TCC/2021/11/0031/RFQ	For the supply and installation of an air compressor	For the supply and installation of an air compressor for indoor shooting range that operates the laser system and supply air to air guns utilised during training and conduct maintenance on air supply system and hoses.		12/10/2021 12:00:00 PM	Closed	View Details
TFR/2021/12/0014/RFQ	ELECTRICAL MATERIAL (CABLES)	SUPPLY AND DELIVERY OF ELECTRICAL MATERIAL (CABLES) FOR A ONCE OFF PERIOD		12/13/2021 4:00:00 PM	Closed	View Details
TFR/2021/12/0017/RFQ	CRAC_JHB_36509.	FOR THE SUPPLY AND DELIVERY OF HIGH BACK CHAIRS FOR CTC OFFICES IN CENTRAL, EASTERN AND WESTERN REGIONS, FOR A ONCE OFF PERIOD.		12/14/2021 10:00:00 AM	Closed	View Details
TFR/2021/12/0015/RFQ	CRAC-JHB-36313	FOR THE SUPPLY AND DELIVERY OF VARIOUS CLAMPS, TERMINAL LUGS, DROPPER CLIPS AND		1/13/2022 12:00:00	Closed	View Details

When signed in, select "ADVERTISED TENDERS".

To manually search and change the view from Closed to Open, click twice on arrow next to "Tender Status". The arrow pointing down will change to blue and open tenders will be displayed.

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ADVERTISED TENDERS

Open Tenders
Other Tenders

Show
▼
entries
Search:

Reference Number	Tender Name	Description	Briefing Session	Closing Date	Tender Status	
TE/2022/04/0450/RFQ	VALVE:L-1 LOAD DET,WAGONS AIRBRAKE	VALVE:L-1 LOAD DET,WAGONS AIRBRAKE-062101802 VALVE; TYPE: L-1 LOAD DETECTOR, MEDIA FOR WHICH DESIGNED: WAGONS AIRBRAKE, CONNECTION TYPE: FLANGE, SPECIAL FEATURES: BLUE, WITHOUT PIPE BRACKET; SIMILAR ITEM: 062004338		4/8/2022 10:00:00 AM	Open	View Details
TE/2022/04/0494/RFQ	GEAR OIL	OIL, GEAR TYPE SYNTHETIC BRAND NAME MOBILGEAR SHC SERIES GRADE SCH 6800 VISCOSITY RATING 220 TO 320 FLASH POINT 234 DEG C COLOR ORANGE CONTAINER TYPE SACHET 250 G CONTAINER CAPACITY 14 KG FOR USE ON: 39-200 GM, 15E AND 19E LOCOMOTIVES		4/8/2022 10:00:00 AM	Open	View Details
TE/2022/04/0495/RFQ	SUPPLY OF CORROSION (NALCOOL) - APPROVED	ITEM NUMBER - 077807563 INHIBITOR, CORROSION; TYPE: COOL-C18, COLOR: RED,		4/8/2022 10:00:00	Open	View Details

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entries
Search: TE/2022/04/0697/RFQ

Reference Number	Tender Name	Description	Briefing Session	Closing Date	Tender Status	
TE/2022/04/0697/RFQ	TE22-SRX-1FG-02068	STOP; TOP BUNK, OD 19.5 X HT 6.5 MM		4/13/2022 10:00:00 AM	Open	View Details

To search for a specific tender, the tender number, tender name or description can be used for searching.

ADVERTISED TENDERS

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Other Tenders

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entries
Search: TE22-SRX-1FG-02068

Reference Number	Tender Name	Description	Briefing Session	Closing Date	Tender Status	
TE/2022/04/0697/RFQ	TE22-SRX-1FG-02068	STOP; TOP BUNK, OD 19.5 X HT 6.5 MM		4/13/2022 10:00:00	Open	View Details

When the tender has been identified, click on "View Details"

When the “View Details” has been selected, the following screen will be displayed where the attachments can be viewed or downloaded.

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TENDER DETAILS

Tender Details

Tender Reference Number	TE/2022/04/0697/RFQ
Name Of Tender	TE22-SRX-1FG-02068
Description	STOP; TOP BUNK, OD 19.5 X HT 6.5 MM
Tender Type	RFQ
Contact Person	Charl du Preez Transnet Engineering SLR
Contact Person Email Address	Charl.duPreez@transnet.net
Date Published	4/7/2022 3:51:47 PM
Closing Date	4/13/2022 10:00:00 AM
Briefing Date And Time	
Briefing Details	
Location Of Service	Coaches, Salt River

Briefing Session
Closing Date
4/13/2022 10:00:00 AM
Attachments

2.14 Standard Terms and Conditions of Contract f

2.18 Supplier Integrity Pact_April 2020_v1.pdf

2.19 Non Disclosure Agreement_April 2020_v1.pdf

2.9 Request for Quotations TE22-SRX-1FG-02068,

Log An Intent To Bid
☐

If interested to bid, on the same page there's an option to select: **Log an Intent to Bid**. Once selected, an option will appear to “**Submit Intent**” or “**Cancel**”. Click on **Submit Intent**

Tender Details

Tender Reference Number	TE/2022/04/0697/RFQ
Name Of Tender	TE22-SRX-1FG-02068
Description	STOP; TOP BUNK, OD 19.5 X HT 6.5 MM
Tender Type	RFQ
Contact Person	Charl du Preez Transnet Engineering SLR
Contact Person Email Address	Charl.duPreez@transnet.net
Date Published	4/7/2022 3:51:47 PM
Closing Date	4/13/2022 10:00:00 AM
Briefing Date And Time	
Briefing Details	
Location Of Service	Coaches, Salt River
Name Of Institution	TE
Tender Category	Goods
Tender Status	Open

Briefing Session
Closing Date
4/13/2022 10:00:00 AM
Attachments

2.14 Standard Terms and Conditions of Contract f

2.18 Supplier Integrity Pact_April 2020_v1.pdf

2.19 Non Disclosure Agreement_April 2020_v1.pdf

2.9 Request for Quotations TE22-SRX-1FG-02068,

Log An Intent To Bid
☒

Tender Details

Tender Reference Number

Name Of Tender

Description

Tender Type RFQ

Contact Person Charl du Preez Transnet Engineering SLR

Contact Person Email Address Charl.duPreez@transnet.net

Date Published 4/7/2022 3:51:47 PM

Closing Date 4/13/2022 10:00:00 AM

Briefing Date And Time

Briefing Details

Location Of Service

Name Of Institution

Tender Category

Tender Status

Intent to Bid

Your request to log an intent to bid has been successfully submitted.

Close

When the "Submit Intent" is selected, a message will appear to indicate that the request was successfully submitted. Click on close and wait for the next screen.

Briefing Session

Closing Date 4/13/2022 10:00:00 AM

Attachments

- 2.14 Standard Terms and Conditions of Contract for
- 2.18 Supplier Integrity Pact_April 2020_v1.pdf
- 2.19 Non Disclosure Agreement_April 2020_v1.pdf
- 2.9 Request for Quotations TE22-SRX-1FG-02068.pdf

Log An Intent To Bid

☒

[Submit Intent](#) [Cancel](#)



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MY SUBMISSION INTENTS

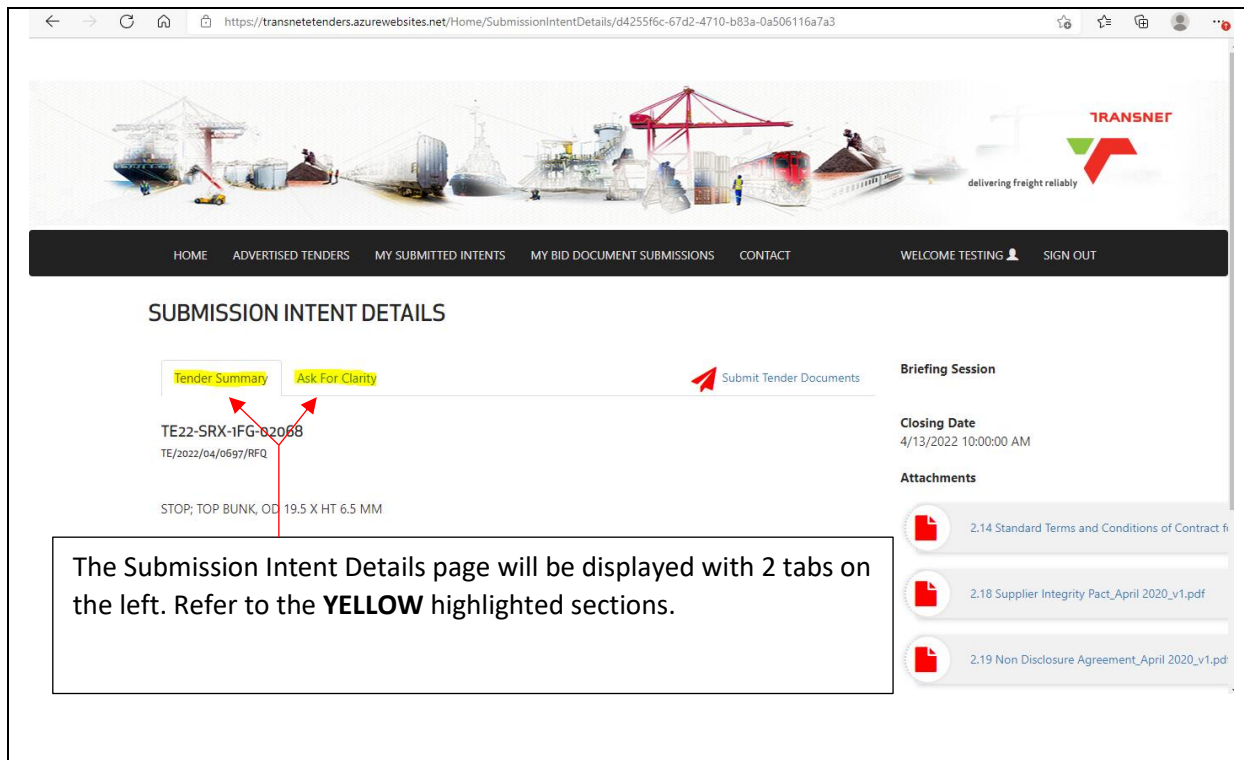
Show 10 entries

Tender Reference Number	Name	Description Of Tender	Briefing Session Date	Closing Date	View Details
TE/2022/04/0697/RFQ	TE22-SRX-1FG-02068	STOP; TOP BUNK, OD 19.5 X HT 6.5 MM		4/13/2022 10:00:00 AM	View Details

Showing 1 to 1 of 1 entries

Previous 1 Next

The screen should be updated and load the "MY SUBMITTED INTENTS". To proceed to capturing your bid documents, click on "View Details"



https://transnettenders.azurewebsites.net/Home/SubmissionIntentDetails/d4255f6c-67d2-4710-b83a-0a506116a7a3

HOME ADVERTISED TENDERS MY SUBMITTED INTENTS MY BID DOCUMENT SUBMISSIONS CONTACT WELCOME TESTING SIGN OUT

SUBMISSION INTENT DETAILS

Tender Summary **Ask For Clarity** [Submit Tender Documents](#)

TE22-SRX-1FG-02068
TE/2022/04/0697/RFQ

STOP, TOP BUNK, OD 19.5 X HT 6.5 MM

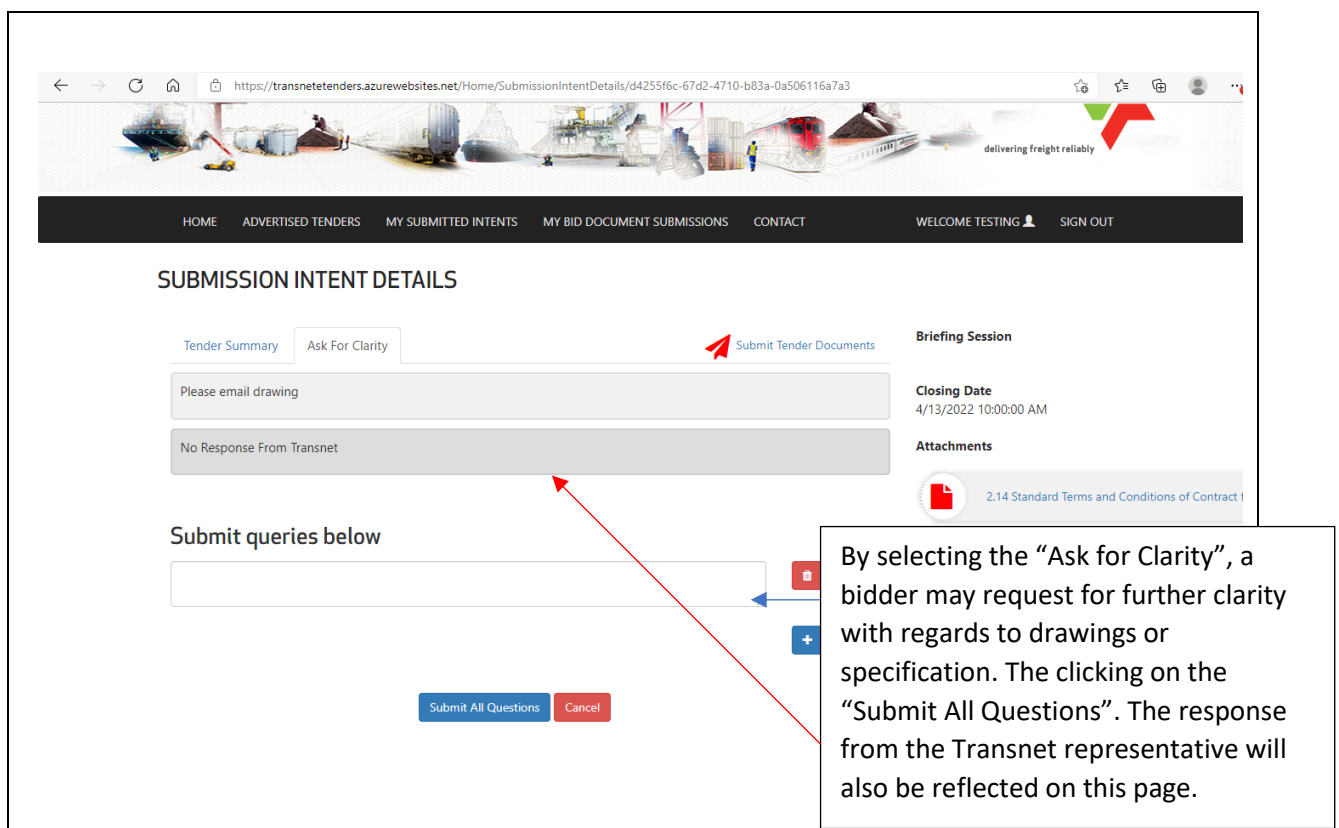
Briefing Session

Closing Date
4/13/2022 10:00:00 AM

Attachments

- 2.14 Standard Terms and Conditions of Contract fi
- 2.18 Supplier Integrity Pact_April 2020_v1.pdf
- 2.19 Non Disclosure Agreement_April 2020_v1.pdf

The Submission Intent Details page will be displayed with 2 tabs on the left. Refer to the **YELLOW** highlighted sections.



https://transnettenders.azurewebsites.net/Home/SubmissionIntentDetails/d4255f6c-67d2-4710-b83a-0a506116a7a3

HOME ADVERTISED TENDERS MY SUBMITTED INTENTS MY BID DOCUMENT SUBMISSIONS CONTACT WELCOME TESTING SIGN OUT

SUBMISSION INTENT DETAILS

Tender Summary **Ask For Clarity** [Submit Tender Documents](#)

Please email drawing

No Response From Transnet

Submit queries below

[Submit All Questions](#) [Cancel](#)

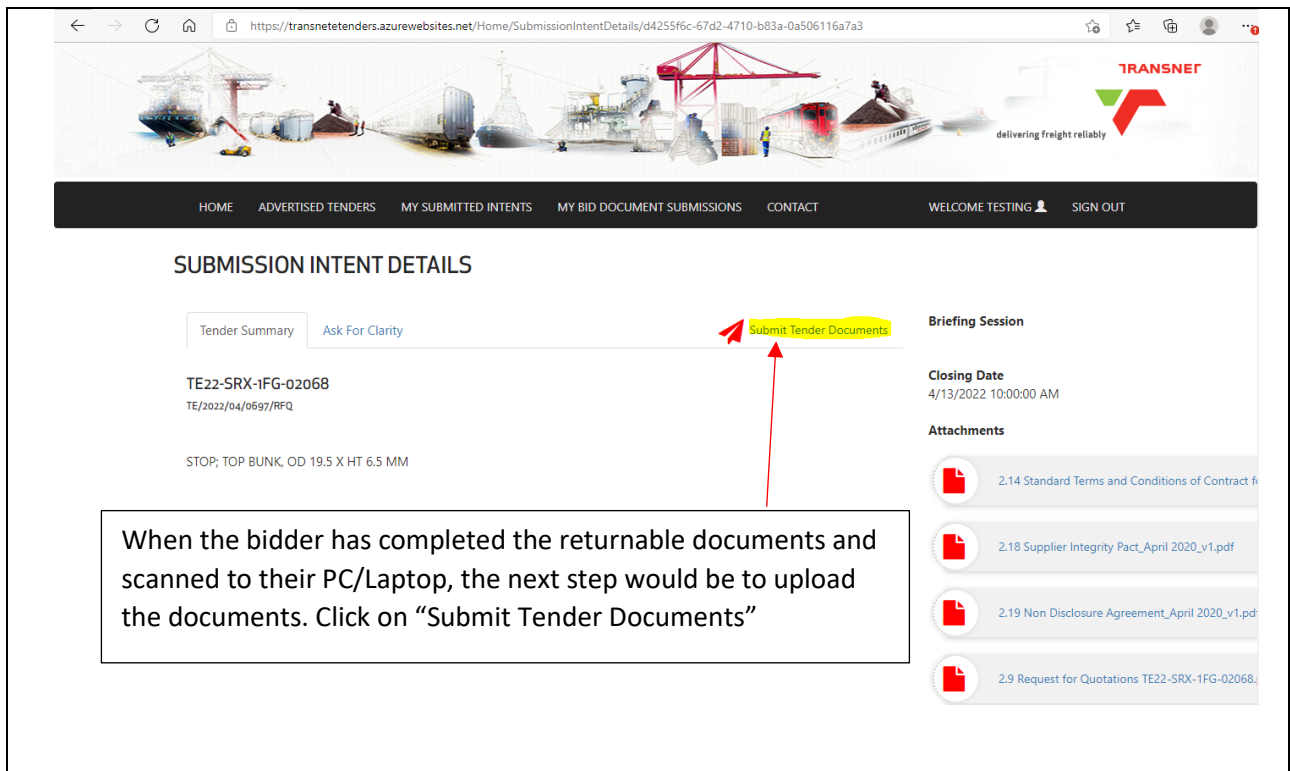
Briefing Session

Closing Date
4/13/2022 10:00:00 AM

Attachments

- 2.14 Standard Terms and Conditions of Contract 1

By selecting the "Ask for Clarity", a bidder may request for further clarity with regards to drawings or specification. The clicking on the "Submit All Questions". The response from the Transnet representative will also be reflected on this page.



Submission Intent Details

Tender Summary Ask For Clarity **Submit Tender Documents**

TE22-SRX-1FG-02068
TE/2022/04/0697/RFQ

STOP; TOP BUNK, OD 19.5 X HT 6.5 MM

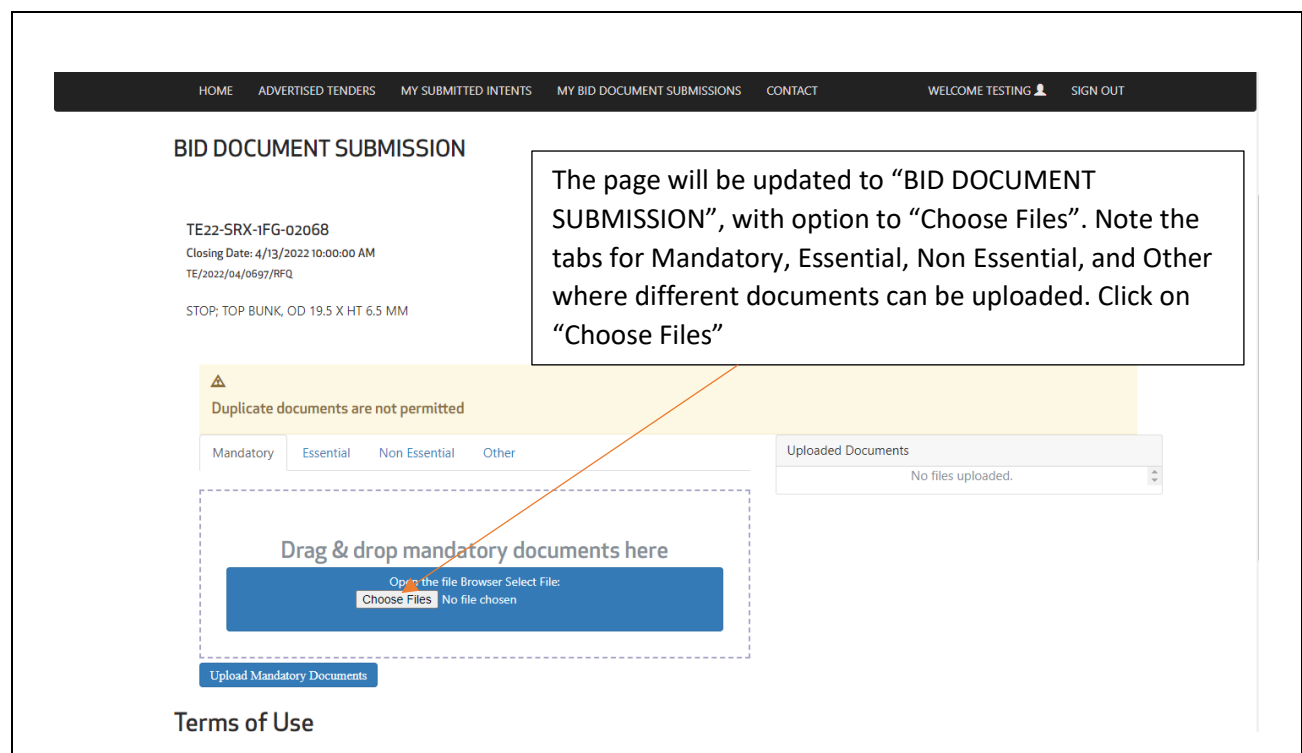
Briefing Session

Closing Date
4/13/2022 10:00:00 AM

Attachments

- 2.14 Standard Terms and Conditions of Contract f
- 2.18 Supplier Integrity Pact_April 2020_v1.pdf
- 2.19 Non Disclosure Agreement_April 2020_v1.pdf
- 2.9 Request for Quotations TE22-SRX-1FG-02068.

When the bidder has completed the returnable documents and scanned to their PC/Laptop, the next step would be to upload the documents. Click on “Submit Tender Documents”



BID DOCUMENT SUBMISSION

TE22-SRX-1FG-02068
Closing Date: 4/13/2022 10:00:00 AM
TE/2022/04/0697/RFQ

STOP; TOP BUNK, OD 19.5 X HT 6.5 MM

Choose Files

The page will be updated to “BID DOCUMENT SUBMISSION”, with option to “Choose Files”. Note the tabs for Mandatory, Essential, Non Essential, and Other where different documents can be uploaded. Click on “Choose Files”

Duplicate documents are not permitted

Mandatory Essential Non Essential Other

Uploaded Documents
No files uploaded.

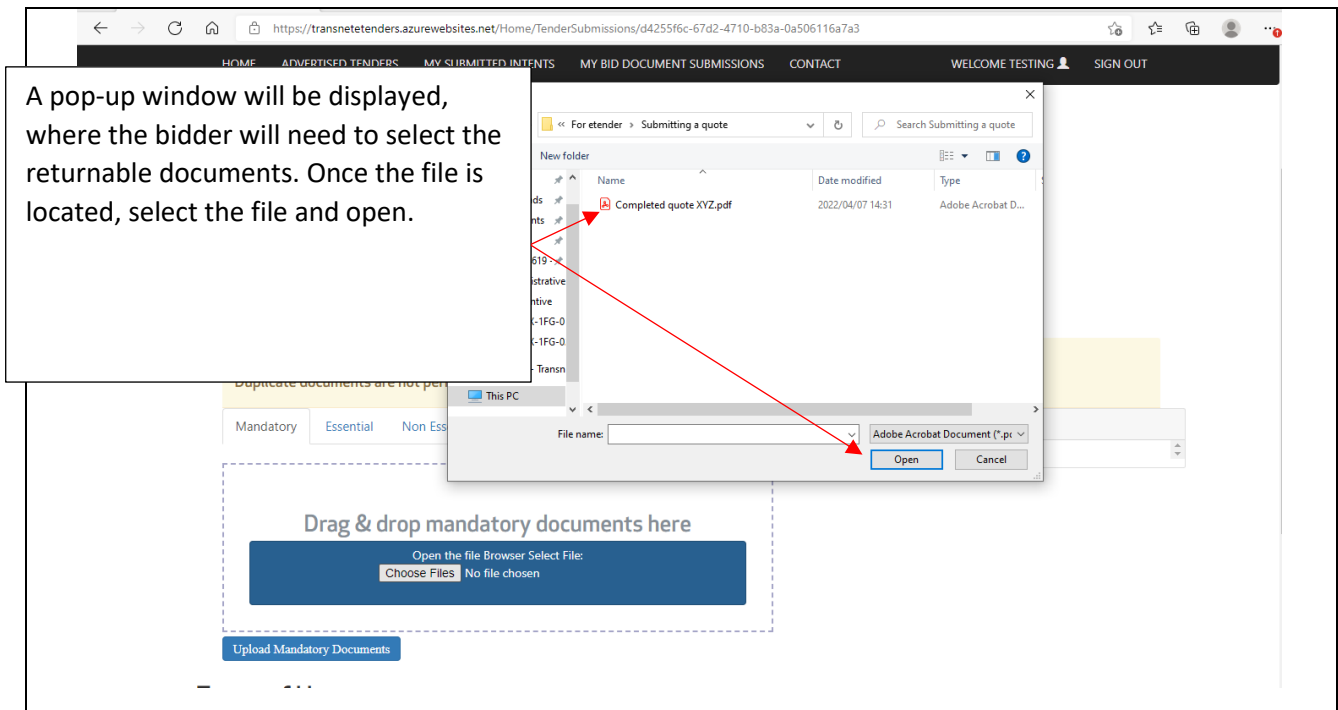
Drag & drop mandatory documents here

Open the file Browser Select File:
Choose Files No file chosen

Upload Mandatory Documents

Terms of Use

A pop-up window will be displayed, where the bidder will need to select the returnable documents. Once the file is located, select the file and open.



BID DOCUMENT SUBMISSION

TE22-SRX-IFG-02068
 Closing Date: 4/13/2022 10:00:00 AM
 TE/2022/04/0697/RFQ
 STOP; TOP BUNK, OD 19.5 X HT 6.5 MM

Duplicate documents are not permitted

Mandatory Essential Non Essential Other

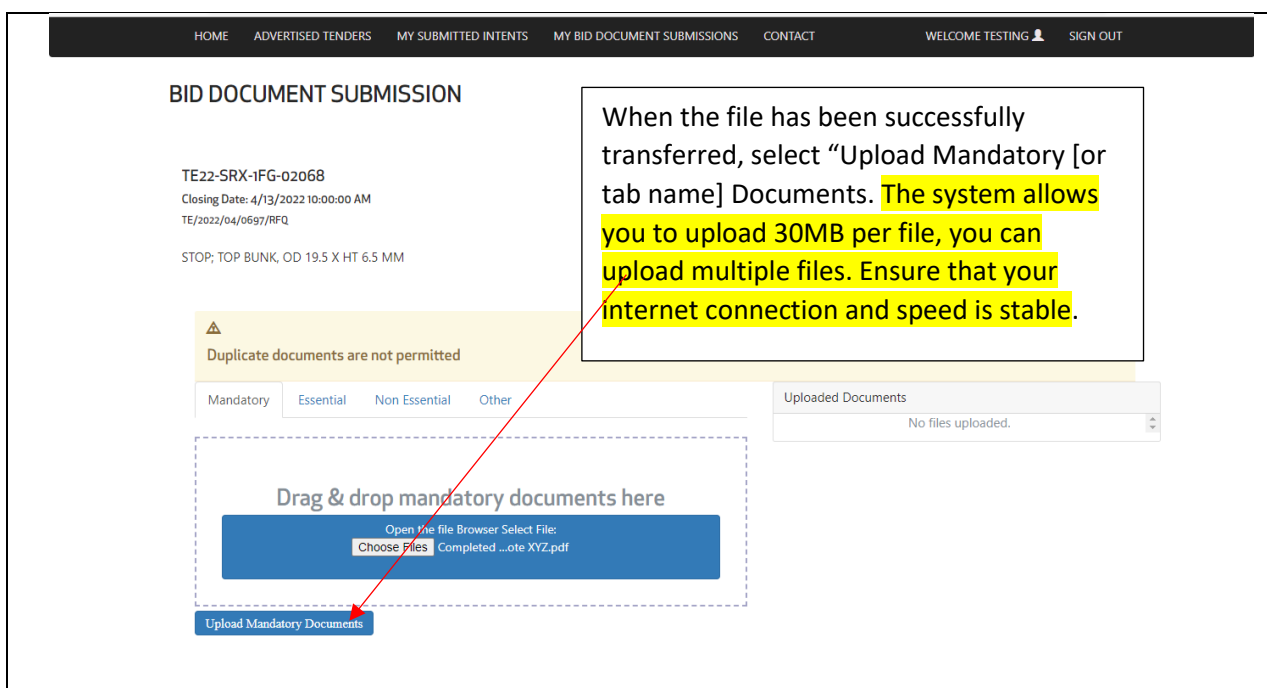
Drag & drop mandatory documents here

Open the file Browser Select File:
 Choose Files Completed ...ote XYZ.pdf

Upload Mandatory Documents

Uploaded Documents
 No files uploaded.

When the file has been successfully transferred, select "Upload Mandatory [or tab name] Documents. The system allows you to upload 30MB per file, you can upload multiple files. Ensure that your internet connection and speed is stable.



The "Uploaded Documents" section will be updated to confirm that the document was uploaded, then click on "Submit Bid"

TE/2022/04/0697/RFQ

STOP; TOP BUNK, OD 19.5 X HT 6.5 MM

⚠ Duplicate documents are not permitted

Mandatory Essential Non Essential Other

Drag & drop mandatory documents here

Open the file Browser Select File:
Choose Files No file chosen

Upload Mandatory Documents

Uploaded Documents

Completed quote XYZ.pdf - Document Type: Mandatory Documents

Delete

Terms of Use

Information provided by the bidder through this portal constitute a binding bid submission/response and a commitment to deliver Transnet requirements. Kindly note that the system automatically ranks the outcome of the evaluation of price and BBBEE scoring based on the information provided. Pricing and BBBEE information provided is the responsibility of the bidder to ensure correctness and Transnet will only consider your latest submission made before the closing date.

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→ Submit Bid



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MY BID DOCUMENT SUBMISSIONS

Show 10 entries Search:

Tender Reference Number	Name	Date Submitted	Company Name	View Details
TE/2022/04/0697/RFQ	TE22-SRX-1FG-02068	4/8/2022 8:59:06 AM	Transnet Engineering	View Details

Showing 1 to 1 of 1 entries

Previous 1 Next

The screen will progress to "MY BID DOCUMENT SUBMISSION", where the "View Details" can be selected to confirm that all required information is submitted correctly.

T2.1 List of Returnable Documents

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

Stage One

- T2.2-01 **Stage 1.1 as per CIDB: Eligibility Criteria Schedule** - CIDB Registration
- T2.2-02 **Stage 1.2** - Certificate of attendance at Compulsory Tender Clarification Meeting
- T2.2-03 **Stage 1.3** - Proof of Professional Registrations

2.1.2 Stage Two: Technical Evaluation these schedules will be utilised for evaluation purposes:

- T2.2-04 **Evaluation Schedule:** Management & CV's
- T2.2-05 **Evaluation Schedule:** Project Organogram
- T2.2-06 **Evaluation Schedule:** Health and Safety Management
- T2.2-07 **Evaluation Schedule:** Environmental Management
- T2.2-08 **Evaluation Schedule:** Previous experience
- T2.2-09 **Evaluation Schedule:** Approach Paper
- T2.2-10 **Evaluation Schedule:** Functional Specification of the Utility Management Software
- T2.2-11 **Evaluation Schedule:** Programme
- T2.2-12 **Evaluation Schedule:** Quality Management

2.1.3 Returnable Schedules:

General:

- T2.2-13 Authority to submit tender
- T2.2-14 Record of addenda to tender documents
- T2.2-15 Letter of Good Standing
- T2.2-16 Risk Elements
- T2.2-17 Availability of equipment and other resources
- T2.2-18 Schedule of proposed Subcontractors
- T2.2-19 Site Establishment requirements
- T2.2-20 Job-Creation Schedule
- T2.2-21 CIDB BUILD Program
- T2.2-22 Health & Safety Cost Breakdown

2.1.4 Agreement and Commitment by Tenderer:

- T2.2-23 CIDB SFU ANNEX G Compulsory Enterprise Questionnaire
- T2.2-24 RFP Declaration Form
- T2.2-25 Non-Disclosure Agreement
- T2.2-26 Tender - Breach of Law
- T2.2-27 Certificate of Acquaintance with Tender Document
- T2.2-28 Service Provider Integrity Pact
- T2.2-29 Supplier Code of Conduct
- T2.2-30 Agreement in terms of Protection of Personal Information Act
- T2.2-31 Supplier Declaration Form
- T2.2-32 Domestic Prominent Influential Persons (DPIP) or Foreign Prominent Public Officials

2.1.5 Bonds/Guarantees/Financial/Insurance:

- T2.2-33 Insurance provided by the Contractor
- T2.2-34 Form of Intent to provide a Performance Guarantee
- T2.2-35 Forecast Rate of Invoicing
- T2.2-36 Three (3) years audited financial statements

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

2.3 C1.2 Contract Data – Part 2

2.4 C1.3 Forms of Securities

2.5 C2.1 Pricing Instructions (Bill of Quantities)

2.6 C2.2 Bill of Quantities

Note 1: In the case of the CIDB Standard for Skills Development there are **NO** returnable documents (except for pricing the relevant section of the Bill of Quantities). Following award of the contract to the successful tenderer, the *employer* shall provide to the *Contractor* the following documents which shall be completed by the *Contractor* and submitted within the stipulated period.

- A1 – List of Recognized Skills Development Agencies (*21 days after acceptance*),
- A2 – Baseline Training Plan (*21 days after acceptance*),
- A3 – Project Interim Report (*21 days after the end of each reporting period*),
- A4 – Supervisor Agreement (*21 days after acceptance*), and
- A5 – Project Completion Report (*21 days after Final Completion*)

In respect of the CIDB Standard for Indirect Targeting & Enterprise Development, there are **NO** returnable documents (except for pricing the relevant section of the Bill of Quantities). Following award of the contract to the successful tenderer, the *employer* shall provide to the *Contractor* the following documents which shall be completed by the *Contractor* and submitted within the stipulated period:

- The Needs Analysis (*60 days after acceptance*),
- The Project Interim Report (*21 days after the end of each reporting period*),
- The Project Completion Report (*21 days after Final Completion*), and
- The Declaration (*21 days after acceptance*).

T2.2-01: Eligibility Criteria Schedule - CIDB Grading Designation

Note to tenderers:

Tenderers are to indicate their CIDB Grading by filling in the table below. **Attach a copy of the CIDB Grading Designation or evidence of being capable of being so registered.**

CRS Number	Status	Grading	Expiry Date

- Only those tenderers who are registered with the CIDB or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a **9CE** class of construction work, are eligible to have their tenders evaluated.

2. Joint Venture (JV)

Joint ventures are eligible to submit tenders subject to the following:

- every member of the joint venture is registered with the CIDB;
- the lead partner has a contractor grading designation of not lower than one level below the required grading designation in the class of construction works under consideration and possesses the required recognition status; and
- the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **9CE** class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations
- the Contractor shall provide the employer with a certified copy of its signed joint venture agreement; and
- In the event that the joint venture is an 'Incorporated Joint Venture' the Memorandum of Incorporation is to be provided within 4 (four) weeks of the Contract Date.

T2.2-02: Eligibility Criteria Schedule:

Certificate of Attendance at Tender Clarification Meeting

Note: T2.02-02 Returnable, signed by the Employer's Representative, will be circulated to Tenderers who would have attended the compulsory clarification meeting via email

This is to certify that

(Company Name)

Represented
by:

(Name and
Surname)

Was represented at the compulsory tender clarification meeting

Held at:		
On (date)		Starting time:

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

T2.2-03: Eligibility Criteria Schedule – Professional Registration

Notes to tenderers:

The **Mandatory eligibility** criteria in respect of Professional Registration is set out in the table below.

Tenderers are required to submit valid registration certificates with the relevant Built Environment Council for each of the resources stated below.

Notwithstanding the certification submitted with the tender, compliance with this criterion will be determined by the actual status of registration of each resource on the relevant professional Council's webpage. If registrations are not active/ valid at the time of evaluation – the tender will not be evaluated further.

<u>Pre-Qualification Criteria</u>	Description	Criteria
Key Personnel and Qualifications	Professional Construction Project Manager	Valid Pr. CPM registration with SACPCMP
	Professional Construction Manager – CM1	Valid Pr. CM registration with SACPCMP
	Construction Health and Safety Manager	Valid CHSM or CHSA registration with SACPCMP
	Construction Health and Safety Officer – HSO 1	Valid CHSO registration with SACPCMP
	Professional Engineering Technician (Civil)	Valid Pr. Techni Eng registration with ECSA.

NB: Registrations in the "Candidate" category will not be accepted.

T2.2-04: Evaluation Schedule – Management & CVs of Key Personnel

The tender must be able to demonstrate that the project personnel have sufficient knowledge, experience and qualifications to provide the required services and submit the following documents as a minimum with the tender:

1. The experience of assigned *key persons* in relation to the scope of work will be evaluated from three different points of view, namely:
 - i. General experience (total duration of construction activity) and positions held of each discipline specific team member.
 - ii. The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the Scope of Works. Proof of education and training must be attached to the C.V.
 - iii. Signed Letter of Intent or Letter of Employment
2. Comprehensive CV's should be attached to this schedule:

As a minimum each CV should address the following, but not be limited to;

 - i. Personal particulars
 - a. Name
 - b. Date and place of birth
 - a. Place (s) of tertiary education and dates associated therewith
 - ii. Qualifications (degrees, diplomas)
 - iii. Professional Registrations (Registration with the specified Professional Council, in the specified category). Registrations in the "Candidate" category will not be evaluated.
 - iv. Name of current employer and position in enterprise
 - v. Overview of post graduate experience (year, organization and position)
 - vi. Outline of recent assignments/ experience that has a bearing on the Scope of Works

3. CV's for people proposed for all identified posts including:

Site Management;

▪ Professional Construction Project Manager x 1:

The Tenderer must provide a CV for the Professional Construction Project Manager. The Construction Project Manager must be registered with the South African Council for the Project and Construction Management Professions (SACPCMP) in the category Pr. CPM, with a minimum of 6 years total experience in Construction projects. All Professional Registration certificates will be evaluated by reference to the SACPCMP web page. Notwithstanding certified copies of Professional Registrations, Registrations are required to be valid on the council web site at the time of evaluation, failing which the tender will not be evaluated further.

▪ Professional Construction Manager x 1:

The Tenderer must provide a CV for the Professional Construction Manager. The Professional Construction Manager must be registered with the South African Council for the Project and Construction Management Professions (SACPCMP) in the category Pr. CM with a minimum of 6 years total experience in Construction projects. All Professional Registration certificates will be evaluated by reference to the SACPCMP web page. Notwithstanding certified copies of Professional Registrations, Registrations are

required to be valid on the council web site at the time of evaluation, failing which the tender will not be evaluated further.

▪ **Software Engineer x 1:**

The Tenderer must provide a CV for the Software Engineer. The Software Engineer must have as minimum a National Diploma in Computer Science/ Information System/ Information Technology/ Electrical/ Electronic or Computer Engineering with minimum 6 years total experience in electricity/ water tariffs, smart billing, Software Development, Automation (PLC & SCADA), Software Integration, configuration of the Microsoft SQL Server (Enterprise Edition) and/or OPC Server.

▪ **Professional Engineering Technician (Civil) x 1:**

The Tenderer must provide a CV for the Professional Engineering Civil. The Engineering Technician (Civil) must have a National Diploma in Civil Engineering and Professionally Registered with the Engineering Council of South African (ECSA) with minimum 6 years total experience in Civil Engineering Construction, and Water Projects etc. All Professional Registration certificates will be evaluated by reference to the ECSA web page. Notwithstanding copies of Professional Registrations, Registrations are required to be valid on the council web site at the time of evaluation, failing which the tender will not be evaluated further.

▪ **Network Architect Specialist x 1:**

The Tenderer must provide a CV for the Network Architect Specialist, who shall have as minimum a National Diploma in Computer or Information Technology (IT) with minimum 6 years total experience in the design and installation of Local Area Network (LAN), Wide Area Network (WAN) and Wireless Communication (Radio Frequency, Sigfox, LoRa etc).

List of Key Persons assigned to the above disciplines

No.	Key Persons	Name and Surname	CV attached (Yes/No)
1	Professional Construction Project Manager x 1		
2	Professional Construction Manager – CM 1		
3	Software Engineer x 1		
4	Professional Engineering Technician (Civil) x 1		
5	Network Architect Specialist x 1		

The scoring of the Management & CVs of Key Persons will be evaluated as follows:

- i. General experience (total years of experience) and positions held of each discipline specific team member.

		No Response	Poor	Less than acceptable	Acceptable response to the particular aspect	Above acceptable real understanding	Excellent Response
30	Scores	0	20	40	60	80	100
Points (5)	5	The Tenderer has not submitted the required information	Project Manager: has ≤ 3 years total experience.	Project Manager: has >3 however ≤ 5 years total experience.	Project Manager: has > 5 however ≤ 10 years total experience.	Project Manager: has > 10 however ≤ 15 years of total experience.	Project Manager: has >15 years of experience.
Points (5)	5	The Tenderer has not submitted the required information	Construction Manager: has ≤ 3 years of total experience.	Construction Manager: has >3 however ≤ 5 years total experience.	Construction Manager: has > 5 however ≤ 10 years total experience.	Construction Manager: has > 10 however ≤ 15 years of experience.	Construction Manager: has >15 years of experience.
Points (6)	Experience	The Tenderer has not submitted the required information	Software Engineer: has ≤ 3 years total experience.	Software Engineer: has > 3 however ≤ 5 years total experience.	Software Engineer: has > 5 however ≤ 10 years total experience.	Software Engineer: has > 10 however ≤ 15 years of experience.	Software Engineer: has >15 years of experience.
Points (3)	Education	The Tenderer has not submitted the required information, or Education is NQF Level 3 and below.	Software Engineer: NQF Level 4	Software Engineer: NQF Level 5	Software Engineer: NQF Level 6	Software Engineer: NQF Level 7	Software Engineer: NQF Level 8

		No Response	Poor	Less than acceptable	Acceptable response to the particular aspect	Above acceptable real understanding	Excellent Response
30	Scores	0	20	40	60	80	100
Points (4)	4	The Tenderer has not submitted the required information	Civil Engineer: has ≤ 3 years total experience.	Civil Engineer: has > 3 however ≤ 5 years total experience .	Civil Engineer: has > 5 however ≤ 10 years total experience.	Civil Engineer: has > 10 however ≤ 15 years of experience.	Civil Engineer: has > 15 years of experience.
Points (4)	Experience	The Tenderer has not submitted the required information	Network Specialist: has ≤ 3 years total experience.	Network Specialist: has > 3 however ≤ 5 years total experience.	Network Specialist: has > 5 however ≤ 10 years total experience.	Network Specialist: has > 10 however ≤ 15 years of experience.	Network Specialist: has > 15 years of experience.
Point (3)	Education	The Tenderer has not submitted the required information, or Education is NQF Level 3 and below.	Network Specialist: NQF Level 4	Network Specialist: NQF Level 5	Network Specialist: NQF Level 6	Network Specialist: NQF Level 7	Network Specialist: NQF Level 8
	Maximum number of points						30

NQF Levels Explained		
Higher Education Qualifications as per the South African Qualification Association (SAQA)	Doctoral Degree	10
	Master's Degree	9
	Bachelor's Honors Degree	8
	Postgraduate Diploma	
	Bachelor's Degree	7
	Advanced Diploma	
	Diploma	6
	Advanced Certification	
	Higher Certificate	5
	National Certificate	4
	Grade 12/ Standard 10/ Matric/ Trade Certificate	

The undersigned, who warrants that he / she is duly authorized 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 _____

Tender _____

T2.2-05: Evaluation Schedule: Project Organogram

The Tenderer shall compile a comprehensive and detailed **Project Organogram** that shows the structure and composition of their management structure involved in the *works*, inclusive of the key staff/professionals, identified in the Contract Data Part two and the proposed technical, support, and site staff in line with **T2.2-04- Management & CV's of Key Persons** and Scope Requirements. The Project Organogram should also include all Major Subcontractors, showing the structure and composition of their team. The Tenderer must attach his/ her organization and staffing proposal to this page.

The Tenderer's **Project Organogram** will be evaluated/tested against the four minimum requirements:

- a) Fully aligned with **T2.2-04- Management & CVs of Key Persons**
- b) Resource allocation clearly defined per region (Eastern, Central and Western) including the installation teams (water and Electricity) – *No duplication of names in installation teams.*
- c) Identifies the resources for the key roles
- d) Identifies all Major Sub-Contractors (Billing Software)

The scoring of the **Project Organogram** will be as follows:

Weight	Project Organogram
Points	5
Score	Criteria
0	The Tenderer has submitted no information, or information is inadequate to determine a score.
20	The Tenderer's Project Organogram does not meet the minimum stated requirements; the Organogram complies with at least one of the four stated conditions: a) Fully aligned with T2.2-04- Management & CVs of Key Persons b) Resource allocation clearly defined per region (Eastern, Central and Western) including the installation teams (water and Electricity) c) Identifies the resources for the key roles d) Identifies all Major Sub-Contractors (Billing Software)
40	The Tenderer's Project Organogram does not meet the stated minimum requirements; the Organogram complies with at least two to three of the four stated conditions: a) Fully aligned with T2.2-04- Management & CVs of Key Persons b) Resource allocation clearly defined per region (Eastern, Central and Western) including the installation teams (water and Electricity) c) Identifies the resources for the key roles d) Identifies all Major Sub-Contractors (Billing Software)

Weight	Project Organogram
60	The Tenderer's Project Organogram meets the stated minimum requirements; the Organogram complies with all four stated conditions: a) Fully aligned with T2.2-04- Management & CVs of Key Persons b) Resource allocation clearly defined per region (Eastern, Central and Western) including the installation teams (water and Electricity) c) Identifies the resources for the key roles d) Identifies all Major Sub-Contractors (Billing Software)
80	The Project Organogram is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution, the Organogram provides over and above the stated requirements. The Organogram is structured in way that categories the various functions, that is: • Leadership & Management, • Engineering & Delivery, • Planning & Controls, • Commercial, • Quality, • Health, Safety and Environmental (HSE), • Subcontractors
100	Besides meeting the 80 rating, the Organogram identifies and details the roles and responsibilities of the major subcontractor's resources.



The undersigned, who warrants that he / she is duly authorized 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	_____
Tender	_____		

T2.2-06: EVALUATION SCHEDULE: HEALTH AND SAFETY

The Tenderer must review the following documents for context to meet the Health and Safety requirements, namely:

Annexure F: Transnet Health and Safety Specification

Annexure G: Project Baseline Risk Assessment

Tenderer is required to submit the following documents as a minimum with your tender:

1. Safety & Health Policy signed by the Chief Executive Officer.

The signed Safety & Health Policy List at least the following five elements:

- 1.1 Commitment to safety and prevention of pollution.
- 1.2 Continual improvement.
- 1.3 Compliance to legal requirements and appropriate to the nature of Contractor's activities.
- 1.4 Hold management accountable for development of the safety systems.
- 1.5 Include objectives and targets.

2. Detailed Roles & Responsibilities, such as S16.2 CEO, CR8.1 Construction Manager, CR8.5 Safety officer, CR8.7 Construction Supervisor, CR9.1 Risk Assessor, CR 12 Temporary works designer and 17.1 SHE Reps, etc. as per the Occupational health and safety Act 85 of 1993.

- 2.1 S16.2 CEO
- 2.2 CR 8.1 Construction Manager -SACPCMP registration as Pr. Construction Manager
- 2.3 CR 8.5 SACPMP Registered Construction Health and Safety officer
- 2.4 CR 8.7 Construction Supervisor
- 2.5 CR 9.1 Risk Assessor
- 2.6 CR 12 Temporary works Designer
- 2.7 CR 17.1 SHE Rep as per the Occupational Health and Safety Act 85 of 1993

3. Project specific Baseline Risk Assessment (RA), indicating major activities of the project namely:

- 3.1 Working in confined spaces.
- 3.2 Excavation.

3.3 High Pressure Water Pipelines and Valves.

3.4 Working in Electrical Substations and on Electrical Equipment.

3.5 Working in Operational Areas.

3.6 Traffic Accommodation.

Index of documentation attached to this schedule

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The scoring of the Tenderer's Health and safety requirements will be as follows:

Points (8)	2	2	4
	Safety & Health & Policy signed by the Chief Executive Officer 1. Commitment to Safety, prevention of pollution, 2. Continual improvement, 3. Compliance to legal requirements, appropriate to the nature of Contractor's activities, 4. Hold management accountable for development of the safety systems, 5. Includes objectives and targets.	Roles & Responsibilities 1. S16.2 CEO 2. CR 8.1 Construction Manager - SACPCMP registration as Pr. Construction Manager, 3. CR 8.5 SACPCMP Registered Construction Health and Safety officer, 4. CR 8.7 Construction Supervisor, 5. CR 9.1 Risk Assessor, 6. CR 12 Temporary works designer and 7. CR 17.1 SHE Rep as per the Occupational health and safety Act 85 of 1993	Project Specific Baseline Risk Assessment, indicating major activities of the project namely: 1. Working in confined spaces 2. Excavation 3. High Pressure Water Pipelines and Valves 4. Working in Electrical Substations and on Electrical Equipment 5. Working in Operational Areas 6. Traffic Accommodation
Score 0	The Tenderer has submitted no information or an unsigned policy to determine a score.	The Tenderer has submitted no information to determine a score.	The Tenderer has submitted no information to determine a score.
Score 20	1 of the 5 key policy components are recognized and meet the <i>Employer's</i> requirements and it is signed by the Chief Executive Officer or Delegated Authority.	1 to 2 of 7 Roles and Responsibilities in accordance with the Works Information, the Occupational Health and Safety Act as per	1 of 6 major activities in the project are addressed in the baseline risk assessment.

Points (8)	2	2	4
		Construction Regulations and TNPA Health and Safety Specification.	
Score 40	2 of the 5 key policy components are recognized and meet the <i>Employer's</i> requirements and it is signed by the Chief Executive Officer or Delegated Authority.	3 to 4 of 7 Roles and Responsibilities are in accordance with the Works Information, the Occupational Health and Safety Act as per Construction Regulations and TNPA Health and Safety Specification.	2 of 6 major activities in the project are addressed in the baseline risk assessment.
Score 60	3 of the 5 key policy components are recognized and meet the <i>Employer's</i> requirements and it is signed by the Chief Executive Officer or Delegated Authority.	5 of 7 Roles and Responsibilities are in accordance with the Works Information, the Occupational Health and Safety Act as per Construction Regulations and TNPA Health and Safety Specification.	3 to 4 of 6 major activities in the project are addressed in the baseline risk assessment.
Score 80	4 of the 5 key policy components are recognized and meet the <i>Employer's</i> requirements and it is signed by the Chief Executive Officer or Delegated Authority.	6 of 7 Roles and Responsibilities are in accordance with the Works Information, the Occupational Health and Safety Act as per Construction Regulations and TNPA Health and Safety Specification.	5 of 6 major activities in the project are addressed in the baseline risk assessment.

Points (8)	2	2	4
Score 100	All 5 key policy components are recognized and meet the <i>Employer's</i> requirements, and it is signed by the Chief Executive Officer or Delegated Authority.	All 7 Roles and Responsibilities are in accordance with the Works Information, the Occupational Health and Safety Act as per Construction Regulations and TNPA Health and Safety Specification.	All 6 major activities in the are addressed in the baseline risk assessment.

T2.2-07: Evaluation Schedule: Environmental Management

1. The Tenderer must review the following documents in preparation to meeting the environmental requirements, namely:

Annexure H -	a) Transnet Integrated Management System (TIMS) Policy Commitment Statement.
Annexure I -	b) Transnet Construction Environmental and Sustainability Specification (CESS) TRN-IMS-GRP-GDL-014.4 Rev 3.0
Annexure J -	c) Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP). 009-TCC-CLO-SUS-11386 Rev 1.0

2. The tenderer must provide a project specific **Environmental Management Plan**. This plan must be clear on the following:

- a. A description of the environmental impacts that need to be avoided, managed and mitigated, a description of how those impacts will be avoided, managed and mitigated (impact management actions).
- b. The method and frequency of monitoring the implementation of the impact management actions.
- c. A description of how the environmental incidents will be managed on site.
- d. An indication of the roles and responsibilities in the implementation of the impact management actions.
- e. Records to be kept.
- f. How non-conformance/non-compliance will be dealt with.

3. The Tenderer must provide an **Environmental Policy** signed by Top Management that displays the following key components, namely:

- a. Commitment to comply with all applicable environmental laws, regulations and standards.
- b. Commitment to pollution prevention
- c. Emphasize the organization's commitment to continual improvement in

environmental performance.

- d. Address the sustainable use of resources/ resource conservation.
- e. Is communicated to all employees working for or on behalf of the Contractor.

4. Provide a CV showing environmental staff competencies, **experience and environmental qualification** (Degree/Diploma) relevant to environmental management functions, who will form part of the key environmental officer. **(Proof of Qualification must be submitted).**

Environmental Officer x 1

Must have a Bachelor's Degree or Bachelor of Technology (NQF Level 7 Qualification) in Natural Science or Environmental Studies with a minimum of 5 years total experience in Construction projects.

5. The Tenderer must provide a **list of projects** where construction environmental management duties have been executed including a brief description of such duties as listed on company's experience reference letters. The format below must be used:

Project Name	Start date	End Date	Brief Description of the Environmental Duties in the Project.
1.			
2.			
3.			
4.			
5.			

Index of documentation attached to this schedule

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

	Environmental Management Plan	Environmental Policy	Environmental Officer Qualification	Environmental Officer Experience	List of projects where construction environmental management duties have been executed
Points (5)	1	1	1	1	1
Score 0	The Tenderer has submitted no information to determine a score.	The Tenderer has submitted no information to determine a score.	The Tenderer has submitted no information or submitted Qualifications not in the Natural Science or Environmental Studies to determine a score.	Environmental officer has <1 year of relevant on-the-job experience.	The Tenderer has submitted no information to determine a score.
Score 20	EMP only responds to 1-2 of the items listed under paragraph 2 (a, b, c, d, e & f).	Policy only addresses 1 of the required elements listed under paragraph 3 (a, b, c, d, & e).	Environmental officer is in possession of a Certificate in Natural Science or Environmental Studies	Environmental officer has ≥1 year but ≤3 years of relevant on-the-job experience.	Tender has only executed environmental management duties in 1 project.
Score 40	EMP only responds to 3 of the items listed under paragraph 2 (a, b, c, d, e & f).	Policy only addresses 2 of the required elements listed under paragraph 3 (a, b, c, d, & e).	Environmental officer is in possession of a Diploma in Natural Science or Environmental Studies	Environmental officer has >3 years but ≤4 years of relevant on-the-job experience.	Tender has only executed environmental management duties on 2 projects.

DESCRIPTION OF *WORKS*: SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS

	Environmental Management Plan	Environmental Policy	Environmental Officer Qualification	Environmental Officer Experience	List of projects where construction environmental management duties have been executed
Score 60	EMP only responds to 4 of the items listed under paragraph 2 (a, b, c, d, e & f).	Policy only addresses 3 of the required elements listed under paragraph 3 (a, b, c, d, & e).	Environmental officer is in possession of a bachelor's degree/ B Tech in Natural Science or Environmental Studies.	Environmental officer has >4 years but ≤8 years of relevant on-the-job experience.	Tender has only executed environmental management duties on 3 projects.
Score 80	EMP only responds to 5 of the items listed under paragraph 2 (a, b, c, d, e & f).	Policy only addresses 4 of the required elements listed under paragraph 3 (a, b, c, d, & e).	Environmental officer is in possession of a Bachelor's degree with Honours in Natural Science or Environmental Studies.	Environmental officer has >8 but ≤10 years relevant on-the-job experience.	Tender has only executed environmental management duties on 4 projects.
Score 100	EMP responds to all the items listed under paragraph 2 (a, b, c, d, e & f).	Policy addresses all the required elements listed under paragraph 3 (a, b, c, d, & e).	Environmental officer is in possession of a master's degree in Natural Science or Environmental Studies	Environmental officer has > 10 years of relevant on-the-job experience.	Tender has executed environmental management duties on 5 or more projects.

Attached submissions to this schedule:

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.....

By signing this Tender Schedule, the Tenderer confirms that they will comply with the above requirements and in particular Transnet policy statements and environmental specifications.

Signed	Date
.....	
Name	Position
.....	
Tenderer	
.....	

T2.2-08: Evaluation Schedule: Previous Experience

Tenderers are required to demonstrate their past experience in the delivery of **ANY** of the following projects, Water Network Projects, Automated Pumping System Projects, Automated Firefighting System Projects, Plant Control and Automation Projects, Smart Metering and Billing System Projects within the past 20 years and to this end the Tenderer shall get their Clients for which they have done work to fully complete the Reference Letter (**Template attached**) or a Completion Certificate. **All fields marked with an asterisk (*) are mandatory fields and must be completed.** Incomplete Reference Letters will get a score of 0. The Reference Letter or Completion Certificate must be completed by the Client or Principal Agent/ Engineer and **must be traceable**.

Note: Verification of the Reference will be conducted during Evaluations.

1. Verification of References

Transnet reserves the right to verify the references submitted by the highest-ranked bidder(s) to confirm the validity and authenticity of the experience claimed. Where a referenced organisation cannot be contacted using the details provided, Transnet will make at least three (3) documented attempts. Should these attempts be unsuccessful, Transnet will notify the bidder and allow a period of forty-eight (48) hours for the bidder to facilitate contact with the relevant referee. Transnet may also undertake reasonable due diligence measures to verify the credibility of the referee. If the experience cannot be verified to the satisfaction of Transnet, the points awarded for the relevant evaluation criterion may be withdrawn, which may result in a revision of the bidder's overall ranking.

2. Misrepresentation and Fraud

Where any information submitted (including, but not limited to, reference letters) is found to be false, misleading, and/or fraudulent, Transnet reserves the right to take appropriate action, including the application of sanctions as provided for in clauses 5.1 and 5.2 of the Service Provider Integrity Pact.

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	Previous Experience Points (10)
Score	Reference Letter or Completion Certificate
0	No Reference Letter/Completion Certificate or incomplete Reference Letter submitted (Failed to complete all mandatory fields) or the Reference Letter/ Completion Certificate is irrelevant to the scope of this project.
20	The Tenderer has submitted one (01) fully complete Reference Letter/ Completion Certificate relevant to scope of this project.
40	The Tenderer has submitted two (02) to three (03) fully complete Reference Letters /Completion Certificates relevant to the scope of this project.
60	The Tenderer has submitted four (04) to five (05) fully complete Reference Letters/ Completion Certificates relevant to the scope of this project.
80	The Tenderer has submitted six (06) to seven (07) fully complete Reference Letters/ Completion Certificates relevant to scope of this project.
100	The Tenderer has submitted eight (08) and more fully complete Reference Letters/ Completion Certificates relevant to scope of this project.



The undersigned, who warrants that he / she is duly authorized 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 _____

Tender _____

Reference Letter

Assessment of Bidder's Performance by Independent Reference

[All fields with an asterisk (*) are mandatory fields]

Name of Organisation: (*)	
Address: (*)	
Bid Number: (*)	
Bid Description: (*)	

Name of Bidder: (*)	
Project Name: (*)	
Contract Value: (*)	R
Project Commencement Date: (*)	
Project Duration: (*)	
Project Completion Date: (*)	
Description of the Scope: (*)	

Please evaluate the contractor's performance in the areas listed below by selecting 1 of the options on the right (1=Poor; 5=Excellent)	1	2	3	4	5
Project Scope and Execution: (*)	()				
Quality of Deliverables: (*)	()				
Timelines and Reliability: (*)	()				
Budget and Cost-Effectiveness: (*)	()				
Compliance and Professionalism: (*)	()				
<i>1=Poor; 2=Unsatisfactory; 3= Average; 4=Good; 5=Excellent</i>					

Comment: (Optional)
Would you use the Service Provider again? (*) Yes/No

The undersigned declares the above project has been executed to his/her satisfaction.

Client representative signature and Full Details Below:

Name of the Person Completing this Form: (*)	
Name of the Company: (*)	
Designation: (*)	
Telephone Number: (*)	
Email Address: (*)	
Signature: (*)	
Place and Date: (*)	

OFFICIAL COMPANY STAMP (*)	

T2.2-09: Evaluation Schedule – Technical Approach Paper

The Tenderer submits an approach paper which responds to the scope of work and outlines the proposed approach / methodology. The approach paper should articulate what the Tenderer will provide in achieving the stated objectives for the project and demonstrate alignment to the Programme as contained under **T2.2-11**, which should include details contained in the project programme. Tenderers also display a clear understanding of the project and show a concise method statement for all activities incorporating best practice.

The approach paper shall include as a minimum but not be limited to the following (the *Contractor* must refer to Part C3 Scope of Works for a full description of the scope of the works):

1. Installation of the water meters

- a. Outline of proposed approach.
- b. Narrative related to the programme.
- c. Detailed method statement, technical approach and construction sequencing in terms of the Works Information.
- d. Demonstrate an understanding of how the project objectives are to be achieved.
- e. Detailed list of main equipment required to execute the works, and areas it will be utilized.
- f. Proposed Suppliers and Product (including datasheets).

2. Installation of the Electricity Meters

- a. Outline of proposed approach.
- b. Narrative related to the programme.
- c. Detailed method statement, technical approach and construction sequencing in terms of the Works Information.
- d. Demonstrate an understanding of how the project objectives are to be achieved
- e. Detailed list of main equipment required to execute the works, and areas it will be utilized.
- f. Proposed Suppliers and Product (include electricity meter datasheet).

3. Private Wireless Communication Network (WCN) and Linking Water Meters

- a. Outline of proposed approach.
- b. Narrative related to the programme.
- c. Detailed method statement, technical approach and construction sequencing in terms of the Works Information.
- d. Demonstrate an understanding of how the project objectives are to be achieved.
- e. Detailed list of main equipment required to execute the works, and areas it will be utilized.
- f. Proposed Suppliers and Product (include Gateways and Transceivers datasheets).

4. Installation of the Local Area Network (LAN) and Linking Electricity Meters

- a. Outline of proposed approach.
- b. Narrative related to the programme.
- c. Detailed method statement, technical approach and construction sequencing in terms of the Works Information.
- d. Demonstrate an understanding of how the project objectives are to be achieved.
- e. Detailed list of main equipment required to execute the works, and areas it will be utilized.
- f. Proposed Suppliers and Product (include Network Switch datasheet).

5. Linking the Wireless Communication Network to the Local Area Network and Billing Servers

- a. Outline of proposed approach.
- b. Narrative related to the programme.
- c. Detailed method statement, technical approach and construction sequencing in terms of the Works Information.
- d. Demonstrate an understanding of how the project objectives are to be achieved.
- e. Detailed list of main equipment required to execute the works, and areas it will be utilized.
- f. Network topology (Drawing) – Drawing showing the process of communication, starting from field devices until the billing servers and software.

6. Management/Billing Software Details and Management of Data on the server including integrating the Port systems for Central Remote Viewing:

- a. Outline of proposed approach.
- b. Narrative related to the programme.
- c. Detailed method statement, technical approach and construction sequencing in terms of the Works Information.
- d. Demonstrate an understanding of how the project objectives are to be achieved.
- e. Detailed list of main equipment/ software required to execute the works, and areas it will be utilized.
- f. Proposed Suppliers and Product (include Utility Management Software datasheet).

Index of documentation attached to this schedule

	DOCUMENT NAME
1	
2	
3	
4	
5	
6	
7	

The scoring of the approach paper will be as follows:

Approach is clearly articulated and based on the Works Information

	Installation of the Water Meters	Installation of the Energy Meters	Private WCN and Linking Water Meters	Installation of the LAN and Linking Energy Meters	Linking the WCN to the LAN and Billing Servers	Management Software Details and Management of Data on the server including integrating the Port systems for Central Remote Viewing &
Points (12)	2	2	2	2	2	2
Score	Criteria					
0	The Tenderer has submitted no information/ The technical approach paper and/ or methodology is irrelevant and does not cover any of the elements.					
20	The Tender has submitted a technical approach and/ or Methodology that covers 2 or less out of the 6 elements (a, b, c, d, e & f) as per the requirement.					
40	The Tender has submitted a technical approach and/ or Methodology that covers three 3 of the 6 elements (a, b, c, d, e & f) as per the requirement.					
60	The Tender have submitted a technical approach and/ or Methodology that covers 4 out of the 6 elements (a, b, c, d, e & f) as per the requirement.					
80	The Tender has submitted a technical approach and/ or Methodology that covers 5 of the 6 elements (a, b, c, d, e & f) as per the requirement.					



	Installation of the Water Meters	Installation of the Energy Meters	Private WCN and Linking Water Meters	Installation of the LAN and Linking Energy Meters	Linking the WCN to the LAN and Billing Servers	Management Software Details and Management of Data on the server including integrating the Port systems for Central Remote Viewing &
100	The Tender has submitted a technical approach and/ or Methodology that covers all 6 stated elements (a, b, c, d, e & f). The Scope of Work and approach are succinct, innovative and efficient, indicating that the tenderer has outstanding knowledge of state-of-the- art approach. The approach paper details ways to improve the project's outcomes and the quality of the outputs.					

The undersigned, who warrants that he / she is duly authorized 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

Tender

T2.2-10: Evaluation Schedule: Functional Specification of the Utility Management Software

Tenderer is required to submit with their Tender the Functional Specification of the Software to be supplied that details what the proposed software solution will do and how it will meet the objectives of the Project.

Note: The Functional Specification will be measured on the following:

- (a) **System Function and Capabilities:** A detailed description of what the software must do, including core features and workflows.
- (b) **Integration & Technical Interfaces:** Specifications regarding how the software will communicate with other existing systems or third-party applications.
- (c) **Requirements Compliance:** Demonstrating that the proposed solution complies with the mandatory functional requirements outlined in the tender documents (i.e Works Information).
 - i. License Conditions (*NB: Perpetual License and no cloud-based solution*)
 - ii. Utilities managed on the Software: Water and Electricity
 - iii. Tariff Configuration (Water and Electricity)
 - iv. Software Interfaces and Dashboards
 - v. Integrated Maps/ Geographic Information System (Include Dashboard)
 - vi. Alerts: Generate Automatic Alarms and distribute by email and SMS
 - vii. Produce Reports in a variety of formats (i.e Excel, PDF, Word, CSV, XML etc)
 - viii. Supported communication protocols
 - ix. Capturing Manual Meter Readings
- (d) **Implementation, Software support and Location of Support Team (Branches):** Information on installation, testing, training, and maintenance.
- (e) **Completed Statement of Compliance:** (Attached)

The Scoring will be as follows:

	Functional Specification of the Utility Management Software
Points	14
Score	Criteria
0	The Tenderer has submitted no information/ The Function Specification is irrelevant and does not cover any of the elements (a, b, c, d & e).
20	The Tender has submitted Functional Specification that covers 2 or less out of the 5 elements (a, b, c, d, & e) as per the requirement.
40	The Tender has submitted a Functional Specification that covers 3 to 4 of the 5 elements (a, b, c, d & e) as per the requirement.
60	The Tender has submitted a Functional Specification that covers all 5 stated elements (a, b, c, d & e).
80	The Tender has submitted a Functional Specification that covers all 5 stated elements (a, b, c, d & e) and has submitted a sample of the Billing Statement that comes with the proposed software.
100	The Tender has submitted a Functional Specification that covers all 5 stated elements (a, b, c, d & e), Billing Statement that comes with the proposed software and the User Manual of the Utility Management Software.



STATEMENT OF COMPLIANCE

*NB: Tenderers are required to complete either **Part One** or **Part Two** and **not Both***

PART ONE

This Tender complies with Part C3: Works Information Clause 5.12 Smart Utility Management Software Solution in all respects.

Name & Surname : _____
Designation : _____
Signature : _____ **Date:** _____

PART TWO

This Tender complies generally with this specification but differs from it on the following points:

Name & Surname : _____
Designation : _____
Signature : _____ **Date:** _____

T2.2- 11: Evaluation Schedule: Programme (10 Points)

Work Plan or Schedule or Programme:

The Tenderer details the programme for evaluation and attaches it to this schedule.

The tenderer must provide a Programme which provides the detail that indicates the order and timing of activities to carry out the construction works in terms of the *Employer's* requirements and within the stipulated timeframes. The Tenderer must provide the proposed programme complying with, but not limited to, the minimum format requirements, as follows:

The tenderer shall provide the proposed programme, at a minimum Level 3 showing but not limited to the following:

- 1) Level 3 Primavera P6 or Microsoft Projects (pdf copy is acceptable) detailed programme, compatible with Project Scope.

Criteria scoring: 1) *Submissions that meet the minimum required Level of detail and is developed in the requested software obtain 100% of the (1) point allocated. No Submissions or submissions that do not meet the required level of detail or are submitted in Excel, Word or similar will score 0% of the (1) point allocated.*

- 2) Demonstrate a shortened Construction timeline via Milestones or overall duration.

Criteria scoring: 2) *100% of the one (1) point will be allocated for a shorter timeline than requested, 90% of the (1) point will be allocated for the exact timeline requested, 50% of the one (1) point will be allocated for 1 month exceeding the timeline requested, 25 % of the one (1) point will be allocated for 2 months exceeding the timeline requested, 0% of the one (1) point will be allocated for timelines greater than 2 months over the timeline requested.*

- 3) The columns that should reflect per activity on the schedule as a minimum but not limited to:

Activity No.	Activity Name	Duration	Start Date	Finish Date	Float

Criteria scoring: 3) *Points allocated for each column displayed on schedule, if 6/6 columns are displayed then 100% of the one (1) point will be allocated for the columns requested, if 5/6 columns are displayed then 83% of the one (1) point will be allocated*

for the columns requested, if 4/6 columns are displayed then 67% of the one (1) point will be allocated for the columns requested, if only 3/6 columns are displayed then 50% of the one (1) point will be allocated for the columns requested, if only 2/6 columns are displayed then 33% of the one (1) point will be allocated for the columns requested, if only 1/6 columns are displayed then 17% of the one (1) point will be allocated for the columns requested, if only 0/6 columns are displayed then 0% of the one (1) point will be allocated for the columns requested. (no additional points will be allocated for additional columns that are displayed over and above as the requested minimum).

- 4) The schedule is to have no open-end activities. All activities (including milestones) are to have predecessors and successors except the Start and Finish milestones.

Criteria scoring: 4) *100% of the one (1) point will be allocated if no open-ended activities are identified, 0% of the one (1) point will be allocated if one or more open-ended activities are identified.*

- 5) The schedule is to have no constraints.

Criteria scoring: 5) *100% of the one (1) point will be allocated if no constraints are identified, 0% of the one (1) point will be allocated if one or more constraint is identified.*

- 6) All activities to be practically and logically linked using critical path method (CPM), critical path is to be shown on schedule.

- a) Schedule showing durations of activities using single unit of measure (days)

Criteria scoring: 6) *100% of the one (1) point will be allocated if the critical path is displayed on the schedule via Gantt chart bars and the sequencing is logical, 50% of the one (1) point will be allocated if the critical path is displayed on the schedule via Gantt chart bars but sequencing is illogical, 50% of the one (1) point will be allocated if the critical path is not displayed on schedule via Gantt chart bars but the sequencing is logical, 0% of the one (1) point will be allocated if the critical path is not displayed on the schedule or if it found that the Bars have been manipulated to display the critical path by changing bar colour/s and the sequence is illogical.*

6a) 100% of the one (1) point allocated if shows consistent use of the same unit of measure (days, weeks, or months), 0% of the one (1) point allocated if multiple units of measure are utilised.

- 7) The tenderer to clearly display the following key milestones for all the activities as a minimum but not limited to:

Project start date,
Project Completion date,
Site access date,
Design and or Document review and approval date/s, – If project requires Engineering works to be conducted as part of the contract.
Factory acceptance testing (FAT) and or other inspections date/s,
Long Lead Material delivery date/s,
Sectional Handover date/s. – If project requires or allows for sectional handovers as part of the contract.

Criteria scoring: 7) Points allocated for each milestone displayed on the schedule, if 7/7 columns are displayed then 100% of the one (1) point will be allocated for the Milestones requested, percentage will incrementally decrease the lower the number of milestones displayed, example: if only 3/7 columns are displayed then 43% of the one (1) point will be allocated for the Milestones requested, if 0/7 columns are displayed then 0% of the one (1) point will be allocated for the Milestones requested. (for Milestones that are not required as part of the contract (i.e.: Sectional Handover dates) the percentage of the one (1) point for the Milestone will be allocated to the overall score for the Milestones requested)

- 8) Schedules are to cover all phases within the project scope namely but not limited to:

Engineering, (covering all engineering activities/deliverables) – If project requires Engineering works to be conducted as part of the contract.
Procurement,
Site mobilisation, (pre-construction documents, permits, etc.)
Site establishment,
Construction,
De-establishment activities,
Project close out

All construction activities including but not limited to the following:

- a) main contractors work,
- b) subcontracted works,
- c) procurement:
 - i) ordering of subcontractors,
 - ii) ordering of long lead items,
- d) SHERQ requirements, permits, testing, inspections, and or applications,
- e) time risk allowance (TRA)

Criteria scoring: 8) 100% of the one (1) point will be allocated if the project's required phases are displayed on schedule (displayed as summary/parent tasks), 0% of the one (1) point will be allocated if phases are not displayed on the schedule.

8a) 100% of the one (1) point will be allocated if the main contractors works is clearly referenced, 0% of the one (1) point will be allocated if the main contractor works is not referenced.

8b) 100% of the one (1) point will be allocated if the subcontractor's works is clearly referenced, 0% of the one (1) point will be allocated if the subcontractor's works is not referenced.

8ci&ii) 100% of the one (1) point will be allocated if the procurement of subcontractors and the Long Lead Items are clearly displayed on the schedule, 0% of the one (1) point will be allocated if the procurement of the subcontractors and the Long Lead Items are not clearly displayed on the schedule.

8d) 100% of the one (1) point will be allocated if the SHERQ requirements are displayed on the schedule, 0% of the one (1) point will be allocated if the SHERQ requirements are not displayed on the schedule.

8e) 100% of the one (1) point will be allocated if the time risk allowance (TRA) is displayed on the schedule, 0% of the one (1) point will be allocated if the time risk allowance (TRA) is not displayed on the schedule.

(for phases that are not required as part of the contract (i.e.: Engineering) the percentage of the one (1) point for the phases will be allocated to the overall score for the phases requested)

The table below indicates the method of scoring that will be followed to evaluate the programme submitted by the Tenderer based on the above-mentioned requirements points 1-14:

Score 0	Tenderer has not developed or submitted a schedule, or submission in non-planning software e.g., excel or word document, etc. or submission is below Level 3.
Score 20	Tenderer has addressed up to and including 3 out of the 14 requirements (incl. sub items) that supports the scope of work which is less than 25% of all points 1 to 14
Score 40	Tenderer has addressed more than 3, up to and including 7 out of the 14 requirements (incl. sub items) that supports the scope of work which is less than or equal to 50% of all points 1 to 14.
Score 60	Tenderer has addressed more than 7 up to and including 10 out of the 14 requirements (incl. sub items) that supports the scope of work which is greater than 50% but less than 75% of all points 1 to 14
Score 80	Tenderer has addressed more than 10, up to and including 13 out of the 14 requirements (incl. sub items) that supports the scope of work which is more than 75% but less than 100% of all points 1 to 14.
Score 100	Tenderer has addressed all 14 requirements (incl. sub items) that support the scope of work which is 100% of all points 1 to 14.

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

T2.2-12: Evaluation Schedule: Quality Management

Due consideration must be given to the deliverables required to execute and complete the contract as per **Annexure K: TNPA-QUAL-REQ-014.1** - General Quality Requirements for Contractors and Suppliers and **ISO 9001:2015** QMS requirements and should include but not be limited to:

- 1) Quality Policy that is aligned to ISO 9001:2015 requirements.
- 2) Project Quality Plan for the contract SHALL cover project scope and be aligned to **TNPA-QUAL-REQ-014.1**: General Quality Requirements for Contractors and Suppliers.
- 3) The following Quality Control Plans are required to be submitted by the Tenderer:
 - Installation and commissioning of Smart Water Meters
 - Installation and commissioning of Smart Electricity Meters
 - Design and installation of the Operational Technology (OT) Network (i.e. Fiber Optic Network, Wireless Network) and Utility Management Software.

Refer to:

Annexure C: OT Standard-V1.0_2025-04-30 Approved By GCIO

Annexure D: Project Specification Fiber Cables 08-2025

Annexure L: Cybersecurity and Network Security Requirements

These Quality Control Plans shall clearly identify the sequence of activities, all inspection, test and verification requirements to meet contractual obligations, specifications and drawings as required by the project scope.

Index of documentation attached to this schedule

	DOCUMENT NAME
1	
2	
3	
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The scoring will be as follows:

Points	Quality Policy Policy Elements:	Project Quality Plan for the contract Key requirements of the Project Quality Plan	Quality Control Plan (QCP's)
	- is appropriate to the purpose and context of the organization. - provides a framework for setting quality objectives. - includes a commitment to satisfy applicable requirements. - includes a commitment to continual improvement - is communicated and understood within the organization.	- Scope of works - Control of documented information - Resources - Audits - Control	- Installation and commissioning of Smart Water Meters [1] - Installation and commissioning of Smart Electricity Meters [1] - Design and installation of the Operational Technology (OT) Network (i.e. Fiber Optic Network, Wireless Network) and Utility Management Software [1]
6	1	2	3
Score (0)	No Quality policy submitted/Policy submitted but does not address any of the 5 key requirements.	No PQP submitted/PQP submitted but does not address any of the 5 key requirements.	No QCP's submitted/QCP's submitted but do not address any of the 5 key requirements.
Score (20)	Quality Policy contains 1 of the 5 key policy elements: - is appropriate to the purpose and context of the organization. - provides a framework for setting quality objectives. - includes a commitment to satisfy applicable requirements.	Project Quality Plan contains 1 of the 5 PQP requirements: - Scope of works - Control of documented information - Resources - Audits - Control of nonconforming outputs	Quality Control Plan contains 1 of the 5 QCP requirements. - Sequence of activities - Procedure/Code specifications - Intervention Points - Field inspection checklist - Relevant signatories

	4. includes a commitment to continual improvement. 5. is communicated and understood within the organization.		
Score 40	Quality Policy contains 2 of the 5 key policy elements: 1. is appropriate to the purpose and context of the organization. 2. provides a framework for setting quality objectives. 3. includes a commitment to satisfy applicable requirements. 4. includes a commitment to continual improvement. 5. is communicated and understood within the organization.	Project Quality Plan contains 2 of the 5 PQP requirements: 1. Scope of works 2. Control of documented information 3. Resources 4. Audits 5. Control of nonconforming outputs	Quality Control Plan contains 2 of the 5 QCP requirements. 1. Sequence of activities 2. Procedure/Code specifications 3. Intervention Points 4. Field inspection checklist 5. Relevant signatories
Score 60	Quality Policy contains 3 of the 5 key policy elements: 1. is appropriate to the purpose and context of the organization. 2. provides a framework for setting quality objectives. 3. includes a commitment to satisfy applicable requirements. 4. includes a commitment to continual improvement.	Project Quality Plan contains 3 of the 5 PQP requirements: 1. Scope of works 2. Control of documented information 3. Resources 4. Audits 5. Control of nonconforming outputs	Quality Control Plan contains 3 of the 5 QCP requirements. 1. Sequence of activities 2. Procedure/Code specifications 3. Intervention Points 4. Field inspection checklist 5. Relevant signatories

	5. is communicated and understood within the organization.		
Score 80	Quality Policy contains 4 of the 5 key policy elements: 1. is appropriate to the purpose and context of the organization. 2. provides a framework for setting quality objectives. 3. includes a commitment to satisfy applicable requirements. 4. includes a commitment to continual improvement. 5. is communicated and understood within the organization.	Project Quality Plan contains 4 of the 5 PQP requirements: 1. Scope of works 2. Control of documented information 3. Resources 4. Audits 5. Control of nonconforming outputs	Quality Control Plan contains 4 of the 5 QCP requirements. 1. Sequence of activities 2. Procedure/Code specifications 3. Intervention Points 4. Field inspection checklist 5. Relevant signatories
Score 100	Quality Policy contains all 5 key policy elements: 1. is appropriate to the purpose and context of the organization. 2. provides framework for setting quality objectives. 3. includes a commitment to satisfy applicable requirements. 4. includes a commitment to continual improvement.	Project Quality Plan contains all 5 of the PQP requirements: 1. Scope of works 2. Control of documented information 3. Resources 4. Audits 5. Control of nonconforming outputs	Quality Control Plan contains all 5 of the QCP requirements. 1. Sequence of activities 2. Procedure/Code specifications 3. Intervention Points 4. Field inspection checklist 5. Relevant signatories

	5. is communicated and understood within the organization.		

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 _____

Tender _____



T2.2-13: 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



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.



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 capitals) and capacity

TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2025/02/0002/89478/RFP

DESCRIPTION OF THE WORKS: SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS.

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

T2.2-14: 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		
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T2.2-15 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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Part T2: Returnable Schedules

T2.2-16: Risk Elements

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]

T2.2-18: 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*.

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 NEC 3 ECC 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
% 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
	☐	☐	☐	☐	☐	☐		☐

Tenderers to indicate their Site establishment area requirements:

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is a vertical margin line on the left side, creating a narrow left margin. The paper appears to be from a notebook or a standard ruled document.

T2.2-20: JOB-CREATION SCHEDULE

The Government has identified State Owned Enterprises sourcing activities as a key enabler to achieve the National Development Plan (NDP) objective of reducing unemployment from the current baseline of 28% to 6%.

In order to give effect to these job creation objectives, Tenderers are required to provide the following undertaking of new jobs that will be created (either by them or by their subcontractors) should they be awarded this tender.

Tenderers to note, that if successful, any deviations from the Job creation Schedule in the contract phase will be subject to acceptance by the *Project Manager* in terms of the Conditions of Contract. Please also note the applicable Z clauses in Contract Data by *Employer*.

(a) Please indicate total number of new jobs that will be created over the term of the contract:

Total number and value of new jobs created	Total number of new jobs	Total rand value of new jobs created

(b) Of the total number of new jobs created, please indicate the number and value of new jobs to be created for the following designated groups:

	Total number of new jobs	Total rand value of new jobs
Black men		
Black women		
Black Youth		
Black people living in rural or underdeveloped areas or townships		
Black People with Disabilities		

(c) Of the total number of new jobs created, please indicate the number of skilled, semi-skilled and unskilled new jobs that will be created over the term of the contract:

	Total number of Skilled jobs	Total number of Semi- skilled jobs	Total number of Unskilled jobs
Black men			
Black women			
Black Youth			
Black people living in rural or underdeveloped areas or townships			
Black People with Disabilities			
Other			

(d) Please indicate the number of new jobs to be created, broken down per quarter over the term of the contract.

Year 1	Q1	Q2	Q3	Q4
Total number of new jobs				
Number of new jobs for Black men				
Number of new jobs for black women				
Number of new jobs for black youth				
Number of new jobs for black people living in rural or underdeveloped areas or townships				
Number of new jobs for black People with Disabilities				
Number of new jobs for other categories				
Number of new skilled jobs				
Number of new semi-skilled jobs				
Number of new unskilled jobs				

Year 2	Q1	Q2	Q3	Q4
Total number of new jobs				
Number of new jobs for Black men				
Number of new jobs for black women				
Number of new jobs for black youth				
Number of new jobs for black people living in rural or underdeveloped areas or townships				
Number of new jobs for black People with Disabilities				
Number of new jobs for other categories				
Number of new skilled jobs				
Number of new semi-skilled jobs				
Number of new unskilled jobs				

Year 3	Q1	Q2	Q3	Q4
Total number of new jobs				
Number of new jobs for Black men				
Number of new jobs for black women				
Number of new jobs for black youth				
Number of new jobs for black people living in rural or underdeveloped areas or townships				
Number of new jobs for black People with Disabilities				
Number of new jobs for other categories				
Number of new skilled jobs				
Number of new semi-skilled jobs				
Number of new unskilled jobs				



T2.2-27: CIDB Standard for Contract Skills Development Goals

The contractor shall achieve, in the performance of the contract, the Contract Skills Development Goal (CSDG) established in the CIDB Standard for Developing Skills through Infrastructure Contracts, published in Gazette Notice No.43495 of 3 July 2020.

This standard is applicable to a contract, or an order issued in terms of a framework that has a duration of 12 months or more and a contract amount exceeding R20 million in the case of an engineering and construction works, or design and build contract or an order issued in terms of such contract. The Standard is applicable to all CIDB Classes of Works.

This standard establishes a minimum contract skills development goal to be achieved in the performance of a contract in relation to the provision of different types of workplace opportunities, linked to work associated with a contract culminating in or leading to:

- a) a part or full occupational qualification registered on the National Qualification Framework;
- b) a trade qualification leading to a listed trade (GG No. 35625, 31 August 2012)
- c) a national diploma registered on the National Qualification Framework; and
- d) registration in a professional category by one of the professional bodies listed in the standard

The standard is obtainable from the CIDB's website www.cidb.org.za

The following construction skills development goals (%) for different classes of engineering and construction works contracts will apply:

Class of construction works as identified in terms of the cidb regulation		Construction skills development goal (%)
Designation	Description	
CE	Civil Engineering	0.25
CE and GB	Civil Engineering and General Building	0.375
EB	Electrical Engineering work (buildings)	0.25
EP	Electrical Engineering works (infrastructure)	0.25
GB	General Building	0.5
ME	Mechanical Engineering	0.25
	Specialist works	0.25

In the case of the Standard, there are no returnable documents notwithstanding the Employer shall provide the proforma documents that shall be completed by the contractors after award of the contract within the stipulated period. (Form A1 List of Recognised Skills Development Agencies, Form A2 Baseline Training Plan, Form A3 Project Interim Report, Form A4 Supervisor Agreement, Form A5 Project Completion Report)

NB: The forms referred to above will be shared with the Contractor after award

T2.2-22 Health and Safety Cost Breakdown

Tenderer (Company)	Responsible Person	Designation	Date
Project/Tender Title	Project/Tender No.	Project Location / Description	

#	Cost element	Unit Cost (R)	# of Units	Total Cost (R)
1.	Human Resources			
2.	Systems Documentation			
3.	Meetings & Administration			
4.	H&S Training			
5.	PPE & Safety Equipment			
6.	Signage & Barricading			
7.	Workplace Facilities			
8.	Emergency & Rescue Measures			
9.	Hygiene Surveys & Monitoring			
10.	Medical Surveillance			
11.	Safe Transport of Workers			
12.	HazMat Management (e.g. asbestos /silica)			
13.	Substance Abuse Testing (3 kits @R500 pm)			
14.	H&S Reward & Recognition			

Total Health and Safety Estimate (R)	
Total Estimate Value (R)	
H&S Cost as % of Tender value	

T2.2-23: 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 6.1 must be completed for each tender and be attached as a tender requirement.

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 the 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	_____

Bidder's Declaration

SBD 4

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 interest¹ 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 State institution

¹ 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.

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 consortium² 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.

3.5 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.

² 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.

3.6 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.

3.7 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

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 either exceed not exceed R50 000 000 (all applicable taxes included) and therefore either the 80/20 or 90/10 preference point system will apply. 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	POINTS
PRICE	80	90
B-BBEE STATUS LEVEL OF CONTRIBUTOR Level 1 or 2	08	04
The promotion of supplier development through subcontracting for a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs black-owned	12	06

	POINTS	POINTS
Total points for Price and B-BBEE must not exceed	100	100

- 1.5 Failure on the part of a bidder to submit proof of evidence required for any of the specific 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 defines 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 defines 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 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 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20

or

90/10

$$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right) \quad \text{or} \quad P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

P_s = Points scored for comparative price of bid under consideration

P_t = Comparative price of bid under consideration

$P_{\min}$ = 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 Level of Contributor level 1 or 2	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
The promotion of supplier development through subcontracting for a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs black-owned	- Sub-contracting agreement(s) and declaration. - Subcontractors CIPC B-BBEE Certificate / Sworn - Affidavit / B-BBEE Certificate as per DTIC guidelines.

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

Enterprise	B-BBEE Certificate, CIPC 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.]
EME³	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 Certificate issued by SANAS accredited verification agency only if the EME is being measured on the QSE scorecard

³ In terms of the Implementation Guide: Preferential Procurement Regulations, 2017, Version 2, paragraph 11.11 provides that in the Transport Sector, EMEs can provide a letter from accounting officer or get verified and be issued with a B-BBEE certificate by SANAS accredited professional or agency as the Transport Sector Code has not been aligned to the generic Codes. EMEs in the Transport Sector are not allowed to provide a sworn affidavit as the generic codes are not applicable to them.

- 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 1 or 2: (maximum of 8 / 4 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***)

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 Supplier/Service provider
- ☐ Other Suppliers/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:

T2.2-24: TENDER 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:

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 Transnet Supply Chain Management (SCM) Complaints and Allegations Office process and will be subject to the Terms of Reference of SCM Complaints and Allegations Office. Transnet Supply Chain SCM Complaints and Allegations Office 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 SCM Complaints and Allegations Office without having to follow a formal court process to have such award or decision set aside.

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

IMPORTANT NOTICE TO TENDERERS

- Transnet established the SCM Complaints and Allegations Office to investigate any material complaint in respect of any tenders regardless of the value. Should a Tenderer have any material concern regarding a tender process, a complaint may be lodged with Transnet SCM Complaints and Allegations Office for further investigation.
- It is incumbent on the Tenderer to familiarise himself/herself with the Terms of Reference for the Transnet SCM Complaints and Allegations Office, details of which are available for review at Transnet's website www.transnet.net.
- An official complaint form which will be shared upon receipt of a complaint should be completed and submitted, together with any supporting documentation, to groupscmcomplaints@transnet.net
- 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 bidder on its List of Excluded Tenderers.

T2.2-25 NON-DISCLOSURE AGREEMENT

[..... 2026]

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

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, 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.
- 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.
- 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.

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	_____		

T2.2-26: 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____

SIGNATURE OF TENDER

T2.2-27 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 Tender. 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:
 - 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

T2.2-28 Service Provider Integrity Pact

Important Note: All potential tenderers must read this document and certify in the Tender Declaration Form that that 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")

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.



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- 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:



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- 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



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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 TENDER; 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.



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- 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.



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- 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:



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- 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.

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

T2.2-29: 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:
 - 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.
- 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.

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

T2.2-30 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(Pty) Ltd 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.

- 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 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.

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: _____

..... (Pty) Ltd

(Operator)

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

AS WITNESSES:

1. Name: _____ Signature: _____

2. Name: _____ Signature: _____

T2.2-31 SUPPLIER DECLARATION FORM

Transnet Vendor Management has received a request to load / change your company details onto the Transnet vendor master database. Please return the completed Supplier Declaration Form (SDF) together with the required supporting documents as per Appendix A to the Transnet Official who is intending to procure your company's services / products, to enable us to process this request. Please only submit the documentation relevant to your request.

Please Note: all organisations, institutions and individuals who wish to provide goods and/or services to organs of the State must be registered on the National Treasury's Central Supplier Database (CSD). This needs to be done via their portal at <https://secure.csd.gov.za/> **before applying to Transnet.**

General Terms and Conditions:

Please Note: Failure to submit the relevant documentation will delay the vendor creation / change process.

Where applicable, the respective Transnet Operating Division processing your application may request further or additional information from your company.

The Service Provider warrants that the details of its bank account ("the nominated account") provided herein, are correct and acknowledges that payments due to the Supplier will be made into the nominated account. If details of the nominated account should change, the Service Provider must notify Transnet in writing of such change, failing which any payments made by Transnet into the nominated account will constitute a full discharge of the indebtedness of Transnet to the Supplier in respect of the payment so made. Transnet will incur no liability for any payments made to the incorrect account or any costs associated therewith. In such an event, the Service Provider indemnifies and holds Transnet harmless in respect of any payments made to an incorrect bank account and will, on demand, pay Transnet any costs associated herewith.

Transnet expects its suppliers to timeously renew their Tax Clearance and B-BBEE certificates (Large Enterprises and QSEs less than 51% black owned) as well as sworn affidavits in the case of EMEs and QSEs with more than 51% black ownership as per Appendices C and D.

In addition, please take note of the following very important information:

1. If your annual turnover is R10 million or less, then in terms of the DTI Generic Codes of Good Practice, you are classified as an Exempted Micro Enterprise (EME). If your company is classified as an EME, please include in your submission a sworn affidavit confirming your company's most recent annual turnover is less than R10 million and percentage of black ownership and black female ownership in the company (Appendix C) OR B-BBEE certificate issued by a verification agency accredited by SANAS in terms of the EME scorecard should you feel you will be able to attain a better B-BBEE score. It is only in this context that an EME may submit a B-BBEE verification certificate. These EME sworn affidavits must be accepted by the . Government introduced this mechanism specifically to reduce the cost of doing business and regulatory burden for these entities and the template for the sworn affidavit is available at no cost on the website www.thedti.gov.za or EME certificates at CIPC from www.cipic.co.za.

The B-BBEE Commission said "that only time an EME can be verified by a SANAS accredited verification professional is when it wishes to maximise its B-BBEE points and move to a higher B-BBEE recognition level, and that must be done use the QSE Scorecard".

2. If your annual turnover is between R10 million and R50 million, then in terms of the DTI codes, you are classified as a Qualifying Small Enterprise (QSE). A QSE which is at least 51% black owned, is required to submit a sworn affidavit confirming their annual total revenue of between R10 million and R50 million and level of black ownership (Appendix D). QSE 'that does not qualify for 51% of black ownership, are required to submit a B-BBEE verification certificate issued by a verification agency accredited by SANAS their QSEs are required to submit a B-BBEE verification certificate issued by a verification agency accredited by SANAS.

Please Note: B-BBEE certificate and detailed scorecard should be obtained from an accredited rating agency (e.g. SANAS Member).

3. If your annual turnover exceeds R50 million, then in terms of the DTI codes, you are classified as a Large Enterprise. Large Enterprises are required to submit a B-BBEE level verification certificate issued by a verification agency accredited by SANAS.

Please Note: B-BBEE certificate and detailed scorecard should be obtained from an accredited rating agency (e.g. SANAS Member).

4. The supplier to furnish proof to the procurement department as required in the Fourth Schedule of the Income Tax Act. 58 of 1962 whether a supplier of service is to be classified as an "employee", "personal service provider" or "labour broker". Failure to do so will result in the supplier being subject to employee's tax.

5. No payments can be made to a vendor until the vendor has been registered / updated, and no vendor can be registered / updated until the vendor application form, together with its supporting documentation, has been received and processed. No payments can be made to a vendor until the vendor has met / comply with the procurement requirements.

6. It is in line with PPPFA Regulations, only valid B-BBEE status level certificate issued by an unauthorised body or person OR a sworn affidavit as prescribed by the B-BBEE Codes of Good Practice, OR any other requirement prescribed in terms of the Broad- Based Black Economic Empowerment Act.

7. The B-BBEE Commission advises entities and organs of state to reject B-BBEE certificates that have been issues by verification agencies or professionals who are not accredited by South African National Accreditation Systems ("SANAS) as such B-BBEE certificates are invalid for lack of authority and mandate to issue them. A list of SANAS Accredited agencies is available on the SANAS website at www.sanas.co.za.

8. Presenting banking details. Please note: Banks have decided to enable the customers and provide the ability for customers to generate Account Confirmation/Bank Account letters via their online platform; this is a digital approach to the authentication of banking details.

SUPPLIER DECLARATION FORM

Supplier Declaration Form

Important Notice: all organisations, institutions and individuals who wish to provide goods and/or services to organs of the State must be registered on the National Treasury Central Supplier Database (CSD). This needs to be done via their portal at <https://secure.csd.gov.za/> **before applying to Transnet.**

CSD Number (MAAA xxxxxxxx):

Company Trading Name						
Company Registered Name						
Company Registration No Or ID No If a Sole Proprietor						
Company Income Tax Number						
Form of Entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
	Non-profit (NPO's or NPC)	Personal Liability Co	State Owned Co	National Govt	Provincial Govt	Local Govt
	Educational Institution	Specialised Profession	Financial Institution	Joint Venture	Foreign International	Foreign Branch Office

Did your company previously operate under another name?					Yes	No
If YES state the previous details below:						
Trading Name						
Registered Name						
Company Registration No Or ID No If a Sole Proprietor						
Form of Entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
	Non-profit (NPO's or NPC)	Personal Liability Co	State Owned Co	National Govt	Provincial Govt	Local Govt
	Educational Institution	Specialised Profession	Financial Institution	Joint Venture	Foreign International	Foreign Branch Office

Your Current Company's VAT Registration Status	
VAT Registration Number	
If Exempted from VAT registration , state reason and submit proof from SARS in confirming the exemption status	

If your business entity is not VAT Registered, please submit a current original sworn affidavit (see example in Appendix I). Your Non VAT Registration must be confirmed annually.

Company Banking Details		Bank Name	
Universal Branch Code		Bank Account Number	

Company Physical Address		Code	
Company Postal Address		Code	
Company Telephone number			
Company Fax Number			
Company E-Mail Address			
Company Website Address			

Company Contact Person Name	
Designation	
Telephone	
Email	

Is your company a Labour Broker?	Yes		No	
Main Product / Service Supplied e.g. Stationery / Consulting / Labour etc.				
How many personnel does the business employ?	Full Time		Part Time	
Please Note: Should your business employ more than 2 full time employees who are not connected persons as defined in the Income Tax Act, please submit a sworn affidavit, as per Appendix II.				

Most recent Financial Year's Annual Turnover	<R10Million EME		>R10Million <R50Million QSE		>R50Million Large Enterprise	

Does your company have a valid proof of B-BBEE status?						Yes		No			
Please indicate your Broad-Based BEE status (Level 1 to 9)			1	2	3	4	5	6	7	8	9
Majority Race of Ownership											
% Black Ownership		% Black Women Ownership		% Black Disabled person(s) Ownership				% Black Youth Ownership			
% Black Unemployed		% Black People Living in Rural Areas		% Black Military Veterans							
Please Note: Please provide proof of B-BBEE status as per Appendix C and D:											

- Large Enterprise and QSEs with less than 51% black ownership need to obtain a B-BBEE certificate and detailed scorecard from an accredited rating agency;
- EMEs and QSEs with at least 51% black ownership may provide an affidavit using the templates provided in Appendix C and D respectively;
- Black Disabled person(s) ownership will only be accepted if accompanied with a certified letter signed by a physician on the physician's letterhead confirming the disability;
- A certified South African identification document will be required for all Black Youth Ownership.

Supplier Development Information Required			
EMPOWERING SUPPLIER An Empowering Supplier is a B-BBEE compliant Entity which complies with at least three criteria if it is a large Entity, or one criterion if it is a Qualifying Small Enterprise ("QSE"), as detailed in Statement 400 of the New Codes. In terms of the requirements of an Empowering Supplier, numerous companies found it challenging to meet the target of 25% transformation of raw materials or beneficiation including local manufacturing, particularly so, if these companies imported goods or products from offshore. The matter was further compounded by the requirement for 25% of Cost of Sales, excluding labour cost and depreciation, to be procured from local producers or suppliers.	YES	☐	NO ☐
FIRST TIME SUPPLIER A supplier that we haven't as yet Traded within Transnet and will be registered via our database for the 1 st time.	YES	☐	NO ☐
SUPPLIER DEVELOPMENT PLAN Supplier Development Plan is a plan that when we as Transnet award a supplier a long term contract depending on the complexity of the Transaction. We will negotiate supplier development obligations that they must meet throughout the contract duration. e.g. we might request that they (create jobs or do skills development or encourage procurement from designated groups. (BWO, BYO & BDO etc.).	YES	☐	NO ☐
DEVELOPMENT PLAN DOCUMENT Agreed plan that will be crafted with the supplier in regard to their development (It could be for ED OR SD in terms of their developmental needs they may require with the company.	YES	☐	NO ☐
ENTERPRISE DEVELOPMENT BENEFICIARY A supplier that is not as yet in our value chain that we are assisting in their developmental area.	YES	☐	NO ☐

SUPPLIER DEVELOPMENT BENEFICIARY A supplier that we are already doing business with or transacting with and we are also assisting them in their developmental area e.g. (They might require training or financial assistance etc.)	YES ☐ NO ☐
GRADUATION FROM ED TO SD BENEFICIARY When a supplier that we assisted with as an ED beneficiary then gets awarded a business and we start Transacting with.	YES ☐ NO ☐
ENTERPRISE DEVELOPMENT RECIPIENT A supplier that isn't in our value chain as yet but we have assisted them with an ED intervention	YES ☐ NO ☐

By signing below, I hereby verify that I am duly authorised to sign for and on behalf of firm / organisation and that all information contained herein and attached herewith are true and correct			
Name and Surname		Designation	
Signature		Date	

APPENDIX B

Affidavit or Solemn Declaration as to VAT registration status

Affidavit or Solemn Declaration

I, _____ solemnly swear/declare
that _____ is not a registered VAT
vendor and is not required to register as a VAT vendor because the combined value of taxable supplies
made by the provider in any 12 month period has not exceeded or is not expected to exceed R1million
threshold, as required in terms of the Value Added Tax Act.

Signature: _____

Designation: _____

Date: _____

Commissioner of Oaths

Thus signed and sworn to before me at _____ on this the _____
day of _____ 20_____,

the Deponent having knowledge that he/she knows and understands the contents of this Affidavit,
and that he/she has no objection to taking the prescribed oath, which he/she regards binding on
his/her conscience and that the allegations herein contained are all true and correct.

Commissioner of Oaths

APPENDIX C

SWORN AFFIDAVIT – B-BBEE QUALIFYING SMALL ENTERPRISE – GENERAL

I, the undersigned,

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.
2. I am a Member / Director / Owner of the following enterprise and am duly authorised to act on its behalf:

Enterprise Name:	
Trading Name (If Applicable):	
Registration Number:	
Enterprise Physical Address:	
Type of Entity (CC, (Pty) Ltd, Sole Prop etc.):	
Nature of Business:	
Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds and Indians – (a) who are citizens of the Republic of South Africa by birth or descent; or (b) who became citizens of the Republic of South Africa by naturalisation- i. before 27 April 1994; or ii. on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date;"
Definition of "Black"	Black Designated Groups means:

Designated Groups"	(a) unemployed black people not attending and not required by law to attend an educational institution and not awaiting admission to an educational institution; (b) Black people who are youth as defined in the National Youth Commission Act of 1996; (c) Black people who are persons with disabilities as defined in the Code of Good Practice on employment of people with disabilities issued under the Employment Equity Act; (d) Black people living in rural and under developed areas; (e) Black military veterans who qualifies to be called a military veteran in terms of the Military Veterans Act 18 of 2011;"

3. I hereby declare under Oath that:

- The Enterprise is _____% Black Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Female Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Designated Group Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- Black Designated Group Owned % Breakdown as per the definition stated above:
- Black Youth % = _____%
- Black Disabled % = _____%
- Black Unemployed % = _____%
- Black People living in Rural areas % = _____%
- Black Military Veterans % = _____%
- Based on the Financial Statements/Management Accounts and other information available on the latest financial year-end of _____, the annual Total Revenue was between R10,000,000.00 (Ten Million Rands) and R50,000,000.00 (Fifty Million Rands),
- Please confirm on the table below the B-BBEE level contributor, **by ticking the applicable box.**

100% Black Owned	Level One (135% B-BBEE procurement recognition level)	
At Least 51% black owned	Level Two (125% B-BBEE procurement recognition level)	

4. I know and understand the contents of this affidavit and I have no objection to take the prescribed oath and consider the oath binding on my conscience and on the owners of the enterprise which I represent in this matter.

5. The sworn affidavit will be valid for a period of 12 months from the date signed by commissioner.

Deponent Signature

Date

Commissioner of Oaths

Signature & stamp

APPENDIX D

SWORN AFFIDAVIT – B-BBEE EXEMPTED MICRO ENTERPRISE – GENERAL

I, the undersigned,

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.
2. I am a Member / Director / Owner of the following enterprise and am duly authorised to act on its behalf:

Enterprise Name:	
Trading Name (If Applicable):	
Registration Number:	
Enterprise Physical Address:	
Type of Entity (CC, (Pty) Ltd, Sole Prop etc.):	
Nature of Business:	
Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds and Indians – (a) who are citizens of the Republic of South Africa by birth or descent; or (b) who became citizens of the Republic of South Africa by naturalisation-

	i. before 27 April 1994; or ii. on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date;”
Definition of “Black Designated Groups”	“Black Designated Groups means: (a) unemployed black people not attending and not required by law to attend an educational institution and not awaiting admission to an educational institution; (b) Black people who are youth as defined in the National Youth Commission Act of 1996; (c) Black people who are persons with disabilities as defined in the Code of Good Practice on employment of people with disabilities issued under the Employment Equity Act; (d) Black people living in rural and underdeveloped areas; (e) Black military veterans who qualifies to be called a military veteran in terms of the Military Veterans Act 18 of 2011;”

3. I hereby declare under Oath that:

- The Enterprise is _____% Black Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Female Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Designated Group Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- Black Designated Group Owned % Breakdown as per the definition stated above:
- Black Youth % = _____%
- Black Disabled % = _____%
- Black Unemployed % = _____%
- Black People living in Rural areas % = _____%
- Black Military Veterans % = _____%

- Based on the Financial Statements/Management Accounts and other information available on the latest financial year-end of _____, the annual Total Revenue was R10,000,000.00 (Ten Million Rands) or less
- Please Confirm on the below table the B-BBEE Level Contributor, **by ticking the applicable box.**

100% Black Owned	Level One (135% B-BBEE procurement recognition)	
At least 51% Black Owned	Level Two (125% B-BBEE procurement recognition level)	
Less than 51% Black Owned	Level Four (100% B-BBEE procurement recognition level)	

4. I know and understand the contents of this affidavit and I have no objection to take the prescribed oath and consider the oath binding on my conscience and on the Owners of the Enterprise which I represent in this matter.

5. The sworn affidavit will be valid for a period of 12 months from the date signed by commissioner.

Deponent Signature

Date

Commissioner of Oaths

Signature & stamp

VENDOR REGISTRATION DOCUMENTS CHECKLIST

Please note that you will have to provide the first two documents on the list (highlighted in red) and the rest will be provided by the supplier:

	Yes	No
1. Complete the "Supplier Declaration Form" (SDF) (commissioned). See attachment.		
2. Complete the "Supplier Code of Conduct" (SCC). See attachment.		
3. Copy of cancelled cheque OR letter from the bank verifying banking details (with bank stamp not older than 3 Months & sign by Bank Teller).		
4. Certified (Not Older than 3 Months) copy of Identity document of Shareholders/Directors/Members (where applicable).		
5. Certified copy of certificate of incorporation, CM29 / CM9 (name change).		
6. Certified copy of share Certificates of Shareholders, CK1 / CK2 (if CC).		
7. A letter with the company's letterhead confirming both Physical and Postal address.		
8. Original or certified copy of SARS Tax Clearance certificate and Vat registration certificate.		
9. BBBEE certificate and detailed scorecard from a SANAS Accredited Verification Agency and/or Sworn Certified Affidavit.		
10. Central Supplier Database (CSD) Summary Registration Report.		

T2.2-32: Domestic prominent influential persons (DPIP) or foreign prominent public officials (FPPO)

Transnet is free to procure the services of any person within or outside the Republic of South Africa in accordance with applicable legislation. Transnet shall not conduct or conclude business transactions, with any Respondents without having:

- Considered relevant governance protocols;
- Determined the DPIP or FPPO status of that counterparty; and
- Conducted a risk assessment and due diligence to assess the potential risks that may be posed by the business relationship.

As per the Transnet Domestic Prominent Influential Persons (DPIP) and Foreign Prominent Public Officials (FPPO) and Related Individuals Policy available on Transnet website <https://www.transnet.net/search/pages/results.aspx?k=FPIDP#k=DPIP>, Respondents are required to disclose any commercial relationship with a DPIP or FPPO (as defined in the Policy) by completing the following section:

The below form contains personal information as defined in the Protection of Personal Information Act, 2013 (the "Act"). By completing the form, the signatory consents to the processing of her/his personal information in accordance with the requirements of the Act. Consent cannot unreasonably be withheld.

Is the Respondent
(Complete with a "Yes" or "No")

A		Closely Related to a		Closely Associated to a	
DPIP/FPPO		DPIP/FPPO		DPIP/FPPO	

List all known business interests, in which a DPIP/FPPO may have a direct/indirect interest or significant participation or involvement.

	Name of Entity / Business	Role in the Entity / Business (Nature of interest/ Participation)	Shareholding %	Registration Number	Status (Mark the applicable option with an X)	
						Non-Active

Respondents declaring a commercial relationship with a DPIP or FPPO are to note that Transnet is required to annually publish on its website a list of all business contracts entered into with DPIP or FPPO. This list will include successful Respondents, if applicable.

T2.2-33: 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.			
Insurance in respect of loss of or damage to own property and equipment.			
(Other)			

T2.2-34: Form of Intent to Provide a Performance Guarantee

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



T2.2-35: 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:

T2.2-36: 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 AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS

The tenderer, identified in the Offer signature block, has 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.

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)

Name &
signature of
witness

Date

Tenderer's CIDB registration number:

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).

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

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	_____	_____

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	
		X1: Price adjustment for inflation
		X2: Changes in the law
		X5: Sectional Completion
		X7: Delay damages
		X13: Performance Bond
		X16: Retention
		X18: Limitation of liability
		Z: <i>Additional conditions of contract</i>
	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 National Ports Authority 237 Mahatma Gandhi Road Queen Warehouse Durban 4001
10.1	The <i>Project Manager</i> is:	Sphelele Ngcobo
	Address	Transnet National Ports Authority 237 Mahatma Gandhi Road 1st Floor Queen Warehouse Durban 4001
	Tel	(031) 361 8828
	e-mail	Sphelele.Ngcobo@transnet.net
10.1	The <i>Supervisor</i> is:	To be Confirmed
	Address	Transnet National Port Authority XXXXXXXXXXXXX XXXXXXX XXXXX XXX
	Tel No.	
	e-mail	
11.2(13)	The <i>works</i> are	Supply and Installation of Smart Water and Electricity Meters with a Software Solution (Utilities Management) Across the Eight Ports

11.2(14)	The following matters will be included in the Risk Register	1. Working in an operational area. 2. Dealing with asbestos contamination including working on old asbestos cement pipe. 3. Working in substations housing "Live" electrical equipment. 4. Traffic Congestion. 5. Unforeseen damage to existing unknown underground services. 6. Working in confined spaces including existing tunnelling, chambers, etc. 7. Loss of data and disruption on existing billing systems while migrating to the new Utilities Management Software. 8. Occupation constraints on various "Live" metering (water and electricity) points. 9. Limited downtime for installation on various metering points due to disruption to operations.
11.2(15)	The <i>boundaries of the site</i> are	As stated in Part C4.1." Description of the Site and its 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	Two (02) 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	
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	29 May 2030

11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	Condition to be met	key date																		
		1 Submission of all documents required for application of construction work permit & documents required to be accepted by the <i>Project Manager</i> in accordance with the Works Information to ensure site access certificate can be issued	Within six (06) weeks of contract start date																		
		2 Handover of all closeout documentation associated with the Completion of the <i>works</i> and acceptance of same by the <i>Project Manager</i>.	Two 2 weeks after to completion date																		
30.1	The <i>access dates</i> are	<table><tr><th>Part of the Site</th><th>Date</th></tr><tr><td>1 Port of Richards</td><td>25 February 2027</td></tr><tr><td>2 Port of Port Elizabeth</td><td>25 February 2027</td></tr><tr><td>3 Port of Cape Town</td><td>25 February 2027</td></tr><tr><td>4 Port of Durban</td><td>07 January 2028</td></tr><tr><td>5 Port of East London</td><td>07 January 2028</td></tr><tr><td>6 Port of Saldanha</td><td>07 January 2028</td></tr><tr><td>7 Port of Ngqura</td><td>30 November 2028</td></tr><tr><td>8 Port of Mossel Bay</td><td>30 November 2028</td></tr></table>	Part of the Site	Date	1 Port of Richards	25 February 2027	2 Port of Port Elizabeth	25 February 2027	3 Port of Cape Town	25 February 2027	4 Port of Durban	07 January 2028	5 Port of East London	07 January 2028	6 Port of Saldanha	07 January 2028	7 Port of Ngqura	30 November 2028	8 Port of Mossel Bay	30 November 2028	
Part of the Site	Date																				
1 Port of Richards	25 February 2027																				
2 Port of Port Elizabeth	25 February 2027																				
3 Port of Cape Town	25 February 2027																				
4 Port of Durban	07 January 2028																				
5 Port of East London	07 January 2028																				
6 Port of Saldanha	07 January 2028																				
7 Port of Ngqura	30 November 2028																				
8 Port of Mossel Bay	30 November 2028																				
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	Two (02) weeks of the Contract Date.																			
31.2	The <i>starting date</i> is	11 November 2026																			

32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	Two (02) weeks.
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.	01 May 2030
4	Testing and Defects	
42.2	The <i>defects date</i> is	Fifty-two (52) weeks after Completion of the whole of the <i>works</i>.
43.2	The <i>defect correction period</i> is	Two (02) weeks.
5	Payment	
50.1	The <i>assessment interval</i> is monthly on the	Twenty fifth (25th) day of each successive month.
51.1	The <i>currency of this contract</i> is the	South African Rand.
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 Rand Merchant Bank
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 place where weather is to be recorded (on the Site) is:	The <i>Contractor's</i> Site establishment area

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

Durban, KwaZulu Natal
Richards Bay, KwaZulu Natal
East London, Eastern Cape
Gqeberha, Eastern Cape
Ngqura, Eastern Cape
Mossel Bay, Western Cape
Cape Town, Western Cape
Saldanha Bay, Western Cape

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	None
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.
	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> must comply at a minimum with the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended.
	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.

- 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*.
-

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:	Transnet's' Principal Controlled Insurance policy for Contract .
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.
60.6	The <i>method of measurement</i> is	The Bill of Quantities have been measured in accordance with the Standard System of Measuring Building Work & SANS 1200 unless indicated otherwise.
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)			
	The place where arbitration is to be held is	Durban, KwaZulu Natal, South Africa			
	The person or organisation who will choose an arbitrator	The Chairman of the Association of Arbitrators (Southern Africa)			
	- if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is				
12	Data for secondary Option clauses				
X1	Price adjustment for inflation				
X1.1(a)	The <i>base date</i> for indices is	24 July 2026			
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:	Pro-portion	linked to index for	Index prepared by	
		0.30	Labour (People)	The Consumer Price Index (CPI) for "All Items" in Table 1 (Consumer price indices for the total country) of the Statistical Release P0141 "Consumer Price Index - Additional Tables" published by Statistics South Africa. (Link- http://www.statssa.gov.za/?page_id=1854&PPN=P0141)	

0.05	Plant (Equipment)	The "Plant and Equipment" index in Table 4 (Mining and construction plant and equipment price index) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa. (Link - http://www.statssa.gov.za/?page_id=1854&PPN=P0151.1)
0.20	Material (Civil)	The "Civil Engineering Material - Total" index in Table 6 (Civil engineering material price indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa. (Link - http://www.statssa.gov.za/?page_id=1854&PPN=P0151.1); and

		0.25	Material (Electrical)	The "Electrical Engineering" index in Table 5 (Mechanical and Electrical Engineering Input Price Indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa.
		0.05	Fuel	The "Diesel" index in Table 1 (PPI for final manufactured goods) of the Statistical Release P0142.1 "Producer Price Index" published by Statistics South Africa. (Link - http://www.statssa.gov.za/?page_id=1854&PPN=P0142.1)
		0.15	Non-adjustable	
		1.00		
	*Statistical release P0151 – Contract Price Adjustment Provisions (CPAP) Work Group and Selected Materials Indices			
X2	Changes in the law	No additional data is required for this Option		
X5	Sectional Completion			
X5.1	The <i>completion date</i> for each <i>section</i> of the <i>works</i> is:	Section	Description	Completion date
		1	Port of Richards	07 December 2027

		2	Port of Port Elizabeth	26 January 2028
		3	Port of Cape Town	07 December 2027
		4	Port of Durban	09 August 2028
		5	Port of East London	29 November 2028
		6	Port of Saldanha	20 September 2028
		7	Port of Ngqura	08 August 2029
		8	Port of Mossel Bay	25 July 2029
		9	HQ Central Viewing	01 May 2030
X5 & X7	Sectional Completion and delay damages used together			
X7.1	Delay damages for late			
X5.1	Completion of the <i>sections</i> of the <i>works</i> are:			
		Section	Description	Amount per day
		1	Port of Richards	R 8 000
		2	Port of Port Elizabeth	R 8 000
		3	Port of Cape Town	R 8 000
		4	Port of Durban	R 8 000
		5	Port of East London	R 8 000
		6	Port of Saldanha	R 8 000
		7	Port of Ngqura	R 8 000
		8	Port of Mossel Bay	R 8 000
X7	Delay damages			
X7.1	Delay damages for Completion of the whole of the <i>works</i> are		R 8 000.00 per day	
X13	Performance bond			
X13.1	The amount of the performance bond is		5% of the total of the Prices	
X16	Retention			

X16.1	The retention free amount is	Nil
	The retention percentage is	10% on all payments certified.
X18	Limitation of liability	
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	Nil
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	3 years after Completion of the whole of the <i>works</i>

Z	<i>Additional conditions of contract are:</i>

Z1	Obligations in respect of Job Creation
Z1.1	It will be a material term of this contract that the <i>Contractor</i> must contribute to the <i>Employer's</i> job-creation objectives as set out in Returnable Schedule T2.2 -20.
Z1.2	The <i>Contractor's</i> undertaking as to the number of new jobs created due to the award of this contract as set out in Returnable Schedule T2.2-20 will constitute a binding agreement throughout the duration of the contract until Completion, if not, it will be deemed that the <i>Contractor</i> has failed in full to meet this specific material term of the contract, which may constitute a reason for termination.
Z1.3	The <i>Contractor</i> shall provide to the <i>Employer</i> , on a monthly basis or upon receiving an instruction to do so by the <i>Project Manager</i> , any documentation and/or evidence required by the <i>Employer</i> , which in the <i>Employer's</i> opinion would be necessary to verify whether the <i>Contractor</i> has maintained the job-creation undertaking as stipulated in Returnable Schedule T2.2-20. The <i>Contractor</i> shall provide the said documentation and/or evidence within the period stated or as instructed. The provision of the documentation and/or evidence shall not constitute a compensation event.

**Z2 Additional clause relating to
Performance Bonds and/or
Guarantees**

Z2.1

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 (Forms of Securities), in favour of the *Employer* by a financial institution reasonably acceptable to the *Employer*.

**Z3 Additional clauses relating to
Joint Venture**

Z3.1

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;**
 - 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.

Z3.2

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*.

Z4 Subcontracting Clauses

The Contractor's Subcontracting percentage as detailed in the tender submission Returnable T2.2-18 will constitute a binding agreement throughout the duration of the contract until Completion, if not, it will be deemed that the Contractor has failed in full to meet the material term of the contract, which may constitute a reason for termination.

The Contractor shall report to the Employer on a monthly basis during the term of the Contract, the amounts spent on each sub-contractor.

Insert addition to Clause 26.2. The Contractor may not replace any sub-contractor without acceptance of the Project Manager.

The Project Manager shall before acceptance of a replacement by the Contractor of any sub-contractor as detailed in the tender submission Returnable T2.2-18, obtain representations or input from the initial sub-contractor to make an informed decision as to the proposed replacement.

The sub-contracting arrangement/contract remains between the Contractor and sub-contractor.

The Contractor shall provide the said documentation and/or evidence within the period stated in the instruction. The provision of the documentation and/or evidence shall not constitute a compensation event

Z5	Additional obligations in respect of Termination	
Z5.1		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)
Z5.2	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"
Z5.3		Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."

Z6	Right Reserved by the <i>Employer</i> to Conduct Vetting through SSA	
Z6.1		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.
Z7	Additional Clause Relating to Collusion in the Construction Industry	
Z7.1		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.
Z8	Protection of Personal Information Act	
Z8.1		The <i>Employer</i> and the <i>Contractor</i> 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.

Z9 The first *assessment* interval

Z9.1

In the event that the *Contractor* is not loaded on the vendor data base, the *Project Manager's* first *assessment* of the amount due will be done once the *Contractor* has been successfully loaded as a vendor on the *Employer's* data base following submitting all valid updated documents to the Procurement officer. Therefore, on NEC ECC Clause 50.1 the following text is removed in its entirety "and is no later than the *assessment* interval after the *starting date*."

Z10 Design Work

All design work must be certified by a professional registered with Engineering Council of South Africa (ECSA).

Z11 Key Persons

The Contractor ensures that all personnel as 'Key Persons' in Data Part Two holds and maintain valid professional registration with South African Council for the Project and Construction Management Professions (SACPCMP).

**Z12 CIDB BUILD Standard Contract
Skills Development Goal
(CSDG) & Contract
Participation Goals (CPG)**

Z12.1

The contractor shall achieve in the performance of the contract the Contract Skills Development Goal (CSDG) established in the CIDB Standard for Developing Skills through Infrastructure Contracts, published in Gazette Notice No.43495 of 3 July 2020. The CSDG stipulated for this contract is 0.25%

Z12.2

The contractor shall achieve in the performance of the contract the Contract Participation Goals (CPG) relating to the engagement of targeted enterprises as established in the CIDB Standard for Indirect Targeting for Enterprise Development through Construction works Contracts Gazette Notice No.36190 of 25 February 2013. The CPG stipulated for this contract is 30%. This value is targeting EME's and QSE's, prioritising youth owned entities.

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:	Project Manager
	Responsibilities:	
	Qualifications:	
	Experience:	
	2 Name:	
	Job	Construction Manager (CM 1) - Eastern Region
	Responsibilities:	
	Qualifications:	
	Experience:	

	3 Name:	
	Job	Construction Manager (CM 2) - Central Region
	Responsibilities:	
	Qualifications:	
	Experience:	
	4 Name:	
	Job	Construction Manager (CM 3)) - Western Region
	Responsibilities:	
	Qualifications:	
	Experience:	
	5 Name:	
	Job	Health and Safety Officer (HSO 1) - Eastern Region
	Responsibilities:	
	Qualifications:	
	Experience:	
	6 Name:	
	Job	Health and Safety Officer (HSO 2) - Central Region
	Responsibilities:	
	Qualifications:	
	Experience:	
	7 Name:	
	Job	Health and Safety Officer (HSO 3) - Western Region
	Responsibilities:	
	Qualifications:	

	Experience:	
		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	Part C2: Pricing Schedule
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

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

C1.3 Forms of Securities

Pro forma Performance Guarantee

For use with the NEC3 Engineering & Construction Contract - June 2005 (with amendments June 2006 and April 2013)

The *conditions of contract* stated in the Contract Data Part 1 include the following Secondary Option:

Option X13: Performance bond

The pro forma document for this Guarantee is provided here for convenience but is to be treated as part of the *Works Information*.

The organisation providing the Guarantee does so by copying the pro forma document onto its letterhead without any change to the text or format and completing the required details. The completed document is then given to the *Employer* within the time stated in the contract.

The Performance Bond needs to be issued by an institution that are reasonably acceptable to the *Employer*.

Transnet may choose to not to accept an Issuer. Should the issuer not being accepted, the performance bond needs to be replaced by an issuer that are acceptable to Transnet. Issuers need to be verified for acceptance by Transnet before a performance bond is issued.

Pro-forma Performance Bond (for use with Option X13)

(to be reproduced exactly as shown below on the letterhead of the Surety)

Transnet SOC Ltd
 C/o Transnet National Ports Authority
 Transnet Corporate Centre
 138 Eloff Street
 Braamfontein
 Johannesburg
 2000

Date:

Dear Sirs,

Performance Bond for Contract No. TNPA/2025/02/0002/89478/RFP

With reference to the above numbered contract made or to be made between

Transnet SOC Limited, Registration No. 1990/000900/30 (the *Employer*) and

{Insert registered name and address of the *Contractor*} (the *Contractor*), for

{Insert details of the *works* from the Contract Data} (the *works*).

I/We the undersigned

on behalf of the
 Guarantor

of physical address

and duly authorised thereto do hereby bind ourselves as Guarantor and co-principal debtors in solidum for the due and faithful performance of all the terms and conditions of the Contract by the *Contractor* and for all losses, damages and expenses that may be suffered or incurred by the *Employer* as a result of non-performance of the Contract by the *Contractor*, subject to the following conditions:

1. The terms *Employer*, *Contractor*, *Project Manager*, *works* and Completion Certificate have the meaning as assigned to them by the *conditions of contract* stated in the Contract Data for the aforesaid Contract.
2. We renounce all benefits from the legal exceptions "Benefit of Excussion and Division", "No value received" and all other exceptions which might or could be pleaded against the validity of this bond, with the meaning and effect of which exceptions we declare ourselves to be fully acquainted.
3. The *Employer* has the absolute right to arrange his affairs with the *Contractor* in any manner which the *Employer* deems fit and without being advised thereof the Guarantor shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the Guarantor. Without derogating from the foregoing compromise, extension of the construction period, indulgence, release or variation of the *Contractor's* obligation shall not affect the validity of this performance bond.



TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2025/02/0002/89478/RFP

DESCRIPTION OF WORKS: SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS

4. This bond will lapse on the earlier of
- the date that the Guarantor receives a notice from the *Project Manager* stating that the Completion Certificate for the whole of the *works* has been issued, that all amounts due from the *Contractor* as certified in terms of the contract have been received by the *Employer* and that the *Contractor* has fulfilled all his obligations under the Contract, or
 - the date that the Surety issues a replacement Performance Bond for such lesser or higher amount as may be required by the *Project Manager*.
5. Always provided that this bond will not lapse in the event the Guarantor is notified by the *Project Manager*, (before the dates above), of the *Employer's* intention to institute claims and the particulars thereof, in which event this bond shall remain in force until all such claims are paid and settled.
6. The amount of the bond shall be payable to the *Employer* upon the *Employer's* demand and no later than 7 days following the submission to the Guarantor of a certificate signed by the *Project Manager* stating the amount of the *Employer's* losses, damages and expenses incurred as a result of the non-performance aforesaid. The signed certificate shall be deemed to be conclusive proof of the extent of the *Employer's* loss, damage and expense.
7. Our total liability hereunder shall not exceed the sum of:
- (say) _____
- R _____
8. This Performance Bond is neither negotiable nor transferable and is governed by the laws of the Republic of South Africa, subject to the jurisdiction of the courts of the Republic of South Africa

Signed at _____ on this _____ day of _____ 201_

Signature(s)

Name(s) (printed)

Position in Guarantor company

Signature of Witness(s)

Name(s) (printed)

PART 2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option B	4
C2.2	Bill of Quantities	296

C2.1 Pricing Instructions: Option B**1. The conditions of contract****1.1. CIDB B.U.I.L.D Programme Standards**

The *Contractor* shall provide for Contract Skills Development Goals (CSDG) in accordance with the B.U.I.L.D Programme Standards. The minimum value allocated to CSDG shall not be less than 0.25% of the Contract Amount, expressed in Rand

Transnet has determined a Contract Participation Goal (CPG) of 30% subcontracting for this Contract. The corresponding amount shall be included under Enterprise Development in the Preliminary and General section as a Provisional Sum (Indirect Targeting). The value is determined as the contract value (Excluding VAT, Escalation, Contingencies) of the contract including labour and material to EME's and QSE's targeting youth owned enterprises. This amount is to include all costs associated with the management of all subcontractors associated with the Contract Participation Goal (CPG)

1.2. How the Contract Prices Work and How Progress Payments are Assessed

Clause 11 in NEC3 Engineering and Construction Contract, June 2005 and 2013 (ECC) Option B states:

**Identified
and defined
terms**

11

11.2

(21) The Bill of Quantities is the *bill of quantities* as changed in accordance with this 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 subcontracted 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 would either 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 NEC3 ECC Option B is a re-measurement contract. The Bill of Quantities comprises items measured by quantities and rates together with lump sum items. Value-related items are not used. Time-related items are measured using rates expressed per unit of time

1.3. Guidance before pricing and measuring

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 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 bill. On the other hand, because ECC caters for a number of disciplines in the same contract, including electrical works, a different approach not currently found in local methods of measurement to the Preliminary & General 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.

2. Measurement and payment

2.1. Symbols

The units of measurement described in the Bill of Quantities are metric units abbreviated as follows:

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
Prov sum ¹	provisional sum
PC-sum	prime cost sum
R/only	Rate only
Sum	Lump sum
T	ton (1000kg)
W/day	Work day

¹ Provisional Sums should not be used unless absolutely unavoidable. Rather include specifications and associated bill items for the most likely scope of work, and then change later using the compensation event procedure if necessary. This is because tenderers cannot programme effectively for unknown scopes of work

2.2. General assumptions

- 2.2.1. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance has been made in the quantities for waste.
- 2.2.2. 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.
- 2.2.3. 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.
- 2.2.4. 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.
- 2.2.5. 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.
- 2.2.6. 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.
- 2.2.7. The short descriptions of the items of payment given in the *bill of quantities* are only for the purposes of identifying the items. More detail regarding the extent of the work entailed under each item is provided in the Works Information.

2.3. Amplification of or assumptions about measurement items

For the avoidance of doubt the following is provided to assist in the interpretation of descriptions given in the *method of measurement*. In the event of any ambiguity or inconsistency between the statements in the *method of measurement* and this section, the interpretation given in this section shall be used.

SUMMARY		
BILL	DESCRIPTION	AMOUNT R
	RICHARDS BAY	
	DURBAN	
	EAST LONDON	
	NGQURA	
	PORT ELIZABETH	
	MOSSEL BAY	
	CAPE TOWN	
	SALDANHA	
	SUB -TOTAL 1	
	CIDB B.U.I.L.D PROGRAMME	
	CIDB CONTRACT SKILLS DEVELOPMENT GOALS (CSDG) (0.25% FACTOR X SUB TOTAL 1)	
	ALLOW THE SUM OF 0.2% OF SUB TOTAL 2 FOR THE CIDB BUILD FEE	
	ENTERPRISE DEVELOPMENT	
	SUB -TOTAL 2	
	NET TOTAL OF TENDER CARRIED FORWARD TO FORM OF OFFER	R
Note: Tenderers must incorporate the B.U.I.L.D Participation Fee of 0.2%. Transnet will withhold this percentage and it will be paid directly to CIDB as per the below: "In terms of section 23 (3) of the CIDB Act, Transnet must pay to the CIDB a prescribed percentage of 0.2% of the total tender value..."		

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
1	Enterprise Development (CIDB B.U.I.L.D PROGRAM) Indirect Targeting for Enterprise Development through Construction Works Contracts, Gazette Notice No.36190 of 25 February 2013 (a) Enterprise Development of Targeted Enterprise or JV partners				
1.1	(a.1) Needs Analysis and Enterprise Development Plan per Targeted Enterprise (An amount of R5000 per region)	Item	3	R 5 000,00	R 15 000,00
1.2	(a.2) Monitoring and Interim Reporting per Targeted Enterprise	Per Quarter	12	R 20 000,00	R 240 000,00
1.3	(a.3) Project Completion Report per Targeted Enterprise	Item	3	R 5 000,00	R 15 000,00
1.4	Total Enterprise Development (Items 1.1–1.3)	Provisional Sum	1	R 270 000,00	R 270 000,00
2	Contract Participation Goal (CPG) in relation to Subcontracting / Supplier Development of Targeted Enterprises as a Condition of Tender to be In Accordance With Indirect Targeting for Enterprise Development through Construction Works Contracts, Gazette Notice No.36190 of 25 February 2013 It is required that the contractor shall achieve a CPG of 30% (by value) via sub-contracting. The value is determined as the contract value (Excluding VAT, Escalation, Contingencies) of the contract including labour and material to EME's and QSE's. This amount is to include all costs associated with the management of all subcontractors associated with the Contract Participation Goal (CPG)	Compliance Requirement			
	CARRIED FORWARD TO SUMMARY				

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
A	PORT OF RICHARDS BAY				
	<u>PREAMBLES</u>				
	Fixed preliminary items will be valuated and paid on a proven cost basis up to the total value The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made				
1	FIXED-CHARGE ITEMS				
	<u>Contractual Requirements</u>				
1.1	Contractual Requirements: Allow for all contractual obligations in accordance with the NEC3 Engineering and Construction Contract (ECC), including the provision and maintenance of all required performance securities, guarantees, insurances, bonds, warranties, and statutory compliance for the full duration of the Contract.	sum	1		
	Establishment of Facilities on Site				
	Facilities for the Contractor				
1.2	Offices and storage sheds	sum	1		
1.3	Ablution and latrine facilities	sum	1		
1.4	Tools and equipment	sum	1		
1.5	Water supplies, electric power and communications	sum	1		
1.6	Dealing with water	sum	1		
1.7	Access	sum	1		
1.8	Plant	sum	1		
	Other Fixed-charge Obligations:				
1.9	Survey, setting out and preparation of as-built drawings	sum	1		
1.10	Health and Safety Compliance	sum	1		
1.11	Environmental management	sum	1		
	CARRIED FORWARD				

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.12	Security	sum	1		
1.13	Removal of Site Establishment	sum	1		
1.14	Plant	sum	1		
2	TIME-RELATED ITEMS				
	Operation and maintenance of facilities on the Site for duration of construction				
	<u>Facilities for the Engineer</u>				
2.1	Survey assistants and materials	Month	11		
	<u>Facilities for the Contractor</u>				
2.2	Offices and storage sheds	Month	11		
2.3	Ablution and latrine facilities	Month	11		
2.4	Tools and equipment	Month	11		
2.5	Water supplies, electric power and communications	Month	11		
2.6	Dealing with water (Sub-clause 5.5)	Month	11		
2.7	Access (Sub-clause 5.8)	Month	11		
2.8	Plant	Month	11		
	Supervision				
2.9	Supervision for duration of construction	Month	11		
	Other time-related obligations				
2.10	Compliance Occupational Health and Safety Act and Construction Regulations	Month	11		
2.11	Compliance to Environmental Management Plan	Month	11		
	CARRIED FORWARD TO SUMMARY				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
C	PORT OF RICHARDS BAY				
	SUPPLY AND INSTALLATION OF SMART METERS				
1.1	Investigations and site assessment (Refer to WI Clauses 4.3)	sum	1		
1.2	Survey and Ground-Penetrating Radar (GPR) Scans on the route for any potential underground services	m ²	31250		
	SITE CLEARANCE, SITEWORKS, ETC.				
	Site Clearance				
1.3	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m ²	12500		
	Earthworks				
1.4	Excavate and backfill where depth is not exceeding 2m deep (600mm x 600mm x 600mm)	m ³	53		
	SUPPLY AND INSTALLATION OF SMART WATER METERS				
	Below Ground Installation Supply, install, test and commission smart water meters and shall be configured for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis				
	METER No. 01 -Harbour Main Replacement of the meter including associated components, Meter size: 300mm, existing pipe material is HDPE and the pipe size: 320mm				
2.1	Decommission and remove the existing above installation.	No.	1		
2.2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
2.3	Supply and install a 300mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
2.4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
2.5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
2.6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
2.7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
2.8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 02 - Bayview Main Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 180mm				
3.1	Decommission and remove the existing above installation.	No.	1		
3.2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
3.3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
3.4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
3.5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
3.6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
3.7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
3.8	Test and commission the installation	No.	1		
	METER No. 03 - Die Duine Replacement of the meter including associated components, Meter size: 250mm, existing pipe material is HDPE and the pipe size: 280mm				
4.1	Decommission and remove the existing above installation.	No.	1		
4.2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
4.3	Supply and install a 250mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
4.4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
4.5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
4.6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
4.7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
4.8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 04 - Government House Replacement of the meter including associated components Meter size: 100mm, existing pipe material is HDPE and the pipe size: 110mm				
5.1	Decommission and remove the existing above installation.	No.	1		
5.2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
5.3	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
5.4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
5.5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
5.6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
5.7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
5.8	Test and commission the installation	No.	1		
	METER No. 05 -Water Gantry Replacement of the meter including associated components, Meter size: 50mm, existing pipe material is HDPE and the pipe size: 50mm				
6.1	Decommission and remove the existing above installation.	No.	1		
6.2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
6.3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
6.4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
6.5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
6.6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
6.7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
6.8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 06 -Silver Ocean: Main Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 200mm				
7,1	Decommission and remove the existing above installation.	No.	1		
7,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
7,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
7,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
7,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
7,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
7,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
7,6	Test and commission the installation	No.	1		
	METER No. 07 - Newark Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 200mm				
8,1	Decommission and remove the existing above installation.	No.	1		
8,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
8,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
8,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
8,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
8,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
8,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
8,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 08 - Action Cricket Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 170mm				
9,1	Decommission and remove the existing above installation.	No.	1		
9,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
9,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
9,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
9,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
9,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
9,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
9,8	Test and commission the installation	No.	1		
	METER No. 09 - Tidal Gates (Two Meters) Replacement of the meter including associated components, Meter size: 250mm, existing pipe material is HDPE and the pipe size: 270mm				
10,1	Decommission and remove the existing above installation.	No.	1		
10,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
10,3	Supply and install a 250mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
10,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
10,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
10,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
10,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
10,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 10 -Checmical Berth Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 160mm				
11,1	Decommission and remove the existing above installation.	No.	1		
11,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
11,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
11,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
11,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
11,6	Register the meter on both the billing server and the new Utility Management System with apprioptiate tagging	No.	1		
11,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
11,8	Test and commision the installation	No.	1		
	METER No. 11 - 300 Series Replacement of the meter including associated components, Meter size: 200mm, existing pipe material is HDPE and the pipe size: 230mm				
12,1	Decommission and remove the existing above installation.	No.	1		
12,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
12,3	Supply and install a 200mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
12,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
12,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
12,6	Register the meter on both the billing server and the new Utility Management System with apprioptiate tagging	No.	1		
12,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
12,8	Test and commision the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 12 - Baermer Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 150mm				
13,1	Decommission and remove the existing above installation.	No.	1		
13,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
13,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
13,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
13,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
13,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
13,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
13,8	Test and commission the installation	No.	1		
	METER No. 13 - Liquid Pitch Replacement of the meter including associated components, Meter size: 75mm, existing pipe material is HDPE and the pipe size: 90mm				
14,1	Decommission and remove the existing above installation.	No.	1		
14,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
14,3	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
14,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
14,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
14,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
14,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
14,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 14 - Fedmis Main Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 180mm				
15,1	Decommission and remove the existing above installation.	No.	1		
15,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
15,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
15,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
15,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
15,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
15,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
15,8	Test and commission the installation	No.	1		
	METER No. 15 - Fedmis Fire Replacement of the meter including associated components Meter size: 20mm, existing pipe material is HDPE and the pipe size: 22mm				
16,1	Decommission and remove the existing above installation.	No.	1		
16,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
16,3	Supply and install a 20mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
16,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
16,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
16,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
16,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
16,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 16 - Shincell Fire Replacement of the meter including associated components Meter size: 50mm, existing pipe material is HDPE and the pipe size: 63mm				
17,1	Decommission and remove the existing above installation.	No.	1		
17,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
17,3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
17,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
17,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
17,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
17,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
17,8	Test and commission the installation	No.	1		
	METER No. 17 - Shincell Ring Feed Replacement of the meter including associated components Meter size: 100mm, existing pipe material is HDPE and the pipe size: 110mm				
18,1	Decommission and remove the existing above installation.	No.	1		
18,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
18,3	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
18,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
18,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
18,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
18,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
18,8	Test and commission the installation	No.	1		
	METER No. 18 - Fermentech Replacement of the meter including associated components Meter size: 100mm, existing pipe material is HDPE and the pipe size: 110mm				
19,1	Decommission and remove the existing above installation.	No.	1		
19,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
19,3	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
19,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
19,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
19,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
19,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
19,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 19 - Coaking Coal Replacement of the meter including associated components Meter size: 75mm, existing pipe material is HDPE and the pipe size: 90mm				
20,1	Decommission and remove the existing above installation.	No.	1		
20,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
20,3	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
20,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
20,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
20,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
20,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
20,8	Test and commission the installation	No.	1		
	METER No. 20 - IVS: Administration: Small Replacement of the meter including associated components, Meter size: 50mm, existing pipe material is HDPE and the pipe size: 63mm				
21,1	Decommission and remove the existing above installation.	No.	1		
21,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
21,3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
21,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
21,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
21,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
21,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
21,8	Test and commission the installation	No.	1		
	METER No. 21 - IVS: Administration: Large Replacement of the meter including associated components, Meter size: 250mm, existing pipe material is HDPE and the pipe size: 270mm				
22,1	Decommission and remove the existing above installation.	No.	1		
22,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
22,3	Supply and install a 250mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
22,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
22,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
22,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
22,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
22,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 22 - IVS: Gate Replacement of the meter including associated components, Meter size: 50mm, existing pipe material is HDPE and the pipe size: 50mm				
23,1	Decommission and remove the existing above installation.	No.	1		
23,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
23,3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
23,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
23,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
23,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
23,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
23,8	Test and commission the installation	No.	1		
	METER No. 23 - IVS: Fire Main Replacement of the meter including associated components, Meter size: 100mm, existing pipe material is HDPE and the pipe size: 150mm				
24,1	Decommission and remove the existing above installation.	No.	1		
24,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
24,3	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
24,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
24,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
24,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
24,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
24,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 24 - Richards Bay Bunker Terminal Replacement of the meter including associated components, Meter size: 25mm, existing pipe material is HDPE and the pipe size: 35mm				
25,1	Decommission and remove the existing above installation.	No.	1		
25,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
25,3	Supply and install a 25mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
25,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
25,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
25,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
25,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
25,8	Test and commission the installation	No.	1		
	METER No. 25 - RBCT Main (Hydra substation) Replacement of the meter including associated components, Meter size: 200mm, existing pipe material is HDPE and the pipe size: 200mm				
26,1	Decommission and remove the existing above installation.	No.	1		
26,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
26,3	Supply and install a 200mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
26,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
26,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
26,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
26,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
26,8	Test and commission the installation	No.	1		
	METER No. 26 - Carriage & Wagon – Departure Yard Replacement of the meter including associated components, Meter size: 50mm, existing pipe material is HDPE and the pipe size: 50mm				
27,1	Decommission and remove the existing above installation.	No.	1		
27,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
27,3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
27,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
27,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
27,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
27,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
27,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 27 - Shunters Cabin 124 & 138 – Silver Ocean Road Replacement of the meter including associated components, Meter size: 50mm, existing pipe material is HDPE and the pipe size: 50mm				
28,1	Decommission and remove the existing above installation.	No.	1		
28,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
28,3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
28,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
28,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
28,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
28,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
28,8	Test and commission the installation	No.	1		
	METER No. 28 - Shunter's Cabin 139 – Bottom Discharger Replacement of the meter including associated components, Meter size: 20mm, existing pipe material is HDPE and the pipe size: 25mm				
29,1	Decommission and remove the existing above installation.	No.	1		
29,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
29,3	Supply and install a 20mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
29,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
29,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
29,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
29,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
29,8	Test and commission the installation	No.	1		
	METER No. 29 - Shunter's Cabin 229 – Arrivals Yard Replacement of the meter including associated components, Meter size: 20mm, existing pipe material is HDPE and the pipe size: 28mm				
30,1	Decommission and remove the existing above installation.	No.	1		
30,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
30,3	Supply and install a 20mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
30,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
30,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
30,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
30,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
30,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 30 - Shunter's Cabin – CoalLink Replacement of the meter including associated components, Meter size: 20mm, existing pipe material is HDPE and the pipe size: 22mm				
31,1	Decommission and remove the existing above installation.	No.	1		
31,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
31,3	Supply and install a 20mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
31,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
31,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
31,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
31,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
31,8	Test and commission the installation	No.	1		
	METER No. 31 - Shunter's Cabin – Duine Area Replacement of the meter including associated components, Meter size: 20mm, existing pipe material is HDPE and the pipe size: 22mm				
32,1	Decommission and remove the existing above installation.	No.	1		
32,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
32,3	Supply and install a 20mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
32,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
32,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
32,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
32,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
32,8	Test and commission the installation	No.	1		
	METER No. 32 - Carriage and Wagon – Duine Area Replacement of the meter including associated components, Meter size: 100mm, existing pipe material is HDPE and the pipe size: 110mm				
33,1	Decommission and remove the existing above installation.	No.	1		
33,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
33,3	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
33,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
33,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
33,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
33,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
33,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 33 - DBT Storage – Mechanical Replacement of the meter including associated components, Meter size: 50mm, existing pipe material is HDPE and the pipe size: 50mm				
34,1	Decommission and remove the existing above installation.	No.	1		
34,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
34,3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
34,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
34,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
34,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
34,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
34,7	Test and commission the installation	No.	1		
	METER No. 34 - DBT Storage – Electrical Replacement of the meter including associated components, Meter size: 50mm, existing pipe material is HDPE and the pipe size: 50mm				
35,1	Decommission and remove the existing above installation.	No.	1		
35,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
35,3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
35,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
35,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
35,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
35,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
35,8	Test and commission the installation	No.	1		
	METER No. 35 - DBT Storage – Administration Replacement of the meter including associated components, Meter size: 50mm, existing pipe material is HDPE and the pipe size: 50mm				
36,1	Decommission and remove the existing above installation.	No.	1		
36,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
36,3	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
36,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
36,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
36,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
36,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
36,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No.36 - Dry Bulk Terminal Main Meter Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 160mm				
37,1	Decommission and remove the existing above installation.	No.	1		
37,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
37,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
37,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
37,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
37,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
37,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
37,8	Test and commission the installation	No.	1		
	METER No. 37 - DBT – Saxon Road Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 150mm				
38,1	Decommission and remove the existing above installation.	No.	1		
38,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
38,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
38,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
38,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
38,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
38,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
38,8	Test and commission the installation	No.	1		
	METER No. 38 - Mhlathuze Building Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 180mm				
39,1	Decommission and remove the existing above installation.	No.	1		
39,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
39,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
39,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
39,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
39,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
39,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
39,8	Test and commission the installation	No.	1		
	CARRIED FORWARD				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 39 - Office 2279 Replacement of the meter including associated components, Meter size: 100mm, existing pipe material is HDPE and the pipe size: 110mm				
40,1	Decommission and remove the existing above installation.	No.	1		
40,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
40,3	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
40,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
40,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
40,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
40,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
40,8	Test and commission the installation	No.	1		
	METER No. 40 - CoalLink Locomotive Depot Replacement of the meter including associated components, Meter size: 75mm, existing pipe material is HDPE and the pipe size: 90mm				
41,1	Decommission and remove the existing above installation.	No.	1		
41,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
41,3	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
41,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
41,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter reading device and establish connectivity for wireless communication.	No.	1		
41,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
41,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
41,8	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY RCB				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	SUPPLY AND INSTALLATION OF SMART ELECTRICITY METERS				
C	Replacement of Energy Meters in various locations (Three Phase)				
	Supply, install, configure, test and commission Smart Electricity Meters for measurement of different electrical parameters listed elsewhere in the document including Active energy (kWh/MWh), Reactive energy (kVarh/MVarh), Apparent energy (kVAh/MVAh) etc.				
1,1	Decommission and remove the existing Electricity Meters in various locations	No.	94		
1,2	Supply, install and configure a new smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.).	No.	94		
1,3	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs	No.	94		
1,4	Test and commission the installation.	No.	94		
C	Replacement of Electricity Meters in various locations (Single Phase)				
2,1	Decommission and remove the existing Electricity Meters in various locations	No.	20		
2,2	Supply, install and configure a new Smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.).	No.	20		
2,3	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs.	No.	20		
2,4	Test and commission the installation.	No.	20		
	CARRIED FORWARD TO SUMMARY RCB				
PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
D	COMMUNICATION				
1,1	Standalone Fibre Network - Design, supply, install and patch 48 pair single mode fibre optic cable (652D)	m	25000		
1,2	Excavate and backfill where depth is not exceeding 2m deep	m ³	4500		
1,3	Supply and install 110mm PVC pipe and chamber system for the fibre.	m	25000		
1,4	Reinstate existing surface and make good	m ²	3750		
1,5	Supply and install patch panels fully populated 48 pair with Lucent Connector (LC) patch leads	No.	25		
1,6	Supply, install and configure 24 ports managed enterprise network switches including routing and setting up VLANs	No.	25		
1,7	Supply and install a 9U swing frame cabinet 900mm deep	No.	10		
1,8	Design and construction of Manholes for fibre	No.	15		
1,9	Supply, install and setup the servers	No.	2		
1,10	Splicing of Fibres	No.	360		
1,11	OTDR Testing (Test and submit line losses)	No.	360		
1,12	Supply, install, configure and commission a Firewall for LAN, ensure that old and new services going through the Firewall are reinstated. Setup DMZ and position a management workstation within DMZ	Sum	1		
1,13	Supply and install management workstation desktops and link to TNPA corporate network. Setup rules for management workstation and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.	No.	1		
1,14	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
	CARRIED FORWARD TO SUMMARY RCB				

PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
E	PROCUREMENT AND SUPPLY OF SPARES				
1,1	Smart automatic water meter reading devices	No.	4		
1,2	Smart automatic energy meter reading devices	No.	28		
1,3	Supply hand held automatic meter reading device (water & energy)	No.	2		
	CARRIED FORWARD TO SUMMARY RCB				
PORT OF RICHARDS BAY					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION				
1,1	Supply, installation, configure and integrate the metering gateways onto the LAN and utilities management system for uploading water meter data.	No.	5		
1,2	New Utilities Management System Development, Programming and Software integration into the billing server, tariff setup, designing billing template and setting up billing accounts on billing server. Configure the server to send an Alert (SMS) to TNPA for abnormalities. Including linking all Port meters to new utilites management system. Provide license package. Develop an API and link it to the back end of IPMS and SAP FRP	Sum	1		
1,3	Mapping the meters onto the Geographic Information System (GIS) showing the exact installation point, opening meter reading and the picture of the installation	Sum	1		
1,4	Testing and commissioning of the software side both individually and integrated system	Sum	1		
1,5	AMR Training for End Users	Sum	1		
	CARRIED FORWARD TO SUMMARY RCB				

PORT OF RICHARDS BAY		
	DESCRIPTION	AMOUNT R
	PORT OF RICHARDS BAY	
A	PRELIMINARIES AND GENERALS	
B	SUPPLY AND INSTALLATION OF SMART AUTOMATIC WATER METER READING DEVICES	
C	SUPPLY AND INSTALLATION OF SMART AUTOMATIC ENERGY METER READING DEVICES	
D	COMMUNICATION	
E	PROCUREMENT AND SUPPLY OF SPARES	
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION	
TOTAL CARRIED FORWARD TO SUMMARY PAGE:		

PORT OF DURBAN					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF DURBAN				
	<u>PREAMBLES</u>				
	Fixed preliminary items will be valued and paid on a proven cost basis up to the total value The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made				
1	FIXED-CHARGE ITEMS				
	<u>Contractual Requirements</u>				
1.1	Contractual Requirements: Allow for all contractual obligations in accordance with the NEC3 Engineering and Construction Contract (ECC), including the provision and maintenance of all required performance securities, guarantees, insurances, bonds, warranties, and statutory compliance for the full duration of the Contract.	sum	1		
	Establishment of Facilities on Site				
	Facilities for the Contractor				
1.2	Offices and storage sheds	sum	1		
1.3	Ablution and latrine facilities	sum	1		
1.4	Tools and equipment	sum	1		
1.5	Water supplies, electric power and communications	sum	1		
1.6	Dealing with water	sum	1		
1.7	Access	sum	1		
1.8	Plant	sum	1		
	Other Fixed-charge Obligations:				
1.9	Survey, setting out and preparation of as-built drawings	sum	1		
1.10	Health and Safety Compliance	sum	1		
1.11	Environmental management	sum	1		
	CARRIED FORWARD				

PORT OF DURBAN					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.12	Security	sum	1		
1.13	Removal of Site Establishment	sum	1		
1.14	Plant	sum	1		
2	TIME-RELATED ITEMS				
	Operation and maintenance of facilities on the Site for duration of construction				
	Facilities for the Engineer				
2.1	Survey assistants and materials	Month	8		
	Facilities for the Contractor				
2.2	Offices and storage sheds	Month	8		
2.3	Ablution and latrine facilities	Month	8		
2.4	Tools and equipment	Month	8		
2.5	Water supplies, electric power and communications	Month	8		
2.6	Dealing with water (Sub-clause 5.5)	Month	8		
2.7	Access (Sub-clause 5.8)	Month	8		
2.8	Plant	Month	8		
	Supervision				
2.9	Supervision for duration of construction	Month	8		
	Other time-related obligations				
2.10	Compliance Occupational Health and Safety Act and Construction Regulations	Month	8		
2.11	Compliance to Environmental Management Plan	Month	8		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF DURBAN				
B	SUPPLY AND INSTALLATION OF SMART METERS				
1.1	Investigations and site assessment (Refer to WI Clauses 4.3)	sum	1		
1.2	Survey and Ground-Penetrating Radar (GPR) Scans on the route for any potential underground services	m ²	31250		
	CARRIED FORWARD TO SUMMARY DBN				
	SUPPLY AND INSTALLATION OF SMART ELECTRICITY METERS				
C	Replacement of Energy Meters in various locations (Three Phase)				
	Supply, install, configure, test and commission Smart Electricity Meters for measurement of different electrical parameters listed elsewhere in the document including Active energy (kWh/MWh), Reactive energy (kVAh/MVAh), Apparent energy (kVAh/MVAh) etc.				
1.3	Decommission and remove the existing Electricity Meters in various locations	No.	3		
1.4	Re-wire the existing electrical circuits		14		
1.5	Supply, install and configure a new smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.).	No.	52		
1.6	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs	No.	52		
1.7	Test and commission the installation.	No.	52		
	CARRIED FORWARD TO SUMMARY DBN				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
D	COMMUNICATION				
1,1	Standalone Fibre Network - Design, supply, install and patch 48 pair single mode fibre optic cable (652D)	m	6000		
1,2	Excavate and backfill where depth is not exceeding 2m deep	m ³	1080		
1,3	Supply and install 110mm PVC pipe and chamber system for the fibre.	m	6000		
1,4	Reinstate existing surface and make good	m ²	1800		
1,5	Supply and install patch panels fully populated 48 pair with Lucent Connector (LC) patch leads	No.	24		
1,6	Supply and install a 9U swing frame cabinet 900mm deep	No.	1		
1,7	Supply, install, configure and commission a Firewall for LAN, ensure that old and new services going through the Firewall are reinstated. Setup DMZ and position a management workstation within DMZ	Sum	1		
1,8	Supply and install management workstation desktops and link to TNPA corporate network. Setup rules for management workstation and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.	No.	1		
1,9	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
	CARRIED FORWARD TO SUMMARY DBN				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
E	PROCUREMENT AND SUPPLY OF SPARES				
1,1	Smart automatic water meter reading devices	No.	4		
1,2	Smart automatic energy meter reading devices	No.	28		
1,3	Supply hand held automatic meter reading device (water & energy)	No.	2		
	CARRIED FORWARD TO SUMMARY DBN				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION				
1,1	Supply, installation, configure and integrate the metering gateways onto the LAN and utilities management system for uploading water meter data.	No.	5		
1,2	New Utilities Management System Development, Programming and Software integration into the billing server, tariff setup, designing billing template and setting up billing accounts on billing server. Configure the server to send an Alert (SMS) to TNPA for abnormalities. Including linking all Port meters to new utilites management system. Provide license package. Develop an API and link it to the back end of IPMS and SAP ERP.	Sum	1		
1,3	Mapping the meters onto the Geographic Information System (GIS) showing the exact installation point, opening meter reading and the picture of the installation	Sum	1		
1,4	Testing and commissioning of the software side both individually and integrated system	Sum	1		
1,5	AMR Training for End Users	Sum	1		
	CARRIED FORWARD TO SUMMARY DBN				

PORT OF DURBAN		
	DESCRIPTION	AMOUNT R
	PORT OF DURBAN	
A	PRELIMINARIES AND GENERALS	
B	SUPPLY AND INSTALLATION OF SMART AUTOMATIC ENERGY METER READING DEVICES	
C	COMMUNICATION	
D	PROCUREMENT AND SUPPLY OF SPARES	
E	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION	
TOTAL CARRIED FORWARD TO SUMMARY PAGE:		

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF EAST LONDON				
	PREAMBLES				
	Fixed preliminary items will be valued and paid on a proven cost basis up to the total value The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made				
1	FIXED-CHARGE ITEMS				
	<u>Contractual Requirements</u>				
1.1	Contractual Requirements: Allow for all contractual obligations in accordance with the NEC3 Engineering and Construction Contract (ECC), including the provision and maintenance of all required performance securities, guarantees, insurances, bonds, warranties, and statutory compliance for the full duration of the Contract.	sum	1		
	Establishment of Facilities on Site				
	Facilities for the Contractor				
1.2	Offices and storage sheds	sum	1		
1.3	Ablution and latrine facilities	sum	1		
1.4	Tools and equipment	sum	1		
1.5	Water supplies, electric power and communications	sum	1		
1.6	Dealing with water	sum	1		
1.7	Access	sum	1		
1.8	Plant	sum	1		
	Other Fixed-charge Obligations:				
1.9	Survey, setting out and preparation of as-built drawings	sum	1		
1.10	Health and Safety Compliance	sum	1		
1.11	Environmental management	sum	1		
	CARRIED FORWARD				

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.12	Security	sum	1		
1.13	Removal of Site Establishment	sum	1		
1.14	Plant	sum	1		
2	TIME-RELATED ITEMS				
	Operation and maintenance of facilities on the Site for duration of construction				
	<u>Facilities for the Engineer</u>				
2.1	Survey assistants and materials	Month	11		
	<u>Facilities for the Contractor</u>				
2.2	Offices and storage sheds	Month	11		
2.3	Ablution and latrine facilities	Month	11		
2.4	Tools and equipment	Month	11		
2.5	Water supplies, electric power and communications	Month	11		
2.6	Dealing with water (Sub-clause 5.5)	Month	11		
2.7	Access (Sub-clause 5.8)	Month	11		
2.8	Plant	Month	11		
	Supervision				
2.9	Supervision for duration of construction	Month	11		
	Other time-related obligations				
2.10	Compliance Occupational Health and Safety Act and Construction Regulations	Month	11		
2.11	Compliance to Environmental Management Plan	Month	11		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF EAST LONDON				
B	SUPPLY AND INSTALLATION OF SMART METERS				
1.1	Investigations and site assessment (Refer to WI Clauses 4.3)	sum	1		
1.2	Survey and Ground-Penetrating Radar (GPR) Scans on the route for any potential underground services	m ²	31250		
	SITE CLEARANCE, SITEWORKS, ETC.				
	Site Clearance				
1.3	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m ²	6000		
	Earthworks				
1.4	Excavate and backfill where depth is not exceeding 2m deep (600mm x 600mm x 600mm)	m ³	53		
	SUPPLY AND INSTALLATION OF SMART WATER METERS				
	Below Ground Installation Supply, install, test and commission smart water meters and shall be configured for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis				
	METER No. 01 -Orient Beach TNPA Replacement of the meter including associated components, Meter size: 32mm, existing pipe material is HDPE				
2,1	Decommission and remove the existing above installation.	No.	1		
2,2	Supply and install a 32mm water meter compatible with AMR technology, including all necessary couplings, bolts, sealants etc.	No.	1		
2,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
2,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
2,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
2,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
2,7	Test and commission the installation	No.	1		
	METER No. 02 - Orient Beach TNPA Replacement of the meter including associated components, Meter size: 90mm, existing pipe material is HDPE				
3,1	Decommission and remove the existing above installation.	No.	1		
3,2	Supply and install a 90mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
3,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
3,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
3,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
3,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
3,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 02 - Bayview Main Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE and the pipe size: 180mm				
3.1	Decommission and remove the existing above installation.	No.	1		
3.2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
3.3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
3.4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
3.5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
3.6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
3.7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
3.8	Test and commission the installation	No.	1		
	METER No. 03 - Die Duine Replacement of the meter including associated components, Meter size: 250mm, existing pipe material is HDPE and the pipe size: 280mm				
4.1	Decommission and remove the existing above installation.	No.	1		
4.2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
4.3	Supply and install a 250mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
4.4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
4.5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
4.6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
4.7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
4.8	Test and commission the installation	No.	1		
	METER No. 03 - Buffalo Street Replacement of the meter including associated components, Meter size: 32mm, existing pipe material is HDPE				
4,1	Decommission and remove the existing above installation.	No.	1		
4,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
4,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
4,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
4,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
4,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
4,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 04 - Buffalo Street Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE				
5,1	Decommission and remove the existing above installation.	No.	1		
5,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
5,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
5,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
5,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
5,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
5,7	Test and commission the installation	No.	1		
	METER No. 05 - Pontoon Road Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE				
6,1	Decommission and remove the existing above installation.	No.	1		
6,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
6,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
6,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
6,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
6,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
6,7	Test and commission the installation	No.	1		
	METER No. 06 - Old Guard Post near SA navy Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
7,1	Decommission and remove the existing above installation.	No.	1		
7,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
7,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
7,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
7,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
7,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
7,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 07 - Port Captain Replacement of the meter including associated components, Meter size: 32mm, existing pipe material is HDPE				
8,1	Decommission and remove the existing above installation.	No.	1		
8,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
8,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
8,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
8,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
8,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
8,7	Test and commission the installation	No.	1		
	METER No. 08 - Port Captain Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE				
9,1	Decommission and remove the existing above installation.	No.	1		
9,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
9,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
9,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
9,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
9,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
9,7	Test and commission the installation	No.	1		
	METER No. 09 - Latimer's Landing Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
10,1	Decommission and remove the existing above installation.	No.	1		
10,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
10,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
10,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
10,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
10,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
10,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 10 - West Bank near B/R/Y/C Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Asbestos Cement				
11,1	Decommission and remove the existing above installation.	No.	1		
11,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
11,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
11,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
11,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
11,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
11,7	Test and commission the installation	No.	1		
	METER No. 11 - Dale Street Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Asbestos Cement				
12,1	Decommission and remove the existing above installation.	No.	1		
12,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
12,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
12,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
12,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
12,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
12,7	Test and commission the installation	No.	1		
	METER No. 12 - Dale Street TNPA Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Asbestos Cement				
13,1	Decommission and remove the existing above installation.	No.	1		
13,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
13,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
13,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
13,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
13,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
13,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 13 - Strand Street Cabin Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
14,1	Decommission and remove the existing above installation.	No.	1		
14,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
14,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
14,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
14,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
14,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
14,7	Test and commission the installation	No.	1		
	METER No. 14 - Strand Street BCM Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
15,1	Decommission and remove the existing above installation.	No.	1		
15,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
15,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
15,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
15,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
15,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
15,7	Test and commission the installation	No.	1		
	METER No. 15 - Strand Street Replacement of the meter including associated components, Meter size: 32mm, existing pipe material is Galvanised Iron				
16,1	Decommission and remove the existing above installation.	No.	1		
16,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
16,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
16,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
16,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
16,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
16,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 16 - Strand Street Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
17,1	Decommission and remove the existing above installation.	No.	1		
17,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
17,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
17,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
17,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
17,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
17,7	Test and commission the installation	No.	1		
	METER No. 17 - Strand Street TNPA Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
18,1	Decommission and remove the existing above installation.	No.	1		
18,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
18,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
18,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
18,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
18,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
18,7	Test and commission the installation	No.	1		
	METER No. 18 - Grey Stones W/B Replacement of the meter including associated components, Meter size: 32mm, existing pipe material is Asbestos Cement				
19,1	Decommission and remove the existing above installation.	No.	1		
19,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
19,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
19,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
19,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
19,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
19,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 19 - EMD Horseshoe Replacement of the meter including associated components, Meter size: 32mm, existing pipe material is Copper				
20,1	Decommission and remove the existing above installation.	No.	1		
20,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
20,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
20,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
20,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
20,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
20,7	Test and commission the installation	No.	1		
	METER No. 15 - Fedmis Fire Replacement of the meter including associated components Meter size: 20mm, existing pipe material is HDPE and the pipe size: 22mm				
16,1	Decommission and remove the existing above installation.	No.	1		
16,2	Supply and install flange stub HDPE to flange stub AC to exterior of the chamber including gaskets, bolts, sealants, etc.	No.	2		
16,3	Supply and install a 20mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
16,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
16,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
16,6	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
16,7	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
16,8	Test and commission the installation	No.	1		
	METER No. 20 - EMD Horseshoe Replacement of the meter including associated components, Meter size: 90mm, existing pipe material is Copper				
21,1	Decommission and remove the existing above installation.	No.	1		
21,2	Supply and install a 90mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
21,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
21,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
21,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
21,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
21,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 21 - Old Navy Base Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
22,1	Decommission and remove the existing above installation.	No.	1		
22,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
22,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
22,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
22,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
22,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
22,7	Test and commission the installation	No.	1		
	METER No. 22 - Almega College Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
23,1	Decommission and remove the existing above installation.	No.	1		
23,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
23,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
23,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
23,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
23,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
23,7	Test and commission the installation	No.	1		
	METER No. 23 - Almega College TNPA Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
24,1	Decommission and remove the existing above installation.	No.	1		
24,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
24,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
24,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
24,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
24,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
24,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 24 - Latimer's Complex (Bulk) Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
25,1	Decommission and remove the existing above installation.	No.	1		
25,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
25,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
25,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
25,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
25,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
25,7	Test and commission the installation	No.	1		
	METER No. 25 - Latimer's Complex (Normal) Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
26,1	Decommission and remove the existing above installation.	No.	1		
26,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
26,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
26,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
26,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
26,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
26,7	Test and commission the installation	No.	1		
	METER No. 26 - El Yacht Club, Orient Pier Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE				
27,1	Decommission and remove the existing above installation.	No.	1		
27,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
27,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
27,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
27,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
27,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
27,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 27 - Customs House Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE				
28,1	Decommission and remove the existing above installation.	No.	1		
28,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
28,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
28,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
28,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
28,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
28,7	Test and commission the installation	No.	1		
	METER No. 28 - Latimer's Landing Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
29,1	Decommission and remove the existing above installation.	No.	1		
29,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
29,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
29,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
29,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
29,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
29,7	Test and commission the installation	No.	1		
	METER No. 29 - Shipyard Area Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Asbestos Cement				
30,1	Decommission and remove the existing above installation.	No.	1		
30,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
30,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
30,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
30,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
30,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
30,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 30 - Power Boat Club, MC Arthur Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
31,1	Decommission and remove the existing above installation.	No.	1		
31,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
31,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
31,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
31,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
31,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
31,7	Test and commission the installation	No.	1		
	METER No. 31 - House No. 9 Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
32,1	Decommission and remove the existing above installation.	No.	1		
32,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
32,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
32,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
32,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
32,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
32,7	Test and commission the installation	No.	1		
	METER No. 32 - House No. 8 Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
33,1	Decommission and remove the existing above installation.	No.	1		
33,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
33,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
33,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
33,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
33,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
33,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 33 - Foot Prints Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
34,1	Decommission and remove the existing above installation.	No.	1		
34,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
34,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
34,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
34,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
34,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
34,7	Test and commission the installation	No.	1		
	METER No. 34 - Dept Public Works, Saps Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
35,1	Decommission and remove the existing above installation.	No.	1		
35,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
35,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
35,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
35,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
35,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
35,7	Test and commission the installation	No.	1		
	METER No. 35 - Venue Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
36,1	Decommission and remove the existing above installation.	No.	1		
36,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
36,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
36,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
36,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
36,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
36,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 36 - Car Terminal Complex Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Asbestos Cement				
37,1	Decommission and remove the existing above installation.	No.	1		
37,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
37,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
37,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
37,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
37,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
37,7	Test and commission the installation	No.	1		
	METER No. 37 - Terminal Control Bldg. Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
38,1	Decommission and remove the existing above installation.	No.	1		
38,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
38,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
38,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
38,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
38,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
38,7	Test and commission the installation	No.	1		
	METER No. 38 - Straddle Workshop Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
39,1	Decommission and remove the existing above installation.	No.	1		
39,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
39,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
39,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
39,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
39,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
39,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 39 - Mess/Ablution TPT 4 Quay Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
40,1	Decommission and remove the existing above installation.	No.	1		
40,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
40,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
40,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
40,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
40,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
40,7	Test and commission the installation	No.	1		
	METER No. 40 - TPT Admin Building, 3 Quay Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
41,1	Decommission and remove the existing above installation.	No.	1		
41,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
41,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
41,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
41,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
41,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
41,7	Test and commission the installation	No.	1		
	METER No. 41 - G Shed Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
42,1	Decommission and remove the existing above installation.	No.	1		
42,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
42,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
42,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
42,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
42,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
42,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 42 - Elevator EL&P Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
43,1	Decommission and remove the existing above installation.	No.	1		
43,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
43,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
43,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
43,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
43,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
43,7	Test and commission the installation	No.	1		
	METER No. 43 - Elevator Building Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
44,1	Decommission and remove the existing above installation.	No.	1		
44,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
44,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
44,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
44,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
44,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
44,7	Test and commission the installation	No.	1		
	METER No. 44 - TPT Office (Old CPO), 4 QUAY Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
45,1	Decommission and remove the existing above installation.	No.	1		
45,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
45,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
45,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
45,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
45,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
45,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 45 - TPT & IT & Bills Office 4 Quay Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
46,1	Decommission and remove the existing above installation.	No.	1		
46,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
46,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
46,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
46,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
46,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
46,8	Test and commission the installation	No.	1		
	METER No. 47 - Dry Dock Pump Room Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
48,1	Decommission and remove the existing above installation.	No.	1		
48,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
48,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
48,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
48,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
48,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
48,7	Test and commission the installation	No.	1		
	METER No. 48 - Repair Quay Area Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
49,1	Decommission and remove the existing above installation.	No.	1		
49,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
49,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
49,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
49,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
49,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
49,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 49 - Shop 17 Workshop Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
50,1	Decommission and remove the existing above installation.	No.	1		
50,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
50,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
50,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
50,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
50,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
50,7	Test and commission the installation	No.	1		
	METER No. 50 - Shop 17 M & A Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
51,2	Decommission and remove the existing above installation.	No.	1		
51,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
51,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
51,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
51,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
51,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
51,7	Test and commission the installation	No.	1		
	METER No. 51 - Procurement/Security Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is HDPE				
52,2	Decommission and remove the existing above installation.	No.	1		
52,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
52,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
52,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
52,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
52,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
52,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 52 - MHA Area Replacement of the meter including associated components, Meter size: 150mm, existing pipe material is Galvanised Iron				
53,2	Decommission and remove the existing above installation.	No.	1		
53,3	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
53,4	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
53,5	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
53,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
53,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
53,7	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY EL				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	SUPPLY AND INSTALLATION OF SMART ELECTRICITY METERS				
C	Replacement of Energy Meters in various locations (Three Phase)				
	Supply, install, configure, test and commission Smart Electricity Meters for measurement of different electrical parameters listed elsewhere in the document including Active energy (kWh/MWh), Reactive energy (kVARh/MVARh), Apparent energy (kVAh/MVAh) etc.				
1.1	Decommission and remove the existing Electricity Meters in various locations	No.	90		
1.2	Supply, install and configure a new smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.).	No.	90		
1.3	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs	No.	90		
1.4	Test and commission the installation.	No.	90		
	CARRIED FORWARD TO SUMMARY EL				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
D	COMMUNICATION				
1,1	Standalone Fibre Network - Design, supply, install and patch 48 pair single mode fibre optic cable (652D)	m	12000		
1,2	Excavate and backfill where depth is not exceeding 2m deep	m ³	2160		
1,3	Supply and install 110mm PVC pipe and chamber system for the fibre.	m	12000		
1,4	Reinstate existing surface and make good	m ²	3750		
1,5	Supply and install patch panels fully populated 48 pair with Lucent Connector (LC) patch leads	No.	15		
1,6	Supply, install and configure 24 ports managed enterprise network switches including routing and setting up VLANs	No.	15		
1,7	Supply and install a 9U swing frame cabinet 900mm deep	No.	10		
1,8	Design and construction of Manholes for fibre	No.	10		
1,9	Supply, install and setup the severs	No.	2		
1,10	Splicing of Fibres	No.	360		
1,11	OTDR Testing (Test and submit line losses)	No.	360		
1,12	Supply, install, configure and commission a Firewall for LAN, ensure that old and new services going through the Firewall are reinstated. Setup DMZ and position a management workstation within DMZ	Sum	1		
1,13	Supply and install management workstation desktops and link to TNPA corporate network. Setup rules for management workstation and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.	No.	1		
1,14	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
	CARRIED FORWARD TO SUMMARY EL				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
E	PROCUREMENT AND SUPPLY OF SPARES				
1,1	Smart automatic water meter reading devices	No.	5		
1,2	Smart automatic energy meter reading devices	No.	9		
1,3	Supply hand held automatic meter reading device (water & energy)	No.	2		
	CARRIED FORWARD TO SUMMARY EL				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION				
1,1	Supply, installation, configure and integrate the metering gateways onto the LAN and utilities management system for uploading water meter data.	No.	5		
1,2	New Utilities Management System Development, Programming and Software integration into the billing server, tariff setup, designing billing template and setting up billing accounts on billing server. Configure the server to send an Alert (SMS) to TNPA for abnormalities. Including linking all Port meters to new utilites management system. Provide license package. Develop an API and link it to the back end of IPMS and SAP FRP	Sum	1		
1,3	Mapping the meters onto the Geographic Information System (GIS) showing the exact installation point, opening meter reading and the picture of the installation	Sum	1		
1,4	Testing and commissioning of the software side both individually and integrated system	Sum	1		
1,5	AMR Training for End Users	Sum	1		
	CARRIED FORWARD TO SUMMARY EL				

PORT OF EAST LONDON		
	DESCRIPTION	AMOUNT
	PORT OF EAST LONDON	
A	PRELIMINARIES AND GENERALS	
B	SUPPLY AND INSTALLATION OF SMART AUTOMATIC WATER METER READING DEVICES	
C	SUPPLY AND INSTALLATION OF SMART AUTOMATIC ENERGY METER READING DEVICES	
D	COMMUNICATION	
E	PROCUREMENT AND SUPPLY OF SPARES	
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION	
TOTAL CARRIED FORWARD TO SUMMARY PAGE:		

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF NGQURA				
	<u>PREAMBLES</u>				
	Fixed preliminary items will be valuated and paid on a proven cost basis up to the total value The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made				
1	FIXED-CHARGE ITEMS				
	<u>Contractual Requirements</u>				
1.1	Contractual Requirements: Allow for all contractual obligations in accordance with the NEC3 Engineering and Construction Contract (ECC), including the provision and maintenance of all required performance securities, guarantees, insurances, bonds, warranties, and statutory compliance for the full duration of the Contract.	sum	1		
	Establishment of Facilities on Site				
	Facilities for the Contractor				
1.2	Offices and storage sheds	sum	1		
1.3	Ablution and latrine facilities	sum	1		
1.4	Tools and equipment	sum	1		
1.5	Water supplies, electric power and communications	sum	1		
1.6	Dealing with water	sum	1		
1.7	Access	sum	1		
1.8	Plant	sum	1		
	Other Fixed-charge Obligations:				
1.9	Survey, setting out and preparation of as-built drawings	sum	1		
1.10	Health and Safety Compliance	sum	1		
1.11	Environmental management	sum	1		
	CARRIED FORWARD				
PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.12	Security	sum	1		
1.13	Removal of Site Establishment	sum	1		
1.14	Plant	sum	1		
2	TIME-RELATED ITEMS				
	Operation and maintenance of facilities on the Site for duration of construction				
	<u>Facilities for the Engineer</u>				
2.1	Survey assistants and materials	Month	9		
	Facilities for the Contractor				
2.2	Offices and storage sheds	Month	9		
2.3	Ablution and latrine facilities	Month	9		
2.4	Tools and equipment	Month	9		
2.5	Water supplies, electric power and communications	Month	9		
2.6	Dealing with water (Sub-clause 5.5)	Month	9		
2.7	Access (Sub-clause 5.8)	Month	9		
2.8	Plant	Month	9		
	Supervision				
2.9	Supervision for duration of construction	Month	9		
	Other time-related obligations				
2.10	Compliance Occupational Health and Safety Act and Construction Regulations	Month	9		
2.11	Compliance to Environmental Management Plan	Month	9		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF NGQURA				
B	SUPPLY AND INSTALLATION OF SMART METERS				
1.1	Investigations and site assessment (Refer to WI Clauses 4.3)	sum	1		
1.2	Survey and Ground-Penetrating Radar (GPR) Scans on the route for any potential underground services	m ²	31250		
	SITE CLEARANCE, SITEWORKS, ETC.				
	Site Clearance				
1.3	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m ²	5000		
	Earthworks				
1.4	Excavate and backfill where depth is not exceeding 2m deep (600mm x 600mm x 600mm)	m ³	53		
	SUPPLY AND INSTALLATION OF SMART WATER METERS				
	Below Ground Installation Supply, install, test and commission smart water meters and shall be configured for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis				
2	NMBM				
2,1	Decommission and remove the existing water meter.	No.	1		
2,2	Supply and install a new 450 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
2,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
2,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
2,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
2,6	Test and commission the installation	No.	1		
3	Main Ent. Zone 1 (B1)				
3,1	Decommission and remove the existing water meter.	No.	1		
3,2	Supply and install a new 315 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
3,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
3,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
3,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
3,6	Test and commission the installation	No.	1		
4	Main Port Entrance (C1)				
4,1	Decommission and remove the existing water meter.	No.	1		
4,2	Supply and install a new 110 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
4,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
4,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
4,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
4,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5	Main Port Entrance (C2)				
5,1	Decommission and remove the existing water meter.	No.	1		
5,2	Supply and install a new 110 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
5,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
5,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
5,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
5,6	Test and commission the installation	No.	1		
6	Main Port Entrance (C3)				
6,1	Decommission and remove the existing water meter.	No.	1		
6,2	Supply and install a new 110 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
6,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
6,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
6,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
6,6	Test and commission the installation	No.	1		
7	Joorst Park Offices (D)				
7,1	Decommission and remove the existing water meter.	No.	1		
7,2	Supply and install a new 160 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
7,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
7,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
7,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
7,6	Test and commission the installation	No.	1		
8	NCT Trailer Park (G1)				
8,1	Decommission and remove the existing water meter.	No.	1		
8,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
8,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
8,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
8,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
8,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
9	NCT Entrance (F)				
9,1	Decommission and remove the existing water meter.	No.	1		
9,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
9,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
9,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
9,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
9,6	Test and commission the installation	No.	1		
10	NCT Exit (Sec) – (H)				
10,1	Decommission and remove the existing water meter.	No.	1		
10,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
10,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
10,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
10,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
10,6	Test and commission the installation	No.	1		
11	NCT Entrance (Sec) – (I)				
11,1	Decommission and remove the existing water meter.	No.	1		
11,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
11,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
11,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
11,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
11,6	Test and commission the installation	No.	1		
12	NCT Admin Building (K)				
12,1	Decommission and remove the existing water meter.	No.	1		
12,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
12,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
12,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
12,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
12,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
13	NCT Terminal Supply Nort Rail (L)				
13,1	Decommission and remove the existing water meter.	No.	1		
13,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
13,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
13,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
13,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
13,6	Test and commission the installation	No.	1		
14	NCT Hauler Zone (N)				
14,1	Decommission and remove the existing water meter.	No.	1		
14,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
14,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
14,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
14,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
14,6	Test and commission the installation	No.	1		
15	NCT Workshop (S)				
15,1	Decommission and remove the existing water meter.	No.	1		
15,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
15,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
15,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
15,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
15,6	Test and commission the installation	No.	1		
16	Sand Bypass Main Pump Station (E)				
16,1	Decommission and remove the existing water meter.	No.	1		
16,2	Supply and install a new 63 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
16,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
16,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
16,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
16,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
17	BP1 (M)				
17,1	Decommission and remove the existing water meter.	No.	1		
17,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
17,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
17,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
17,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
17,6	Test and commission the installation	No.	1		
18	BP2 (T)				
18,1	Decommission and remove the existing water meter.	No.	1		
18,2	Supply and install a new 250 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
18,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
18,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
18,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
18,6	Test and commission the installation	No.	1		
19	BP3 (P)				
19,1	Decommission and remove the existing water meter.	No.	1		
19,2	Supply and install a new 160 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
19,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
19,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
19,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
19,6	Test and commission the installation	No.	1		
20	TNPA Admin Building (V)				
20,1	Decommission and remove the existing water meter.	No.	1		
20,2	Supply and install a new 110 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
20,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
20,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
20,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
20,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
21	(U)				
21,1	Decommission and remove the existing water meter.	No.	1		R -
21,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		R -
21,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		R -
21,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		R -
21,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		R -
21,6	Test and commission the installation	No.	1		R -
11,8	Test and commission the installation	No.	1		R -
22	(R)				
22,1	Decommission and remove the existing water meter.	No.	1		
22,2	Supply and install a new 200 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
22,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
22,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
22,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
22,6	Test and commission the installation	No.	1		
23	Port Control (O)				
23,1	Decommission and remove the existing water meter.	No.	1		
23,2	Supply and install a new 110 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
23,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
23,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
23,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
23,6	Test and commission the installation	No.	1		
24	ACB Admin (Q)				
24,1	Decommission and remove the existing water meter.	No.	1		
24,2	Supply and install a new 110 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
24,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
24,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
24,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
24,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
12					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
25	To Be Confirmed				
25,1	Decommission and remove the existing water meter.	No.	1		
25,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
25,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
25,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
25,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
25,6	Test and commission the installation	No.	1		
26	To Be Confirmed				
26,1	Decommission and remove the existing water meter.	No.	1		
26,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
26,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
26,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
26,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
26,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
13					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	SUPPLY AND INSTALLATION OF SMART ELECTRICITY METERS				
C	Replacement of Energy Meters in various locations (Three Phase)				
	Supply, install, configure, test and commission Smart Electricity Meters for measurement of different electrical parameters listed elsewhere in the document including Active energy (kWh/MWh), Reactive energy (kVAh/MVAh), Apparent energy (kVAh/MVAh) etc.				
1.3	Decommission and remove the existing Electricity Meters in various locations	No.	3		
1.4	Re-wire the existing electrical circuits		14		
1.5	Supply, install and configure a new smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.).	No.	52		
1.6	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs	No.	52		
1.7	Test and commission the installation.	No.	52		
	CARRIED FORWARD TO SUMMARY NGQURA				
14					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
D	COMMUNICATION				
1,1	Standalone Fibre Network - Design, supply, install and patch 48 pair single mode fibre optic cable (652D)	m	10000		
1,2	Excavate and backfill where depth is not exceeding 2m deep	m3	1800		
1,3	Supply and install 110mm PVC pipe and chamber system for the fibre.	m	10000		
1,4	Reinstate existing surface and make good	m2	3000		
1,5	Supply and install patch panels fully populated 48 pair with Lucent Connector (LC) patch leads	No.	12		
1,6	Supply, install and configure 24 ports managed enterprise network switches including routing and setting up VLANs	No.	12		
1,7	Supply and install a 9U swing frame cabinet 900mm deep	No.	8		
1,8	Design and construction of Manholes for fibre	No.	8		
1,9	Supply, install and setup the servers	No.	6		
1,10	Splicing of Fibres	No.	288		
1,11	OTDR Testing (Test and submit line losses)	No.	288		
1,12	Supply, install, configure and commission a Firewall for LAN, ensure that old and new services going through the Firewall are reinstated. Setup DMZ and position a management workstation within DMZ	Sum	1		
1,13	Supply and install management workstation desktops and link to TNPA corporate network. Setup rules for management workstation and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.	No.	3		
1,14	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
	CARRIED FORWARD TO SUMMARY NGQURA				
15					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
E	PROCUREMENT AND SUPPLY OF SPARES				
1,1	Smart automatic water meter reading devices	No.	3		
1,2	Smart automatic energy meter reading devices	No.	3		
1,3	Supply hand held automatic meter reading device (water & energy)	No.	2		
	CARRIED FORWARD TO SUMMARY NGQURA				
16					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION				
1,1	Supply, installation, configure and integrate the metering gateways onto the LAN and utilities management system for uploading water meter data.	No.	5		
1,2	New Utilities Management System Development, Programming and Software integration into the billing server, tariff setup, designing billing template and setting up billing accounts on billing server. Configure the server to send an Alert (SMS) to TNPA for abnormalities. Including linking all Port meters to new utilities management system. Provide license package. Develop an API and link it to the back end of IPMS and SAP ERP.	Sum	1		
1,3	Mapping the meters onto the Geographic Information System (GIS) showing the exact installation point, opening meter reading and the picture of the installation	Sum	1		
1,4	Testing and commissioning of the software side both individually and integrated system	Sum	1		
1,5	AMR Training for End Users	Sum	1		
	CARRIED FORWARD TO SUMMARY NGQURA				

PORT OF NGQURA		
	DESCRIPTION	AMOUNT
	PORT OF NGQURA	
A	PRELIMINARIES AND GENERALS	
B	SUPPLY AND INSTALLATION OF SMART AUTOMATIC WATER METER READING DEVICES	
C	SUPPLY AND INSTALLATION OF SMART AUTOMATIC ENERGY METER READING DEVICES	
D	COMMUNICATION	
E	PROCUREMENT AND SUPPLY OF SPARES	
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION	
TOTAL CARRIED FORWARD TO SUMMARY PAGE:		

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF PORT ELIZABETH				
	<u>PREAMBLES</u>				
	Fixed preliminary items will be valuated and paid on a proven cost basis up to the total value The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made				
A	FIXED-CHARGE ITEMS				
	<u>Contractual Requirements</u>				
1.1	Contractual Requirements: Allow for all contractual obligations in accordance with the NEC3 Engineering and Construction Contract (ECC), including the provision and maintenance of all required performance securities, guarantees, insurances, bonds, warranties, and statutory compliance for the full duration of the Contract.	sum	1		
	Establishment of Facilities on Site				
	Facilities for the Contractor				
1.2	Offices and storage sheds	sum	1		
1.3	Ablution and latrine facilities	sum	1		
1.4	Tools and equipment	sum	1		
1.5	Water supplies, electric power and communications	sum	1		
1.6	Dealing with water	sum	1		
1.7	Access	sum	1		
1.8	Plant	sum	1		
	Other Fixed-charge Obligations:				
1.9	Survey, setting out and preparation of as-built drawings	sum	1		
1.10	Health and Safety Compliance	sum	1		
1.11	Environmental management	sum	1		
	CARRIED FORWARD				

	PRELIMINARY AND GENERAL				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.12	Security	sum	1		
1.13	Removal of Site Establishment	sum	1		
1.14	Plant	sum	1		
	Operation and maintenance of facilities on the Site for duration of construction				
	<u>Facilities for the Engineer</u>				
2.1	Survey assistants and materials	Month	12		
	<u>Facilities for the Contractor</u>				
2.2	Offices and storage sheds	Month	12		
2.3	Ablution and latrine facilities	Month	12		
2.4	Tools and equipment	Month	12		
2.5	Water supplies, electric power and communications	Month	12		
2.6	Dealing with water (Sub-clause 5.5)	Month	12		
2.7	Access (Sub-clause 5.8)	Month	12		
2.8	Plant	Month	12		
	<u>Other time-related obligations</u>				
2.10	Compliance Occupational Health and Safety Act and Construction Regulations	Month	12		
2.11	Compliance to Environmental Management Plan	Month	12		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF PORT ELIZABETH				
B	SUPPLY AND INSTALLATION OF SMART METERS				
1.1	Investigations and site assessment (Refer to WI Clauses 4.3)	sum	1		
1.2	Survey and Ground-Penetrating Radar (GPR) Scans on the route for any potential underground services	m ²	31250		
	SITE CLEARANCE, SITEWORKS, ETC.				
	Site Clearance				
1.3	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m ²	6000		
	Earthworks				
1.4	Excavate and backfill where depth is not exceeding 2m deep (600mm x 600mm x 600mm)	m ³	53		
	SUPPLY AND INSTALLATION OF SMART WATER METERS				
	Below Ground Installation Supply, install, test and commission smart water meters and shall be configured for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis				
2	Procurement: Replacement of the meter including associated components, Meter size: 15mm				
2,1	Decommission and remove the existing water meter.	No.	1		
2,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
2,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
2,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
2,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
2,6	Test and commission the installation	No.	1		
3	Security cabin green street: Replacement of the meter including associated components, Meter size: 15mm				
3,1	Decommission and remove the existing water meter.	No.	1		
3,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
3,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
3,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
3,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
3,6	Test and commission the installation	No.	1		
4	Clinic: Replacement of the meter including associated components, Meter size: 15mm				
4,1	Decommission and remove the existing water meter.	No.	1		
4,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
4,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
4,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
4,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
4,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
5	SHEQ Building TPT: Replacement of the meter including associated components, Meter size: 15mm				
5,1	Decommission and remove the existing water meter.	No.	1		
5,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
5,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
5,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
5,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
5,6	Test and commission the installation	No.	1		
6	VW Office opposite Shed 101: Replacement of the meter including associated components, Meter size: 15mm				
6,1	Decommission and remove the existing water meter.	No.	1		
6,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
6,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
6,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
6,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
6,6	Test and commission the installation	No.	1		
7	Shunters Cabin (TFR): Replacement of the meter including associated components, Meter size: 15mm				
7,1	Decommission and remove the existing water meter.	No.	1		
7,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
7,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
7,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
7,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
7,6	Test and commission the installation	No.	1		
8	Black Impala: Replacement of the meter including associated components, Meter size: 15mm				
8,1	Decommission and remove the existing water meter.	No.	1		
8,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
8,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
8,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
8,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
8,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
9	Rennies Group: Replacement of the meter including associated components, Meter size: 15mm				
9,1	Decommission and remove the existing water meter.	No.	1		
9,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
9,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
9,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
9,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
9,6	Test and commission the installation	No.	1		
10	Greystone Cargo Systems (PTY) LTD: Replacement of the meter including associated components, Meter size: 15 mm				
10,1	Decommission and remove the existing water meter.	No.	1		
10,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
10,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
10,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
10,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
10,6	Test and commission the installation	No.	1		
11	Bidfreight Port Operations (PTY) LTD: Replacement of the meter including associated components, Meter size: 15 mm				
11,1	Decommission and remove the existing water meter.	No.	2		
11,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	2		
11,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	2		
11,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
11,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
11,6	Test and commission the installation	No.	2		
12	J.L Wessels: Replacement of the meter including associated components, Meter size: 15 mm				
12,1	Decommission and remove the existing water meter.	No.	1		
12,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
12,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
12,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
12,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
12,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
13	Commercial Marine: Replacement of the meter including associated components, Meter size: 15 mm				
13,1	Decommission and remove the existing water meter.	No.	1		
13,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
13,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
13,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
13,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
13,6	Test and commission the installation	No.	1		
14	CDC Commercial Divers: Replacement of the meter including associated components, Meter size: 15 mm				
14,1	Decommission and remove the existing water meter.	No.	1		
14,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
14,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
14,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
14,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
14,6	Test and commission the installation	No.	1		
15	Security Foot Bridge: Replacement of the meter including associated components, Meter size: 22 mm				
15,1	Decommission and remove the existing water meter.	No.	1		
15,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
15,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
15,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
15,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
15,6	Test and commission the installation	No.	1		
16	HR Offices/ Building: Replacement of the meter including associated components, Meter size: 22 mm				
16,1	Decommission and remove the existing water meter.	No.	1		
16,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
16,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
16,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
16,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
16,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
17	103 Tower: Replacement of the meter including associated components, Meter size: 22 mm				
17,1	Decommission and remove the existing water meter.	No.	1		
17,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
17,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
17,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
17,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
17,6	Test and commission the installation	No.	1		
18	102 Tower: Replacement of the meter including associated components, Meter size: 22 mm				
18,1	Decommission and remove the existing water meter.	No.	1		
18,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
18,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
18,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
18,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
18,6	Test and commission the installation	No.	1		
19	Security Container Entrance: Replacement of the meter including associated components, Meter size: 22 mm				
19,1	Decommission and remove the existing water meter.	No.	1		
19,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
19,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
19,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
19,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
19,6	Test and commission the installation	No.	1		
20	103 Quay Side: Replacement of the meter including associated components, Meter size: 22 mm				
20,1	Decommission and remove the existing water meter.	No.	1		
20,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
20,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
20,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
20,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
20,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
21	102 Quay Side: Replacement of the meter including associated components, Meter size: 22 mm				
21,1	Decommission and remove the existing water meter.	No.	1		
21,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
21,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
21,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
21,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
21,6	Test and commission the installation	No.	1		
22	Shed 101: Replacement of the meter including associated components, Meter size: 22 mm				
22,1	Decommission and remove the existing water meter.	No.	1		
22,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
22,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
22,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
22,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
22,6	Test and commission the installation	No.	1		
23	Car Terminal Admin Office: Replacement of the meter including associated components, Meter size: 22 mm				
23,1	Decommission and remove the existing water meter.	No.	1		
23,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
23,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
23,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
23,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
23,6	Test and commission the installation	No.	1		
24	Spoornet: Replacement of the meter including associated components, Meter size: 22 mm				
24,1	Decommission and remove the existing water meter.	No.	1		
24,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
24,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
24,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
24,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
24,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
25	Malgas (TFR): Replacement of the meter including associated components, Meter size: 22 mm				
25,1	Decommission and remove the existing water meter.	No.	1		
25,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
25,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
25,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
25,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
25,6	Test and commission the installation	No.	1		
26	National Sea Rescue Institute: Replacement of the meter including associated components, Meter size: 22 mm				
26,1	Decommission and remove the existing water meter.	No.	1		
26,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
26,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
26,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
26,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
26,6	Test and commission the installation	No.	1		
27	Stormfire Trading 11 CC: Replacement of the meter including associated components, Meter size: 22 mm				
27,1	Decommission and remove the existing water meter.	No.	1		
27,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
27,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
27,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
27,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
27,6	Test and commission the installation	No.	1		
28	Tabak: Replacement of the meter including associated components, Meter size: 22 mm				
28,1	Decommission and remove the existing water meter.	No.	1		
28,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
28,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
28,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
28,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
28,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
29	Umsobomvu (No.2): Replacement of the meter including associated components, Meter size: 22 mm				
29,1	Decommission and remove the existing water meter.	No.	1		
29,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
29,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
29,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
29,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
29,6	Test and commission the installation	No.	1		
30	Shell South Africa Marketing (PTY)LTD: Replacement of the meter including associated components, Meter size: 22 mm				
30,1	Decommission and remove the existing water meter.	No.	2		
30,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
30,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	m	8		
30,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
30,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
30,6	Test and commission the installation	No.	1		
31	Shell SA (PTY) LTD Replacement of the meter including associated components, Meter size: 22 mm				
31,1	Decommission and remove the existing water meter.	No.	1		
31,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
31,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
31,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
31,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
31,6	Test and commission the installation	No.	1		
32	Extreme Projects: Replacement of the meter including associated components, Meter size: 22 mm				
32,1	Decommission and remove the existing water meter.	No.	1		
32,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
32,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
32,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
32,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
32,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
33	DS +CL Sgacace Fishing Farming Replacement of the meter including associated components, Meter size: 22 mm				
33,1	Decommission and remove the existing water meter.	No.	1		
33,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
33,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
33,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
33,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
33,6	Test and commission the installation	No.	1		
34	CVC Africa: Replacement of the meter including associated components, Meter size: 22 mm				
34,1	Decommission and remove the existing water meter.	No.	1		
34,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
34,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
34,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
34,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
34,6	Test and commission the installation	No.	1		
35	Toilet TPM Kepli Petroleum Replacement of the meter including associated components, Meter size: 22 mm				
35,1	Decommission and remove the existing water meter.	No.	1		
35,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
35,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
35,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
35,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
35,6	Test and commission the installation	No.	1		
36	Blue Water Fishing: Replacement of the meter including associated components, Meter size: 22 mm				
36,1	Decommission and remove the existing water meter.	No.	1		
36,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
36,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
36,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
36,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
36,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
37	Van Niekerk/ Zandalee: Replacement of the meter including associated components, Meter size: 22 mm				
37,1	Decommission and remove the existing water meter.	No.	1		
37,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
37,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
37,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
37,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
37,6	Test and commission the installation	No.	1		
38	Kepu Petroleum: Replacement of the meter including associated components, Meter size: 22 mm				
38,1	Decommission and remove the existing water meter.	No.	1		
38,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
38,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
38,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
38,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
38,6	Test and commission the installation	No.	1		
39	Algoa Bay Sailing Marina: Replacement of the meter including associated components, Meter size: 22 mm				
39,1	Decommission and remove the existing water meter.	No.	1		
39,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
39,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
39,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
39,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
39,6	Test and commission the installation	No.	1		
40	Albatross Offshore Services (PTY)LTD: Replacement of the meter including associated components, Meter size: 22 mm				
40,1	Decommission and remove the existing water meter.	No.	1		
40,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
40,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
40,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
40,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
40,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
41	Albatross: Replacement of the meter including associated components, Meter size: 22 mm				
41,1	Decommission and remove the existing water meter.	No.	1		
41,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
41,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
41,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
41,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
41,6	Test and commission the installation	No.	1		
42	Rail to Rail – Red Grouwa (No.1): Replacement of the meter including associated components, Meter size: 22 mm				
42,1	Decommission and remove the existing water meter.	No.	1		
42,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
42,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
42,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
42,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
42,6	Test and commission the installation	No.	1		
43	Camanga: Replacement of the meter including associated components, Meter size: 22 mm				
43,1	Decommission and remove the existing water meter.	No.	1		
43,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
43,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
43,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
43,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
43,6	Test and commission the installation	No.	1		
44	Blue Water Fish Traders: Replacement of the meter including associated components, Meter size: 22 mm				
44,1	Decommission and remove the existing water meter.	No.	1		
44,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
44,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
44,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
44,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
44,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
45	Bureau Veritus: Replacement of the meter including associated components, Meter size: 22 mm				
45,1	Decommission and remove the existing water meter.	No.	1		
45,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
45,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
45,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
45,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
45,6	Test and commission the installation	No.	1		
46	Tanker Berth Control Room: Replacement of the meter including associated components, Meter size: 22 mm				
46,1	Decommission and remove the existing water meter.	No.	1		
46,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
46,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
46,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
46,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
46,6	Test and commission the installation	No.	1		
47	Tanker Berth Security Cabin: Replacement of the meter including associated components, Meter size: 22 mm				
47,1	Decommission and remove the existing water meter.	No.	1		
47,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
47,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
47,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
47,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
47,6	Test and commission the installation	No.	1		
48	Rail Buildings (3): Replacement of the meter including associated components, Meter size: 22 mm				
48,1	Decommission and remove the existing water meter.	No.	1		
48,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
48,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
48,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
48,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
48,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
49	Engen Petroleum Limited: Replacement of the meter including associated components, Meter size: 25 mm				
49,1	Decommission and remove the existing water meter.	No.	1		
49,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
49,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
49,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
49,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
49,6	Test and commission the installation	No.	1		
50	Shell South Africa (PTY) LTD: Replacement of the meter including associated components, Meter size: 25 mm				
50,1	Decommission and remove the existing water meter.	No.	1		
50,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
50,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
50,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
50,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
50,6	Test and commission the installation	No.	1		
51	Chevron South Africa (PTY) LTD: Replacement of the meter including associated components, Meter size: 25 mm				
51,1	Decommission and remove the existing water meter.	No.	1		
51,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
51,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
51,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
51,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
51,6	Test and commission the installation	No.	1		
52	Umsobomvu: Replacement of the meter including associated components, Meter size: 25 mm				
52,1	Decommission and remove the existing water meter.	No.	1		
52,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
52,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
52,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
52,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
52,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
53	Finance Building: Replacement of the meter including associated components, Meter size: 32 mm				
53,1	Decommission and remove the existing water meter.	No.	1		
53,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
53,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
53,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
53,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
53,6	Test and commission the installation	No.	1		
54	Bus Depot (Clinic): Replacement of the meter including associated components, Meter size: 32 mm				
54,1	Decommission and remove the existing water meter.	No.	1		
54,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
54,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
54,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
54,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
54,6	Test and commission the installation	No.	1		
55	Shed 12 TPT Ablutions: Replacement of the meter including associated components, Meter size: 32 mm				
55,1	Decommission and remove the existing water meter.	No.	1		
55,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
55,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
55,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
55,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
55,6	Test and commission the installation	No.	1		
56	Shunters T/S Double Storey: Replacement of the meter including associated components, Meter size: 32 mm				
56,1	Decommission and remove the existing water meter.	No.	1		
56,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
56,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
56,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
56,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
56,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
57	Shell South Africa (PTY) LTD: Replacement of the meter including associated components, Meter size: 32 mm				
57,1	Decommission and remove the existing water meter.	No.	1		
57,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
57,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
57,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
57,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
57,6	Test and commission the installation	No.	1		
58	Total Oil SA (PTY) LTD: Replacement of the meter including associated components, Meter size: 32 mm				
58,1	Decommission and remove the existing water meter.	No.	1		
58,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
58,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
58,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
58,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
58,6	Test and commission the installation	No.	1		
59	ABSM Crane: Replacement of the meter including associated components, Meter size: 32 mm				
59,1	Decommission and remove the existing water meter.	No.	1		
59,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
59,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
59,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
59,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
59,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
60	Eyethu Fishing (PTY) LTD: Replacement of the meter including associated components, Meter size: 32 mm				
60,1	Decommission and remove the existing water meter.	No.	1		
60,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
60,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
60,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
60,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
60,6	Test and commission the installation	No.	1		
61	Talhado Fishing Replacement of the meter including associated components, Meter size: 32 mm				
61,1	Decommission and remove the existing water meter.	No.	1		
61,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
61,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
61,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
61,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
61,6	Test and commission the installation	No.	1		
62	Fingcorp 113 CC: Replacement of the meter including associated components, Meter size: 32 mm				
62,1	Decommission and remove the existing water meter.	No.	1		
62,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
62,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
62,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
62,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
62,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
63	Vacant Building 1: Replacement of the meter including associated components, Meter size: 32 mm				
63,1	Decommission and remove the existing water meter.	No.	1		
63,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
63,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
63,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
63,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
63,6	Test and commission the installation	No.	1		
64	Vacant Building 2: Replacement of the meter including associated components, Meter size: 32 mm				
64,1	Decommission and remove the existing water meter.	No.	1		
64,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
64,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
64,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
64,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
64,6	Test and commission the installation	No.	1		
65	Vacant Building 3 Replacement of the meter including associated components, Meter size: 32 mm				
65,1	Decommission and remove the existing water meter.	No.	1		
65,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
65,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
65,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
65,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
65,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				R -

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
66	Vacant Building 4: Replacement of the meter including associated components, Meter size: 32 mm				
66,1	Decommission and remove the existing water meter.	No.	1		
66,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		R -
66,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		R -
66,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		R -
66,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		R -
66,6	Test and commission the installation	No.	1		R -
67	CVC Building (Ablution Block): Replacement of the meter including associated components, Meter size: 32 mm				
67,1	Decommission and remove the existing water meter.	No.	1		
67,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
67,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
67,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
67,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
67,6	Test and commission the installation	No.	1		
68	Ore Berth (Ablution Block): Replacement of the meter including associated components, Meter size: 32 mm				
68,1	Decommission and remove the existing water meter.	No.	1		
68,2	Supply and install a new 32 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
68,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
68,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
68,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
68,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
69	Civil Depot: Replacement of the meter including associated components, Meter size: 40 mm				
69,1	Decommission and remove the existing water meter.	No.	1		
69,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
69,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
69,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
69,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
69,6	Test and commission the installation	No.	1		
70	Business Manager (MPT): Replacement of the meter including associated components, Meter size: 40 mm				
70,1	Decommission and remove the existing water meter.	No.	1		
70,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
70,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
70,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
70,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
70,6	Test and commission the installation	No.	1		
71	ULwandle (Next to Oyster): Replacement of the meter including associated components, Meter size: 40 mm				
71,1	Decommission and remove the existing water meter.	No.	1		
71,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
71,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
71,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
71,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
71,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
72	Live Fish Tanks (East Coast): Replacement of the meter including associated components, Meter size: 40 mm				
72,1	Decommission and remove the existing water meter.	No.	1		
72,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
72,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
72,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
72,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
72,6	Test and commission the installation	No.	1		
73	Department of Public Works: Replacement of the meter including associated components, Meter size: 40 mm				
73,1	Decommission and remove the existing water meter.	No.	1		
73,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
73,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
73,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
73,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
73,6	Test and commission the installation	No.	1		
74	Alvodex CC: Replacement of the meter including associated components, Meter size: 40 mm				
74,1	Decommission and remove the existing water meter.	No.	1		
74,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
74,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
74,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
74,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
74,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
75	Pumpstation House (Seawater): Replacement of the meter including associated components, Meter size: 40 mm				
75,1	Decommission and remove the existing water meter.	No.	1		
75,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
75,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
75,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
75,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
75,6	Test and commission the installation	No.	1		
76	Trade Motto (1): Replacement of the meter including associated components, Meter size: 40 mm				
76,1	Decommission and remove the existing water meter.	No.	1		
76,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
76,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
76,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
76,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
76,6	Test and commission the installation	No.	1		
77	Trade Motto (2): Replacement of the meter including associated components, Meter size: 40 mm				
77,1	Decommission and remove the existing water meter.	No.	1		
77,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
77,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
77,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
77,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
77,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
78	Rail Buildings (1): Replacement of the meter including associated components, Meter size: 40 mm				
78,1	Decommission and remove the existing water meter.	No.	1		
78,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
78,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
78,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
78,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
78,6	Test and commission the installation	No.	1		
79	Rail Buildings (2): Replacement of the meter including associated components, Meter size: 40 mm				
79,1	Decommission and remove the existing water meter.	No.	1		
79,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
79,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
79,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
79,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
79,6	Test and commission the installation	No.	1		
80	Marine Services: Replacement of the meter including associated components, Meter size: 50 mm				
80,1	Decommission and remove the existing water meter.	No.	2		
80,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	2		
80,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	2		
80,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
80,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
80,6	Test and commission the installation	No.	2		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
81	Port Admin Building (Port Authority): Replacement of the meter including associated components, Meter size: 50 mm				
81,1	Decommission and remove the existing water meter.	No.	1		
81,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
81,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
81,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
81,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
81,6	Test and commission the installation	No.	1		
82	Port Control Tower (Port Captain) Replacement of the meter including associated components, Meter size: 50 mm				
82,1	Decommission and remove the existing water meter.	No.	1		
82,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
82,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
82,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
82,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
82,6	Test and commission the installation	No.	1		
83	Minor Building (Offices): Replacement of the meter including associated components, Meter size: 50 mm				
83,1	Decommission and remove the existing water meter.	No.	1		
83,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
83,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
83,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
83,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
83,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
84	Minor Building (Ablutions): Replacement of the meter including associated components, Meter size: 50 mm				
84,1	Decommission and remove the existing water meter.	No.	1		
84,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
84,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
84,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
84,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
84,6	Test and commission the installation	No.	1		
85	TPT Offices: Replacement of the meter including associated components, Meter size: 50 mm				
85,1	Decommission and remove the existing water meter.	No.	1		
85,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
85,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
85,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
85,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
85,6	Test and commission the installation	No.	1		
86	Shell South Africa (PTY) LTD: Replacement of the meter including associated components, Meter size: 50 mm				
86,1	Decommission and remove the existing water meter.	No.	1		
86,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
86,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
86,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
86,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
86,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
87	Talhado Fishing Enterprise (PTY) LTD: Replacement of the meter including associated components, Meter size: 50 mm				
87,1	Decommission and remove the existing water meter.	No.	1		
87,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
87,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
87,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
87,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
87,6	Test and commission the installation	No.	1		
88	P.E Deep Sea Angling Club: Replacement of the meter including associated components, Meter size: 50 mm				
88,1	Decommission and remove the existing water meter.	No.	1		
88,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
88,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
88,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
88,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
88,6	Test and commission the installation	No.	1		
89	Shall South Africa (PTY) LTD: Replacement of the meter including associated components, Meter size: 50 mm				
89,1	Decommission and remove the existing water meter.	No.	1		
89,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
89,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
89,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
89,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
89,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
90	Biblia Harbour Mission: Replacement of the meter including associated components, Meter size: 50 mm				
90,1	Decommission and remove the existing water meter.	No.	1		
90,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
90,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
90,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
90,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
90,6	Test and commission the installation	No.	1		
91	Talhado Fishing: Replacement of the meter including associated components, Meter size: 50 mm				
91,1	Decommission and remove the existing water meter.	No.	1		
91,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
91,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
91,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
91,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
91,6	Test and commission the installation	No.	1		
92	TNPA Lighthouse Services: Replacement of the meter including associated components, Meter size: 50 mm				
92,1	Decommission and remove the existing water meter.	No.	1		
92,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
92,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
92,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
92,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
92,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
93	Plot No.1 (Shop 17) Breakeven: Replacement of the meter including associated components, Meter size: 50 mm				
93,1	Decommission and remove the existing water meter.	No.	1		
93,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
93,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
93,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
93,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
93,6	Test and commission the installation	No.	1		
94	Zwembesi Farm: Replacement of the meter including associated components, Meter size: 50 mm				
94,1	Decommission and remove the existing water meter.	No.	1		
94,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
94,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
94,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
94,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
94,6	Test and commission the installation	No.	1		
95	BPO: Replacement of the meter including associated components, Meter size: 50 mm				
95,1	Decommission and remove the existing water meter.	No.	1		
95,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
95,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
95,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
95,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
95,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
96	Cargo: Replacement of the meter including associated components, Meter size: 50 mm				
96,1	Decommission and remove the existing water meter.	No.	1		
96,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
96,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
96,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
96,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
96,6	Test and commission the installation	No.	1		
97	Ore Berth Control Tower: Replacement of the meter including associated components, Meter size: 75 mm				
97,1	Decommission and remove the existing water meter.	No.	1		
97,2	Supply and install a new 75 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
97,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
97,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
97,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
97,6	Test and commission the installation	No.	1		
98	Eyethu Fishing (PTY) LTD Replacement of the meter including associated components, Meter size: 75 mm				
98,1	Decommission and remove the existing water meter.	No.	1		
98,2	Supply and install a new 75 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
98,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
98,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
98,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
98,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
99	Siyaloba Fishing Academy: Replacement of the meter including associated components, Meter size: 75 mm				
99,1	Decommission and remove the existing water meter.	No.	1		
99,2	Supply and install a new 75 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
99,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
99,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
99,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
99,6	Test and commission the installation	No.	1		
100	FPT Port Leasing: Replacement of the meter including associated components, Meter size: 75 mm				
100,1	Decommission and remove the existing water meter.	No.	1		
100,2	Supply and install a new 75 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
100,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
100,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
100,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
100,6	Test and commission the installation	No.	1		
101	Technical Manager (Shop 17): Replacement of the meter including associated components, Meter size: 100 mm				
101,1	Decommission and remove the existing water meter.	No.	1		
101,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
101,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
101,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
101,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
101,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
102	Technical Manager: Replacement of the meter including associated components, Meter size: 100 mm				
102,1	Decommission and remove the existing water meter.	No.	1		
102,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
102,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
102,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
102,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
102,6	Test and commission the installation	No.	1		
103	Tipplers: Replacement of the meter including associated components, Meter size: 100 mm				
103,1	Decommission and remove the existing water meter.	No.	1		
103,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
103,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
103,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
103,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
103,6	Test and commission the installation	No.	1		
104	Shell South Africa (PTY) LTD: Replacement of the meter including associated components, Meter size: 100 mm				
104,1	Decommission and remove the existing water meter.	No.	1		
104,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
104,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
104,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
104,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
104,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
105	Talhado Fishing Enterprise (PTY) LTD: Replacement of the meter including associated components, Meter size: 100 mm				
105,1	Decommission and remove the existing water meter.	No.	1		
105,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
105,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
105,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
105,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
105,6	Test and commission the installation	No.	1		
106	Oil Sites main Supply: Replacement of the meter including associated components, Meter size: 150 mm				
106,1	Decommission and remove the existing water meter.	No.	1		
106,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
106,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
106,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
106,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
106,6	Test and commission the installation	No.	1		
107	Baakens Main Supply: Replacement of the meter including associated components, Meter size: 150 mm				
107,1	Decommission and remove the existing water meter.	No.	1		
107,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
107,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
107,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
107,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
107,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
108	Jetty Main Supply: Replacement of the meter including associated components, Meter size: 150 mm				
108,1	Decommission and remove the existing water meter.	No.	1		
108,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
108,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
108,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
108,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
108,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY PE				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	SUPPLY AND INSTALLATION OF SMART ELECTRICITY METERS				
C	Replacement of Energy Meters in various locations (Three Phase)				
	Supply, install, configure, test and commission Smart Electricity Meters for measurement of different electrical parameters listed elsewhere in the document including Active energy (kWh/MWh), Reactive energy (kVARh/MVARh), Apparent energy (kVAh/MVAh) etc.				
1.3	Decommission and remove the existing Electricity Meters in various locations	No.	108		
1.4	Re-wire the existing electrical circuits		108		
1.5	Supply, install and configure a new smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.).	No.	108		
1.6	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs	No.	108		
1.7	Test and commission the installation.	No.	108		
	CARRIED FORWARD TO SUMMARY PE				
41					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
D	COMMUNICATION				
1,1	Standalone Fibre Network - Design, supply, install and patch 48 pair single mode fibre optic cable (652D)	m	12000		
1,2	Excavate and backfill where depth is not exceeding 2m deep	m ³	2160		
1,3	Supply and install 110mm PVC pipe and chamber system for the fibre.	m	12000		
1,4	Reinstate existing surface and make good	m ²	3600		
1,5	Supply and install patch panels fully populated 48 pair with Lucent Connector (LC) patch leads	No.	15		
1,6	Supply, install and configure 24 ports managed enterprise network switches including routing and setting up VLANs	No.	15		
1,7	Supply, install and configure media converters	No.	6		
1,8	Supply and install a 9U swing frame cabinet 900mm deep	No.	10		
1,9	Design and construction of Manholes for fibre	No.	10		
1,10	Supply, install and setup the severs	No.	2		
1,11	Splicing of Fibres	No.	360		
1,12	OTDR Testing (Test and submit line losses)	No.	360		
1,13	Supply, install, configure and commission a Firewall for LAN, ensure that old and new services going through the Firewall are reinstated. Setup DMZ and position a management workstation within DMZ	Sum	1		
1,14	Supply and install management workstation desktops and link to TNPA corporate network. Setup rules for management workstation and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.	No.	1		
1,15	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
	CARRIED FORWARD SUMMARY PE				
28					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
E	PROCUREMENT AND SUPPLY OF SPARES				
1,1	Smart automatic water meter reading devices	No.	12		
1,2	Smart automatic energy meter reading devices	No.	11		
1,3	Supply hand held automatic meter reading device (water & energy)	No.	2		
	CARRIED FORWARD SUMMARY PE				
27					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION				
	Metering gateways				
1,1	Supply, installation, configure and integrate the metering gateways onto the LAN and utilities management system for uploading water meter data.	No.	5		
1,2	new Utilities Management System Development, Programming and Software integration into the billing server, tariff setup, designing billing template and setting up billing accounts on billing server. Configure the server to send an Alert (SMS) to TNPA for abnormalities. Including linking all Port meters to new utilities management system. Provide license package. Develop an API and link it to the back end of IPMS and CAP ERP	Sum	1		
1,3	Mapping the meters onto the Geographic Information System (GIS) showing the exact installation point, opening meter reading and the picture of the installation.	Sum	1		
1,4	Testing and commissioning of the software side both individual	Sum	1		
1,5	AMR Training for End Users	Sum	1		
	CARRIED FORWARD SUMMARY PE				

PORT OF PORT ELIZABETH		
	DESCRIPTION	AMOUNT R
	PORT OF PORT ELIZABETH	
A	PRELIMINARIES AND GENERALS	
B	SUPPLY AND INSTALLATION OF SMART AUTOMATIC WATER METER READING DEVICES	
C	SUPPLY AND INSTALLATION OF SMART AUTOMATIC ENERGY METER READING DEVICES	
D	COMMUNICATION	
E	PROCUREMENT AND SUPPLY OF SPARES	
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION	
TOTAL CARRIED FORWARD TO SUMMARY PAGE:		

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF MOSSEL BAY				
	<u>PREAMBLES</u>				
	Fixed preliminary items will be valued and paid on a proven cost basis up to the total value The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made				
A	FIXED-CHARGE ITEMS				
	<u>Contractual Requirements</u>				
1.1	Contractual Requirements: Allow for all contractual obligations in accordance with the NEC3 Engineering and Construction Contract (ECC), including the provision and maintenance of all required performance securities, guarantees, insurances, bonds, warranties, and statutory compliance for the full duration of the Contract.	sum	1		
	Establishment of Facilities on Site				
	Facilities for the Contractor				
1.2	Offices and storage sheds	sum	1		
1.3	Ablution and latrine facilities	sum	1		
1.4	Tools and equipment	sum	1		
1.5	Water supplies, electric power and communications	sum	1		
1.6	Dealing with water	sum	1		
1.7	Access	sum	1		
1.8	Plant	sum	1		
	Other Fixed-charge Obligations:				
1.9	Survey, setting out and preparation of as-built drawings	sum	1		
1.10	Health and Safety Compliance	sum	1		
1.11	Environmental management	sum	1		
	CARRIED FORWARD				

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.12	Security	sum	1		
1.13	Removal of Site Establishment	sum	1		
1.14	Plant	sum	1		
2	TIME-RELATED ITEMS				
	Operation and maintenance of facilities on the Site for duration of construction				
	Facilities for the Engineer				
2.1	Survey assistants and materials	Month	11		
	Facilities for the Contractor				
2.2	Offices and storage sheds	Month	11		
2.3	Ablution and latrine facilities	Month	11		
2.4	Tools and equipment	Month	11		
2.5	Water supplies, electric power and communications	Month	11		
2.6	Dealing with water (Sub-clause 5.5)	Month	11		
2.7	Access (Sub-clause 5.8)	Month	11		
2.8	Plant	Month	11		
	Supervision				
2.9	Supervision for duration of construction	Month	11		
	Other time-related obligations				
2.10	Compliance Occupational Health and Safety Act and Construction Regulations	Month	11		
2.11	Compliance to Environmental Management Plan	Month	11		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF MOSSEL BAY				
B	SUPPLY AND INSTALLATION OF SMART METERS				
1.1	Investigations and site assessment (Refer to WI Clauses 4.3)	sum	1		
1.2	Survey and Ground-Penetrating Radar (GPR) Scans on the route for any potential underground services	m ²	31250		
	SITE CLEARANCE, SITEWORKS, ETC.				
	Site Clearance				
1.3	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m ²	2500		
	Earthworks				
1.4	Excavate and backfill where depth is not exceeding 2m deep (600mm x 600mm x 600mm)	m ³	53		
	SUPPLY AND INSTALLATION OF SMART WATER METERS				
	Below Ground Installation Supply, install, test and commission smart water meters and shall be configured for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis				
	METER No. 01 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
2,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
2,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
2,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
2,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
2,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
2,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
2,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
2,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
2,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
2.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	
	BROUGHT FORWARD				
	METER No. 02 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
3,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
3,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
3,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
3,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
3,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
3,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
3,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
3,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
3,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
3.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
8					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 03 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
4,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
4,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
4,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
4,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
4,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
4,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
4,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
4,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
4,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
4.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
9					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 04 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
5,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
5,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
5,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
5,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
5,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
5,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
5,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
5,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
5,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
5.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 05 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
6,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
6,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
6,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
6,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
6,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
6,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
6,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
6,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
6,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
6.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 06 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
7,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
7,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
7,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
7,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
7,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
7,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
7,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
7,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
7,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
7.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
12					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 07 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
8,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
8,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
8,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
8,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
8,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
8,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
8,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
8,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
8,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
8.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 09 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
10.1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
10.2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
10.3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
10.4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
10.5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
10.6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
10.7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
10.8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
10.9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
10.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 10 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
11,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
11,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
11,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
11,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
11,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
11,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
11,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
11,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
11,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
11.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 11 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
12,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
12,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
12,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
12,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
12,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
12,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
12,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
12,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
12,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
12.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 12 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
13,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
13,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
13,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
13,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
13,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
13,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
13,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
13,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
13,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
13.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 13 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
14,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
14,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
14,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
14,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
14,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
14,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
14,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
14,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
14,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
14.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 14 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
15,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
15,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
15,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
15,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
15,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
15,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
15,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
15,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
15,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
15.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 15 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
16,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
16,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
16,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
16,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
16,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
16,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
16,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
16,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
16,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
16.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 16 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
17,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
17,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
17,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
17,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
17,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
17,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
17,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
17,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
17,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
17.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 17 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
18,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
18,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
18,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
18,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
18,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
18,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
18,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
18,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
18,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
18.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 18 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
19,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
19,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
19,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
19,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
19,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
19,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
19,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
19,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
19,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
19.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 19 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
20,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
20,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
20,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
20,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
20,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
20,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
20,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
20,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
20,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
20.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 20 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
21,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
21,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
21,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
21,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
21,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
21,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
21,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
21,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
21,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
21.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 21 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
22,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
22,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
22,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
22,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
22,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
22,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
22,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
22,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
22,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
22.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 22 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
23,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m3	5		
23,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
23,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
23,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
23,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
23,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
23,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
23,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
23,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
23.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 23 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
24,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
24,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
24,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
24,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
24,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
24,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
24,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
24,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
24,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
24.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 24 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
251	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
251,1	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
251,2	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
251,3	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
251,4	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
251,5	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
251,6	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
251,7	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
251,8	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
25.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 25 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
26,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
26,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
26,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
26,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
26,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
26,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
26,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
26,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
26,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
26.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 26 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
27,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
27,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
27,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
27,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
27,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
27,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
27,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
27,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
27,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
27.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 27 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
28,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
28,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
28,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
28,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
28,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
28,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
28,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
28,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
28,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
28.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 28 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
29,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
29,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
29,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
29,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
29,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
29,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
29,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
29,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
29,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
29.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 29 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
30,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
30,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
30,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
30,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
30,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
30,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
30,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
30,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
30,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
30.10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
31	MZR 181 Flames Area				
31,1	Decommission and remove the existing water meter.	No.	1		
31,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
31,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
31,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
31,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
31,6	Test and commission the installation	No.	1		
32	Flames Restaurant				
32,1	Decommission and remove the existing water meter.	No.	1		
32,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
32,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
32,4	Register the meter on both the billing server and the new Utility Mana	No.	1		
32,5	Create an account and link the meter to the account and apply the ap	No.	1		
32,6	Test and commission the installation	No.	1		
33	Car Wash				
33,1	Decommission and remove the existing water meter.	No.	1		
33,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
33,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
33,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
33,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
33,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
34	Station Complex (Check Meter)				
34,1	Decommission and remove the existing water meter.	No.	1		
34,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
34,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
34,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
34,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
34,6	Test and commission the installation	No.	1		
35	Bedding Stores				
35,1	Decommission and remove the existing water meter.	No.	1		
35,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
35,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
35,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
35,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
35,6	Test and commission the installation	No.	1		
36	Station 1				
36,1	Decommission and remove the existing water meter.	No.	1		
36,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
36,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
36,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
36,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
36,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
37	Station 2 Laparon				
37,1	Decommission and remove the existing water meter.	No.	1		
37,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
37,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
37,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
37,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
37,6	Test and commission the installation	No.	1		
38	Old Electrical Workshop				
38,1	Decommission and remove the existing water meter.	No.	1		
38,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
38,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
38,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
38,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
38,6	Test and commission the installation	No.	1		
39	Station Platform				
39,1	Decommission and remove the existing water meter.	No.	1		
39,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
39,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
39,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
39,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
39,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
40	GZR 257 Bridge Bulk (Quay 4)				
40,1	Decommission and remove the existing water meter.	No.	1		
40,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
40,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
40,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
40,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
40,6	Test and commission the installation	No.	1		
41	Recreational Slipway Office				
41,1	Decommission and remove the existing water meter.	No.	1		
41,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
41,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
41,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
41,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
41,6	Test and commission the installation	No.	1		
42	Recreational Brick Building Ablutions TNPA				
42,1	Decommission and remove the existing water meter.	No.	1		
42,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
42,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
42,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
42,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
42,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
43	Mobile Toilets TNPA				
43,1	Decommission and remove the existing water meter.	No.	1		
43,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
43,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
43,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
43,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
43,6	Test and commission the installation	No.	1		
44	WAG/Steakhouse				
44,1	Decommission and remove the existing water meter.	No.	1		
44,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
44,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
44,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
44,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
44,6	Test and commission the installation	No.	1		
45	KAAI 4				
45,1	Decommission and remove the existing water meter.	No.	1		
45,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
45,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
45,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
45,5	Create an account and link the meter to the account and apply the ap	No.	1		
45,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
46	London Bus/Oyster Bar				
46,1	Decommission and remove the existing water meter.	No.	1		
46,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
46,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
46,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
46,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
46,6	Test and commission the installation	No.	1		
47	Waterfront 1				
47,1	Decommission and remove the existing water meter.	No.	1		
47,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
47,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
47,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
47,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
47,6	Test and commission the installation	No.	1		
48	Waterfront 2				
48,1	Decommission and remove the existing water meter.	No.	1		
48,2	Supply and install a new 22 mm water meter compatible with AMR technology	No.	1		
48,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
48,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
48,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
48,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
49	Romonza				
49,1	Decommission and remove the existing water meter.	No.	1		
49,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
49,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
49,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
49,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
49,6	Test and commission the installation	No.	1		
50	Minoli				
50,1	Decommission and remove the existing water meter.	No.	1		
50,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
50,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
50,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
50,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
50,6	Test and commission the installation	No.	1		
51	Gate No 2				
51,1	Decommission and remove the existing water meter.	No.	1		
51,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
51,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
51,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
51,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
51,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
52	Good Shed				
52,1	Decommission and remove the existing water meter.	No.	1		
52,2	Supply and install a new 80 mm water meter compatible with AMR technology	No.	1		
52,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
52,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
52,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
52,6	Test and commission the installation	No.	1		
53	F/H Supply Bulk meter (Station Platform)				
53,1	Decommission and remove the existing water meter.	No.	1		
53,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
53,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
53,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
53,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
53,6	Test and commission the installation	No.	1		
54	Check Meter VJ				
54,1	Decommission and remove the existing water meter.	No.	1		
54,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
54,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
54,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
54,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
54,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
55	VJ Security Guardhouse				
55,1	Decommission and remove the existing water meter.	No.	1		
55,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
55,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
55,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
55,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
55,6	Test and commission the installation	No.	1		
56	TNPA Marine Supply Point Artic Turn				
56,1	Decommission and remove the existing water meter.	No.	1		
56,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
56,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
56,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
56,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
56,6	Test and commission the installation	No.	1		
57	TNPA Marine Supply Point Snipe				
57,1	Decommission and remove the existing water meter.	No.	1		
57,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
57,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
57,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
57,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
57,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
58	Smit Amandla				
58,1	Decommission and remove the existing water meter.	No.	1		
58,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
58,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
58,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
58,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
58,6	Test and commission the installation	No.	1		
59	VJ Quay Side Supply Pnt #1				
59,1	Decommission and remove the existing water meter.	No.	1		
59,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
59,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
59,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
59,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
59,6	Test and commission the installation	No.	1		
60	VJ Quay Side Supply Pnt #2				
60,1	Decommission and remove the existing water meter.	No.	1		
60,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
60,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
60,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
60,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
60,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
61	VJ Quay Side Supply Pnt #3				
61,1	Decommission and remove the existing water meter.	No.	1		
61,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
61,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
61,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
61,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
61,6	Test and commission the installation	No.	1		
62	VJ Quay Side Supply Pnt #4				
62,1	Decommission and remove the existing water meter.	No.	1		
62,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
62,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
62,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
62,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
62,6	Test and commission the installation	No.	1		
63	Sliding Door				
63,1	Decommission and remove the existing water meter.	No.	1		
63,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
63,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
63,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
63,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
63,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
64	Store Racks				
64,1	Decommission and remove the existing water meter.	No.	1		
64,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
64,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
64,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
64,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
64,6	Test and commission the installation	No.	1		
65	Wash Bay				
65,1	Decommission and remove the existing water meter.	No.	1		
65,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
65,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
65,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
65,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
65,6	Test and commission the installation	No.	1		
66	Tsisa yama				
66,1	Decommission and remove the existing water meter.	No.	1		
66,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
66,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
66,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
66,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
66,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
67	Sea Gypsey				
67,1	Decommission and remove the existing water meter.	No.	1		
67,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
67,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
67,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
67,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
67,6	Test and commission the installation	No.	1		
68	Biblia				
68,1	Decommission and remove the existing water meter.	No.	1		
68,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
68,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
68,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
68,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
68,6	Test and commission the installation	No.	1		
69	Gate 1 Guard House				
69,1	Decommission and remove the existing water meter.	No.	1		
69,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
69,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
69,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
69,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
69,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
70	Border Management Agency				
70,1	Decommission and remove the existing water meter.	No.	1		
70,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
70,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
70,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
70,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
70,6	Test and commission the installation	No.	1		
71	Luna Moon				
71,1	Decommission and remove the existing water meter.	No.	1		
71,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
71,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
71,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
71,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
71,6	Test and commission the installation	No.	1		
72	PetroSA Office				
72,1	Decommission and remove the existing water meter.	No.	1		
72,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
72,30	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
72,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
72,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
72,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
73	PetroSA Mess & Ablution				
73,1	Decommission and remove the existing water meter.	No.	1		
73,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
73,3	Supply, install, mount and configure a smart IP68 automatic data logger	No.	1		
73,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
73,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
73,6	Test and commission the installation	No.	1		
74	Meg Plant (Tanks)				
74,1	Decommission and remove the existing water meter.	No.	1		
74,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
74,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
74,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
74,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
74,6	Test and commission the installation	No.	1		
75	Long Shed (PetroSA) Q4				
75,1	Decommission and remove the existing water meter.	No.	1		
75,2	Supply and install a new 90 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
75,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
75,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
75,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
75,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
76	Quay Side Point 1 (Charlie)				
76,1	Decommission and remove the existing water meter.	No.	1		
76,2	Supply and install a new 90 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
76,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
76,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
76,5	Create an account and link the meter to the account and apply the ap	No.	1		
76,6	Test and commission the installation	No.	1		
77	Quay Side Point 2 (Bravo)				
77,1	Decommission and remove the existing water meter.	No.	1		
77,2	Supply and install a new 90 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
77,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
77,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
77,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
77,6	Test and commission the installation	No.	1		
78	Quay Side Point 3 (Alpha)				
78,1	Decommission and remove the existing water meter.	No.	1		
78,2	Supply and install a new 90 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
78,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
78,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
78,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
78,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
79	UZR 752 Viking Area				
79,1	Decommission and remove the existing water meter.	No.	1		
79,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
79,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
79,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
79,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
79,6	Test and commission the installation	No.	1		
80	Blue Shed				
80,1	Decommission and remove the existing water meter.	No.	1		
80,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
80,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
80,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
80,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
80,6	Test and commission the installation	No.	1		
81	Afro Fishing 2 (Old I & J Site) On quay side				
81,1	Decommission and remove the existing water meter.	No.	1		
81,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
81,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
81,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
81,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
81,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
82	Viking Fishing				
82,1	Decommission and remove the existing water meter.	No.	1		
82,20	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
82,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
82,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
82,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
82,6	Test and commission the installation	No.	1		
83	Gate No.3 TNPA				
83,1	Decommission and remove the existing water meter.	No.	1		
83,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
83,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
83,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
83,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
83,6	Test and commission the installation	No.	1		
84	Kepu Site				
84,1	Decommission and remove the existing water meter.	No.	1		
84,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
84,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
84,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
84,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
84,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
85	Quay No.3 TNPA Supply Point				
85,1	Decommission and remove the existing water meter.	No.	1		
85,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
85,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
85,40	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
85,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
85,6	Test and commission the installation	No.	1		
86	NSRI				
86,1	Decommission and remove the existing water meter.	No.	1		
86,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
86,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
86,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
86,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
86,6	Test and commission the installation	No.	1		
87	Tuck Shop				
87,1	Decommission and remove the existing water meter.	No.	1		
87,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
87,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
87,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
87,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
87,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
88	Slipway				
88,1	Decommission and remove the existing water meter.	No.	1		
88,2	Supply and install a new 28 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
88,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
88,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
88,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
88,60	Test and commission the installation	No.	1		
89	Administration Building (TNPA)				
89,1	Decommission and remove the existing water meter.	No.	1		
89,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
89,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
89,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
89,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
89,6	Test and commission the installation	No.	1		
90	Vincent Jetty Quay Side Supply @ Romonza				
90,1	Decommission and remove the existing water meter.	No.	1		
90,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
90,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
90,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
90,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
90,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
91	Marine Park Home				
91,1	Decommission and remove the existing water meter.	No.	1		
91,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
91,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
91,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
91,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
91,6	Test and commission the installation	No.	1		
92	Pioneer 1				
92,1	Decommission and remove the existing water meter.	No.	1		
92,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
92,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
92,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
92,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
92,6	Test and commission the installation	No.	1		
93	Pioneer 2				
93,1	Decommission and remove the existing water meter.	No.	1		
93,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
93,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
93,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
93,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
93,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
94	Lucky Star				
94,1	Decommission and remove the existing water meter.	No.	1		
94,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
94,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
94,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
94,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
94,6	Test and commission the installation	No.	1		
95	Walk on Moorings (TNPA)				
95,1	Decommission and remove the existing water meter.	No.	1		
95,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
95,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
95,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
95,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
95,6	Test and commission the installation	No.	1		
96	Wash-bay (TNPA)				
96,1	Decommission and remove the existing water meter.	No.	1		
96,2	Supply and install a new 22 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
96,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
96,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
96,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
96,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
97	LBS 185 (Yacht Club) – Bulk Meter				
97,1	Decommission and remove the existing water meter.	No.	1		
97,2	Supply and install a new 28 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
97,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
97,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
97,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
97,6	Test and commission the installation	No.	1		
98	Blue Door				
98,1	Decommission and remove the existing water meter.	No.	1		
98,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
98,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
98,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
98,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
98,6	Test and commission the installation	No.	1		
99	Mozambiek				
99,1	Decommission and remove the existing water meter.	No.	1		
99,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
99,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
99,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
99,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
99,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
100	Ladies Ablutions (TNPA)				
100,1	Decommission and remove the existing water meter.	No.	1		
100,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
100,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
100,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
100,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
100,6	Test and commission the installation	No.	1		
101	Men's Ablutions (TNPA)				
101,1	Decommission and remove the existing water meter.	No.	1		
101,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
101,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
101,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
101,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
101,6	Test and commission the installation	No.	1		
102	Aquamarine				
102,1	Decommission and remove the existing water meter.	No.	1		
102,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
102,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
102,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
102,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
102,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY MSB				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	SUPPLY AND INSTALLATION OF SMART ELECTRICITY METERS				
C	Replacement of Electricity Meters in various locations (Three Phase)				
	Supply, install, configure, test and commission Smart Electricity Meters for measurement of different electrical parameters listed elsewhere in the document including Active energy (kWh/MWh), Reactive energy (kVARh/MVARh), Apparent energy (kVAh/MVAh) etc.,				
1,1	Decommission and remove the existing Electricity Meters in various locations	No.	68		
1,2	Supply, install and configure a new Smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.),	No.	68		
1,3	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs.	No.	68		
1,4	Test and commission the installation.	No.	68		
	Replacement of Electricity Meters in various locations (Single Phase)				
2,1	Decommission and remove the existing Electricity Meters in various locations	No.	2		
2,2	Supply, install and configure a new Smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.),	No.	2		
2,3	Establish connectivity: Link the meters to the billing server and the new Utilities Management System via the LAN.	No.	2		
2,4	Test and commission the installation.	No.	2		
2,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
2,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
2,7	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY MSB				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
D	COMMUNICATION				
1,1	Standalone Fibre Network - Design, supply, install and patch 48 pair single mode fibre optic cable (652D)	m	5000		
1,2	Excavate and backfill where depth is not exceeding 2m deep	m ³	900		
1,3	Supply and install 110mm PVC pipe and chamber system for the fibre.	m	5000		
1,4	Reinstate existing surface and make good	m ²	1500		
1,5	Supply and install patch panels fully populated 48 pair with Lucent Connector (LC) patch leads	No.	2		
1,6	Supply, install and configure media converters	No.	6		
1,7	Supply, install and configure 24 ports managed enterprise network switches including routing and setting up VLANs	No.	2		
1,8	Supply and install a 9U swing frame cabinet 900mm deep	No.	1		
1,9	Design and construction of Manholes for fibre	No.	5		
1,10	Supply, install and setup the sewers	No.	2		
1,12	Splicing of Fibres	No.	48		
1,13	OTDR Testing (Test and submit line losses)	No.	48		
1,14	Supply, install, configure and commission a Firewall for LAN, ensure that old and new services going through the Firewall are reinstated. Setup DMZ and position a management workstation within DMZ	Sum	1		
1,15	Supply and install management workstation desktops and link to TNPA corporate network. Setup rules for management workstation and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.	No.	1		
1,16	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
	CARRIED FORWARD TO SUMMARY MSB				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
E	PROCUREMENT AND SUPPLY OF SPARES				
1,1	Smart automatic water meter reading devices	No.	6		
1,2	Smart automatic energy meter reading devices	No.	7		
1,3	Supply hand held automatic meter reading device (water & energy)	No.	2		
	CARRIED FORWARD TO SUMMARY MSB				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION				
	Metering gateways				
1,1	Supply, installation, configure and integrate the metering gateways onto the LAN and utilities management system for uploading water meter data.	No.	5		
1,2	New Utilities Management System Development, Programming and Software integration into the billing server, tariff setup, designing billing template and setting up billing accounts on billing server. Configure the server to send an Alert (SMS) to TNPA for abnormalities. Including linking all Port meters to new utilities management system. Provide license package. Develop an API and link it to the back end of IPMS and SAP ERP.	Sum	1		
1,3	Mapping the meters onto the Geographic Information System (GIS) showing the exact installation point, opening meter reading and the picture of the installation.	Sum	1		
1,4	Testing and commissioning of the software side both individually and	Sum	1		
1,5	AMR Training for End Users	Sum	1		
	CARRIED FORWARD TO SUMMARY MSB				

PORT OF MOSSEL BAY		
	DESCRIPTION	AMOUNT R
A	PRELIMINARIES AND GENERALS	
B	SUPPLY AND INSTALLATION OF SMART AUTOMATIC WATER METER READING DEVICES	
C	SUPPLY AND INSTALLATION OF SMART AUTOMATIC ENERGY METER READING DEVICES	
D	COMMUNICATION	
E	PROCUREMENT AND SUPPLY OF SPARES	
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION	
TOTAL CARRIED FORWARD TO SUMMARY PAGE:		

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF CAPE TOWN				
	<u>PREAMBLES</u>				
	Fixed preliminary items will be valuated and paid on a proven cost basis up to the total value The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made				
A	FIXED-CHARGE ITEMS				
	<u>Contractual Requirements</u>				
1.1	Contractual Requirements: Allow for all contractual obligations in accordance with the NEC3 Engineering and Construction Contract (ECC), including the provision and maintenance of all required performance securities, guarantees, insurances, bonds, warranties, and statutory compliance for the full duration of the Contract	sum	1		
	Establishment of Facilities on Site				
	Facilities for the Contractor				
1.2	Offices and storage sheds	sum	1		
1.3	Ablution and latrine facilities	sum	1		
1.4	Tools and equipment	sum	1		
1.5	Water supplies, electric power and communications	sum	1		
1.6	Dealing with water	sum	1		
1.7	Access	sum	1		
1.8	Plant	sum	1		
	Other Fixed-charge Obligations:				
1.9	Survey, setting out and preparation of as-built drawings	sum	1		
1.10	Health and Safety Compliance	sum	1		
1.11	Environmental management	sum	1		
	CARRIED FORWARD				

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.12	Security	sum	1		
1.13	Removal of Site Establishment	sum	1		
1.14	Plant	sum	1		
2	TIME-RELATED ITEMS				
	Operation and maintenance of facilities on the Site for duration of construction				
	<u>Facilities for the Engineer</u>				
2.1	Survey assistants and materials	Month	11		
	<u>Facilities for the Contractor</u>				
2.2	Offices and storage sheds	Month	11		
2.3	Ablution and latrine facilities	Month	11		
2.4	Tools and equipment	Month	11		
2.5	Water supplies, electric power and communications	Month	11		
2.6	Dealing with water (Sub-clause 5.5)	Month	11		
2.7	Access (Sub-clause 5.8)	Month	11		
2.8	Plant	Month	11		
	Supervision				
2.9	Supervision for duration of construction	Month	11		
	Other time-related obligations				
2.10	Compliance Occupational Health and Safety Act and Construction Regulations	Month	11		
2.11	Compliance to Environmental Management Plan	Month	11		
	CARRIED FORWARD TO SUMMARY				0,00

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF CAPE TOWN				
B	SUPPLY AND INSTALLATION OF SMART METERS				
1.1	Investigations and site assessment (Refer to WI Clauses 4.3)	sum	1		
1.2	Survey and Ground-Penetrating Radar (GPR) Scans on the route for any potential underground services	m ²	31250		
	SITE CLEARANCE, SITEWORKS, ETC.				
	Site Clearance				
1.3	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m ²	2500		
	Earthworks				
1.4	Excavate and backfill where depth is not exceeding 2m deep (600mm x 600mm x 600mm)	m ³	53		
	SUPPLY AND INSTALLATION OF SMART WATER METERS				
	Below Ground Installation Supply, install, test and commission smart water meters and shall be configured for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis				
	METER No. 01 Replacement of the meter including associated components Meter size: 200mm, existing pipe material is unknown				
2,1	Decommission and remove the existing above installation.	No.	1		
2,2	Supply and install a 200mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
2,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
2,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
7					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 02 Replacement of the meter including associated components Meter size: 200mm, existing pipe material is unknown				
3,1	Decommission and remove the existing above installation.	No.	1		
3,2	Supply and install a 200mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
3,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
3,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	METER No. 03 Installation of Automatic Meter Reading Device				
4,1	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	METER No. 04 Installation of Automatic Meter Reading Device				
5,1	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	METER No. 05 Installation of Automatic Meter Reading Device				
6,1	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	METER No. 06 Installation of Automatic Meter Reading Device				
7,1	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication. Link the meter on both the billing server and the new Utilites Management System Link the meter on both the billing server and the new Utilites Management System	No.	1		
	CARRIED FORWARD				
8					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	Replacement of Existing Water Meters				
8	NPA House out building (Plan room & toilet)				
8,1	Decommission and remove the existing water meter.	No.	1		
8,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
8,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
8,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
8,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
8,6	Test and commission the installation	No.	1		
9	Security hut - A Berth				
9,1	Decommission and remove the existing water meter.	No.	1		
9,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
9,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
9,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
9,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
9,6	Test and commission the installation	No.	1		
10	Corner A & B Berth tunnel.				
10,1	Decommission and remove the existing water meter.	No.	1		
10,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
10,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
10,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
10,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
10,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
9					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
11	Ferro-marine - A Berth - Ablution				
11,1	Decommission and remove the existing water meter.	No.	1		
11,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
11,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
11,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
11,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
11,6	Test and commission the installation	No.	1		
12	Ferro-marine - A Berth - Admin office				
12,1	Decommission and remove the existing water meter.	No.	1		
12,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
12,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
12,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
12,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
12,6	Test and commission the installation	No.	1		
13	NPA House				
13,1	Decommission and remove the existing water meter.	No.	1		
13,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
13,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
13,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
13,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
13,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
<u>10</u>					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
14	A Berth area.				
14,1	Decommission and remove the existing water meter.	No.	1		
14,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
14,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
14,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
14,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
14,6	Test and commission the installation	No.	1		
15	Corporate Affairs - B Berth				
15,1	Decommission and remove the existing water meter.	No.	1		
15,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
15,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
15,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
15,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
15,6	Test and commission the installation	No.	1		
16	IT - Opp Corp Affrs - vacant				
16,1	Decommission and remove the existing water meter.	No.	1		
16,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
16,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
16,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
16,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
16,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
17	Training Centre				
17,1	Decommission and remove the existing water meter.	No.	1		
17,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
17,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
17,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
17,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
17,6	Test and commission the installation	No.	1		
18	Fresh Produce Term. (in manhole on B/C Berth)				
18,1	Decommission and remove the existing water meter.	No.	1		
18,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
18,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
18,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
18,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
18,6	Test and commission the installation	No.	1		
19	Fresh Produce Term. (in manhole on B/C Berth)				
19,1	Decommission and remove the existing water meter.	No.	1		
19,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
19,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
19,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
19,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
19,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
12					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
20	Fresh Produce Terminals Cape Town.				
20,1	Decommission and remove the existing water meter.	No.	1		
20,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
20,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
20,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
20,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
20,6	Test and commission the installation	No.	1		
21	Fresh Produce Terminals Cape Town. (On balcony)				
21,1	Decommission and remove the existing water meter.	No.	1		
21,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
21,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
21,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
21,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
21,6	Test and commission the installation	No.	1		
22	B-C Berth (Tunnel - sprinkler system) - FPT				
22,1	Decommission and remove the existing water meter.	No.	1		
22,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
22,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
22,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
22,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
22,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
23	Fresh Produce Term. (Against wall- inside D Shed)				
23,1	Decommission and remove the existing water meter.	No.	1		
23,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
23,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
23,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
23,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
23,6	Test and commission the installation	No.	1		
24	Long Line Tuna Corporation (pty) Ltd				
24,1	Decommission and remove the existing water meter.	No.	1		
24,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
24,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
24,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
24,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
24,6	Test and commission the installation	No.	1		
25	Portside Stevedoring Services offices.				
25,1	Decommission and remove the existing water meter.	No.	1		
25,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
25,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
25,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
25,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
25,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
14					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
26	SA Police / Dept.of Public Works				
26,1	Decommission and remove the existing water meter.	No.	1		
26,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
26,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
26,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
26,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
26,6	Test and commission the installation	No.	1		
27	South Arm Rd Security building				
27,1	Decommission and remove the existing water meter.	No.	1		
27,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
27,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
27,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
27,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
27,6	Test and commission the installation	No.	1		
28	CCC Municipal water meter at Dock Road.				
28,1	Decommission and remove the existing water meter.	No.	1		
28,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
28,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
28,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
28,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
28,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
15					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
29	Transnet Projects RME (Bruce)				
29,1	Decommission and remove the existing water meter.	No.	1		
29,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
29,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
29,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
29,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
29,6	Test and commission the installation	No.	1		
30	Svitzer Wijsmuller (inside Filing room)				
30,1	Decommission and remove the existing water meter.	No.	1		
30,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
30,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
30,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
30,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
30,6	Test and commission the installation	No.	1		
31	Svitzer Wijsmuller				
31,1	Decommission and remove the existing water meter.	No.	1		
31,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
31,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
31,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
31,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
31,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
16					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
32	Bid freight.				
32,1	Decommission and remove the existing water meter.	No.	1		
32,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
32,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
32,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
32,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
32,6	Test and commission the installation	No.	1		
33	SA Stevedores				
33,1	Decommission and remove the existing water meter.	No.	1		
33,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
33,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
33,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
33,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
33,6	Test and commission the installation	No.	1		
34	SA Stevedores / Lighthouse Martinet Ind.Eng.CC				
34,1	Decommission and remove the existing water meter.	No.	1		
34,2	Supply and install a new 200 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
34,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
34,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
34,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
34,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
35	Magmaster (Lighthouse) (INCOMING)				
35,1	Decommission and remove the existing water meter.	No.	1		
35,2	Supply and install a new 200 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
35,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
35,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
35,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
35,6	Test and commission the installation	No.	1		
36	Magmaster (Lighthouse) (REVERSE)				
36,1	Decommission and remove the existing water meter.	No.	1		
36,2	Supply and install a new 200 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
36,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
36,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
36,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
36,6	Test and commission the installation	No.	1		
37	Magmaster (Lighthouse) (NETT INCOMING)				
37,1	Decommission and remove the existing water meter.	No.	1		
37,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
37,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
37,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
37,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
37,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
18					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
38	Lighthouse Services				
38,1	Decommission and remove the existing water meter.	No.	1		
38,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
38,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
38,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
38,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
38,6	Test and commission the installation	No.	1		
39	SA Stevedores (Melfra)				
39,1	Decommission and remove the existing water meter.	No.	1		
39,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
39,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
39,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
39,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
39,6	Test and commission the installation	No.	1		
40	Robben Marine / SA Stevedores				
40,1	Decommission and remove the existing water meter.	No.	1		
40,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
40,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
40,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
40,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
40,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
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ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
41	Safbulk (pty) ltd				
41,1	Decommission and remove the existing water meter.	No.	1		
41,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
41,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
41,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
41,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
41,6	Test and commission the installation	No.	1		
42	Atlotech (pty) ltd - offices				
42,1	Decommission and remove the existing water meter.	No.	1		
42,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
42,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
42,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
42,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
42,6	Test and commission the installation	No.	1		
43	Atlotech (pty) ltd - workshop				
43,1	Decommission and remove the existing water meter.	No.	1		
43,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
43,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
43,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
43,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
43,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				R -
20					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
44	Mission to seamen in SA				
44,1	Decommission and remove the existing water meter.	No.	1		
44,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
44,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
44,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
44,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
44,6	Test and commission the installation	No.	1		
45	Electrical workshop				
45,1	Decommission and remove the existing water meter.	No.	1		
45,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
45,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
45,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
45,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
45,6	Test and commission the installation	No.	1		
46	Elect. Depot Mess & Ablution.				
46,1	Decommission and remove the existing water meter.	No.	1		
46,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
46,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
46,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
46,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
46,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				R -
<u>21</u>					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
47	Berthing Office				
47,1	Decommission and remove the existing water meter.	No.	1		
47,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
47,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
47,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
47,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
47,6	Test and commission the installation	No.	1		
48	P&O Ports Nationwide Cargo Terminal SA (pty) Ltd.				
48,1	Decommission and remove the existing water meter.	No.	1		
48,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
48,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
48,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
48,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
48,6	Test and commission the installation	No.	1		
49	Cowrie place (MPT) - Bon 1				
49,1	Decommission and remove the existing water meter.	No.	1		
49,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
49,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
49,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
49,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
49,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
50	Cowrie place (MPT) - Bon 1				
50,1	Decommission and remove the existing water meter.	No.	1		
50,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
50,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
50,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
50,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
50,6	Test and commission the installation	No.	1		
51	Ship Society of SA / Port Services (pty) Ltd - Bon 1				
51,1	Decommission and remove the existing water meter.	No.	1		
51,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
51,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
51,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
51,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
51,6	Test and commission the installation	No.	1		
52	Christelike Seemans Organisasie - D Mast Bon 1				
52,1	Decommission and remove the existing water meter.	No.	1		
52,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
52,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
52,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
52,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
52,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				R -
24					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
53	Marine Operations Manager - Dock Master Bon 1				
53,1	Decommission and remove the existing water meter.	No.	1		
53,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
53,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
53,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
53,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
53,6	Test and commission the installation	No.	1		
54	Dockland				
54,1	Decommission and remove the existing water meter.	No.	1		
54,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
54,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
54,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
54,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
54,6	Test and commission the installation	No.	1		
55	Control Point 26 (Spoornet)				
55,1	Decommission and remove the existing water meter.	No.	1		
55,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
55,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
55,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
55,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
55,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				R -

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
56	Security Hut (Heerengracht Entrance)				
56,1	Decommission and remove the existing water meter.	m ³	5		
56,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	m	4,5		
56,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
56,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
56,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
56,6	Test and commission the installation	No.	1		
57	Maritime Training (Ex Creche)				
57,1	Decommission and remove the existing water meter.	No.	1		
57,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	m	8		
57,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
57,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
57,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
57,6	Test and commission the installation	No.	1		
58	Spoornet (Heerengracht Entrance)				
58,1	Decommission and remove the existing water meter.	No.	1		
58,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
58,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
58,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
58,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
58,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
59	Die Evangelie aan die seelui.				
59,1	Decommission and remove the existing water meter.	m ³	5		
59,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	m	4,5		
59,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
59,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
59,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
59,6	Test and commission the installation	No.	1		
60	Training Centre for Seamen.	No.	1		
60,1	Decommission and remove the existing water meter.	No.	1		
60,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	m	8		
60,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
60,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging				
60,5	Create an account and link the meter to the account and apply the appropriate tariffs				
60,6	Test and commission the installation				
61	Eastern deli				
61,1	Decommission and remove the existing water meter.	No.	1		
61,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
61,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
61,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
61,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
61,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				
27					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
62	SHEQ building				
62,1	Decommission and remove the existing water meter.	No.	1		
62,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
62,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
62,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
62,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
62,6	Test and commission the installation	No.	1		
63	Pirow St. Security building				
63,1	Decommission and remove the existing water meter.	No.	1		
63,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
63,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
63,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
63,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
63,6	Test and commission the installation	No.	1		
64	E-Berth Shed (Cold Store)				
64,1	Decommission and remove the existing water meter.	No.	1		
64,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
64,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
64,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
64,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
64,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
65	E-Berth Shed (Passenger Terminal)				
65,1	Decommission and remove the existing water meter.	No.	4		
65,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	4		
65,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	4		
65,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	4		
65,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	4		
65,6	Test and commission the installation	No.	4		
66	F-Berth Security bldg.				
66,1	Decommission and remove the existing water meter.	No.	1		
66,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
66,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
66,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
66,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
66,6	Test and commission the installation	No.	1		
67	Weighbridge (F Berth)				
67,1	Decommission and remove the existing water meter.	No.	1		
67,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
67,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
67,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
67,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
67,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
68	Duty Free Shop				
68,1	Decommission and remove the existing water meter.	No.	1		
68,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
68,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
68,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
68,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
68,6	Test and commission the installation	No.	1		
69	Heribi House				
69,1	Decommission and remove the existing water meter.	No.	1		
69,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
69,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
69,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
69,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
69,6	Test and commission the installation	No.	1		
70	SA Stevedores (Port Services) - ex gardener bldg				
70,1	Decommission and remove the existing water meter.	No.	1		
70,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
70,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
70,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
70,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
70,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
71	Combi Terminal bldg.				
71,1	Decommission and remove the existing water meter.	No.	1		
71,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
71,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
71,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
71,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
71,6	Test and commission the installation	No.	1		
72	G-Berth Shed (New meter)				
72,1	Decommission and remove the existing water meter.	No.	1		
72,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
72,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
72,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
72,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
72,6	Test and commission the installation	No.	1		
73	G-Berth Shed (Against inside wall)				
73,1	Decommission and remove the existing water meter.	No.	1		
73,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
73,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
73,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
73,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
73,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
74	G-Berth mess & ablution.				
74,1	Decommission and remove the existing water meter.	No.	1		
74,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
74,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
74,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
74,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
74,6	Test and commission the installation	No.	1		
75	G-Berth Quay office				
75,1	Decommission and remove the existing water meter.	No.	1		
75,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
75,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
75,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
75,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
75,6	Test and commission the installation	No.	1		
76	H-Berth Security kiosk				
76,1	Decommission and remove the existing water meter.	No.	1		
76,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
76,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
76,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
76,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
76,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				
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ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
77	H-Berth Shed				
77,1	Decommission and remove the existing water meter.	No.	3		
77,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	3		
77,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	3		
77,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	3		
77,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	3		
77,6	Test and commission the installation	No.	3		
78	J-Berth mess & ablution				
78,1	Decommission and remove the existing water meter.	No.	1		
78,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
78,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
78,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
78,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
78,6	Test and commission the installation	No.	1		
79	J-Berth Shed				
79,1	Decommission and remove the existing water meter.	No.	2		
79,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	2		
79,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	2		
79,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
79,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
79,6	Test and commission the installation	No.	2		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
80	J-Berth store & Toilets				
80,1	Decommission and remove the existing water meter.	No.	1		
80,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
80,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
80,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
80,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
80,6	Test and commission the installation	No.	1		
81	Operations Rail to rail control block offices				
81,1	Decommission and remove the existing water meter.	No.	1		
81,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
81,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
81,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
81,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
81,6	Test and commission the installation	No.	1		
82	Forklift depot				
82,1	Decommission and remove the existing water meter.	No.	1		
82,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
82,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
82,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
82,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
82,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
83	L-Berth Mess & Ablution bldg				
83,1	Decommission and remove the existing water meter.	No.	1		
83,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
83,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
83,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
83,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
83,6	Test and commission the installation	No.	1		
84	L-Berth Security bldg.				
84,1	Decommission and remove the existing water meter.	No.	1		
84,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
84,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
84,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
84,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
84,6	Test and commission the installation	No.	1		
85	J-Berth Security kiosk				
85,1	Decommission and remove the existing water meter.	No.	1		
85,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
85,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
85,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
85,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
85,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
86	Commercial Cold Store (Duncan Dock) (pty) Ltd				
86,1	Decommission and remove the existing water meter.	No.	1		
86,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
86,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
86,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
86,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
86,6	Test and commission the installation	No.	1		
87	SAS Unities M-Berth				
87,1	Decommission and remove the existing water meter.	No.	2		
87,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	2		
87,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	2		
87,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
87,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
87,6	Test and commission the installation	No.	2		
88	Security hut (M-Berth)				
88,1	Decommission and remove the existing water meter.	No.	1		
88,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
88,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
88,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
88,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
88,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				
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ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
89	Boss marine				
89,1	Decommission and remove the existing water meter.	No.	1		
89,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
89,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
89,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
89,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
89,6	Test and commission the installation	No.	1		
90	Resource Ballast				
90,1	Decommission and remove the existing water meter.	No.	1		
90,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
90,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
90,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
90,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
90,6	Test and commission the installation	No.	1		
91	RCYC Water supply to ships.				
91,1	Decommission and remove the existing water meter.	No.	1		
91,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
91,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
91,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
91,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
91,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
92	RCYC (inside repair area)				
92,1	Decommission and remove the existing water meter.	No.	1		
92,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
92,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
92,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
92,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
92,6	Test and commission the installation	No.	1		
93	RCYC (entrance - inside)				
93,1	Decommission and remove the existing water meter.	No.	1		
93,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
93,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
93,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
93,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
93,6	Test and commission the installation	No.	1		
94	RCYC (entrance - outside)				
94,1	Decommission and remove the existing water meter.	No.	1		
94,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
94,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
94,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
94,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
94,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
95	RCYC (kitchen area)				
95,1	Decommission and remove the existing water meter.	No.	1		
95,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
95,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
95,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
95,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
95,6	Test and commission the installation	No.	1		
96	Sailing School (RCYC)				
96,1	Decommission and remove the existing water meter.	No.	1		
96,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
96,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
96,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
96,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
96,6	Test and commission the installation	No.	1		
97	International Yacht Brokers Cape (pty) Ltd				
97,1	Decommission and remove the existing water meter.	No.	1		
97,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
97,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
97,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
97,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
97,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
98	Spoornet (opposite RCYC)				
98,1	Decommission and remove the existing water meter.	No.	1		
98,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
98,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
98,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
98,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
98,6	Test and commission the installation	No.	1		
99	Globe Engineering Works (pty) Ltd				
99,1	Decommission and remove the existing water meter.	No.	1		
99,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
99,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
99,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
99,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
99,6	Test and commission the installation	No.	1		
100	Misplon bridge Security building				
100,1	Decommission and remove the existing water meter.	No.	1		
100,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
100,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
100,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
100,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
100,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
101	Misplon bridge Security building				
101,1	Decommission and remove the existing water meter.	No.	1		
101,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
101,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
101,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
101,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
101,6	Test and commission the installation	No.	1		
102	JJ van Greunen				
102,1	Decommission and remove the existing water meter.	No.	1		
102,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
102,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
102,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
102,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
102,6	Test and commission the installation	No.	1		
103	De Beers				
103,1	Decommission and remove the existing water meter.	No.	1		
103,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
103,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
103,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
103,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
103,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
104	Harbour Weld				
104,1	Decommission and remove the existing water meter.	No.	1		
104,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
104,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
104,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
104,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
104,6	Test and commission the installation	No.	1		
105	Fusion Hydraulics CC				
105,1	Decommission and remove the existing water meter.	No.	1		
105,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
105,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
105,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
105,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
105,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
106	MRH				
106,1	Decommission and remove the existing water meter.	No.	1		
106,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
106,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
106,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
106,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
106,6	Test and commission the installation	No.	1		
107	NNA				
107,1	Decommission and remove the existing water meter.	No.	1		
107,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
107,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
107,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
107,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
107,6	Test and commission the installation	No.	1		
108	SGB Scaffolding				
108,1	Decommission and remove the existing water meter.	No.	1		
108,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
108,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
108,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
108,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
108,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
109	Hazard Marine CC				
109,1	Decommission and remove the existing water meter.	No.	1		
109,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
109,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
109,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
109,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
109,6	Test and commission the installation	No.	1		
110	Marine manager CC Propnet				
110,1	Decommission and remove the existing water meter.	No.	1		
110,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
110,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
110,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
110,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
110,6	Test and commission the installation	No.	1		
111	Quantum leap				
111,1	Decommission and remove the existing water meter.	No.	1		
111,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
111,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
111,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
111,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
111,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
112	Cape Diving (Pty) Ltd				
112,1	Decommission and remove the existing water meter.	No.	1		
112,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
112,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
112,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
112,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
112,6	Test and commission the installation	No.	1		
113	NPA Staff SDD ablution (Grant Walker-Dockmaster)				
113,1	Decommission and remove the existing water meter.	No.	1		
113,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
113,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
113,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
113,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
113,6	Test and commission the installation	No.	1		
114	Dock Master's office				
114,1	Decommission and remove the existing water meter.	No.	1		
114,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
114,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
114,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
114,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
114,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
115	ALBATROSS (trevshan)				
115,1	Decommission and remove the existing water meter.	No.	1		
115,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
115,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
115,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
115,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
115,6	Test and commission the installation	No.	1		
116	Globe Engineering (office block & Ablution).				
116,1	Decommission and remove the existing water meter.	No.	1		
116,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
116,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
116,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
116,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
116,6	Test and commission the installation	No.	1		
117	Supply pipe for lessees in SSD area.				
117,1	Decommission and remove the existing water meter.	No.	1		
117,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
117,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
117,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
117,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
117,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
118	Security hut SSD boom entrance				
118,1	Decommission and remove the existing water meter.	No.	1		
118,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
118,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
118,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
118,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
118,6	Test and commission the installation	No.	1		
119	The Pure Cane Molasses Co.				
119,1	Decommission and remove the existing water meter.	No.	1		
119,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
119,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
119,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
119,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
119,6	Test and commission the installation	No.	1		
120	Elekt. Werkwinkel				
120,1	Decommission and remove the existing water meter.	No.	1		
120,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
120,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
120,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
120,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
120,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
121	Taipei Liaison office				
121,1	Decommission and remove the existing water meter.	No.	1		
121,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
121,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
121,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
121,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
121,6	Test and commission the installation	No.	1		
122	South East Marine services (pty) Ltd				
122,1	Decommission and remove the existing water meter.	No.	1		
122,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
122,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
122,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
122,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
122,6	Test and commission the installation	No.	1		
123	Nautilus (pty) Ltd				
123,1	Decommission and remove the existing water meter.	No.	3		
123,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	3		
123,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	3		
123,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	3		
123,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	3		
123,6	Test and commission the installation	No.	3		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
124	Marine Slops (pty) Ltd				
124,1	Decommission and remove the existing water meter.	No.	1		
124,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
124,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
124,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
124,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
124,6	Test and commission the installation	No.	1		
125	Albatross Offshore Services				
125,1	Decommission and remove the existing water meter.	No.	1		
125,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
125,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
125,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
125,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
125,6	Test and commission the installation	No.	1		
126	To be confirmed				
126,1	Decommission and remove the existing water meter.	No.	1		
126,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
126,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
126,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
126,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
126,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
127	Elgin Brown Hamer (pty) ltd				
127,1	Decommission and remove the existing water meter.	No.	1		
127,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
127,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
127,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
127,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
127,6	Test and commission the installation	No.	1		
128	Security hut SSDb				
128,1	Decommission and remove the existing water meter.	No.	1		
128,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
128,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
128,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
128,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
128,6	Test and commission the installation	No.	1		
129	Watermain feeding Landing Wall.				
129,1	Decommission and remove the existing water meter.	No.	1		
129,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
129,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
129,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
129,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
129,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
130	Crossberth Cold Stores (PTY) LTD				
130,1	Decommission and remove the existing water meter.	No.	1		
130,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
130,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
130,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
130,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
130,6	Test and commission the installation	No.	1		
131	Crossberth Cold Stores (PTY) LTD				
131,1	Decommission and remove the existing water meter.	No.	1		
131,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
131,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
131,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
131,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
131,6	Test and commission the installation	No.	1		
132	Globe Engineering Works (pty) Ltd				
132,1	Decommission and remove the existing water meter.	No.	1		
132,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
132,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
132,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
132,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
132,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
133	Feedline to Caltex area.				
133,1	Decommission and remove the existing water meter.	No.	1		
133,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
133,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
133,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
133,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
133,6	Test and commission the installation	No.	1		
134	Security hut Tanker basin				
134,1	Decommission and remove the existing water meter.	No.	1		
134,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
134,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
134,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
134,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
134,6	Test and commission the installation	No.	1		
135	Astron Energy (PTY) LTD				
135,1	Decommission and remove the existing water meter.	No.	1		
135,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
135,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
135,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
135,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
135,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
136	BP, Caltex, SA Energy Co, Shell (JBS)				
136,1	Decommission and remove the existing water meter.	No.	1		
136,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
136,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
136,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
136,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
136,6	Test and commission the installation	No.	1		
137	Fire Dept. Tanker basin 2 - NPA				
137,1	Decommission and remove the existing water meter.	No.	1		
137,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
137,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
137,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
137,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
137,6	Test and commission the installation	No.	1		
138	Fire Dept. (Steel scrap yard - Reclaimed Area).				
138,1	Decommission and remove the existing water meter.	No.	1		
138,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
138,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
138,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
138,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
138,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
139	Astron Energy (PTY) LTD				
139,1	Decommission and remove the existing water meter.	No.	2		
139,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	2		
139,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	2		
139,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
139,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
139,6	Test and commission the installation	No.	2		
140	Pump room on Eastern Mole No.2				
140,1	Decommission and remove the existing water meter.	No.	1		
140,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
140,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
140,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
140,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
140,6	Test and commission the installation	No.	1		
141	Mess & Ablution on Eastern Mole No.2.				
141,1	Decommission and remove the existing water meter.	No.	1		
141,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
141,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
141,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
141,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
141,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
142	Toilet on Eastern Mole No.2.				
142,1	Decommission and remove the existing water meter.	No.	1		
142,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
142,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
142,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
142,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
142,6	Test and commission the installation	No.	1		
143	Telkom SA Ltd				
143,1	Decommission and remove the existing water meter.	No.	1		
143,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
143,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
143,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
143,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
143,6	Test and commission the installation	No.	1		
144	Standpipe TAP				
144,1	Decommission and remove the existing water meter.	No.	1		
144,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
144,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
144,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
144,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
144,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
145	FFS				
145,1	Decommission and remove the existing water meter.	No.	1		
145,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
145,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
145,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
145,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
145,6	Test and commission the installation	No.	1		
146	Cape Town Bulk Storage (pty) Ltd FFS				
146,1	Decommission and remove the existing water meter.	No.	1		
146,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
146,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
146,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
146,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
146,6	Test and commission the installation	No.	1		
147	Cape Town Bulk Storage (pty) Ltd				
147,1	Decommission and remove the existing water meter.	No.	1		
147,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
147,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
147,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
147,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
147,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
148	Elliott Basin security bldg				
148,1	Decommission and remove the existing water meter.	No.	1		
148,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
148,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
148,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
148,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
148,6	Test and commission the installation	No.	1		
149	Dorbyl Marine (pty) Ltd.				
149,1	Decommission and remove the existing water meter.	No.	1		
149,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
149,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
149,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
149,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
149,6	Test and commission the installation	No.	1		
150	Dorbyl Marine (pty) Ltd (right next to workshop)				
150,1	Decommission and remove the existing water meter.	No.	1		
150,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
150,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
150,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
150,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
150,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
151	Dorbyl Marine (pty) ltd (workshop) (inside building)				
151,1	Decommission and remove the existing water meter.	No.	1		
151,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
151,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
151,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
151,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
151,6	Test and commission the installation	No.	1		
152	Globe Engineering (domestic main)				
152,1	Decommission and remove the existing water meter.	No.	1		
152,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
152,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
152,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
152,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
152,6	Test and commission the installation	No.	1		
153	Globe Engineering				
153,1	Decommission and remove the existing water meter.	No.	1		
153,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
153,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
153,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
153,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
153,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
154	Elliott Basin ring feed meter				
154,1	Decommission and remove the existing water meter.	No.	1		
154,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
154,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
154,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
154,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
154,6	Test and commission the installation	No.	1		
155	Indo Atlantic Fishing (SHIPPING)				
155,1	Decommission and remove the existing water meter.	No.	1		
155,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
155,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
155,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
155,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
155,6	Test and commission the installation	No.	1		
156	Theodore Luis Camara				
156,1	Decommission and remove the existing water meter.	No.	1		
156,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
156,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
156,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
156,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
156,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
157	Mechanical workshop				
157,1	Decommission and remove the existing water meter.	No.	1		
157,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
157,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
157,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
157,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
157,6	Test and commission the installation	No.	1		
158	Shop 24				
158,1	Decommission and remove the existing water meter.	No.	1		
158,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
158,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
158,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
158,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
158,6	Test and commission the installation	No.	1		
1,16	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
159	Shop 24 mess & ablution for general workers.				
159,1	Decommission and remove the existing water meter.	No.	1		
159,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
159,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
159,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
159,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
159,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
160	Farocean marine (Damen Shipping)				
160,1	Decommission and remove the existing water meter.	No.	1		
160,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
160,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
160,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
160,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
160,6	Test and commission the installation	No.	1		
161	Bassticks				
161,1	Decommission and remove the existing water meter.	No.	1		
161,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
161,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
161,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
161,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
161,6	Test and commission the installation	No.	1		
162	Damen Shipping (Back yard).				
162,1	Decommission and remove the existing water meter.	No.	1		
162,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
162,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
162,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
162,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
162,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
163	Panama Jacks (pty) ltd				
163,1	Decommission and remove the existing water meter.	No.	1		
163,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
163,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
163,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
163,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
163,6	Test and commission the installation	No.	1		
164	Damen				
164,1	Decommission and remove the existing water meter.	No.	1		
164,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
164,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
164,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
164,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
164,6	Test and commission the installation	No.	1		
165	Royal Cape Yacht Club (meter that supplies yachts)				
165,1	Decommission and remove the existing water meter.	No.	2		
165,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	2		
165,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	2		
165,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
165,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
165,6	Test and commission the installation	No.	2		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
166	Security hut Quay 500				
166,1	Decommission and remove the existing water meter.	No.	1		
166,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
166,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
166,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
166,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
166,6	Test and commission the installation	No.	1		
167	Quay 500 Polution.				
167,1	Decommission and remove the existing water meter.	No.	1		
167,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
167,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
167,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
167,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
167,6	Test and commission the installation	No.	1		
168	Ro-Ro Pier (Quay 500) Mountain side				
168,1	Decommission and remove the existing water meter.	No.	1		
168,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
168,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
168,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
168,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
168,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
169	WBHO Work site (Panama Jacks)				
169,1	Decommission and remove the existing water meter.	No.	1		
169,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
169,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
169,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
169,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
169,6	Test and commission the installation	No.	1		
170	Damen Shipping (Panama Jacks side)				
170,1	Decommission and remove the existing water meter.	No.	1		
170,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
170,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
170,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
170,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
170,6	Test and commission the installation	No.	1		
171	WBHO Container (Medite bldg.)				
171,1	Decommission and remove the existing water meter.	No.	1		
171,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
171,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
171,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
171,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
171,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
172	Civil Store under BS bridge				
172,1	Decommission and remove the existing water meter.	No.	1		
172,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
172,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
172,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
172,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
172,6	Test and commission the installation	No.	1		
173	Crest Chemicals				
173,1	Decommission and remove the existing water meter.	No.	1		
173,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
173,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
173,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
173,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
173,6	Test and commission the installation	No.	1		
174	Lusitania Frozen Goods Container Road				
174,1	Decommission and remove the existing water meter.	No.	1		
174,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
174,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
174,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
174,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
174,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
175	R.J.Sauthey (Scaffolding)				
175,1	Decommission and remove the existing water meter.	No.	1		
175,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
175,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
175,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
175,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
175,6	Test and commission the installation	No.	1		
176	Old Container link (Grindrod Logistics) (SACD)				
176,1	Decommission and remove the existing water meter.	No.	1		
176,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
176,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
176,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
176,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
176,6	Test and commission the installation	No.	1		
177	Caltex service station Marine Drive/Astron Energy (PTY) LTD				
177,1	Decommission and remove the existing water meter.	No.	1		
177,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
177,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
177,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
177,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
177,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
178	TCP (Ismail)				
178,1	Decommission and remove the existing water meter.	No.	1		
178,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
178,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
178,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
178,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
178,6	Test and commission the installation	No.	1		
179	Security gate NPA Paarden Eiland				
179,1	Decommission and remove the existing water meter.	No.	1		
179,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
179,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
179,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
179,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
179,6	Test and commission the installation	No.	1		
180	Joint Bunkering Services Container Road				
180,1	Decommission and remove the existing water meter.	No.	1		
180,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
180,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
180,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
180,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
180,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
181	Shmidthauser				
181,1	Decommission and remove the existing water meter.	No.	1		
181,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
181,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
181,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
181,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
181,6	Test and commission the installation	No.	1		
182	Y & L Frozen Fish Enterprises Container Road				
182,1	Decommission and remove the existing water meter.	No.	1		
182,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
182,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
182,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
182,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
182,6	Test and commission the installation	No.	1		
183	Y & L Frozen Fish Enterprises Container Road				
183,1	Decommission and remove the existing water meter.	No.	1		
183,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
183,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
183,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
183,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
183,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
184	M.M.Hilario				
184,1	Decommission and remove the existing water meter.	No.	1		
184,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
184,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
184,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
184,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
184,6	Test and commission the installation	No.	1		
185	BSD Weigh bridge				
185,1	Decommission and remove the existing water meter.	No.	1		
185,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
185,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
185,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
185,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
185,6	Test and commission the installation	No.	1		
186	BSD Weigh bridge				
186,1	Decommission and remove the existing water meter.	No.	1		
186,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
186,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
186,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
186,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
186,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
187	Container Terminal drivers mess & ablution. (Reverse)				
187,1	Decommission and remove the existing water meter.	No.	1		
187,2	Supply and install a new 40 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
187,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
187,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
187,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
187,6	Test and commission the installation	No.	1		
188	Container Terminal drivers mess & ablution.				
188,1	Decommission and remove the existing water meter.	No.	1		
188,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
188,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
188,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
188,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
188,6	Test and commission the installation	No.	1		
189	Security bldg (Quay 700)				
189,1	Decommission and remove the existing water meter.	No.	1		
189,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
189,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
189,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
189,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
189,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
190	WBHO Site office (Quay 700)				
190,1	Decommission and remove the existing water meter.	No.	1		
190,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
190,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
190,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
190,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
190,6	Test and commission the installation	No.	1		
191	SAPO ski-cabin				
191,1	Decommission and remove the existing water meter.	No.	1		
191,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
191,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
191,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
191,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
191,6	Test and commission the installation	No.	1		
192	Vehicle Testing Centre (old) (Kershaw 073 257 1736)				
192,1	Decommission and remove the existing water meter.	No.	1		
192,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
192,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
192,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
192,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
192,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
193	Vehicle Repair Centre (Freight Dynamics)				
193,1	Decommission and remove the existing water meter.	No.	1		
193,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
193,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
193,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
193,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
193,6	Test and commission the installation	No.	1		
194	Container Fruit Terminal (inside Fire Control room)				
194,1	Decommission and remove the existing water meter.	No.	1		
194,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
194,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
194,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
194,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
194,6	Test and commission the installation	No.	1		
195	Helicopter Africa (pty) Ltd				
195,1	Decommission and remove the existing water meter.	No.	1		
195,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
195,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
195,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
195,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
195,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
196	Makhulu				
196,1	Decommission and remove the existing water meter.	No.	1		
196,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
196,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
196,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
196,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
196,6	Test and commission the installation	No.	1		
197	Blastrite (pty) ltd				
197,1	Decommission and remove the existing water meter.	No.	1		
197,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
197,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
197,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
197,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
197,6	Test and commission the installation	No.	1		
198	Road to Rail building				
198,1	Decommission and remove the existing water meter.	No.	1		
198,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
198,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
198,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
198,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
198,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
199	Spoornet (Bay Road)				
199,1	Decommission and remove the existing water meter.	No.	1		
199,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
199,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
199,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
199,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
199,6	Test and commission the installation	No.	1		
200	Tryang Trading Import & Export (Pty) Ltd				
200,1	Decommission and remove the existing water meter.	No.	1		
200,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
200,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
200,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
200,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
200,6	Test and commission the installation	No.	1		
201	Optimal Maintenance services CC				
201,1	Decommission and remove the existing water meter.	No.	1		
201,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
201,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
201,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
201,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
201,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
202	Raw Engineering CC				
202,1	Decommission and remove the existing water meter.	No.	1		
202,2	Supply and install a new 25 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
202,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
202,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
202,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
202,6	Test and commission the installation	No.	1		
203	Helicopter Heli Pad Cold Storage				
203,1	Decommission and remove the existing water meter.	No.	1		
203,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
203,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
203,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
203,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
203,6	Test and commission the installation	No.	1		
204	Transeva Shipping Services (Pty) Ltd				
204,1	Decommission and remove the existing water meter.	No.	1		
204,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
204,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
204,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
204,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
204,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
205	PIP Site main meter (Entrance)				
205,1	Decommission and remove the existing water meter.	No.	1		
205,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
205,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
205,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
205,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
205,6	Test and commission the installation	No.	1		
206	SACD PIP Site				
206,1	Decommission and remove the existing water meter.	No.	1		
206,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
206,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
206,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
206,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
206,6	Test and commission the installation	No.	1		
207	Eskom PIP site				
207,1	Decommission and remove the existing water meter.	No.	1		
207,2	Supply and install a new 300 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
207,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
207,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
207,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
207,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
208	East Coast Containers				
208,1	Decommission and remove the existing water meter.	No.	1		
208,2	Supply and install a new 200 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
208,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
208,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
208,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
208,6	Test and commission the installation	No.	1		
209	CCC Municipal water meter at Marine Drive.				
209,1	Decommission and remove the existing water meter.	No.	1		
209,2	Supply and install a new 200 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
209,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
209,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
209,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
209,6	Test and commission the installation	No.	1		
210	Magmaster				
210,1	Decommission and remove the existing water meter.	No.	3		
210,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	3		
210,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	3		
210,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	3		
210,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	3		
210,6	Test and commission the installation	No.	3		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
211	Two Oceans Boat Sales Marine Drive				
211,1	Decommission and remove the existing water meter.	No.	3		
211,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	3		
211,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	3		
211,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	3		
211,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	3		
211,6	Test and commission the installation	No.	3		
212	Province Log Cabins Marine Drive				
212,1	Decommission and remove the existing water meter.	No.	1		
212,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
212,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
212,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
212,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
212,6	Test and commission the installation	No.	1		
213	RME is occupying a site next to House of Cabin.				
213,1	Decommission and remove the existing water meter.	No.	1		
213,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
213,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
213,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
213,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
213,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
214	Shop 17				
214,1	Decommission and remove the existing water meter.	No.	1		
214,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
214,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
214,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
214,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
214,6	Test and commission the installation	No.	1		
215	Shop 17				
215,1	Decommission and remove the existing water meter.	No.	1		
215,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
215,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
215,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
215,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
215,6	Test and commission the installation	No.	1		
216	Civil Depot watermain				
216,1	Decommission and remove the existing water meter.	No.	1		
216,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
216,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
216,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
216,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
216,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
217	Roro Control office & abl. BSD				
217,1	Decommission and remove the existing water meter.	No.	1		
217,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
217,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
217,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
217,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
217,6	Test and commission the installation	No.	1		
218	Old SACD site (TCP - Bert)				
218,1	Decommission and remove the existing water meter.	No.	1		
218,2	Supply and install a new 80 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
218,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
218,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
218,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
218,6	Test and commission the installation	No.	1		
219	New Container Entrance to Terminal				
219,1	Decommission and remove the existing water meter.	No.	1		
219,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
219,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
219,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
219,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
219,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
220	Old Mediterranean Shipping building				
220,1	Decommission and remove the existing water meter.	No.	1		
220,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
220,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
220,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
220,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
220,6	Test and commission the installation	No.	1		
221	Quay 501 Container control office & abl. BSD				
221,1	Decommission and remove the existing water meter.	No.	1		
221,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
221,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
221,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
221,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
221,6	Test and commission the installation	No.	1		
222	Quay 601 Container control office & abl. BSD				
222,1	Decommission and remove the existing water meter.	No.	1		
222,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
222,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
222,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
222,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
222,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
223	Quay 602 Container control office & abl. BSD				
223,1	Decommission and remove the existing water meter.	No.	1		
223,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
223,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
223,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
223,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
223,6	Test and commission the installation	No.	1		
224	Quay 603 Container control office & abl. BSD				
224,1	Decommission and remove the existing water meter.	No.	1		
224,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
224,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
224,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
224,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
224,6	Test and commission the installation	No.	1		
225	Quay 604 Container control office & abl. BSD				
225,1	Decommission and remove the existing water meter.	No.	1		
225,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
225,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
225,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
225,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
225,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
226	Quay 602 Container control office & abl. BSD seaside				
226,1	Decommission and remove the existing water meter.	No.	1		
226,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
226,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
226,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
226,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
226,6	Test and commission the installation	No.	1		
227	Container Terminal building				
227,1	Decommission and remove the existing water meter.	No.	1		
227,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
227,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
227,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
227,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
227,6	Test and commission the installation	No.	1		
228	Chevron (Tanker Basin Cross Berth)				
228,1	Decommission and remove the existing water meter.	No.	1		
228,2	Supply and install a new 150 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
228,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
228,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
228,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
228,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
229	Joint Bunkering Services (TBXB)				
229,1	Decommission and remove the existing water meter.	No.	1		
229,2	Supply and install a new 100 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
229,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
229,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
229,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
229,6	Test and commission the installation	No.	1		
230	Quay 502 Container control office & abl. BSD				
230,1	Decommission and remove the existing water meter.	No.	1		
230,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
230,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
230,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
230,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
230,6	Test and commission the installation	No.	1		
231	WBHO				
231,1	Decommission and remove the existing water meter.	No.	2		
231,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	2		
231,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	2		
231,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
231,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
231,6	Test and commission the installation	No.	2		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
232	PIP Site (S a fence & Gate)				
232,1	Decommission and remove the existing water meter.	No.	1		
232,2	Supply and install a new 15 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
232,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
232,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
232,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
232,6	Test and commission the installation	No.	1		
233	PIP site (Christopher Clement)				
233,1	Decommission and remove the existing water meter.	No.	1		
233,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
233,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
233,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
233,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
233,6	Test and commission the installation	No.	1		
234	Proticon Containers				
234,1	Decommission and remove the existing water meter.	No.	1		
234,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
234,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
234,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
234,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
234,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
235	Q 501 (Security) Robben Eiland				
235,1	Decommission and remove the existing water meter.	No.	1		
235,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
235,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
235,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
235,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
235,6	Test and commission the installation	No.	1		
236	PIP SITE NEW SECURITY BLDG				
236,1	Decommission and remove the existing water meter.	No.	1		
236,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
236,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
236,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
236,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
236,6	Test and commission the installation	No.	1		
237	DAMEN SPRAY ROOM				
237,1	Decommission and remove the existing water meter.	No.	1		
237,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
237,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
237,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
237,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
237,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
238	Etlin International (pty) Ltd (Cape Cold Storage) Heli pad				
238,1	Decommission and remove the existing water meter.	No.	1		
238,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
238,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
238,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
238,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
238,6	Test and commission the installation	No.	1		
239	CONTAINER X-RAY				
239,1	Decommission and remove the existing water meter.	No.	1		
239,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
239,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
239,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
239,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
239,6	Test and commission the installation	No.	1		
240	SJW CIVILS				
240,1	Decommission and remove the existing water meter.	No.	1		
240,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
240,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
240,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
240,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
240,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
241	Servest Marine				
241,1	Decommission and remove the existing water meter.	No.	1		
241,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
241,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
241,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
241,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
241,6	Test and commission the installation	No.	1		
242	Shouters Kiosk Blue Store				
242,1	Decommission and remove the existing water meter.	No.	1		
242,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
242,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
242,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
242,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
242,6	Test and commission the installation	No.	1		
243	Washing Bay TPT				
243,1	Decommission and remove the existing water meter.	No.	1		
243,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
243,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
243,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
243,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
243,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
244	De Beers @ L-Berth				
244,1	Decommission and remove the existing water meter.	No.	1		
244,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
244,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
244,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
244,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
244,6	Test and commission the installation	No.	1		
245	Construction @ Eastern Mole				
245,1	Decommission and remove the existing water meter.	No.	1		
245,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
245,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
245,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
245,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
245,6	Test and commission the installation	No.	1		
246	Next to old Fire				
246,1	Decommission and remove the existing water meter.	No.	1		
246,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
246,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
246,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
246,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
246,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
247	FFS New Buildings				
247,1	Decommission and remove the existing water meter.	No.	2		
247,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	2		
247,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	2		
247,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	2		
247,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	2		
247,6	Test and commission the installation	No.	2		
248	Security bldg (Quay 500) new meter				
248,1	Decommission and remove the existing water meter.	No.	1		
248,2	Supply and install a new 20 mm water meter compatible with AMR technology including all necessary fittings, couplings, sealants etc.	No.	1		
248,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
248,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
248,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
248,6	Test and commission the installation	No.	1		
249	Ams Construction (Ocean Road)				
249,1	Decommission and remove the existing water meter.	No.	1		
249,2	Supply and install a new 50 mm water meter compatible with AMR technology including all necessary fittings, couplings, bolts, sealants etc.	No.	1		
249,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
249,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
249,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
249,6	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY CPT				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	SUPPLY AND INSTALLATION OF SMART ELECTRICITY METERS				
C	Replacement of energy meters in various locations (Three Phase)				
	Supply, install, configure, test and commission Smart Electricity Meters for measurement of different electrical parameters listed elsewhere in the document including Active energy (kWh/MWh), Reactive energy (kVArh/MVArh), Apparent energy (kVAh/MVAh) etc.,				
1,1	Decommission and remove the existing Electricity Meters in various locations	No.	160		
1,2	Supply and Install Metering panels for substations.	No.	36		
1,3	Supply, install and configure a new Smart Electricity Meter with all the necessary comms required (communication module, GSM antenna etc.),	No.	160		
1,4	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs.	No.	160		
1,5	Test and commission the installation.	No.	160		
	CARRIED FORWARD TO SUMMARY CPT				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
D	COMMUNICATION				
1,1	Supply and install signal repeaters to be linked to closest meters and gateway.	No.	20		
1,2	Standalone Fibre Network - Design, supply, install and patch 48 pair single mode fibre optic cable (652D)	m	13000		
1,3	Excavate and backfill where depth is not exceeding 2m deep	m ³	2340		
1,4	Supply and install 110mm PVC pipe and chamber system for the fibre.	m	13000		
1,5	Reinstate existing surface and make good	m ²	3900		
1,6	Supply and install patch panels fully populated 48 pair with Lucent Connector (LC) patch leads	No.	15		
1,7	Supply, install and configure 24 ports managed enterprise network switches including routing and setting up VLANs	No.	15		
1,8	Supply and install a 9U swing frame cabinet 900mm deep	No.	10		
1,9	Design and construction of Manholes for fibre	No.	10		
1,10	Supply, install and setup the servers	No.	2		
1,11	Splicing of Fibres	No.	360		
1,12	OTDR Testing (Test and submit line losses)	No.	360		
1,13	Supply, install, configure and commission a Firewall for LAN, ensure that old and new services going through the Firewall are reinstated. Setup DMZ and position a management workstation within DMZ	Sum	1		
1,14	Supply and install management workstation desktops and link to TNPA corporate network. Setup rules for management workstation and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.	No.	1		
1,15	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
	CARRIED FORWARD TO SUMMARY CPT				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
E	PROCUREMENT AND SUPPLY OF SPARES				
1,1	Smart automatic water meter reading devices	No.	3		
1,2	Smart automatic energy meter reading devices	No.	26		
1,3	Supply hand held automatic meter reading device (water & energy)	No.	2		
	CARRIED FORWARD TO SUMMARY CPT				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION				
	Metering gateways				
1,1	Supply, installation, configure and integrate the metering gateways onto the LAN and utilities management system for uploading water meter data. I	No.	5		
1,2	New Utilities Management System Development, Programming and Software integration into the billing server, tariff setup, designing billing template and setting up billing accounts on billing server. Configure the server to send an Alert (SMS) to TNPA for abnormalities. Including linking all Port meters to new utilites management system. Provide license package. Develop an API and link it to the back end of IPMS and SAP ERP.	Sum	1		
1,3	Mapping the meters onto the Geographic Information System (GIS) showing the exact installation point, opening meter reading and the picture of the installation.	Sum	1		
1,4	Testing and commissioning of the software side both individu	Sum	1		
1,5	AMR Training for End Users	Sum	1		
	CARRIED FORWARD TO SUMMARY CPT				

PORT OF CAPE TOWN		
	DESCRIPTION	AMOUNT
A	PRELIMINARIES AND GENERALS	
B	SUPPLY AND INSTALLATION OF SMART AUTOMATIC WATER METER READING DEVICES	
C	SUPPLY AND INSTALLATION OF SMART AUTOMATIC ENERGY METER READING DEVICES	
D	COMMUNICATION	
E	PROCUREMENT AND SUPPLY OF SPARES	
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION	
TOTAL CARRIED FORWARD TO SUMMARY PAGE:		

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF SALDANHA				
	<u>PREAMBLES</u>				
	Fixed preliminary items will be valuated and paid on a proven cost basis up to the total value The tenderer is expected to understand the site, restrictions, and scope of work and price only the relevant items within the Preliminaries. All items priced will be assessed in relevance to the contract prior to any payments being made				
A	FIXED-CHARGE ITEMS				
	<u>Contractual Requirements</u>				
1.1	Contractual Requirements: Allow for all contractual obligations in accordance with the NEC3 Engineering and Construction Contract (ECC), including the provision and maintenance of all required performance securities, guarantees, insurances, bonds, warranties, and statutory compliance for the full duration of the Contract.	sum	1		
	Establishment of Facilities on Site				
	Facilities for the Contractor				
1.2	Offices and storage sheds	sum	1		
1.3	Ablution and latrine facilities	sum	1		
1.4	Tools and equipment	sum	1		
1.5	Water supplies, electric power and communications	sum	1		
1.6	Dealing with water	sum	1		
1.7	Access	sum	1		
1.8	Plant	sum	1		
	Other Fixed-charge Obligations:				
1.9	Survey, setting out and preparation of as-built drawings	sum	1		
1.10	Health and Safety Compliance	sum	1		
1.11	Environmental management	sum	1		
	CARRIED FORWARD				

PRELIMINARY AND GENERAL					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
1.12	Security	sum	1		
1.13	Removal of Site Establishment	sum	1		
1.14	Plant	sum	1		
2	TIME-RELATED ITEMS				
	Operation and maintenance of facilities on the Site for duration of construction				
	<u>Facilities for the Engineer</u>				
2.1	Survey assistants and materials	Month	10		
	<u>Facilities for the Contractor</u>				
2.2	Offices and storage sheds	Month	10		
2.3	Ablution and latrine facilities	Month	10		
2.4	Tools and equipment	Month	10		
2.5	Water supplies, electric power and communications	Month	10		
2.6	Dealing with water (Sub-clause 5.5)	Month	10		
2.7	Access (Sub-clause 5.8)	Month	10		
2.8	Plant	Month	10		
	<u>Supervision</u>				
2.9	Supervision for duration of construction	Month	10		
	<u>Other time-related obligations</u>				
2.10	Compliance Occupational Health and Safety Act and Construction Regulations	Month	10		
2.11	Compliance to Environmental Management Plan	Month	10		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	PORT OF SALDANHA				
B	SUPPLY AND INSTALLATION OF SMART METERS				
1.1	Investigations and site assessment (Refer to WI Clauses 4.3)	sum	1		
1.2	Survey and Ground-Penetrating Radar (GPR) Scans on the route for any potential underground services	m ²	31250		
	SITE CLEARANCE, SITEWORKS, ETC.				
	Site Clearance				
1.3	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc and trees not exceeding 200mm girth	m ²	2500		
	Earthworks				
1.4	Excavate and backfill where depth is not exceeding 2m deep (600mm x 600mm x 600mm)	m ³	53		
	SUPPLY AND INSTALLATION OF SMART WATER METERS				
	Below Ground Installation Supply, install, test and commission smart water meters and shall be configured for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis				
	METER No. 01 Replacement of the meter including associated components Meter size: 300mm, existing pipe material is u-PVC				
2,1	Decommission and remove the existing above installation.	No.	1		
2,2	Supply and install a 300mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
2,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
2,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
2,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
2,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
2,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 02 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is u-PVC				
3,1	Decommission and remove the existing above installation.	No.	1		
3,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
3,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
3,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
3,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
3,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
3,7	Test and commission the installation	No.	1		
3,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
	METER No. 03 Replacement of the meter including associated components Meter size: 200mm, existing pipe material is u-PVC				
4,1	Decommission and remove the existing above installation.	No.	1		
4,2	Supply and install a 200mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
4,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
4,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
4,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
4,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
4,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 04 Replacement of the meter including associated components Meter size: 50mm, existing pipe material is u-PVC				
5,1	Decommission and remove the existing above installation.	No.	1		
5,2	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
5,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
5,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
5,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
5,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
5,7	Test and commission the installation	No.	1		
	METER No. 05 Replacement of the meter including associated components Meter size: 32mm, existing pipe material is Polycop				
6,1	Decommission and remove the existing above installation.	No.	1		
6,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
6,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
6,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
6,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
6,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
6,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 06 Replacement of the meter including associated components Meter size: 32mm, existing pipe material is Polycop				
7,1	Decommission and remove the existing above installation.	No.	1		
7,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
7,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
7,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
7,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
7,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
7,7	Test and commission the installation	No.	1		
	METER No. 07 Replacement of the meter including associated components Meter size: 32mm, existing pipe material is Polycop				
8,1	Decommission and remove the existing above installation.	No.	1		
8,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
8,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
8,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
8,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
8,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
8,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 08 Replacement of the meter including associated components Meter size: 200mm, existing pipe material is u-PVC				
9,1	Decommission and remove the existing above installation.	No.	1		
9,2	Supply and install a 200mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
9,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
9,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
9,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
9,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
9,7	Test and commission the installation	No.	1		
	METER No. 09 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is HDPE				
10,1	Decommission and remove the existing above installation.	No.	1		
10,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
10,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
10,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
10,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
10,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
10,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 10 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is u-PVC				
11,1	Decommission and remove the existing above installation.	No.	1		
11,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
11,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
11,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
11,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
11,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
11,7	Test and commission the installation	No.	1		
	METER No. 11 Replacement of the meter including associated components Meter size: 22mm, existing pipe material is Polycop				
12,1	Decommission and remove the existing above installation.	No.	1		
12,2	Supply and install a 22mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
12,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
12,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
12,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
12,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
12,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				
12					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 14 Replacement of the meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
13,1	Decommission and remove the existing above installation.	No.	1		
13,2	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
13,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
13,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
13,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
13,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
13,7	Test and commission the installation	No.	1		
	METER No. 15 Replacement of the meter including associated components Meter size: 100mm, existing pipe material is u-PVC/HDPE				
14,1	Decommission and remove the existing above installation.	No.	1		
14,2	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
14,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
14,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
14,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
14,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
14,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 18 Replacement of the meter including associated components Meter size: 150mm, existing pipe material is Asbestos Cement				
15,1	Decommission and remove the existing above installation.	No.	1		
15,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
15,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
15,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
15,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
15,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
15,7	Test and commission the installation	No.	1		
	METER NO. 19 Replacement of the meter including associated components Meter size: 100mm, existing pipe material is Asbestos Cement				
16,1	Decommission and remove the existing above installation.	No.	1		
16,2	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
16,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
16,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
16,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
16,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
16,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				
14					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 20 Replacement of the meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
17,1	Decommission and remove the existing above installation.	No.	1		
17,2	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
17,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
17,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
17,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
17,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
17,7	Test and commission the installation	No.	1		
	METER NO. 21 Replacement of the meter including associated components Meter size: 50mm, existing pipe material is u-PVC				
18,1	Decommission and remove the existing above installation.	No.	1		
18,2	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
18,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
18,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
18,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
18,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
18,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 22 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is u-PVC				
19,1	Decommission and remove the existing above installation.	No.	1		
19,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
19,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
19,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
19,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
19,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
19,7	Test and commission the installation	No.	1		
	METER No. 23 Replacement of the meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
20,1	Decommission and remove the existing above installation.	No.	1		
20,2	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
20,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
20,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
20,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
20,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
20,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				
16					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 25 Replacement of the meter including associated components Meter size: 100mm, existing pipe material is Asbestos Cement				
21,1	Decommission and remove the existing above installation.	No.	1		
21,2	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
21,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
21,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
21,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
21,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
21,7	Test and commission the installation	No.	1		
	METER No. 26 Replacement of the meter including associated components Meter size: 22mm, existing pipe material is Polycop				
22,1	Decommission and remove the existing above installation.	No.	1		
22,2	Supply and install a 22mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
22,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
22,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
22,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
22,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
22,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
	METER NO. 28 Replacement of the meter including associated components Meter size: 100mm, existing pipe material is Asbestos Cement				
23,1	Decommission and remove the existing above installation.	No.	1		
23,2	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
23,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
23,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
23,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
23,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
23,7	Test and commission the installation	No.	1		
	METER No. 30 Replacement of the meter including associated components Meter size: 100mm, existing pipe material is Asbestos Cement				
24,1	Decommission and remove the existing above installation.	No.	1		
24,2	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
24,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
24,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
24,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
24,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
24,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 31 Replacement of the meter including associated components Meter size: 100mm, existing pipe material is u-PVC				
25,1	Decommission and remove the existing above installation.	No.	1		
25,2	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
25,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
25,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
25,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
25,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
25,7	Test and commission the installation	No.	1		
	METER No. 32 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is u-PVC				
26,1	Decommission and remove the existing above installation.	No.	1		
26,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
26,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
26,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
26,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
26,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
26,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
	METER NO. 33 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is u-PVC				
27,1	Decommission and remove the existing above installation.	No.	1		
27,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
27,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
27,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
27,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
27,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
27,7	Test and commission the installation	No.	1		
	METER NO. 35 Replacement of the meter including associated components Meter size: 200mm, existing pipe material is Galvanised Steel				
28,1	Decommission and remove the existing above installation.	No.	1		
28,2	Supply and install a 200mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
28,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
28,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
28,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
28,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
28,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 36 Replacement of the meter including associated components Meter size: 150mm, existing pipe material is Asbestos Cement				
29,1	Decommission and remove the existing above installation.	No.	1		
29,2	Supply and install a 150mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
29,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
29,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
29,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
29,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
29,7	Test and commission the installation	No.	1		
	METER No. 37 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is Asbestos Cement				
30,1	Decommission and remove the existing above installation.	No.	1		
30,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
30,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
30,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
30,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
30,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
30,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 40 Replacement of the meter including associated components Meter size: 100mm, existing pipe material is Asbestos Cement				
31,1	Decommission and remove the existing above installation.	No.	1		
31,2	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
31,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
31,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
31,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
31,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
31,7	Test and commission the installation	No.	1		
	METER NO. 43 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is Steel				
32,1	Decommission and remove the existing above installation.	No.	1		
32,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
32,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
32,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
32,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
32,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
32,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
	METER No. 44 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is Steel				
33,1	Decommission and remove the existing above installation.	No.	1		
33,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
33,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
33,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
33,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
33,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
33,7	Test and commission the installation	No.	1		
	METER No. 45 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is Steel				
34,1	Decommission and remove the existing above installation.	No.	1		
34,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
34,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
34,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
34,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
34,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
34,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 47 Replacement of the meter including associated components Meter size: 32mm, existing pipe material is Polycop				
35,1	Decommission and remove the existing above installation.	No.	1		
35,2	Supply and install a 32mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
35,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
35,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
35,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
35,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
35,7	Test and commission the installation	No.	1		
	METER NO. 49 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is u-PVC				
36,1	Decommission and remove the existing above installation.	No.	1		
36,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
36,3	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
36,4	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
36,5	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
36,6	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
36,7	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	Above Ground Installation				
	Supply, install, test and commission smart water meters and shall be configured for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis				
	METER No. 27 Replacement of the meter including associated components Meter size: 22mm, existing pipe material is Polycop				
37,1	Decommission and remove the existing installation.	No.	1		
37,2	Supply and install a 22mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
37,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
37,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
37,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
37,6	Test and commission the installation	No.	1		
	METER No. 29 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is Steel				
38,1	Decommission and remove the existing installation.	No.	1		
38,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
38,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
38,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
38,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
38,6	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 46 Replacement of the meter including associated components Meter size: 75mm, existing pipe material is Steel				
39,1	Decommission and remove the existing installation.	No.	1		
39,2	Supply and install a 75mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
39,3	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
39,4	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
39,5	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
39,6	Test and commission the installation	No.	1		
39,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
	CARRIED FORWARD				
27					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 13 Installation of New meter including associated components Meter size: 200mm, existing pipe material is u-PVC				
40,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
40,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
40,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
40,4	Supply and install 200mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
40,5	Supply and install 200mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
40,6	Supply and install a 200mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
40,7	Supply and install a 200mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
40,8	Supply and install a 200mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
40,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
40,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
40,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
40,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
40,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 16 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
41,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
41,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
41,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
41,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
41,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
41,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
41,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
41,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
41,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
41,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
41,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
41,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
41,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 17 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
42,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
42,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
42,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
42,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
42,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
42,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
42,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
42,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
42,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
42,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
42,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
42,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
42,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 34 Installation of New meter including associated components Meter size: 110mm, existing pipe material is u-PVC				
43,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
43,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
43,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
43,4	Supply and install 110mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
43,5	Supply and install 110mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
43,6	Supply and install a 110mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
43,7	Supply and install a 110mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
43,8	Supply and install a 110mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
43,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
43,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
43,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
43,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
43,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 38 Installation of New meter including associated components Meter size: 50mm, existing pipe material is u-PVC				
44,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
44,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
44,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
44,4	Supply and install 50mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
44,5	Supply and install 50mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
44,6	Supply and install a 50mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
44,7	Supply and install a 50mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
44,8	Supply and install a 50mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
44,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
44,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
44,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
44,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
44,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 39 Installation of New meter including associated components Meter size: 50mm, existing pipe material is HDPE				
45,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
45,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
45,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
45,4	Supply and install 40mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
45,5	Supply and install 40mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
45,6	Supply and install a 40mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
45,7	Supply and install a 40mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
45,8	Supply and install a 40mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
45,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
45,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
45,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
45,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
45,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER NO. 41 Installation of New meter including associated components Meter size: 100mm, existing pipe material is Asbestos Cement				
46,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
46,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
46,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
46,4	Supply and install 100mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
46,5	Supply and install 100mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
46,6	Supply and install a 100mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
46,7	Supply and install a 100mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
46,8	Supply and install a 100mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
46,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
46,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
46,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
46,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
46,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 42 Installation of New meter including associated components Meter size: 110mm, existing pipe material is u-PVC				
47,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
47,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
47,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
47,4	Supply and install 110mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
47,5	Supply and install 110mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
47,6	Supply and install a 110mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
47,7	Supply and install a 110mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
47,8	Supply and install a 110mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
47,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
47,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
47,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
47,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
47,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 48 Installation of New meter including associated components Meter size: 160mm, existing pipe material is u-PVC				
48,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
48,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
48,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
48,4	Supply and install 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
48,5	Supply and install 160mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
48,6	Supply and install a 160mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
48,7	Supply and install a 160mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
48,8	Supply and install a 160mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
48,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
48,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
48,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
48,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
48,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				
28					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				R -
	METER No. 50 Installation of New meter including associated components Meter size: 110mm, existing pipe material is u-PVC				
49,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
49,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
49,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
49,4	Supply and install 110mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
49,5	Supply and install 110mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
49,6	Supply and install a 110mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
49,7	Supply and install a 110mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
49,8	Supply and install a 110mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
49,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
49,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
49,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
49,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
49,13	Test and commission the installation	No.	1		
	CARRIED FORWARD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
	METER No. 51 Installation of New meter including associated components Meter size: 110mm, existing pipe material is u-PVC				
50,1	Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.	m ³	5		
50,2	Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe as per drawings and specifications	m	4,5		
50,3	Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.	No.	1		
50,4	Supply and install 110mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.	No.	2		
50,5	Supply and install 110mm spool pieces in varying lengths flanged on both ends and fitted to meter, strainer & valve including all necessary, gaskets, bolts, sealants etc.	No.	2		
50,6	Supply and install a 110mm swing check valve flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
50,7	Supply and install a 110mm In-line strainer, flanged on both ends and fitted to new flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
50,8	Supply and install a 110mm water meter compatible with AMR technology, flanged on both ends and fitted to new-flanged pipes including all necessary gaskets, bolts, sealants etc.	No.	1		
50,9	Pipes underground to be taped shall be coated with appropriate primer and the tape shall be applied with minimum 15mm lap per spiral	m	8		
50,10	Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.	No.	1		
50,11	Register the meter on both the billing server and the new Utility Management System with appropriate tagging	No.	1		
50,12	Create an account and link the meter to the account and apply the appropriate tariffs	No.	1		
50,13	Test and commission the installation	No.	1		
	CARRIED FORWARD TO SUMMARY SLD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
SUPPLY AND INSTALLATION OF SMART ELECTRICITY METER READING DEVICES					
C	Replacement of energy meters in various locations (Three Phase)				
	Supply, install, configure, test and commission Smart Electricity Meters for measurement of different electrical parameters listed elsewhere in the document including Active energy (kWh/MWh), Reactive energy (kVArh/MVArh), Apparent energy (kVAh/MVAh) etc.,				
1,1	Decommission and remove the existing Electricity Meters in various locations	No.	2		
1,2	Supply and Install Current Transformer for Medium Voltage feeders.	No.	39		
1,3	Supply, install and configure a new smart energy meter with all the necessary comms required (communication module, GSM antenna etc.),	No.	13		
1,4	Establish connectivity: Link the meters to the billing server and the new Utilities Management System, Create Accounts and apply the tariffs.	No.	18		
1,5	Test and commission the installation.	No.	18		
	CARRIED FORWARD TO SUMMARY SLD				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
D	COMMUNICATION				
1,1	Standalone Fibre Network - Design, supply, install and patch 48 pair single mode fibre optic cable (652D)	m	10000		
1,2	Excavate and backfill where depth is not exceeding 2m deep	m ³	1800		
1,3	Supply and install 110mm PVC pipe and chamber system for the fibre.	m	10000		
1,4	Reinstate exsiting surface and make good	m ²	3000		
1,5	Supply and install patch panels fully populated 48 pair with Lucent Connector (LC) patch leads	No.	10		
1,6	Supply and install a media converter	No.	12		
1,7	Supply, install and configure 24 ports managed enterprise network switches including routing and setting up VLANs	No.	10		
1,8	Supply and install a 9U swing frame cabinet 900mm deep	No.	10		
1,9	Design and construction of Manholes for fibre	No.	10		
1,10	Supply, install and setup the severs	No.	2		
1,12	Splicing of Fibres	No.	240		
1,13	OTDR Testing (Test and submit line losses)	No.	240		
1,14	Supply, install, configure and commission a Firewall for LAN, ensure that old and new services going through the Firewall are reinstated. Setup DMZ and position a management workstation within DMZ	Sum	1		
1,15	Supply and install management workstation desktops and link to TNPA corporate network. Setup rules for management workstation and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it	No.	1		
1,16	Supply and install the latest Microsoft SQL server (permanent license)	No.	2		
	CARRIED FORWARD TO SUMMARY				

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
	BROUGHT FORWARD				
E	PROCUREMENT AND SUPPLY OF SPARES				
1,1	Smart automatic water meter reading devices	No.	52		
1,2	Smart automatic energy meter reading devices	No.	19		
1,3	Supply hand held automatic meter reading device (water & energy)	No.	2		
	CARRIED FORWARD TO SUMMARY SLD				
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE R	AMOUNT R
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION				
	Metering gateways				
1,1	Supply, installation, configure and integrate the metering gateways onto the LAN and utilities management system for uploading water meter data. Including civil and structural works and all appurtenances	No.	5		
1,2	New Utilities Management System Development, Programming and Software integration into the billing server, tariff setup, designing billing template and setting up billing accounts on billing server. Configure the server to send an Alert (SMS) to TNPA for abnormalities. Including linking all Port meters to new utilities management system. Provide license package. Develop an API and link it to the back end of IPMS and SAP ERP	Sum	1		
1,3	Mapping the meters onto the Geographic Information System (GIS) showing the exact installation point, opening meter reading and the picture of the installation.	Sum	1		
1,4	Testing and commissioning of the software side both individ	Sum	1		
1,5	AMR Training for End Users	Sum	1		
	CARRIED FORWARD TO SUMMARY SLD				

PORT OF SALDANHA		
	DESCRIPTION	AMOUNT R
A	PRELIMINARIES AND GENERALS	
B	SUPPLY AND INSTALLATION OF SMART AUTOMATIC WATER METER READING DEVICES	
C	SUPPLY AND INSTALLATION OF SMART AUTOMATIC ENERGY METER READING DEVICES	
D	COMMUNICATION	
E	PROCUREMENT AND SUPPLY OF SPARES	
F	AUTOMATIC METER READING (AMR) SYSTEM AND SOFTWARE INTEGRATION	
TOTAL CARRIED FORWARD TO SUMMARY PAGE:		



PART C3: SCOPE OF WORK

Document reference	Title	No of page
C3.1	This cover page	1
	<i>Employer’s Works Information</i>	2 - 133
Total number of pages		133

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SECTION 1

1 Description of the *works*

1.1 Executive overview

Transnet National Ports Authority (TNPA) owns, manages, controls and administers the South African Ports. TNPA's responsibility is to ensure that the Ports are efficient and economical. In doing so, TNPA is on a journey to a world-class port system thus introducing a new Operating Model, focusing on effective oversight, utilities management (water & electricity) and enabling platform which supports and monitors all operational activities across the entire ports system.

Utilities management assist in ensuring that the appropriate revenue is recovered against consumption of utilities for TNPA properties, other Transnet Operational Divisions' (Port Terminals and Freight Rail) and Tenants. Ultimately, this aids in identifying utilities constraints and ensure that these are addressed timeously and efficiently.

The management of utilities differs in all eight commercial Ports. As a result, the business is faced with under recoveries that emanates from various attributing factors which are:

Table 1: Under-recoveries and attributing factors.

No:	Utilities	Attributing factors
1.	Water	Infrastructure
		- Ageing and reaching the end of its useful life. - The increasing incidents of failures; leading to losses due to undetected leaks and unaccounted water (UAW). - Illegal connections and usage.
		Metering
		- Unregistered and unmetered connection points. - Manual capturing of readings. - Inadequate metering of usage at the connecting points for private tenants and other Transnet OD's.
		Billing and Recoveries
		- High cost paid to municipalities versus recoveries. - Improper tariff application and billing (surcharge, connection costs and maintenance costs). - Under-recoveries result from UAW and outstanding water bills where TNPA supplies water and the End-user does not pay for the service.

No:	Utilities	Attributing factors
2.	Electricity	Infrastructure
		- Capacity to identify Poor power quality due to the lack of Power Factor Correction equipment (PFC) in some Ports. - Absence of PFCs resulting in high energy consumption, high municipality bills and penalties.
		Metering
		- Outdated meters (analog) - not compatible with Automatic Meter Reading/Advanced Metering Infrastructure (AMR/AMI). - Unmetered supply points.
		Billing and Recoveries
		- Inconsistent tariff structure across the port system. - Manual recording of readings resulting in human errors (inaccurate billing).

TNPA is in search of a utility management software solution to assist the business in better management of utilities across Transnet. The software solution shall have the capability to monitor, perform analysis, retrieve water and electricity data from various software and be able to store TNPA's metering data in one central point.

In conclusion, leveraging on best practices will result in accurate billing as well as the reviewing and implementation of the following:

- The processes related to utilities management (water, electricity, rates and taxes) as far as:
 - Asset class, municipal account and expense validation.
 - Expense and accounts processing (capture, process, payment and reconciliation).
 - Recovery process (billing, collections and annual escalations).
- Development and embedment of a utilities management (smart metering system) which will detail how the entire process will be managed.

The scope to be carried out under this Contract includes but is not limited to the following items of work as summarised below which covers supply, installation, configuration, integration, design of communication networks [Local Area Network (LAN) & Private Wireless Network e.g. Radio Frequency (RF)], testing and commissioning of a utilities management solution across all ports:

- Supply, install, configure, test and commission smart electricity meters for measurement of different electrical parameters listed elsewhere in the document including Active Energy (kWh/MWh), Reactive Energy (kVARh/MVARh), Apparent Energy (kVAh/MVAh) etc.
- Supply, install, configure, test and commission smart water meters for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis.
- Supply, install, configure, test and commission all necessary AMR/AMI communication modules, transceivers, repeaters, gateways etc. All equipment to be supplied shall be of the latest AMR/AMI technologies.
- Design, develop, install, integrate (with existing systems in each port or lack thereof), test and commission a new utilities management software solution across all ports.
- Perform all the works, procurement, installation, testing and supervision to ensure compliance with the Employer's Works Information and all applicable standards.
- Design, supply and installation of networks (i.e. LAN and Wireless) including trenching, manholes, sleeves etc..
- Updating of as-builts, operating and maintenance manuals,
- Maintenance and Technical Support post implementation for a period of 12 months:
- In conjunction with the Defects Liability Period the Contractor shall undertake all system repairs, service and maintenance requirements including provision of manpower and consumables.
- Provision of the critical spares where required.
- Provision of training on the AMR and Utilities Management Software Solution.

1.2 Interpretation and terminology

Table 2: Abbreviations used in this Works Information

Abbreviation	Meaning given to the abbreviation
AIA	Authorised Inspection Authority
AMR	Automatic Meter Reading
BBBEE	Broad Based Black Economic Empowerment
CEMP	Construction Environmental Management Plan
CD	Compact Disc
CDR	<i>Contractor</i> Documentation Register
CSHEO	<i>Contractor's</i> Safety, Health and Environmental Officer
CM	Construction Manager
DWG	Drawings
EO	Environmental Officer
GIS	Geographic Information System
HAZOP	Hazard and Operability Study
HSSP	Health and Safety Surveillance Plan
JSA	Job Safety Analysis

Abbreviation	Meaning given to the abbreviation
Native	Original electronic file format of documentation
PES	Project Environmental Specifications
PHA	Preliminary Hazard Assessment
PSSM	Project Site Safety Manager
QA	Quality Assurance
SANS	South African National Standards
SASRIA	South African Special Risks Insurance Association
SES	Standard Environmental Specification
SHE	Safety, Health and Environment
SIP	Site Induction Programme
SMP	Safety Management Plan
uPVC	Unplasticized Poly Vinyl Chloride
TNPA	Transnet National Port Authority
OEM	Original Equipment Manufactures
K/L	Kilolitre
kWh	Kilo Watt hour
KVA	Kilovolts-Ampere
kVAR	Kilovolts-Ampere Reactive
R	Rands
AMR	Automatic Meter Reading
IoT	Internet of Things

2 Engineering and the *Contractor's* Design

2.1 *Employer's* design

2.1.1 No designs have been performed. However, the *Employer* shall supply the following information:

- Works Information
- Required Software Dashboards
- Project Specifications for Fiber Cable Installation

2.1.2 The *Employer* grants the *Contractor* authority to use existing copyrighted data presented for the purpose of the *works* only.

2.2 Parts of the *Works* which the *Contractor* is to design

2.2.1 The *Contractor* designs the parts of the *works* as outlined in this section for each port listed below:

- a. Port of Richards Bay.
 - b. Port of Durban.
 - c. Port of East London.
 - d. Port of Ngqura.
 - e. Port of Port Elizabeth.
 - f. Port of Mossel Bay.
 - g. Port of Cape Town.
 - h. Port of Saldanha.
- Design, develop, install, test and commission a utilities management software solution.
 - Design all graphic displays, dashboards, tabs (Water, Electricity, Financial etc.) and report templates on the utilities management system as per the required Software Dashboards.
 - Design, supply, install, test and commission Fibre Optic (LAN) and Wireless Communication Networks in all 8 ports (in compliance with Annexures C, E & L). This includes the required Civil works for fibre routing such as trenching, sleeves, manholes, road cutting backfilling etc in accordance with Project Specifications for Fiber Cable Installation.
 - Develop and design all communication and instrumentation required for AMR including linking all smart meters to the billing servers and setting up management workstations.
 - Program and integrate the software solution to the new and existing systems as well as the billing server(s).
 - Billing Software: Create accounts, link them to the meters and setup the tariffs.

- Install a Central Server at HQ and link all data servers from all ports to the one central repository and allow retrieval of information across the system.
- Backup data locally and all ports' centrally to Head Quarters (HQ).
- Should a server fail or malfunction at a particular port, the data shall failover (Backup) to HQ.
- Design all the changes required to suit existing equipment or software.

The final design and installation drawings must be based upon site confirmed dimensions and conditions. It is the responsibility of the *Contractor* to confirm all site conditions and produce these drawings to suit the actual conditions per port.

The *Contractor* is responsible for the design and overall integration of the *works* with the existing installations and software systems. All AMR gateways are to be linked through the LAN to upload data from the field devices to the billing servers.

The *Contractor* is required to submit all system designs and associated information to the *Employer* for review prior to procuring the systems equipment, this includes but is not limited to the following deliverables:

- a. Technical specification of the AMR system
- b. AMR system drawings including architectural layout and physical equipment and cable routing layout
- c. Software Design document e.g. Functional design specification (FDS) and/or detailed design specification (DDS)
- d. Network (wired and wireless) design documents e.g. technical specification and network architecture drawings
- e. Equipment lists
- f. Equipment data sheets
- g. Cable Schedules
- h. Schematic drawings
- i. Hook-up drawings (where applicable)
- j. Execution strategy report/ method statement
- k. Drawing Register
- l. Document Register

2.3 Procedure for submission and acceptance of *Contractor's* designs/ documentation

- 2.3.1** The *Contractor's* documentation shall be issued to the *Employer* under the cover of the *Contractor's* Transmittal Note indicating all Contract references (i.e., Project No, Package No, etc.) as well as the *Contractor's* Project Document Number, Revision Number, Title and chronological listing of transmitted documentation. Formats of *Contractor* data submitted is dependent on the project procedure and shall be specified by the *Employer*, upon the notified request of the *Contractor*.
- 2.3.2** The *Contractor* shall deliver both hard copies and electronic media copies (USB) to the *Employer* either at the address stated within the Contract Data or at the Project site office.
- 2.3.3** All electronic documentation shall be submitted by the *Contractor* in Adobe Acrobat (.PDF) and native file format.
- 2.3.4** The *Contractor* shall submit design drawings and other technical documentation for review and acceptance by the *Project Manager*.
- 2.3.5** No manufacturing or installation work is to commence until the drawings have been accepted.

2.4 Review and Acceptance of *Contractor's* Documentation

- 2.4.1** The *Contractor* submits documentation as required by the 'Works Information' to the *Project Manager* for review and acceptance.
- 2.4.2** Acceptance of documentation by the *Employer* will in no way relieve the *Contractor* of their responsibility for the correctness of information, or conformance with their obligation to Provide the Services. This obligation rests solely with the *Contractor*.
- 2.4.3** After review, a copy of the original reviewed/marked-up drawing/document, with the *Employer's* consolidated comments and document status marked on the Squad Check Form, is scanned and the copy shall be returned to the *Contractor* under cover of the project's Transmittal Note for revision or re-submittal as instructed.
- 2.4.4** The *Contractor* shall allow the *Employer* two weeks (unless otherwise stated and agreed) to review and respond to the *Contractor's* submission of their documentation, i.e., from time of receipt by the project to the time of despatch.
- 2.4.5** On receipt of the reviewed documentation the *Contractor* shall make any modifications requested/marked-up and resubmit the revised documentation to the *Employer* within two weeks. Queries regarding comments/changes should be addressed with the *Employer* prior to re-submittal.
- 2.4.6** Any re-submittals, which have not included the changes/comments identified, will be returned to the *Contractor* to be corrected. The *Contractor* shall re-issue the revised documentation incorporating all comments and other specified details not included in the previous issue.

2.5 Other requirements of the *Contractor's* designs

- 2.5.1** The *Contractor's* designs shall comply with all the SABS/IEC specifications, Codes of practice and all Engineering standards required for the works to be performed.

2.6 Use of *Contractor's* design

- 2.6.1** 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 the *works* with such licence being capable of transfer to any third Party without the consent of the *Contractor*.
- 2.6.2** The *Contractor* vests in the *Employer* full title to the intellectual property and copyright in the design data created in relation to the Works, irrespective of where or what those Works may be.
- 2.6.3** The *Contractor* grants the *Employer* a non-exclusive license, in accordance with the provisions of Section 22 of the Copyright Act 1978, to copy any document/calculation compiled/done by the *Contractor* in connection with the Works, to make free and unrestricted use thereof for his own purposes, modify some or having it modified by a third party for any reasons, to provide copies thereof to a third party (*Contractors* or *Consultants*) of the *Employer* to be used by them for the purposes of tendering or consultancy.
- 2.6.4** Furthermore, if any such document/calculation by any principal *Contractor* or *SubContractor* is used for the Works, the *Contractor* requests such principal *Contractor* or *SubContractor* to grant to the *Employer* a similar non-exclusive license for the purposes set out herein. The provisions of this clause do not apply to documents made in connection with the manufacturing process of Plant but only to the Plant itself.

2.7 As-built drawings, operating manuals and maintenance schedules

The *Contractor* shall provide, monthly, throughout the duration of the contract, redline marked-up drawings, including all changes to the drawings for the entire site, with accurate information pertaining to all constructed installations and infrastructure, irrespective of whether the equipment and infrastructure is underground or above ground. Final as-built drawings shall be submitted in 'rvt', 'dgn', 'dxf', 'dwg' and .PDF formats as applicable.

The *Contractor* provides the following:

2.7.1 As-Built/Final Documentation

- 2.7.1.1** In Providing the Services (including all incidental services required), the *Contractor* shall conform and adhere to the requirements of the *Employer's* Document Submission.

- 2.7.1.2 As-Built drawings to be signed off by the Construction Manager and a TNPA representative.
- 2.7.1.3 The *Contractor* will prepare the final As-Built drawings within 14 days of receiving the accepted red line drawings from the *Employer*.
- 2.7.1.4 Though stated below, the scope and format, including the required indexing of the as-built information shall still be discussed and agreed with the *Employer* prior to compilation and submission of the final documentation.
- 2.7.1.5 All as-built documents shall be signed off by the *Contractor* and submitted to the *Employer* for approval, as these are developed and at completion of the *Works*.
- 2.7.1.6 All as-built documents shall be furnished to the *Employer* in both hard and soft copy formats.

The *Contractor* is required to deliver, but not limited to the following documentation as part of the *Works*:

- 2.7.1.7 All design information in 2.2.1 and As-Built drawings in hard and soft copies.
- 2.7.1.8 Equipment data sheets and OEM Manuals (Configuration, installation, support and user manuals, etc.)
- 2.7.1.9 Applicable systems software and licenses, including all final programming of equipment on CD-ROMs/ USB.
- 2.7.1.10 SAT Procedures & reports including equipment certificates, which at minimum includes the following,
 - a) System execution strategy/ method statement
 - b) LAN execution strategy/ method statement
 - c) SAT certificates
 - d) Optic fibre cables test results (where required)
 - e) Ethernet cables test results (where required)
 - f) Wireless network coverage test results
 - g) Network bandwidth report
 - h) Network and software security test report
- 2.7.1.11 Device Configuration Records that accurately captures the system and software configuration of each configurable device (e.g., switches, meters, etc.)
- 2.7.1.12 Equipment list complete with serial numbers or part numbers, etc.
- 2.7.1.13 Cable schedules
- 2.7.1.14 Patching Schedule and IP Address schedule including used switch ports
- 2.7.1.15 Operating and Maintenance procedures

- 2.7.1.16 End of life software, firmware, and hardware support information
- 2.7.1.17 Equipment guarantees/warranties.
- 2.7.1.18 Certificate of Compliance where applicable
- 2.7.1.19 Any other as-built documentation as required by the *Employer*.
- 2.7.1.20 Critical and routine spare part lists
- 2.7.1.21 Documents and Drawings registers

2.7.2 As-Built Drawings

- 2.7.2.1 The *Contractor* shall keep a separate set of project drawings for marking up changes to the original design as the Works progress. Marked-up red lined hard copies of drawings shall be maintained by the *Contractor* during installation of the equipment and shall be included in the handover documentation.
- 2.7.2.2 As-built drawings shall include the drawings issued by the *Employer* (if any) as well as any drawings compiled by the *Contractor*.
- 2.7.2.3 Software copies of the "as-constructed" drawings shall be provided in 'rvt', 'dgn', 'dwg', 'dxf' and 'PDF' formats as applicable and requested by the *Employer*.

The final, as-built drawings shall be signed off by the *Contractor* and submitted to the *Employer* for approval at completion of the Works.

2.7.3 Data Books

Data packs for all equipment and materials shall be provided by the *Contractor* in electronic and hard-copy format and shall be neatly indexed and referenced to facilitate easy navigation by the *Employer* between documents. This shall include, but not be limited to, the following:

- 2.7.3.1 Final design documentation as stated in 2.7.1, including native software files.
- 2.7.3.2 As-built drawings including but not limited to as stated in 2.7.2.
- 2.7.3.3 The *Contractor* prepares two (2) marked up hard copies of the latest revision of the *Employer* documents/drawings to represent the As-Built/Final status.
- 2.7.3.4 The mark-ups shall be in RED pencil or pen and be complete and accurate. The *Contractor* submits same to the *Project Manager* under cover of a *Contractor's* Transmittal Note.
- 2.7.3.5 Drawings and charts larger than A4 are folded and those greater than A3 are enclosed in an A4 plastic pocket of adequate strength.
- 2.7.3.6 The *Contractor* submits the draft Table of Contents to the *Project Manager* for acceptance prior to the compilation and official submittal of the manuals.
- 2.7.3.7 The originals of all brochures shall be issued to the *Project Manager*. When a general brochure is applicable to a range of equipment, then the 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.

2.7.3.8 Where manuals include 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 such drawing has been incorporated. The required number of copies of the manual (s) shall be as specified by the *Project Manager* and submitted per type or model number of equipment included in the contract, or as specified by the *Project Manager*. A typical example of what the binder/file (s) shall be marked with on the spine and the front cover is as follows:

- Project No./Name
- Manual Title, e.g. Installation, Maintenance and Operating Manual
- Manual Numbering (e.g. Volume 1 of 2, etc.)
- Contract Number
- Contractor Name

2.7.3.9 Unless otherwise stated, the required number of copies of all As-Built/Final/Data Packs shall be:

- 3 x hard copies (Full size)
- 3 x USB drives Adobe Acrobat (.pdf) and "Native" formats

2.7.3.10 The physical and postal address, phone, website, email and reference numbers of all Sub-*Contractors* is provided.

2.7.4 Installation, Maintenance and Operating Manuals

2.7.4.1 Operating and maintenance manuals for all installations are to be provided by the *Contractor*. The *Employer* may request, and the *Contractor* shall provide, additional details for specific items or components, or further information for Works done by other disciplines.

2.7.4.2 The operating and maintenance manuals shall be neatly bound in a single A4 or A3 format book or file. As a minimum, three paper copies as well as an electronic PDF version will be required. Reference shall be made to the specifications and bill of quantities for additional requirements.

2.7.4.3 The *Contractor* provides manuals in an A4 hard covered, red, grease and waterproof binder, using 2 ring type binders. The manuals are well indexed and user friendly and include a summarized Table of Contents.

2.7.4.4 The required number of copies of the manual(s) shall be as specified by the *Employer* and submitted per type or model number of equipment included in the contract, or as specified by the *Project Manager*.

2.8 Plant and Material

2.8.1 Schedule of spares and consumables

The *Contractor* provides a schedule of recommended spare parts for the complete system. The following data is to be listed for item:

- Part description.
- Positional assembly indication.
- Part/drawing number.
- Quantity used.
- Quantity recommended.
- Delivery time and price.

2.8.2 Provision of spare parts and consumables

The *Contractor* provides all spare parts and consumables as allowed for in the Pricing Schedule.

3 Construction

3.1 Execution Plan

3.1.1 Sequence of Construction or Installation

All construction activities and sequencing of the works shall be planned as per the programming and method of construction outlined in this document.

This document contains the engineering and construction activities for all eight ports. The ports have been organized into three main regions: Eastern, Central and Western, each with its own distinct characteristics and specialized services. The Eastern region includes Durban and Richards Bay. The Central region consists of East London, Ngqura and Port Elizabeth. The Western region is composed of Mossel Bay, Cape Town and Saldanha.

The *Contractor* is required to have construction/ installation Teams per region (Eastern, Central and Western) and the Teams are to be subdivided into two i.e., one for the supply and installation of water meters and one for the supply and installation of electricity meters. These installations shall take place simultaneously. The *Contractor* is required to provide all necessary resources, tools and equipment to support this strategy. These requirements shall be included in the *Contractor's* schedule by the *Contractor*.

Eastern Region		
a.	Port of Richards Bay	Team One - Water Team Two - Electricity
b.	Port of Durban	Team Two - Electricity
Central Region		
c.	Port of Port Elizabeth	Team One - Water Team Two - Electricity
d.	Port of East London	Team One - Water Team Two - Electricity
e.	Port of Ngqura	Team One - Water Team Two - Electricity
Western Region		
f.	Port of Cape Town	Team One - Water Team Two - Electricity
g.	Port of Saldanha	Team One - Water Team Two - Electricity
h.	Port of Mossel Bay	Team One - Water Team Two - Electricity

3.2 Temporary works, site services & construction constraints

3.2.1 Employer's Site entry and security control, permits and Site regulations

- 3.2.1.1 The *Contractor* complies with the *Employer's* site entry, security control, permits, site regulations and Port rules.
- 3.2.1.2 The *Contractor* shall take out temporary entry permits for all personnel working within the harbour. All costs incurred shall be borne by the *Contractor*.
- 3.2.1.3 The *Contractor* complies with the following requirements of the *Employer*:
- a) All *Contractor's* personnel who will be working on this project shall undergo a safety induction conducted by *Employer's* representative before occupying the *Employer's* premises.
 - b) All *Contractor's* personnel shall always wear their uniform bearing their *Employer's* name or colour code to be easily identifiable as being employed by the company concerned.
 - c) The *Contractor* personnel shall adhere to all the standard operating procedures for the *Employer's* security to ensure compliance to the applicable standards and regulations [e.g., International Ship and Port Facility Security (ISPS) Code].
 - d) The *Contractor* personnel shall ensure compliance with National Ports Act and Port Rules.
 - e) The *Contractor* shall adhere to the stipulated speed limits.

3.2.2 Restrictions to access on Site, roads, walkways and barricades

- 3.2.2.1 The *Contractor* is specifically excluded from entering the *Employer's* operational areas which are adjacent to the site and Working Areas unless authorized by the *Project Manager*. The *Contractor* plans and organises his work in such a manner to cause least possible disruptions to the *Employer's* operations.
- 3.2.2.2 The *Contractor* ensures the safe passage of traffic to and around the Site and Working Areas at all times, this includes providing flagmen, protective barriers, signage etc. for protection, direction and control of traffic.

3.2.3 People restrictions on Site; Hours of Work, Conduct and Records

- 3.2.3.1 The *Contractor's* normal hours of work for his people employed on the Site shall be in accordance with the requirements of the Department of Labour or with the agreement of the relevant trade unions. The *Contractor* shall advise the *Project Manager* of his intended working hours at the first Project Kick-off meeting.
- 3.2.3.2 The *Project Manager's* office hours are 08h00 to 16h30 Monday to Friday. The offices are closed on Saturdays, Sundays and Public Holidays.

3.2.3.3 The *Contractor* keeps daily records of his people, Plant and Equipment engaged on Site and Working Areas (including Sub-*Contractors*) with access to such daily records available for inspection by the *Project Manager* at all reasonable times.

3.2.4 Health and Safety facilities on Site

3.2.4.1 All health and safety matters associated with the works shall be dealt with in accordance with Occupational Health & Safety Act, 1993 (Act No. 85 of 1993) and the Transnet National Ports Authority Health and Safety Specifications which will be attached to the Works Information.

3.2.4.2 The *Contractor* shall prepare, implement and administer the *Contractor's* Health and Safety Management Plan (CHSMP). The Health and Safety Management Plan must provide a systematic method of managing hazards and implementing control measures.

3.2.4.3 The *Contractor* must prepare and submit the occupational health & safety file to the *Project Manager* for acceptance. The *Project Manager* will then submit the Occupational Health & Safety File to the *Employer's* Legal & Compliance Department for approval before the commencement of the *works*.

3.2.4.4 Pre-employment medical examinations as well as exit medicals will be required and must further include for chest X-rays. These medical examinations must be carried out by a registered Occupational Health practitioner. All costs associated will be for the *Contractor's* account.

3.2.4.5 The *Contractor* ensures that its Sub-*Contractors* comply with the requirements of the Occupational Health & Safety Act, 1993 (Act No. 85 of 1993).

3.2.4.6 The *Contractor* performs the works and all construction activities within the site and Working Areas in accordance with the *Contractor's* Health and Safety Management Plan (CHSMP).

3.2.4.8 The *Contractor* complies with the requirements stated under clauses 3.1.2 and 3.1.4 of C3.1 *Employer's* Works Information.

3.2.5 Title to Materials from stripping, demolition and excavation

The *Contractor* has no title to Materials arising from removal of redundant equipment in the performance of the *works*. Redundant meters (water and electricity) are to be temporary stored at the *Contractor's* site camp; this will then be later transported to TNPA maintenance depots. However, all waste material shall be cleared from site by the *Contractor* and disposed in a designated disposal area or suitable waste container to avoid pollution. 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.

3.2.6 Cooperating with and obtaining acceptance of Others

- 3.2.6.1 The *Contractor* performs the work and co-operates with the *Employer* (including the agents of the *Employer*) who operates on site during the entire duration of the contract period. The *works* will be performed in an operational environment.
- 3.2.6.2 The *Contractor* performs the *works* and co-operates with Others, of whom the *Contractor* is to be notified once appointed by the *Employer*, who operates on site during the entire duration of the contract period.

3.2.7 Publicity and progress photographs

- 3.2.7.1 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*.
- 3.2.7.2 The *Contractor* obtains the permission and approval of the *Project Manager* before erecting any notice boards or using the details of the contract in any advertising media.

3.2.8 Contractor's Equipment

- 3.2.8.1 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.
- 3.2.8.2 All Equipment used by the *Contractor* on Site shall be properly maintained and operated. All vehicles on public roads shall be roadworthy, with the necessary licences and safety requirements. A checklist/register shall be implemented which lists the operator's qualifications and medical records.
- 3.2.8.3 The *Contractor* complies with the following:
- a) The *Contractor* shall supply all necessary Materials, labour, tools, Equipment, PPE, demarcating signage as per the latest construction regulation and transport required for the proper Completion of the *works*.
 - b) The *Contractor* shall submit a comprehensive list of Equipment, intended for use on this contract.
 - c) The use of all such Equipment shall be subject to approval by the *Project Manager*, though such approval shall not relieve the *Contractor* of any of their responsibilities under the contract.
 - d) Equipment and Materials to be used, shall be of high quality, and shall comply with all relevant specifications, codes as mentioned in the previous clause as well as Occupational Health and Safety Act of 1993(Act 85 of 1993).

3.2.9 Equipment provided by the Employer

- 3.2.9.1 No Equipment will be provided by the *Employer*.

3.2.10 Site services and facilities

3.2.10.1 The *Employer* provides the following facilities for the *Contractor*:

At each port, the *Employer* will provide a laydown area for the *Contractor* to establish his site camp. However, all preparation, fencing and security shall be provided by the *Contractor*.

The *Employer* will also provide the following metered connections to services within the site and lay down area for the *Contractor's* use and the cost shall be for the *Contractor's* account:

- Water supply point.
- Electrical connection point.

3.2.10.2 Facilities provided by the *Contractor*:

At each port, the *Contractor* provides at his cost all required facilities for his own use to provide the *works*, including offices, toilets and ablutions, stores, change rooms etc.

The *Contractor* submits a layout drawing of the proposed facilities to the *Project Manager* for acceptance before commencing with the establishment of each port site facilities.

3.2.11 Existing premises, inspection of adjoining properties and checking work of Others

The *Contractor* will be held responsible for any damage to existing structures and surfacing caused by the *Contractor* during the execution of the contract; fair wear and tear excluded and shall repair it to the satisfaction of the *Supervisor* on conclusion of the *works*. For this purpose, a joint inspection with the *Supervisor* will be carried out prior to occupation of the Site(s) and any existing damage noted.

3.2.12 Excavations and associated water control

3.2.12.1 If there is any excavation, the purpose will be to expose the main water line and laying of the fibre optic cable.

3.2.12.2 The *Contractor* protects all excavations against any water ingress whether by seepage, rain, storms, floods or any other means (i.e. highwater table etc.).

3.2.12.3 All trenching and work area is to be barricaded.

3.2.12.4 The excavated area is to be re-instated to original state upon completion of works.

3.2.13 Existing underground services

3.2.13.1 Due to the potentially high density of underground services in the ports, the uncertainty regarding their exact locations and sensitivity of the products, the *Contractor* will be required to search for existing services by using appropriate probing equipment before excavating.

3.2.13.2 The Contractor exercises due care and attention in carrying out any excavation work to avoid damage or disruption to existing services.

3.2.13.3 Where the Contractor encounters existing underground services, the Contractor undertakes the following:

The *Contractor* shall immediately notify the *Project Manager* of such service encountered who will then arrange for testing and verification if it is a "live" or "dead" service.

3.2.13.4 Should the *Contractor* fail to exercise the requisite care and attention in carrying out the excavation work, the *Contractor* will be held liable for any claims arising out of damage caused by such excavations.

3.2.14 Control of noise, dust, water and waste

Before the *Contractor* commences with any *works* that will produce noise, dust, water and waste, the *Contractor* submits his proposed methods of construction which demonstrate the measures taken to avoid and or reduce any nuisance arising from dust, noise and vibration for acceptance by the *Project Manager*.

3.3 Completion, testing, commissioning and correction of Defects

3.3.1 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.

Item of work	To be completed by
- As-built drawings - Valid calibration certificates - Data Books - Configuration Files including Usernames and Password - Configuration Software - Operating manuals - Maintenance Plans with: - Schedules in both hard copy - Electronic Format	Completion
Performance testing of the <i>works</i>	Completion

3.3.2 The *Contractor* is permitted to carry out the following works after Completion

Repair Defects identified within the guarantee/ Defects period.

3.3.3 Commissioning

3.3.3.1 The installation including the software part shall be comprehensibly tested and commissioned as individual and integrated system prior to completion.

3.3.3.2 The *Contractor* provides the following commissioning activities to bring the works in use in liaison with the *Employer*:

- The *Contractor* shall submit a planned commissioning procedure to the *Project Manager* at least two weeks before commissioning commences.
- The Contractor shall provide all relevant test equipment required to test and commission the complete works.
- The Contractor shall provide adequate and competent personnel for testing and commissioning.

3.3.4 Take over procedures

- 3.3.4.1 The *Employer* may take over the completed section of the works before the Completion Date. The *Employer* shall take over the works once the works has been tested and commissioned.
- 3.3.4.2 The Contractor ensures that the documentation as described under paragraph 3.2.1 is presented to the Project Manager by the Completion Date.
- 3.3.4.3 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 present to the Employer.

3.3.5 Access given by the *Employer* for correction of Defects

- 3.3.5.1 Access shall be given as stated under clauses 3.1.1 and 3.1.2 of this document.
- 3.3.5.2 The *Contractor* complies with the following constraints and procedures of the *Employer* where the *Project Manager* arranges access for the *Contractor* after Completion as stated under clauses 3.1.3 and 3.1.4.

3.3.6 Training and technology transfer for the Owner's personnel

- 3.3.6.1 The installation of the new automatic metering infrastructure and related systems, especially the AMR and software solution, will make a significant change in the operation and maintenance requirement for the *Employer*. The *Employer's* maintenance personnel will be exposed to new technology.
- 3.3.6.2 It is therefore essential that the Contractor provides an Accredited Facilitator in rendering the theoretical and practical training to the Employer's personnel. On completion of the training, it is expected that the Employer's personnel will be able to competently address any breakdown (both hardware and software) that may arise.
- 3.3.6.3 The Contractor compiles a Training Manual containing easy-to-understand notes on all subject matters critical for troubleshooting and resolving issues that may arise. Each Learner must receive a copy of the Training Manual for the course that he/she has attended. In addition, three copies of each Training Manual must be provided for the Project Manager to deliver to the Employer for reference purposes.
- 3.3.6.4 All training must be completed prior to the commencement of each port's commissioning (i.e., before Completion). The Employer will not accept responsibility for the Operation and Maintenance of any of the works in use until the training has been satisfactorily completed.
- 3.3.6.5 The Contractor is required to submit a Training Plan to the Project Manager for review no later than eight weeks before the commencement of commissioning per port.
- 3.3.6.6 The Contractor maintains an accurate record of the training given and is to submit a report on completion of the training. The report will include, details of the Trainer, the scope of the training, the duration of training and the Employer's personnel who received training.

3.3.6.7 Each port's training shall accommodate a minimum of seven (07) *Employer* attendees however not exceeding 15 for both theoretical classroom and practical session on site with equipment (Maintenance/ Communication/ Troubleshooting/ Q&A). Training shall be conducted per port and shall cover the following:

- (a) Maintenance and Operation of the system i.e., LAN, WAN, AMR and Billing Software
- (b) Administrator Training
- (c) Software and Hardware

Each Port	Employer's Delegates
	2x Electrical Engineer(s)/ Technicians 2x Civil Engineer(s)/ Technicians 2x Supervisors 1x IT Specialist and etc.

3.3.7 Maintenance and Technical Support Post Implementation

During the Defects Liability Period the *Contractor* shall undertake all system repairs, service and maintenance requirements including provision of manpower and consumables.

3.3.8 CIDB BUILD Requirements

3.3.8.1 The Socio-economic objectives of the project are:

- To train occupational qualifications, trade qualifications, work integrated learners – P1 and P2 learners, professional candidates.
- To develop targeted enterprises who are either JV partners to the successful bidder or sub-contractors. Development will be undertaken in identified areas following a Needs Analysis.

Standard for Skills Development

3.3.8.2 The *Contractor* further submit to the *Employer's* representative:

- An interim contract compliance training report in the specific format (Form A3 Project Interim Report) at intervals which do not exceed 3 months; and
- A final contract compliance training report, in the specific format (Form A5 Project Completion Report). This report shall, respectively, be submitted within 15 days of; reaching completion, end of the service, the delivery date for all work required or practical completion (in the case of professional service), service, design and construct contracts, and engineering and construction works contracts.

3.3.8.3 For Structured Workplace Learning for Candidates (Method 3 and Method 4) The *Contractor* shall:

- a) Appoint a supervisor who is actively engaged in work directly associated with the contract to issue tasks,
- b) Appoint a suitable mentor as required by the professional body statutory council.
- c) Management Meetings
- d) The Contractor shall report to the Employer's Representative on the implementation and progress of the CSDG.
- e) The Forms for contract administration
- f) The Contractor shall submit to the Employer's Representative the following proformas:
 - Form A2 Baseline Training Plan
 - Form A3 Project Interim Report
 - Form A5 Project Completion Report

3.3.8.4 Records

The *Contractor* shall:

- Keep records for learners and candidates of the hours worked and registration with the CISB SDA, Sector Education Training Authorities SETA's (where required) and professional statutory councils (where required) particulars towards compliance with this Standard.
- Ensure all the documentation required in terms of clause 4 in the Standard is provided in a timely manner and according to a prescribed format where applicable.
- Upon termination of the opportunities provided to satisfy the CSDG, certify the quantum and nature of the opportunity and submit the certificate and counter-certified by the relevant individual, to the Employer's Representative for record-keeping purposes.

3.3.8.5 Payment Certificates

The *Contractor* shall:

- Achieve the measurable CSDG as agreed by providing opportunities to learners requiring structured workplace learning using one or a combination of any of the Skills Methods as per the Standard in relation to work directly related to the contract or order as indicated under clause 4.2 and 4.3 in the Standard.
- Submit payment certificates to the Employer's Representative at intervals determined in the Contract.

Standard for Indirect Targeting

3.3.8.6 *Employer's Objective:*

- The objective of the project is to provide a minimum Contract Participation Goal (CPG) of 30% of the total project value and to develop targeted enterprises by the main or lead partner contractors.
- The successful Contractor shall:
 - I. Subcontract a minimum of 5% of the total project value to targeted enterprises;
 - II. Develop the targeted enterprise/s in two development areas as specified in the Standard, and agreed by both the Main Contractor and the targeted enterprise/s;
 - III. Perform needs analysis on the target enterprise to identify development goals;
 - IV. Provide internal mentorship support to improve the targeted enterprise/s performance,
 - V. Develop a project specific enterprise development plan to improve the targeted enterprise/s performance in the identified development areas;
 - VI. Monitor and report the progress of the agreed development areas with the targeted enterprise/s; and
 - VII. Submit a project completion report to the Employer's Representative for each targeted enterprise.

3.3.8.7 The development of the Targeted Enterprise shall be guided by the CIDB Competence Standard for Contractors Gazette No. 41237, 10 November 2017. Table 2.

3.3.8.8 The *Contractor* shall appoint an Enterprise Development Coordinator who shall:

- Develop a project specific Enterprise Development Plan to improve the targeted enterprise's performance in the identified development areas and shall allocate resources to monitor progress in relation to improved performance; and
- Shall submit to the Employer's Representative a monthly enterprise development report (Performa – ED105P) which documents all mentoring activities that have taken place during that month, and the progress made in improving the targeted enterprise's performance in the agreed development areas, countersigned by the targeted enterprise.

3.3.8.9 Competence Criteria for an Enterprise Development Coordinator

The enterprise development coordinator shall have the following competencies:

- a) Minimum experience of 5 years in the construction industry at Managerial level as a Site Agent, Contracts Manager, Site Manager, Construction Manager, Business Development Manager or Enterprise Development Manager.

- b) Minimum experience of 2 years in training and development in Building or Construction; and
- c) National Diploma or B Degree in the Built Environment or Business Management.

3.3.8.10 Management

The *Contractor* shall provide a competent person/s to provide internal mentorship to the Targeted Enterprise/s in the two agreed development areas.

3.3.8.11 The Format of Communications

The *Contractor* shall submit to the *Employer's* Representative:

- I. Project interim reports in the specified format (ED105P) detailing interim value of the CPG that was achieved. Such a report shall also contain a monthly progress report, compiled by the *Employer's* Representative and the *Contractor*, detailing an assessment of the enterprise development support provided.
- II. Project completion report, in the specified format (ED101P), to the Employer's Representative for acceptance within 15 days of achieving practical completion. The report shall include the value of the CPG that was certified in accordance with the contract, CIBD registration numbers of each and every targeted enterprise and the value of the subcontracted works or the participation parameter of the joint venture entered into; and
- III. Enterprise development declaration (ED104P).

3.3.8.12 The Key Personnel

The *Contractor* shall appoint an Enterprise Development Coordinator and a competent person/s to provide internal mentorship.

3.3.8.13 Management Meetings

The *Contractor* shall report to the *Employer's* Representative on the implementation and progress of the targeted enterprise development and CPG.

3.3.8.14 The Forms for contract administration

The *Contractor* shall submit to the *Employer's* Representative the following proformas:

- Form ED 105P Project Interim Report
- Form ED 104P Enterprise Development Declaration
- Form ED 101P Project Completion Report

3.3.8.15 Records

The *Contractor* shall:

- Keep records of the targeted enterprise development,
- Keep records of the payments made to the targeted enterprises in relation to the CPG,

- Ensure all the documentation required in terms of the Standard is provided in a timely manner and according to a prescribed format where applicable.

3.3.8.16 Payment Certificates

The *Contractor* shall:

- Achieve the measurable CPG and providing enterprise development support to the targeted enterprise/s as per the Standard,
- Submit payment certificates to the Employer's Representative at intervals determined in the Contract.

4 Plant and Materials Standards and Workmanship

4.1 Standards and Specifications Applicable to the Works

4.1.1 The latest SABS publications for specifications and codes will be used in the execution of this contract.

IEC 62052-11	Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 11: Metering equipment.
IEC 62053-22	Electricity metering equipment (AC) – Particular requirements - Part-22: Static Meters for Active Energy (Class 0.5S).
IEC 62053-23	Electricity metering equipment (AC) – Particular requirements - Part-23: Static Meters for Reactive Energy.
IEC 62056-21	Electricity metering: Data exchange for meter reading, tariff and load control - Part 21: Direct local data exchange.
SANS 241	Water for domestic supplies.
SANS 1529-1:2006	Metrological characteristics of mechanical water meters of nominal bore not exceeding 100mm.
SANS 1529-3:2006	Physical dimensions.
SANS 1529-4:2006	Mechanical meters of nominal bore exceeding 100mm but not exceeding 800mm.
Trade Metrology Act, 1973 (Act 77 of 1973).	

4.2 Plant, Material and Workmanship

4.2.1 All Plant and Material used in the installations shall be of high quality and the work be of a high standard of workmanship carried out by qualified personnel under proper supervision by experienced and competent officers.

4.2.2 All materials and products shall be used in strict accordance with manufacturer's instructions and specifications.

4.2.3 The Contractor shall supply all necessary Materials, labor, tools, Plant, PPE, demarcating signage and transport required for the proper Completion of the works.

4.2.4 All Plant and Material shall comply with the relevant SANS or International standard specifications.

4.3 Investigation, and Site Assessment

The *Contractor* carries out the following investigations at the sites:

- 4.3.1** The *Contractor* validates the information provided by the *Project Manager* and records all existing and level of accuracy on drawings and presents this to the *Project Manager* for acceptance.
- 4.3.2** Perform assessment and collaborate with the Employer on the best possible route for the fiber optic cable. The Contractor records the route on drawings and presents this to the Project Manager for acceptance.
- 4.3.3** Survey and perform Ground-Penetrating Radar (GRP) scans on the route for any potential underground services and overlay on the fiber optic cable route.
- 4.3.4** Perform assessment and collaborate with the Employer on the best possible location for the AMR Gateways and other communication equipment. The Contractor records the route on drawings and presents this to the Project Manager for acceptance
- 4.3.5** Perform assessment and collaborate with the Employer on the possible workstations and server rooms to install the servers and workstation computers and their power supply points.
- 4.3.6** Perform assessment and collaborate with the Employer on the conditions and storage of the existing water and electricity meters to be replaced.
- 4.3.7** Where required, the Contractor will make the new infrastructure available for a logical software, hardware and outside penetration security audit by consultants nominated by the Employer, during or after the commissioning.

5 Works Information

The *Contractor* shall be responsible for the design, supply, delivery, installation, configuration, software integration, testing, and commissioning of all the AMR meters as well as the software solution in all ports.

The scope to be carried out by the *Contractor* includes but not limited to the following items of work as summarized below:

- Supply, install, configure, test and commission smart electricity meters for measurement of different electrical parameters listed elsewhere in the document including Active Energy (kWh/MWh), Reactive Energy (kVARh/MVARh), Apparent Energy (kVAh/MVAh) etc.
- Supply, install, configure, test and commission smart water meters for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis.
- Supply, installation and configuration of transmitters, data loggers/ recorder/ pulse and counters.
- Design, develop, install, test and commission a smart utility management software solution including all graphic displays, dashboards, tabs, report templates etc.
- Design, install, test and commission Fibre Optic Local Area Network and Private Wireless Communication Network in each port.
- Selection of all communication and instrumentation required for Automatic Meter Reading (AMR) including linking the meters to the billing servers.
- Billing Software: Create accounts, link them to the meters and setup the tariffs. The billing software should also allow for capturing manual readings for Shipping water and small water meters.
- Program and integrate the software solution to new and existing systems as well as the billing servers.
- Link all the data servers from the eight ports to one central repository and allow retrieval of information across the system.
- Testing and commissioning of the installations as individual and integrated system.
- Issuing of Valid calibration certificates, Data Books, Operating manuals, Maintenance plans and schedules in both hard copy and electronic format.
- Supplying all necessary Materials, labour, tools, Plant, PPE, demarcating signage and transport required for the proper Completion of the works.

5.1 Port of Richard Bay

Site Conditions

All Plants and Materials offered shall be rated for continuous operation under the following service conditions: (Port to inputs data)

Altitude	Sea level to + 50m
Ambient air temperature	Max. 40 degrees Celsius; Min. – 5 degrees Celsius
Humidity	As high as 86%
Lightning conditions	10 strikes per year as listed in SABS codes
Atmosphere	Highly saline with heavy corrosive industrial, chemical and dust-laden nature. Frequent heavy rains driven by winds reaching speeds of 100km/h and above.
Water supply pressure	between 2.0 – 6.0bar

NEW SMART ELECTRICITY METERS

5.1.1 Replacement of smart Power Quality Meters

- 5.1.1.1 The *Contractor* shall perform the following activities during installation of power quality meters (Listed in Table 1):
- 5.1.1.2 Supply, install and configure new power quality meters.
- 5.1.1.3 Supply and install the I/O Modules.
- 5.1.1.4 Establish connectivity; Register the meters on the billing server, existing SCADA and the new Central Utility Management System with appropriate tagging.
- 5.1.1.5 Create accounts and link to the meter and apply the appropriate tariffs.
- 5.1.1.6 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.1.1.7 Test and commission the installation.
- 5.1.1.8 Reinstate power.

Table 1: Shows the areas where power quality meters are located and quantities to be replaced

Item No.	Location	Meter Type	Meter QTY	I/O Module QTY
1	Harbour West	Power Quality	28	28
2	Workshop Substation	Power Quality	7	7
3	Office Substation	Power Quality	5	5

Item No.	Location	Meter Type	Meter QTY	I/O Module QTY
4	Departure Yard Sub	Power Quality	6	6
5	Sort Yard Sub	Power Quality	6	6
6	Liquid Pitch Sub	Power Quality	7	7
7	Arrivals Yard Sub	Power Quality	6	6
8	Eastern Intake Sub	Power Quality	6	6
9	Admin Quay	Power Quality	7	7
10	Hydra Yard	Power Quality	7	7
11	Berth 209	Power Quality	8	8
12	South Dunes	Power Quality	8	8

5.1.2 Replacement of Old Electricity Meters

- 5.1.2.1 The *Contractor* shall perform the following activities on all the meters listed in Table 2:
- 5.1.2.2 Decommission and remove the existing electricity meter.
- 5.1.2.3 Supply, install and configure a new smart electricity meter with all the necessary comms required (communication module, GSM antenna etc.).
- 5.1.2.4 Establish connectivity; Register the meters on both the billing server and the new Utilities Management System with appropriate tagging.
- 5.1.2.5 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.1.2.6 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.1.2.7 Test and commission the installation.
- 5.1.2.8 Reinstate power.

Table 2: Shows the areas where the new smart electricity meters are to be installed.

Item No.	Meter Location	Type of Circuit	Meter Quantity
1	Arrivals Yard New Ark Lights	3 Phase	01
2	Bayvue Yard High Mast Lights	3 Phase	01
3	Berthing Master Northmoore Road	3 Phase	01
4	Berth 208 Lights (Medium Masts)	3 Phase	01
5	Berth 300 Lights	3 Phase	01
6	Departure Yard High Mast Lights	3 Phase	01
7	Departure Yard Silver Ocean Lights	3 Phase	01
8	Eastern Sub Silver Ocean Lights	3 Phase	01
9	Ferro High Mast Lights	3 Phase	01
10	Heli Pad Complex	3 Phase	01

Item No.	Meter Location	Type of Circuit	Meter Quantity
11	CCTV Technical (Harbour Café)	3 Phase	01
12	Maritime Complex	3 Phase	01
13	Mini Sub–South Break Water	3 Phase	01
14	Osizweni	3 Phase	01
15	Pioneer Centre	3 Phase	01
16	Port Control	3 Phase	01
17	Sorting Yard High Mast Lights	3 Phase	01
18	Sorting Yard New Ark Road	3 Phase	01
19	Sorting Yard Wayfearers Road	3 Phase	01
20	Truck Staging Area	3 Phase	01
21	Western Intake Urania & San Road Thom Kiosk	3 Phase	01
22	Workshop New Ark & Ventura Roads	3 Phase	01
23	Workshop Generator (Vikela Security/Clinic and Fire dept.)	3 Phase	01
24	Bureau Viritas	Single Phase	01
25	KNK Curries 3 (new)	Single Phase	01
26	Police Boat	Single Phase	01
27	Bid Freight (Coal Quay)-Kiosk Berth. Master	Single Phase	01
28	Spoornet Trunk Counter	Single Phase	01
29	(M & L) TFR Automatic Signals	Single Phase	01
30	CCTV TPT	Single Phase	01
31	TFR Automated Signals	Single Phase	01
32	KNK Curries (1)	Single Phase	01
33	Bidfreight (New container)	Single Phase	01
34	BTT Mess and Ablution	Single Phase	01
35	KNK Curries (2)	Single Phase	01

NEW SMART WATER METERS

5.1.3 Replacement of Old Water Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 3:

- 5.1.3.1 Decommission and remove the existing water meter.
- 5.1.3.2 Supply and install flange stub HDPE to flange stub AC to exterior of the chamber
- 5.1.3.3 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.

- 5.1.3.4 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.1.3.5 The Contractor shall ensure the water meter chamber is watertight after completion of the work.
- 5.1.3.6 Register the meter on both the billing server and the new Utilities Management System with appropriate tagging.
- 5.1.3.7 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.1.3.8 Test and commission the installation.

Table 3: Shows the areas where the new smart water meters are to be installed.

Meter No.	Meter Location	Existing Pipe Size (mm)	Existing Pipe Material	Installation Type	Meter Size (mm)
1	Harbour Main Meter	320	HDPE	Inside a Manhole	300
2	Bayview Main Meter	180	HDPE	Inside a Manhole	150
3	Die Duine Main Meter	280	HDPE	Inside a Manhole	250
4	Government House	110	HDPE	Inside a Manhole	100
5	Water Gantry	50	HDPE	Inside a Manhole	50
6	Silver Ocean: Main	200	HDPE	Inside a Manhole	150
7	Newark: Main	200	HDPE	Inside a Manhole	150
8	Action Cricket	170	HDPE	Inside a Manhole	150
9	Tidal Gates (Two Meters)	270	HDPE	Inside a Manhole	250
10	Chemical Berth Main	160	HDPE	Inside a Manhole	150
11	300 Series Meter	230	HDPE	Inside a Manhole	200
12	Baermer	150	HDPE	Inside a Manhole	150
13	Liquid Pitch	90	HDPE	Inside a Manhole	75
14	Fedmis Main Meter	180	HDPE	Inside a Manhole	150
15	Fedmis Fire	22	HDPE	Inside a Manhole	20
16	Shincell Fire	63	HDPE	Inside a Manhole	50
17	Shincell Ring Feed	110	HDPE	Inside a Manhole	100
18	Fermentech	110	HDPE	Inside a Manhole	100
19	Coaking Coal	90	HDPE	Inside a Manhole	75
20	IVS: Administration: Small	63	HDPE	Inside a Manhole	50
21	IVS: Administration: Large	270	HDPE	Inside a Manhole	250
22	IVS: Gate	50	HDPE	Inside a Manhole	50
23	IVS: Fire Main	150	HDPE	Inside a Manhole	100
24	Richards Bay Bunker Terminal	35	HDPE	Inside a Manhole	25
25	RBCT Main (Hydra substation)	200	HDPE	Inside a Manhole	200

Meter No.	Meter Location	Existing Pipe Size (mm)	Existing Pipe Material	Installation Type	Meter Size (mm)
26	Carriage & Wagon – Departure Yard	50	HDPE	Inside a Manhole	50
27	Shunters Cabin 124 & 138 – Silver Ocean Road	50	HDPE	Inside a Manhole	50
28	Shunter's Cabin 139 – Bottom Discharger	25	HDPE	Inside a Manhole	20
29	Shunter's Cabin 229 – Arrivals Yard	28	HDPE	Inside a Manhole	20
30	Shunter's Cabin – CoalLink	22	HDPE	Inside a Manhole	20
31	Shunter's Cabin – Duine Area	22	HDPE	Inside a Manhole	20
32	Carriage and Wagon – Duine Area	110	HDPE	Inside a Manhole	100
33	DBT Storage – Mechanical	50	HDPE	Inside a Manhole	50
34	DBT Storage – Electrical	50	HDPE	Inside a Manhole	50
35	DBT Storage – Administration	50	HDPE	Inside a Manhole	50
36	Dry Bulk Terminal Main Meter	160	HDPE	Inside a Manhole	150
37	DBT – Saxon Road	150	HDPE	Inside a Manhole	150
38	Mhlathuze Building	180	HDPE	Inside a Manhole	150
39	Office 2279	110	HDPE	Inside a Manhole	100
40	CoalLink Locomotive Depot	90	HDPE	Inside a Manhole	75

EXISTING SYSTEMS AND INTEGRATION

- 5.1.4** The Port of Richards Bay currently makes use of Adroit SCADA system, ION Setup Vista and ECWIN for monitoring and management of utilities with TCP/IP & Modbus communication protocols. The new Utility Management System shall integrate seamlessly with existing systems.
- 5.1.5** The *Contractor* must develop an Application Programming Interface (APIs) to integrate the software with existing systems including linking the Utility Management Software to both Transnet Integrated Port Management System (IPMS) and SAP ERP (Enterprise Resource Planning) to transfer billing data (kilo Liters & Rand Value, kilowatts hours & Rand Value) on 15th of each month.

COMMUNICATION INFRASTRUCTURE

5.1.6 Communication Infrastructure Requirements (LAN & Wireless Network)

- 5.1.6.1 Design a fibre optic Local Area Network within the port boundary.
- 5.1.6.2 Trench to lay the fibre optic sleeves, trenching to minimum depth of 600mm and a width of 300mm.
- 5.1.6.3 Supply and install 110mm PVC pipe and chamber system for the fibre.
- 5.1.6.4 Supply and install fibre optic manholes where required.
- 5.1.6.5 The trenching for complete installation shall not exceed a total length of 25km. Backfill and reinstate existing surface and make good.
- 5.1.6.6 Supply and install 25 patch panels fully populated 48 pair with LC patch leads.
- 5.1.6.7 Supply, install and patch a total of 25km of 48 pair single mode fibre optic cable (652D).
- 5.1.6.8 Supply, install and configure 25 by 24 ports managed enterprise network switches.
- 5.1.6.9 Supply and install a 9U swing frame cabinet 900mm deep.
- 5.1.6.10 Link all electricity meters through the LAN to transmit data to the billing server for processing via the Utilities Management Software.

5.1.7 Wireless Communication Network for the water meters

- 5.1.7.1 All waters are to be fitted with an AMR interface (IoT devices) for logging of data and communicate to the closest gateway. The AMR interface shall have long range transmission and operate on low power.
- 5.1.7.2 Supply and install metering gateways including civil and structural works and all appurtenances.
- 5.1.7.3 Configure and integrate the gateways onto the LAN to transfer data to the server and Utilities Management Software.
- 5.1.7.4 Supply and install a server (Network & Application) to manage and control the network. The network server shall receive data and control messages from the gateways and process the data. The application server shall interface with the network server and shall store the data, perform analytics and enable integration with other systems.
- 5.1.7.5 Develop an Application Programming Interface (API) to allow the network to transmit relevant billing data to the billing server and Utilities Management Software.

5.1.8 Servers

- 5.1.8.1 Supply, install and configure two 8-core (2.10GHz), 16GB, 8 x Hot plug 2.5in, smart array P408ia, 2 x 500W, rack mount billing servers.
- 5.1.8.2 Each server shall be supplied with four 1.2TB Hard Drives.

- 5.1.8.3 Supply and install the latest Microsoft SQL server (permanent license) for the management of data, storage and perform analytics via the Utilities Management Software.

5.1.9 Firewall

- 5.1.9.1 Supply, install, configure, and commission a Firewall for LAN. The *Contractor* shall ensure that old and new services going through the Firewall are reinstated.
- 5.1.9.2 Setup DMZ and position a management workstation within DMZ.

5.1.10 Management Workstation

- 5.1.10.1 Supply, install and setup a Management Workstation [(31.5 inch USB Hub Monitor, QHD, 60Hz, support Display Port Alt Mode with up to 90W Power Delivery, 1xHDMI, 1xRJ-45 (Ethernet 1 GbE), 4x Superspeed USB (5Gbps)].
- 5.1.10.2 Setup rules for management workstation to control SCADA and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.
- 5.1.10.3 Test and commission entire installation.

5.2 Port of Durban

Site Conditions

All Plants and Materials offered shall be rated for continuous operation under the following service conditions:

Altitude	Sea level to +50m
Ambient air temperature	Max. 40 degrees Celsius; Min. – 5 degrees Celsius
Humidity	As high as 86%
Lightning conditions	10 strikes per year as listed in SABS codes
Atmosphere	Highly saline with heavy corrosive industrial, chemical and dust-laden nature. Frequent heavy rains driven by winds reaching speeds of 100km/h and above.
Water supply pressure	between 2.0 – 6.0bar

NEW SMART ELECTRICITY METERS

5.2.1 Building & Marine Depot (Berth 100)

- 5.2.1.1 Re-wire the existing electrical circuits.
- 5.2.1.2 Supply, install and configure two smart electricity meters with all the necessary comms module as per the standard specification.
- 5.2.1.3 Supply and install ± 300 m single mode fibre optic between Building & Marine and Berth 100 Substation.
- 5.2.1.4 Supply and install a media converter.
- 5.2.1.5 Establish connectivity on the existing Local Area Network and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.
- 5.2.1.6 Create an account and link with the meter and apply the appropriate tariffs.
- 5.2.1.7 Test and commission the installations.

5.2.2 Shameisher Langerberg (Building & Marine)

- 5.2.2.1 Re-wire the existing electrical circuits.
- 5.2.2.2 Supply, install and configure two (02) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.2.3 Supply and install $\pm 300\text{m}$ single mode fibre optic between Building & Marine and Berth 100 Substation.

5.2.2.4 Supply and install a media converter.

5.2.2.5 Establish connectivity on the existing Local Area Network and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.2.6 Create an account and link with the meter and apply the appropriate tariffs.

5.2.2.7 Test and commission the installations.

5.2.3 Power Supplies and Services Depot

5.2.3.1 There are already existing electricity meters with comms module installed already.

5.2.3.2 The Contractor shall re-wire the electrical circuits, configure and register the smart electricity meters to the billing server and the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.3.3 Create an account and link with the meter and apply the appropriate tariffs.

5.2.3.4 Test and commission the installations.

5.2.4 Pollution Control Depot

5.2.4.1 Supply, install and configure four (04) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.4.2 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.4.3 Create an account and link with the meter and apply the appropriate tariffs.

5.2.4.4 Test and commission the installations.

5.2.5 Lighthouse Department

5.2.5.1 Re-wire the existing electrical circuits.

5.2.5.2 Supply, install and configure two (02) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.5.3 Supply and install $\pm 300\text{m}$ single mode fibre optic between Light House and Durban Harbour Intake (DHI) Substation.

5.2.5.4 Supply and install a media converter.

5.2.5.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.5.6 Create an account and link with the meter and apply the appropriate tariffs.

5.2.5.7 Test and commission the installations.

5.2.6 Workshop 24

5.2.6.1 Re-wire the existing electrical circuits.

5.2.6.2 Supply, install and configure six (06) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.6.3 Supply and install $\pm 100\text{m}$ single mode fibre optic between Workshop 24 and Short Blast Shop Substation.

5.2.6.4 Supply and install two (02) media converters.

5.2.6.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.6.6 Create an account and link with the meter and apply the appropriate tariffs.

5.2.6.7 Test and commission the installations.

5.2.7 Graving Dock

5.2.7.1 Re-wire the existing electrical circuits.

5.2.7.2 Supply, install and configure three (03) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.7.3 Supply and install $\pm 30\text{m}$ single mode fibre optic to the Graving Dock Substation.

5.2.7.4 Supply and install one (01) media converters.

5.2.7.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.7.6 Create an account and link with the meter and apply the appropriate tariffs.

5.2.7.7 Test and commission the installations.

5.2.8 Crane Supply Mini Substation

- 5.2.8.1 Re-wire the existing electrical circuits.
- 5.2.8.2 Supply, install and configure three (03) smart electricity meters with all the necessary comms module as per the standard specification.
- 5.2.8.3 Supply and install $\pm 5\text{m}$ single mode fibre optic between Graving Dock Substation and Crane Supply Mini Substation.
- 5.2.8.4 Supply and install one (01) media converter.
- 5.2.8.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS).
- 5.2.8.6 Create an accounts and link with the meter and apply the appropriate tariffs.
- 5.2.8.7 Test and commission the installations.

5.2.9 Building & Marine Depot (Methven Road)

- 5.2.9.1 Re-wire the existing electrical circuits.
- 5.2.9.2 Supply, install and configure four (04) smart electricity meters with all the necessary comms module as per the standard specification.
- 5.2.9.3 Supply and install $\pm 400\text{m}$ single mode fibre optic between Building & Marine Depot and Congella No.1 Mini Substation.
- 5.2.9.4 Supply and install one (01) media converter.
- 5.2.9.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.
- 5.2.9.6 Create an account and link with the meter and apply the appropriate tariffs.
- 5.2.9.7 Test and commission the installations.

5.2.10 Point Clinic

- 5.2.10.1 Re-wire the existing electrical circuits.
- 5.2.10.2 Supply, install and configure two (02) smart electricity meters with all the necessary comms module as per the standard specification.
- 5.2.10.3 Supply and install $\pm 50\text{m}$ single mode fibre optic between Point Clinic and R Berth Mini Substation.
- 5.2.10.4 Supply and install one (01) media converter.

5.2.10.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.10.6 Create an account and link with meter and apply the appropriate tariffs.

5.2.10.7 Test and commission the installations.

5.2.11 Bay Terrace Building

5.2.11.1 Re-wire the existing electrical circuits.

5.2.11.2 Supply, install and configure five (05) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.11.3 Supply and install $\pm 500\text{m}$ single mode fibre optic between Bay Terrace and Stanger Street Substation.

5.2.11.4 Supply and install one (01) media converter.

5.2.11.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.11.6 Create an account and link with the meter and apply the appropriate tariffs.

5.2.11.7 Test and commission the installations.

5.2.12 Queens Warehouse Building

5.2.12.1 Re-wire the existing electrical circuits.

5.2.12.2 Supply, install and configure five (05) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.12.3 Supply and install $\pm 500\text{m}$ single mode fibre optic between Queens Warehouse and Sand Bypass Substation.

5.2.12.4 Supply and install two (02) media converters.

5.2.12.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.12.6 Create an account and link with the meter and apply the appropriate tariffs.

5.2.12.7 Test and commission the installations.

5.2.13 TNPA Security Maydon Wharf

- 5.2.13.1 Re-wire the existing electrical circuits.
- 5.2.13.2 Supply, install and configure two (02) smart electricity meters with all the necessary comms module as per the standard specification.
- 5.2.13.3 Supply and install $\pm 500\text{m}$ single mode fibre optic between Bay Terrace and R Stanger Street Substation.
- 5.2.13.4 Supply and install two (02) media converters.
- 5.2.13.5 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.
- 5.2.13.6 Create an account and link with the meter and apply the appropriate tariffs.
- 5.2.13.7 Test and commission the installations.

5.2.14 Cato Creek Yard

- 5.2.14.1 Supply, install and configure two (02) smart electricity meters with all the necessary comms module as per the standard specification.
- 5.2.14.2 Supply and install $\pm 300\text{m}$ single mode fibre optic between Cato Creek Yard and Stanger Street Substation.
- 5.2.14.3 Supply and install two (02) media converters.
- 5.2.14.4 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.
- 5.2.14.5 Create an account and link with the meter and apply the appropriate tariffs.
- 5.2.14.6 Test and commission the installations.

5.2.15 Manganese Yard

- 5.2.15.1 Supply, install and configure one (01) smart electricity meters with all the necessary comms module as per the standard specification.
- 5.2.15.2 Supply and install $\pm 300\text{m}$ single mode fibre optic between Manganese Yard and Inner Caisson House.
- 5.2.15.3 Supply and install one (01) media converters.
- 5.2.15.4 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.15.5 Create an account and link with the meter and apply the appropriate tariffs.

5.2.15.6 Test and commission the installations.

5.2.16 Hokaido Yard

5.2.16.1 Supply, install and configure two (02) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.16.2 Supply and install $\pm 500\text{m}$ single mode fibre optic between Manganese Yard and Inner Caisson House.

5.2.16.3 Supply and install one (01) media converters.

5.2.16.4 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.16.5 Create an account and link with the meter and apply the appropriate tariffs.

5.2.16.6 Test and commission the installations.

5.2.17 Fynnland Yard

5.2.17.1 Supply, install and configure two (02) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.17.2 Supply and install $\pm 250\text{m}$ single mode fibre optic between Fynnland Yard and PSS Depot.

5.2.17.3 Supply and install one (01) media converters.

5.2.17.4 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.17.5 Create an account and link with meter and apply the appropriate tariffs.

5.2.17.6 Test and commission the installations.

5.2.18 Tank Washout Yard

5.2.18.1 Supply, install and configure two (02) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.18.2 The nearest existing fibre communication network is inside Tank Washout Mini Substation.

5.2.18.3 Supply and install one (01) media converters.

5.2.18.4 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.18.5 Create accounts and link with meter and apply the appropriate tariffs.

5.2.18.6 Test and commission the installations.

5.2.19 Kingsrest Yard

5.2.19.1 Supply, install and configure three (03) smart electricity meters with all the necessary comms module as per the standard specification.

5.2.19.2 Supply and install $\pm 150\text{m}$ single mode fibre optic between Kingsrest Yard and Kingsrest Mini No.1 & 2.

5.2.19.3 Supply and install two (02) media converters.

5.2.19.4 Establish connectivity on the existing Local Area Network; register the meters on the billing server and integrate the meters onto the existing Switch (Admin Console) Meter Data Management System (MDMS) with appropriate tagging.

5.2.19.5 Create an account and link with the meter and apply the appropriate tariffs.

5.2.19.6 Test and commission the installations.

NEW SMART WATER METERS

5.2.20 Port of Durban Smart Water Meters

All water meters in the Port of Durban are being replaced on the on-going project "Replace Water Pipeline and Billing System".

EXISTING SYSTEMS AND INTEGRATION

5.2.21 TNPA Port of Durban Electrical Department has a standalone backbone fibre optic communication network [i.e., TCP/IP (Transmission Control Protocol/ Internet Protocol) & OPC (Open Platform Communication)] around the port for the SCADA and Electricity Billing system as well as a Long Range (LoRa) Private Wireless network for water meters. The port uses Power Smart Web and Switch (Admin Console) Meter Data Management System (MDMS) for utility management.



5.2.22 The *Contractor* must develop an Application Programming Interface (APIs) to integrate the software with existing systems including linking the Switch (Admin Console) MDMS to Transnets’ Integrated Port Management System (IPMS) and SAP ERP (Enterprise Resource Planning) to transfer billing data (kilo Liters & Rand Value, kilowatts hours & Rand Value) on 15th of each month.

5.3 Port of East London

Site Conditions

All Plants and Materials offered shall be rated for continuous operation under the following service conditions: (Port to inputs data)

Altitude	Sea level to + 50m
Ambient air temperature	Max. 40 degrees Celsius; Min. – 5 degrees Celsius
Humidity	As high as 86%
Lightning conditions	10 strikes per year as listed in SABS codes
Atmosphere	Highly saline with heavy corrosive industrial, chemical and dust-laden nature. Frequent heavy rains driven by winds reaching speeds of 100km/h and above.
Water supply pressure	between 2.0 – 6.0bar

NEW SMART ELECTRICITY METERS

5.3.1 Installation of New Smart Electricity Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 4:

- 5.3.1.1 Decommission and remove the existing electricity meter.
- 5.3.1.2 Supply, install and configure a new smart electricity meter with all the necessary comms required (communication module, GSM antenna etc.).
- 5.3.1.3 Establish connectivity; Register the meters on both the billing server and the new Utilities Management System through the LAN.
- 5.3.1.4 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.3.1.5 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.3.1.6 Test and commission the installation.
- 5.3.1.7 Reinstate power.

Table 4: Shows the areas where the new smart electricity meters are to be installed.

Meter No.	Meter Location	Type of Circuit	Meter Quantity
EM1	EL Yacht Club	3 Phase	01
EM2	Port Admin Building	3 Phase	01
EM3	Port Admin Building	3 Phase	01
EM4	Combi Substation	3 Phase	01
EM5	Biblia Building	3 Phase	01
EM6	State Warehouse Sub	3 Phase	01
EM7	State Warehouse Sub	3 Phase	01
EM8	State Warehouse Sub	3 Phase	01
EM9	C-Berth Building	3 Phase	01
EM10	C-Berth Building	3 Phase	01
EM11	C-Berth Building	3 Phase	01
EM12	C-Berth Building	3 Phase	01
EM13	C-Berth Building	3 Phase	01
EM14	Sewage Pit Shop 17	3 Phase	01
EM15	Shipwrights W/shop	3 Phase	01
EM16	STBD Kiosk No.1	3 Phase	01
EM17	STBD Kiosk No.2	3 Phase	01
EM18	STBD Sub	3 Phase	01
EM19	M.G Room STBD	3 Phase	01
EM20	M.G Room STBD	3 Phase	01
EM21	M.G Room STBD	3 Phase	01
EM22	M.G Room STBD	3 Phase	01
EM23	M.G Room STBD	3 Phase	01
EM24	M.G Room STBD	3 Phase	01
EM25	M.G Room STBD	3 Phase	01
EM26	M.G Room STBD	3 Phase	01
EM27	M.G Room STBD	3 Phase	01
EM28	M.G Room STBD	3 Phase	01
EM29	M.G Room STBD	3 Phase	01
EM30	M.G Room STBD	3 Phase	01
EM31	M.G Room STBD	3 Phase	01
EM32	M.G Room STBD	3 Phase	01
EM33	M.G Room STBD	3 Phase	01
EM34	M.G Room STBD	3 Phase	01
EM35	M.G Room STBD	3 Phase	01
EM36	M.G Room STBD	3 Phase	01
EM37	M.G Room STBD	3 Phase	01

Meter No.	Meter Location	Type of Circuit	Meter Quantity
EM38	M.G Room STBD	3 Phase	01
EM39	M.G Room STBD	3 Phase	01
EM40	M.G Room STBD	3 Phase	01
EM41	M.G Room STBD	3 Phase	01
EM42	M.G Room STBD	3 Phase	01
EM43	M.G Room STBD	3 Phase	01
EM44	M.G Room STBD	3 Phase	01
EM45	M.G Room STBD	3 Phase	01
EM46	M.G Room STBD	3 Phase	01
EM47	M.G Room STBD	3 Phase	01
EM48	M.G Room STBD	3 Phase	01
EM49	M.G Room STBD	3 Phase	01
EM50	M.G Room STBD	3 Phase	01
EM51	M.G Room STBD	3 Phase	01
EM52	M.G Room STBD	3 Phase	01
EM53	M.G Room STBD	3 Phase	01
EM54	M.G Room STBD	3 Phase	01
EM55	M.G Room STBD	3 Phase	01
EM56	M.G Room STBD	3 Phase	01
EM57	M.G Room STBD	3 Phase	01
EM58	M.G Room STBD	3 Phase	01
EM59	M.G Room STBD	3 Phase	01
EM60	M.G Room STBD	3 Phase	01
EM61	M.G Room STBD	3 Phase	01
EM62	M.G Room STBD	3 Phase	01
EM63	M.G Room STBD	3 Phase	01
EM64	M.G Room STBD	3 Phase	01
EM65	M.G Room STBD	3 Phase	01
EM66	M.G Room STBD	3 Phase	01
EM67	M.G Room STBD	3 Phase	01
EM68	M.G Room STBD	3 Phase	01
EM69	M.G Room STBD	3 Phase	01
EM70	M.G Room STBD	3 Phase	01
EM71	M.G Room STBD	3 Phase	01
EM72	M.G Room STBD	3 Phase	01
EM73	M.G Room STBD	3 Phase	01
EM74	M.G Room STBD	3 Phase	01
EM75	M.G Room STBD	3 Phase	01

Meter No.	Meter Location	Type of Circuit	Meter Quantity
EM76	M.G Room STBD	3 Phase	01
EM77	M.G Room STBD	3 Phase	01
EM78	M.G Room STBD	3 Phase	01
EM79	M.G Room STBD	3 Phase	01
EM80	M.G Room STBD	3 Phase	01
EM81	M.G Room STBD	3 Phase	01
EM82	M.G Room STBD	3 Phase	01
EM83	M.G Room STBD	3 Phase	01
EM84	M.G Room STBD	3 Phase	01
EM85	M.G Room STBD	3 Phase	01
EM86	M.G Room STBD	3 Phase	01
EM87	M.G Room STBD	3 Phase	01
EM88	M.G Room STBD	3 Phase	01
EM89	M.G Room STBD	3 Phase	01
EM90	M.G Room STBD	3 Phase	01

NEW SMART WATER METERS

5.3.2 Replacement of Existing Water Meters

The *Contractor* shall perform the following activities on all the meters list in Table 5:

- 5.3.2.1 Decommission and remove the existing water meter.
- 5.3.2.2 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.3.2.3 Supply, install, mount and configure a smart IP68 meter-reading device (scanner and transceiver) and establish connectivity for wireless communication.
- 5.3.2.4 Establish Connectivity, Register the meter on both the billing server and the new Utility Management System.
- 5.3.2.5 Create accounts and link them to the relevant meter and apply the appropriate tariffs.
- 5.3.2.6 Test and commission the installation.

Table 5: Shows the areas where the new smart water meters are to be installed.

Meter No.	Meter Location	Existing Pipe Size	Existing Pipe Material	Installation Type	New Meter Size (mm)
1	Orient Beach TNPA	Unknown	HDPE	Inside a Manhole	32
2	Orient Beach TNPA	Unknown	HDPE	Inside a Manhole	90
3	Buffalo Street	Unknown	HDPE	Inside a Manhole	32
4	Buffalo Street	Unknown	HDPE	Inside a Manhole	150
5	Pontoon Road	Unknown	HDPE	Inside a Manhole	150
6	Old Guard Post near SA navy	Unknown	GI	Inside a Manhole	150
7	Port Captain	Unknown	HDPE	Inside a Manhole	32
8	Port Captain	Unknown	HDPE	Inside a Manhole	150
9	Latimer's Landing	Unknown	GI	Inside a Manhole	150
10	West Bank near B/R/Y/C	Unknown	AC	Inside a Manhole	150
11	Dale Street	Unknown	AC	Inside a Manhole	150
12	Dale Street TNPA	Unknown	AC	Inside a Manhole	150
13	Strand Street Cabin	Unknown	GI	Inside a Manhole	150
14	Strand Street BCM	Unknown	GI	Inside a Manhole	150
15	Strand Street	Unknown	GI	Inside a Manhole	32
16	Strand Street	Unknown	GI	Inside a Manhole	150
17	Strand Street TNPA	Unknown	GI	Inside a Manhole	150
18	Grey Stones W/B	Unknown	AC	Inside a Manhole	32
19	EMD Horseshoe	Unknown	COPPER	Inside a Manhole	32
20	EMD Horseshoe	Unknown	COPPER	Inside a Manhole	90
21	Old Navy Base	Unknown	GI	Inside a Manhole	150
22	Almega College	Unknown	GI	Inside a Manhole	150
23	Almega College TNPA	Unknown	GI	Inside a Manhole	150
24	Latimer's Complex (Bulk)	Unknown	GI	Inside a Manhole	150
25	Latimer's Complex (Normal)	Unknown	GI	Inside a Manhole	150
26	El Yacht Club, Orient Pier	Unknown	HDPE	Inside a Manhole	150
27	Customs House	Unknown	HDPE	Inside a Manhole	150
28	Latimer's Landing	Unknown	GI	Inside a Manhole	150
29	Shipyard Area	Unknown	AC	Inside a Manhole	150
30	Power Boat Club, MC Arthur	Unknown	GI	Inside a Manhole	150
31	House No. 9	Unknown	GI	Inside a Manhole	150
32	House No. 8	Unknown	GI	Inside a Manhole	150
33	Foot Prints	Unknown	GI	Inside a Manhole	150

Meter No.	Meter Location	Existing Pipe Size	Existing Pipe Material	Installation Type	New Meter Size (mm)
34	Dept Public Works, Saps	Unknown	GI	Inside a Manhole	150
35	Venue	Unknown	GI	Inside a Manhole	150
36	Car Terminal Complex	Unknown	AC	Inside a Manhole	150
37	Terminal Control Bldg.	Unknown	GI	Inside a Manhole	150
38	Straddle Workshop	Unknown	GI	Inside a Manhole	150
39	Mess/Ablution TPT 4 Quay	Unknown	GI	Inside a Manhole	150
40	TPT Admin Building, 3 Quay	Unknown	GI	Inside a Manhole	150
41	G Shed	Unknown	GI	Inside a Manhole	150
42	Elevator EL&P	Unknown	GI	Inside a Manhole	150
43	Elevator Building	Unknown	GI	Inside a Manhole	150
44	TPT Office (Old CPO), 4 QUAY	Unknown	GI	Inside a Manhole	150
45	TPT & IT & Bills Office 4 Quay	Unknown	GI	Inside a Manhole	150
46	SHEQ OFFICE On Bank M/Gate	Unknown	GI	Inside a Manhole	150
47	Dry Dock Pump Room	Unknown	GI	Inside a Manhole	150
48	Repair Quay Area	Unknown	GI	Inside a Manhole	150
49	Shop 17 Workshop	Unknown	GI	Inside a Manhole	150
50	Shop 17 M & A	Unknown	GI	Inside a Manhole	150
51	Procurement/Security	Unknown	HDPE	Inside a Manhole	150
52	MHA Area	Unknown	GI	Inside a Manhole	150

EXISTING SYSTEMS AND INTEGRATION

5.3.3 The *Contractor* must develop an Application Programming Interface (APIs) to integrate the software with existing systems including linking the Utility Management Software to Transnets' Integrated Port Management System (IPMS) and SAP ERP (Enterprise Resource Planning) to transfer billing data (kilo Liters & Rand Value, kilowatts hours & Rand Value) on 15th of each month.

COMMUNICATION INFRASTRUCTURE

5.3.4 Communication Infrastructure Requirements

5.3.4.1 Design a fibre optic Local Area Network within the port boundary.

5.3.4.2 Trench to lay the fibre optic sleeves, trenching to minimum depth of 600mm and a width of 300mm.

5.3.4.3 Supply and install 110mm PVC pipe and chamber system for the fibre.

- 5.3.4.4 Supply and install fibre optic manholes where required.
- 5.3.4.5 The trenching for complete installation shall not exceed a total length of 12km. Backfill and reinstate existing surface and make good.
- 5.3.4.6 Supply and install 15 patch panels fully populated 48 pair with LC patch leads.
- 5.3.4.7 Supply, install and patch a total of 12km of 48 pair single mode fibre optic cable (652D).
- 5.3.4.8 Supply, install and configure 15 by 24 ports managed enterprise network switches.
- 5.3.4.9 Supply and install a 9U swing frame cabinet 900mm deep.
- 5.3.4.10 Link all electricity meters through the LAN to transmit data to the billing server for processing via the Utilities Management Software.

5.3.5 Wireless Communication Network for the water meters

- 5.3.5.1 All waters are to be fitted with an AMR interface (IoT devices) for logging of data and communicate to the closest gateway. The AMR interface shall have long range transmission and operate on low power.
- 5.3.5.2 Supply and install metering gateways including civil and structural works and all appurtenances.
- 5.3.5.3 Configure and integrate the gateways onto the LAN to transfer data to the server and Utilities Management Software.
- 5.3.5.4 Supply and install a server (Network & Application) to manage and control the network. The network server shall receive data and control messages from the gateways and process the data. The application server shall interface with the network server and shall store the data, perform analytics and enable integration with other systems.
- 5.3.5.5 Develop an Application Programming Interface (API) to allow the network to transmit relevant billing data to the billing server and Utilities Management Software.

5.3.6 Server

- 5.3.6.1 Supply, install and configure two 8-core (2.10GHz), 16GB, 8 x Hot plug 2.5in, smart array P408ia, 2 x 500W, rack mount billing servers.
- 5.3.6.2 Each server shall be supplied with four 1.2TB Hard Drives.
- 5.3.6.3 Supply and install the latest Microsoft SQL server (permanent license) for the management of data, storage and perform analytics via the Utilities Management Software.

5.3.7 Firewall

- 5.3.7.1 Supply, install, configure, and commission a Firewall for LAN. The *Contractor* shall ensure that old and new services going through the Firewall are reinstated.
- 5.3.7.2 Setup DMZ and position a management workstation within DMZ.



5.3.8 Management Workstation

- 5.3.8.1 Supply, install and setup a Management Workstation [(31.5 inch USB Hub Monitor, QHD, 60Hz, support Display Port Alt Mode with up to 90W Power Delivery, 1xHDMI, 1xRJ-45 (Ethernet 1 GbE), 4x Superspeed USB (5Gbps)].
- 5.3.8.2 Setup rules for management workstation to control SCADA and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.
- 5.3.8.3 Test and commission entire installation.

5.4 Port of Port Elizabeth

Site Conditions

All Plants and Materials offered shall be rated for continuous operation under the following service conditions: (Port to inputs data)

Altitude	Sea level to +50m
Ambient air temperature	Max. 40 degrees Celsius; Min. – 5 degrees Celsius
Humidity	As high as 86%
Lightning conditions	10 strikes per year as listed in SABS codes
Atmosphere	Highly saline with heavy corrosive industrial, chemical and dust-laden nature. Frequent heavy rains driven by winds reaching speeds of 100km/h and above.
Water supply pressure	between 2.0 – 6.0bar

NEW SMART ELECTRICITY METERS

5.4.1 Installation of New Smart Electricity Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 6:

- 5.4.1.1 Decommission and remove the existing electricity meter.
- 5.4.1.2 Supply, install and configure a new smart electricity meter with all the necessary comms required (communication module, GSM antenna etc.).
- 5.4.1.3 Establish connectivity; Register the meters on both the billing server and the new Utility Management System with appropriate tagging.
- 5.4.1.4 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.

5.4.1.5 Test and commission the installation.

5.4.1.6 Reinstate power.

Table 6: Shows the areas where the new smart electricity meters are to be installed.

No.	Meter Location	Type of Circuit	Meter Quantity
1	Talhado	3 Phase	03
2	Live fish tank	3 Phase	01
3	Turntable	3 Phase	01
4	Fire Department (Marine House)	3 Phase	02
5	Ore Berth west Substation	3 Phase	08
6	Oil Site Substation	3 Phase	10
7	Green street	3 Phase	02
8	Rail Substation	3 Phase	02
9	Main Intake Substation (opposite fire dep)	3 Phase	14
10	Kiosk at Jetty entrance	3 Phase	01
11	Metering panels citrus substation (FTP)	3 Phase	04
12	Admin Building Substation	3 Phase	02
13	Charl Malarn Quay Mini Sub	3 Phase	01
14	CAE garage	3 Phase	01
15	Main Intake Substation	3 Phase	02
16	Switch room behind Clinic	3 Phase	01
17	Albatios No 1 Quay	3 Phase	02
18	Malgas Kiosk	3 Phase	01
19	Procurement building	3 Phase	03
20	Admin Building Substation	3 Phase	02
21	Green Street Substation	3 Phase	02
22	Red Ground	3 Phase	02
23	Extreme Project	3 Phase	01
24	Light house Department	3 Phase	01
25	Switch room Behind clinic	3 Phase	05
26	Civil Depot	3 Phase	02
27	Shed 10	3 Phase	01
28	Shed 11	3 Phase	01
29	Shed 12 pump house	3 Phase	01
30	Old Navy (Entrance)	3 Phase	02

No.	Meter Location	Type of Circuit	Meter Quantity
31	Ore berth west substation	3 Phase	07
32	Malgas kiosk	3 Phase	03
33	Dom pedro (Tunnel)	3 Phase	01
34	Ore berth west	3 Phase	01
35	Orange kiosk	3 Phase	04
36	Ship way café	3 Phase	01
37	Siyaloba	3 Phase	01
38	NSRI Building	3 Phase	01
39	PE yatch (Marina)	3 Phase	02
40	Bakkens kiosk	3 Phase	05
41	Slip way	3 Phase	01

NEW SMART WATER METERS

5.4.2 Replacement of Existing Above Ground Water Meters

The *Contractor* shall perform the following activities on all the meters list in Table 7:

- 5.4.2.1 Decommission and remove the existing water meter.
- 5.4.2.2 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.4.2.3 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.4.2.4 Establish Connectivity, Register the meters on both the billing server and the new Utility Management System with appropriate tagging.
- 5.4.2.5 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.4.2.6 Test and commission the installation.

Table 7: Shows the areas where the new smart water meters are to be installed.

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
1	Procurement	15	Polycop/Copper	15
2	Security cabin green street	15	Polycop/ Copper	15
3	Clinic	15	Polycop/ Copper	15
4	SHEQ Building TPT	15	Polycop/ Copper	15

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
5	VW Office opposite Shed 101	15	Polycop/ Copper	15
6	Shunters Cabin (TFR)	15	Polycop/ Copper	15
7	Black Impala	15	Polycop/ Copper	15
8	Rennies Group	15	Polycop/ Copper	15
9	Greystone Cargo Systems (PTY) LTD	15	Polycop/ Copper	15
10	Bidfreight Port Operations (PTY) LTD	15	Polycop/ Copper	15
11	Bidfreight Port Operations (PTY) LTD	15	Polycop/ Copper	15
12	J.L Wessels	15	Polycop/ Copper	15
13	Commercial Marine	15	Polycop/ Copper	15
14	CDC Commercial Divers	15	Polycop/ Copper	15
15	Security Foot Bridge	22	Polycop/ Copper	22
16	HR Offices/ Building	22	Polycop/ Copper	22
17	103 Tower	22	Polycop/ Copper	22
18	102 Tower	22	Polycop/ Copper	22
19	Security Container Entrance	22	Polycop/ Copper	22
20	103 Quay Side	22	Polycop/ Copper	22
21	102 Quay Side	22	Polycop/ Copper	22
22	Shed 101	22	Polycop/ Copper	22
23	Car Terminal Admin Office	22	Polycop/ Copper	22
24	Spoornet	22	Polycop/ Copper	22
25	Malgas (TFR)	22	Polycop/ Copper	22
26	National Sea Rescue Institute	22	Polycop/ Copper	22
27	Stormfire Trading 11 CC	22	Polycop/ Copper	22
28	Tabak	22	Polycop/ Copper	22
29	Umsobomvu (No.2)	22	Polycop/ Copper	22
30	Shell South Africa Marketing (PTY)LTD	22	Polycop/ Copper	22
31	Shell SA (PTY) LTD	22	Polycop/ Copper	22
32	Extreme Projects	22	Polycop/ Copper	22
33	DS +CL Sgacace Fishing Farming	22	Polycop/ Copper	22
34	CVC Africa	22	Polycop/ Copper	22
35	Toilet TPM Kepli Petroleum	22	Polycop/ Copper	22
36	Blue Water Fishing	22	Polycop/ Copper	22
37	Van Niekerk/ Zandalee	22	Polycop/ Copper	22
38	Kepu Petroleum	22	Polycop/ Copper	22
39	Algoa Bay Sailing Marina	22	Polycop/ Copper	22

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
40	Albatross Offshore Services (PTY)LTD	22	Polycop/ Copper	22
41	Albatross	22	Polycop/ Copper	22
42	Rail to Rail – Red Grouwa (No.1)	22	Polycop/ Copper	22
43	Camanga	22	Polycop/ Copper	22
44	Blue Water Fish Traders	22	Polycop/ Copper	22
45	Bereau Veritus	22	Polycop/ Copper	22
46	Tanker Berth Control Room	22	Polycop/ Copper	22
47	Tanker Berth Security Cabin	22	Polycop/ Copper	22
48	Rail Buildings (3)	22	Polycop/ Copper	22
49	Engen Petroleum Limited	25	Polycop/ Copper	25
50	Shell South Africa (PTY) LTD	25	Polycop/ Copper	25
51	Chevron South Africa (PTY) LTD	25	Polycop/ Copper	25
52	Umsobomvu	25	Polycop/ Copper	25

5.4.3 Replacement of Existing Below Ground Water Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 8:

- 5.4.3.1 Decommission and remove the existing water meter.
- 5.4.3.2 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.4.3.3 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.4.3.4 Establish Connectivity, Register the meter on both the billing server and the new Utility Management System with appropriate tagging.
- 5.4.3.5 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.4.3.6 Test and commission the installation.

Table 8: Shows the areas where the new smart water meters are to be installed.

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
53	Finance Building	32	HDPE/Cement Fibre/ Cast-Iron	32
54	Bus Depot (Clinic)	32	HDPE/Cement Fibre/ Cast-Iron	32
55	Shed 12 TPT Ablutions	32	HDPE/Cement Fibre/ Cast-Iron	32

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
56	Shunters T/S Double Storey	32	HDPE/Cement Fibre/ Cast-Iron	32
57	Shell South Africa (PTY) LTD	32	HDPE/Cement Fibre/ Cast-Iron	32
58	Total Oil SA (PTY) LTD	32	HDPE/Cement Fibre/ Cast-Iron	32
59	ABSM Crane	32	HDPE/Cement Fibre/ Cast-Iron	32
60	Eyethu Fishing (PTY) LTD	32	HDPE/Cement Fibre/ Cast-Iron	32
61	Talhado Fishing	32	HDPE/Cement Fibre/ Cast-Iron	32
62	Fingcorp 113 CC	32	HDPE/Cement Fibre/ Cast-Iron	32
63	Vacant Building 1	32	HDPE/Cement Fibre/ Cast-Iron	32
64	Vacant Building 2	32	HDPE/Cement Fibre/ Cast-Iron	32
65	Vacant Building 3	32	HDPE/Cement Fibre/ Cast-Iron	32
66	Vacant Building 4	32	HDPE/Cement Fibre/ Cast-Iron	32
67	CVC Building (Ablution Block)	32	HDPE/Cement Fibre/ Cast-Iron	32
68	Ore Berth (Ablution Block)	32	HDPE/Cement Fibre/ Cast-Iron	32
69	Civil Depot	40	HDPE/Cement Fibre/ Cast-Iron	40
70	Business Manager (MPT)	40	HDPE/Cement Fibre/ Cast-Iron	40
71	ULwandle (Next to Oyster)	40	HDPE/Cement Fibre/ Cast-Iron	40
72	Live Fish Tanks (East Coast)	40	HDPE/Cement Fibre/ Cast-Iron	40
73	Department of Public Works	40	HDPE/Cement Fibre/ Cast-Iron	40
74	Alvodex CC	40	HDPE/Cement Fibre/ Cast-Iron	40
75	Pumpstation House (Seawater)	40	HDPE/Cement Fibre/ Cast-Iron	40
76	Trade Motto (1)	40	HDPE/Cement Fibre/ Cast-Iron	40
77	Trade Motto (2)	40	HDPE/Cement Fibre/ Cast-Iron	40
78	Rail Buildings (1)	40	HDPE/Cement Fibre/ Cast-Iron	40
79	Rail Buildings (2)	40	HDPE/Cement Fibre/ Cast-Iron	40
80	Marine Services	50	HDPE/Cement Fibre/ Cast-Iron	50
81	Marine Services	50	HDPE/Cement Fibre/ Cast-Iron	50
82	Port Admin Building (Port Authority)	50	HDPE/Cement Fibre/ Cast-Iron	50

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
83	Port Control Tower (Port Captain)	50	HDPE/Cement Fibre/ Cast-Iron	50
84	Minor Building (Offices)	50	HDPE/Cement Fibre/ Cast-Iron	50
85	Minor Building (Ablutions)	50	HDPE/Cement Fibre/ Cast-Iron	50
86	TPT Offices	50	HDPE/Cement Fibre/ Cast-Iron	50
87	Shell South Africa (PTY) LTD	50	HDPE/Cement Fibre/ Cast-Iron	50
88	Talhado Fishing Enterprise (PTY) LTD	50	HDPE/Cement Fibre/ Cast-Iron	50
89	P.E Deep Sea Angling Club	50	HDPE/Cement Fibre/ Cast-Iron	50
90	Shall South Africa (PTY) LTD	50	HDPE/Cement Fibre/ Cast-Iron	50
91	Biblia Harbour Mission	50	HDPE/Cement Fibre/ Cast-Iron	50
92	Talhado Fishing	50	HDPE/Cement Fibre/ Cast-Iron	50
93	TNPA Lighthouse Services	50	HDPE/Cement Fibre/ Cast-Iron	50
94	Plot No.1 (Shop 17) Breakeven	50	HDPE/Cement Fibre/ Cast-Iron	50
95	Zwembesi Farm	50	HDPE/Cement Fibre/ Cast-Iron	50
96	BPO	50	HDPE/Cement Fibre/ Cast-Iron	50
97	Cargo	50	HDPE/Cement Fibre/ Cast-Iron	50
98	Ore Berth Control Tower	75	HDPE/Cement Fibre/ Cast-Iron	75
99	Eyethu Fishing (PTY) LTD	75	HDPE/Cement Fibre/ Cast-Iron	75
100	Siyaloba Fishing Academy	75	HDPE/Cement Fibre/ Cast-Iron	75
101	FPT Port Leasing	75	HDPE/Cement Fibre/ Cast-Iron	75
102	Technical Manager (Shop 17)	100	HDPE/Cement Fibre/ Cast-Iron	100
103	Technical Manager	100	HDPE/Cement Fibre/ Cast-Iron	100
104	Tipplers	100	HDPE/Cement Fibre/ Cast-Iron	100
105	Shell South Africa (PTY) LTD	100	HDPE/Cement Fibre/ Cast-Iron	100
106	Talhado Fishing Enterprise (PTY) LTD	100	HDPE/Cement Fibre/ Cast-Iron	100
107	Oil Sites main Supply	150	HDPE/Cement Fibre/ Cast-Iron	150
108	Baakens Main Supply	150	HDPE/Cement Fibre/ Cast-Iron	150
109	Jetty Main Supply	150	HDPE/Cement Fibre/ Cast-Iron	150

EXISTING SYSTEMS AND INTEGRATION

- 5.4.4** The *Contractor* must develop an Application Programming Interface (APIs) to integrate the software with existing systems including linking the Utility Management Software to Transnets' Integrated Port Management System (IPMS) and SAP ERP (Enterprise Resource Planning) to transfer billing data (kilo Liters & Rand Value, kilowatts hours & Rand Value) on 15th of each month.

COMMUNICATION INFRASTRUCTURE

5.4.5 Communication Infrastructure Requirements

- 5.4.5.1 Design a fibre optic Local Area Network within the port boundary.
- 5.4.5.2 Trench to lay the fibre optic sleeves, trenching to minimum depth of 600mm and a width of 300mm.
- 5.4.5.3 Supply and install 110mm PVC pipe and chamber system for the fibre.
- 5.4.5.4 Supply and install fibre optic manholes where required.
- 5.4.5.5 The trenching for complete installation shall not exceed a total length of 12km. Backfill and reinstate existing surface and make good.
- 5.4.5.6 Supply and install 15 patch panels fully populated 48 pair with LC patch leads.
- 5.4.5.7 Supply, install and patch a total of 12km of 48 pair single mode fibre optic cable (652D).
- 5.4.5.8 Supply, install and configure 15 by 24 ports managed enterprise network switches.
- 5.4.5.9 Supply and install a 9U swing frame cabinet 900mm deep.
- 5.4.5.10 Link all electricity meters through the LAN to transmit data to the billing server for processing via the Utilities Management Software.

5.4.6 Wireless Communication Network for the water meters

- 5.4.6.1 All waters are to be fitted with an AMR interface (IoT devices) for logging of data and communicate to the closest gateway. The AMR interface shall have long range transmission and operate on low power.
- 5.4.6.2 Supply and install metering gateways including civil and structural works and all appurtenances.
- 5.4.6.3 Configure and integrate the gateways onto the LAN to transfer data to the server and Utilities Management Software.
- 5.4.6.4 Supply and install a server (Network & Application) to manage and control the network. The network server shall receive data and control messages from the gateways and process the data. The application server shall interface with the network server and shall store the data, perform analytics and enable integration with other systems.

- 5.4.6.5 Develop an Application Programming Interface (API) to allow the network to transmit relevant billing data to the billing server and Utilities Management Software.

5.4.7 Server

- 5.4.7.1 Supply, install and configure two 8-core (2.10GHz), 16GB, 8 x Hot plug 2.5in, smart array P408ia, 2 x 500W, rack mount billing servers.
- 5.4.7.2 Each server shall be supplied with four 1.2TB Hard Drives.
- 5.4.7.3 Supply and install the latest Microsoft SQL server (permanent license) for the management of data, storage and perform analytics via the Utilities Management Software.

5.4.8 Firewall

- 5.4.8.1 Supply, install, configure, and commission a Firewall for LAN. The *Contractor* shall ensure that old and new services going the Firewall are reinstated.
- 5.4.8.2 Setup DMZ and position a management workstation within DMZ.

5.4.9 Management Workstation

- 5.4.9.1 Supply, install and setup a Management Workstation [(31.5 inch USB Hub Monitor, QHD, 60Hz, support Display Port Alt Mode with up to 90W Power Delivery, 1xHDMI, 1xRJ-45 (Ethernet 1 GbE), 4x Superspeed USB (5Gbps)].
- 5.4.9.2 Setup rules for management workstation to control SCADA and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.
- 5.4.9.3 Test and commission entire installation.

5.5 Port of Ngqura

Site Conditions

All Plants and Materials offered shall be rated for continuous operation under the following service conditions: (Port to inputs data)

Altitude	Sea level to +50m
Ambient air temperature	Max. 40 degrees Celsius; Min. -5 degrees Celsius
Humidity	As high as 86%
Lightning conditions	10 strikes per year as listed in SABS codes
Atmosphere	Highly saline with heavy corrosive industrial, chemical and dust-laden nature. Frequent heavy rains driven by winds reaching speeds of 100km/h and above.
Water supply pressure	between 2.0 – 6.0bar

NEW SMART ELECTRICITY METERS

5.5.1 Installation of New Smart Electricity Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 9:

- 5.5.1.1 Supply, install and configure a new smart electricity meter with all the necessary comms required (communication module, GSM antenna etc.).
- 5.5.1.2 Establish connectivity; Register the meters on both the billing server and the new Utilities Management System with appropriate tagging.
- 5.5.1.3 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.5.1.4 Test and commission the installation.
- 5.5.1.5 Reinstate power.

Table 9: Shows the areas where the new smart electricity meters are to be installed.

Item No.	Meter Location	Type of Circuit	Meter Quantity
1.	Substation M100 – HV Switch Room Area	3 Phase	01
2.	Administration Building – LV Panel	3 Phase	01
3.	E Mendi Building – LV Distribution Board	3 Phase	02
4.	Substation 001	3 Phase	01
5.	Substation 002	3 Phase	01
6.	Substation ACB - LV Room	3 Phase	01

Item No.	Meter Location	Type of Circuit	Meter Quantity
7.	ACB Building – LV Switch Room	3 Phase	01
8.	Port Control Building – HV Switch Room	3 Phase	01
9.	AMS Substation – LV Switch Room	3 Phase	01
10.	Sand Bypass MPS, BPS 1, and BPS 3 – LV Switch Room	3 Phase	03
11.	Clear Water Intake	3 Phase	01
12.	Finger Jetty Mini-Substation	3 Phase	01
13.	B100 Mini-Substation	3 Phase	01
Proposed New Installations			
14.	Substation M100 – HV Switch Room	3 Phase	01
15.	Administration Building – LV Panel	3 Phase	01
16.	E Mendi Building – LV Distribution Board	3 Phase	02
17.	Substation 001	3 Phase	01
19.	Substation 002	3 Phase	01
20.	Substation ACB – LV Switch Room	3 Phase	01
21.	ACB Building – LV Switch Room	3 Phase	01
22.	Port Control Building – HV Switch Room	3 Phase	01
23.	AMS Substation LV Switch Room	3 Phase	01
24.	Sand Bypass MPS, BPS 1, and BPS 3 – LV Switch Room	3 Phase	03
25.	Clear Water Intake	3 Phase	01
26.	Finger Jetty Mini-Substation	3 Phase	01
27.	B100 Mini-Substation	3 Phase	01

NEW SMART WATER METERS

5.5.2 Replacement of Existing Water Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 10:

- 5.5.2.1 Decommission and remove the existing water meter.
- 5.5.2.2 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.5.2.3 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.5.2.4 Establish Connectivity, Register the meter on both the billing server and the new Utility Management System with appropriate tagging.

5.5.2.5 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.

5.5.2.6 Test and commission the installation.

Table 10: Shows the areas where the new smart water meters are to be installed.

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
1	NMBM	450	GRP	450
2	Main Ent. Zone 1 (B1)	315	uPVC, Class 16	315
3	Main Port Entrance (C1)	110	uPVC, Class 16	110
4	Main Port Entrance (C2)	110	uPVC, Class 16	110
5	Main Port Entrance (C3)	110	uPVC, Class 16	110
6	Joorst Park Offices (D)	160	uPVC, Class 16	160
7	NCT Trailer Park (G1)	250	uPVC, Class 16	250
8	NCT Trailer Park (G2)	250	uPVC, Class 16	250
9	NCT Entrance (F)	250	uPVC, Class 16	250
10	NCT Exit (Sec) – (H)	250	uPVC, Class 16	250
11	NCT Entrance (Sec) – (I)	250	uPVC, Class 16	250
12	NCT Help Desk (J)	250	uPVC, Class 16	250
13	NCT Admin Building (K)	250	uPVC, Class 16	250
14	NCT Terminal Supply Nort Rail (L)	250	uPVC, Class 16	250
15	NCT Hauler Zone (N)	250	uPVC, Class 16	250
16	NCT Workshop (S)	50	HDPE, Class 12	50
17	Sand Bypass Main Pump Station (E)	63	HDPE, Class 12	63
18	BP1 (M)	250	uPVC, Class 16	250
19	BP2 (T)	250	uPVC, Class 16	250
20	BP3 (P)	160	uPVC, Class 16	160
21	TNPA Admin Building (V)	110	uPVC, Class 16	110
22	(U)	50	HDPE, Class 12	50
23	(R)	200	uPVC, Class 16	200
24	Port Control (O)	110	uPVC, Class 16	110
25	ACB Admin (Q)	110	uPVC, Class 16	110
26	To be confirmed	25	uPVC, Class 16	25
27	To be confirmed	40	uPVC, Class 16	40

Existing Systems and Integration

- 5.5.3** The *Contractor* must develop an Application Programming Interface (APIs) to integrate the software with existing systems including linking the Utility Management Software to Transnets' Integrated Port Management System (IPMS) and SAP ERP (Enterprise Resource Planning) to transfer billing data (kilo Liters & Rand Value, kilowatts hours & Rand Value) on 15th of each month.

Communication Infrastructure

5.5.4 Communication Infrastructure Requirements

- 5.5.4.1 Design a fibre optic Local Area Network within the port boundary.
- 5.5.4.2 Trench to lay the fibre optic sleeves, trenching to minimum depth of 600mm and a width of 300mm.
- 5.5.4.3 Supply and install 110mm PVC pipe and chamber system for the fibre.
- 5.5.4.4 Supply and install fibre optic manholes where required.
- 5.5.4.5 The trenching for complete installation shall not exceed a total length of 10km. Backfill and reinstate existing surface and make good.
- 5.5.4.6 Supply and install 12 patch panels fully populated 48 pair with LC patch leads.
- 5.5.4.7 Supply, install and patch a total of 10km of 48 pair single mode fibre optic cable(652D).
- 5.5.4.8 Supply, install and configure 12 by 24 ports managed enterprise network switches.
- 5.5.4.9 Supply and install a 9U swing frame cabinet 900mm deep.
- 5.5.4.10 Link all electricity meters through the LAN to transmit data to the billing server for processing via the Utilities Management Software.

5.5.5 Wireless Communication Network for the water meters

- 5.5.5.1 All waters are to be fitted with an AMR interface (IoT devices) for logging of data and communicate to the closest gateway. The AMR interface shall have long range transmission and operate on low power.
- 5.5.5.2 Supply and install metering gateways including civil and structural works and all appurtenances.
- 5.5.5.3 Configure and integrate the gateways onto the LAN to transfer data to the server and Utilities Management Software.
- 5.5.5.4 Supply and install a server (Network & Application) to manage and control the network. The network server shall receive data and control messages from the gateways and process the data. The application server shall interface with the network server and shall store the data, perform analytics and enable integration with other systems.
- 5.5.5.5 Develop an Application Programming Interface (API) to allow the network to transmit relevant billing data to the billing server and Utilities Management Software.

5.5.6 Server

- 5.5.6.1 Supply, install and configure two 8-core (2.10GHz), 16GB, 8 x Hot plug 2.5in, smart array P408ia, 2 x 500W, rack mount billing servers.
- 5.5.6.2 Each server shall be supplied with four 1.2TB Hard Drives.
- 5.5.6.3 Supply and install the latest Microsoft SQL server (permanent license) for the management of data, storage and perform analytics via the Utilities Management Software.

5.5.7 Firewall

- 5.5.7.1 Supply, install, configure, and commission a Firewall for LAN. The *Contractor* shall ensure that old and new services going the Firewall are reinstated.
- 5.5.7.2 Setup DMZ and position a management workstation within DMZ.

5.5.8 Management Workstation

- 5.5.8.1 Supply, install and setup a Management Workstation.
- 5.5.8.2 Setup rules for management workstation to control SCADA and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.
- 5.5.8.3 Test and commission entire installation.

5.6 Port of Mossel Bay

Site Conditions

All Plants and Materials offered shall be rated for continuous operation under the following service conditions: (Port to inputs data)

Altitude	Sea level to +50m
Ambient air temperature	Max. 40 degrees Celsius; Min. – 5 degrees Celsius
Humidity	As high as 86%
Lightning conditions	10 strikes per year as listed in SABS codes
Atmosphere	Highly saline with heavy corrosive industrial, chemical and dust-laden nature. Frequent heavy rains driven by winds reaching speeds of 100km/h and above.
Water supply pressure	between 2.0 – 6.0bar

NEW SMART ELECTRICITY METERS

5.6.1 Installation of New Smart Electricity Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 11:

- 5.6.1.1 Supply, install and configure a new smart electricity meter with all the necessary comms required (communication module, GSM antenna etc.).
- 5.6.1.2 Establish connectivity; Register the meters on both the billing server and the new Utility Management System with appropriate tagging.
- 5.6.1.3 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.6.1.4 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.6.1.5 Test and commission each installation.
- 5.6.1.6 Reinstate power.

Table 11: Shows the areas where the new smart electricity meters are to be installed.

Item No.	Meter Location	Type of Circuit	Meter Quantity
1	Yatch Club (Municipality Feeder)	3 Phase	01
2	Yatch Club	Single Phase	01
3	Recreational Area	3 Phase	02
4	Recreational Area	Single Phase	01

Item No.	Meter Location	Type of Circuit	Meter Quantity
5	Main Substation LV Switch Room	3 Phase	05
6	Station Area – Kiosk F	3 Phase	01
7	Station Area – Kiosk E	3 Phase	01
8	Petro SA Kiosk	3 Phase	05
9	Ikamva Mini Substation	3 Phase	01
10	MSB Mini Substation - Tenant	3 Phase	01
11	MSB Mini Substation - TNPA	3 Phase	01
12	Seavuna Mini-Substation (LV)	3 Phase	01
13	Seavuna Mini-Substation (Main Feeder)	3 Phase	01
14	Seavuna Mini-Substation B (LV)	3 Phase	01
15	Seavuna Mini-Substation B (Main Feeder)	3 Phase	01
16	Seavuna Shore Supply – Box No.1	3 Phase	01
17	Seavuna Shore Supply – Box No.2	3 Phase	01
19	Vincent Jetty Mini-Substation	3 Phase	01
20	Vincent Jetty Kiosk		
i.	Spinal Road Street Lights	3 Phase	01
ii.	Sewage Pump	3 Phase	01
iii.	Park Homes	3 Phase	01
iv.	Afro Shore Offices	3 Phase	01
21	Vincent Jetty Shore Plugs		
i.	Power Box 1	3 Phase	01
ii.	Power Box 2	3 Phase	02
iii.	Power Box 3	3 Phase	02
iv.	Power Box 4	3 Phase	05
v.	Power Box 5	3 Phase	05
vi.	Power Box 6	3 Phase	02
vii.	Power Box 7	3 Phase	02
viii.	Power Box 8	3 Phase	02
22	Civil Workshop Switch Room	3 Phase	07
23	Slipway Kiosk G	3 Phase	02
24	Municipality Kiosk		
i.	Blue Shed	3 Phase	01
ii.	Security House	3 Phase	01
iii.	Boundary Lights	3 Phase	01

Item No.	Meter Location	Type of Circuit	Meter Quantity
25	Security Gates		
i.	Gate 1	3 Phase	02
ii.	Gate 1	3 Phase	02
iii.	Gate 1	3 Phase	02

NEW SMART WATER METERS

5.6.2 New Below Ground Water Meter Installation

The *Contractor* shall perform the following activities for the 29 new proposed below ground meter installations:

- 5.6.2.1 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.6.2.2 The existing pipe material is UPVC and the pipe size ranges from 110mm to 160mm.
- 5.6.2.3 Saw cut approximately 4.7x1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.6.2.4 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7x1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.6.2.5 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.6.2.6 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.6.2.7 Supply and install No. 02x steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.6.2.8 Supply and install No. 02x spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.6.2.9 Supply and install a swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.6.2.10 Supply and install an In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.

- 5.6.2.11 Supply and install a 160mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.6.2.12 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.6.2.13 Register the meter on both the billing server and the new Utility Management System.
- 5.6.2.14 Test and commission each installation.

5.6.3 Replacement of Existing Water Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 12:

- 5.6.3.1 Decommission and remove the existing water meter.
- 5.6.3.2 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.6.3.3 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.6.3.4 Register the meter on both the billing server and the new Utility Management System with appropriate tagging.
- 5.6.3.5 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.6.3.6 Test and commission the installation.

Table 12: Shows the areas where the new smart water meters are to be installed.

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
1	MZR 181 Flames Area	80	uPVC	80
2	Flames Restaurant	15	Polypcop	15
3	Car Wash	15	Polypcop	15
4	Station Complex (Check Meter)	80	uPVC	80
5	Bedding Stores	22	Polypcop	22
6	Station 1	22	Polypcop	22
7	Station 2 Laparon	22	Polypcop	22
8	Old Electrical Workshop	22	Polypcop	22
9	Station Platform	22	Polypcop	22
10	GZR 257 Bridge Bulk (Quay 4)	80	uPVC	80
11	Recreational Slipway Office	15	Polypcop	15
12	Recreational Brick Building Ablutions TNPA	15	Polypcop	15
13	Mobile Toilets TNPA	22	Polypcop	22

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
14	WAG/Steakhouse	15	Polypcop	15
15	KAAI 4	15	Polypcop	15
16	London Bus/Oyster Bar	22	Polypcop	22
17	Waterfront 1	15	Polypcop	15
18	Waterfront 2	22	Polypcop	22
19	Romonza	22	Polypcop	22
20	Minoli	22	Polypcop	22
21	Gate No 2	15	Polypcop	15
22	Good Shed	80	uPVC	80
23	F/H Supply Bulk meter (Station Platform)	80	uPVC	80
24	Check Meter VJ	80	uPVC	80
25	VJ Security Guardhouse	15	Polypcop	15
26	TNPA Marine Supply Point Artic Turn	15	Polypcop	15
27	TNPA Marine Supply Point Snipe	15	Polypcop	15
28	Smit Amandla	15	Polypcop	15
29	VJ Quay Side Supply Pnt #1	15	Polypcop	15
30	VJ Quay Side Supply Pnt #2	15	Polypcop	15
31	VJ Quay Side Supply Pnt #3	15	Polypcop	15
32	VJ Quay Side Supply Pnt #4	15	Polypcop	15
33	Sliding Door	15	Polypcop	15
34	Store Racks	15	Polypcop	15
35	Wash Bay	15	Polypcop	15
36	Tsisa yama	15	Polypcop	15
37	Sea Gypsey	22	Polypcop	22
38	Biblia	15	Polypcop	15
39	Gate 1 Guard House	15	Polpcop	15
40	Border Management Agency	22	Polypcop	22
41	Luna Moon	22	Polypcop	22
42	PetroSA Office	22	Polypcop	22
43	PetroSA Mess & Ablution	22	Polypcop	22
44	Meg Plant (Tanks)	50	uPVC	50
45	Long Shed (PetroSA) Q4	50	uPVC	50
46	Quay Side Point 1 (Charlie)	90	uPVC	90
47	Quay Side Point 2 (Bravo)	90	uPVC	90

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
48	Quay Side Point 3 (Alpha)	90	uPVC	90
49	UZR 752 Viking Area	80	uPVC	80
50	Blue Shed	80	uPVC	80
51	Afro Fishing 2 (Old I & J Site) On quay side	80	uPVC	80
52	Viking Fishing	80	uPVC	80
53	Gate No.3 TNPA	22	Polypcop	22
54	Kepu Site	22	Polypcop	22
55	Quay No.3 TNPA Supply Point	22	Polypcop	22
56	NSRI	22	Polypcop	22
57	Tuck Shop	15	Polypcop	15
58	Slipway	28	Copper	28
59	Administration Building (TNPA)	50	uPVC	50
60	Vincent Jetty Quay Side Supply @ Romonza	15	Polypcop	15
61	Marine Park Home	22	Polypcop	22
62	Pioneer 1	50	uPVC	50
63	Pioneer 2	50	uPVC	50
64	Lucky Star	50	uPVC	50
65	Walk on Moorings (TNPA)	22	Polypcop	22
66	Wash-bay (TNPA)	22	Polpcop	22
67	LBS 185 (Yacht Club) – Bulk Meter	28	Copper	28
68	Blue Door	15	Polypcop	15
69	Mozambiek	15	Polypcop	15
70	Ladies Ablutions (TNPA)	15	Polypcop	15
71	Men's Ablutions (TNPA)	15	Polypcop	15
72	Aquamarine	15	Polypcop	15

Existing Systems and Integration

5.6.4 The *Contractor* must develop an Application Programming Interface (APIs) to integrate the software with existing systems including linking the Utility Management Software to Transnets' Integrated Port Management System (IPMS) and SAP ERP (Enterprise Resource Planning) to transfer billing data (kilo Liters & Rand Value, kilowatts hours & Rand Value) on 15th of each month.

Communication Infrastructure

5.6.5 Communication Infrastructure Requirements

- 5.6.5.1 Design a fiber optic Local Area Network within the port boundary.
- 5.6.5.2 Trench to lay the fibre optic sleeves, trenching to minimum depth of 600mm and a width of 300mm.
- 5.6.5.3 Supply and install 110mm PVC pipe and chamber system for the fibre.
- 5.6.5.4 Supply and install fibre optic manholes where required.
- 5.6.5.5 The trenching for complete installation shall not exceed a total length of 5km. Backfill and reinstate existing surface and make good.
- 5.6.5.6 Supply and install 2 patch panels fully populated 48 pair with LC patch leads and 6 media converters.
- 5.6.5.7 Supply, install and patch a total of 5km of 48 pair single mode fibre optic cable (652D).
- 5.6.5.8 Supply, install and configure 2 by 24 ports managed enterprise network switches.
- 5.6.5.9 Supply and install a 9U swing frame cabinet 900mm deep.
- 5.6.5.10 Link all electricity meters through the LAN to transmit data to the billing server for processing via the Utilities Management Software.

5.6.6 Wireless Communication Network for the water meters

- 5.6.6.1 All waters are to be fitted with an AMR interface (IoT devices) for logging of data and communicate to the closest gateway. The AMR interface shall have long range transmission and operate on low power.
- 5.6.6.2 Supply and install metering gateways including civil and structural works and all appurtenances.
- 5.6.6.3 Configure and integrate the gateways onto the LAN to transfer data to the server and Utilities Management Software.
- 5.6.6.4 Supply and install a server (Network & Application) to manage and control the network. The network server shall receive data and control messages from the gateways and process the data. The application server shall interface with the network server and shall store the data, perform analytics and enable integration with other systems.
- 5.6.6.5 Develop an Application Programming Interface (API) to allow the network to transmit relevant billing data to the billing server and Utilities Management Software.

5.6.7 Server

- 5.6.7.1 Supply, install and configure two 8-core (2.10GHz), 16GB, 8 x Hot plug 2.5in, smart array P408ia, 2 x 500W, rack mount billing servers.
- 5.6.7.2 Each server shall be supplied with four 1.2TB Hard Drives.

- 5.6.7.3 Supply and install the latest Microsoft SQL server database for the management of data, storage and perform analytics via the Utilities Management Software.

5.6.8 Firewall

- 5.6.8.1 Supply, install, configure, and commission a Firewall for LAN. The *Contractor* shall ensure that old and new services going the Firewall are reinstated.
- 5.6.8.2 Setup DMZ and position a management workstation within DMZ.

5.6.9 Management Workstation

- 5.6.9.1 Supply, install and setup a Management Workstation [(31.5 inch USB Hub Monitor, QHD, 60Hz, support Display Port Alt Mode with up to 90W Power Delivery, 1xHDMI, 1xRJ-45 (Ethernet 1 GbE), 4x Superspeed USB (5Gbps)].
- 5.6.9.2 Setup rules for management workstation to control SCADA and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.
- 5.6.9.3 Test and commission entire installation.

5.7 Port of Cape Town

Site Conditions

All Plants and Materials offered shall be rated for continuous operation under the following service conditions: (Port to inputs data)

Altitude	Sea level to +50m
Ambient air temperature	Max. 40 degrees Celsius; Min. – 5 degrees Celsius
Humidity	As high as 86%
Lightning conditions	10 strikes per year as listed in SABS codes
Atmosphere	Highly saline with heavy corrosive industrial, chemical and dust-laden nature. Frequent heavy rains driven by winds reaching speeds of 100km/h and above.
Water supply pressure	between 2.0 – 6.0bar

NEW SMART ELECTRICITY METERS

5.7.1 Installation of New Smart Electricity Meters

- 5.7.1.1 Ensure the relevant circuit has been isolated and it is safe to commence with work.
- 5.7.1.2 Decommission and remove the existing electricity meter.
- 5.7.1.3 Supply and install 36 metering panels, Metal Cabinet Construction: (LxWxH =1000mm x 330mm x 1420mm, double door, stainless steel 3CR12, powder coated in "Orange") for the substations.
- 5.7.1.4 Supply, install, mount and configure 160 new three phase smart electricity meters with necessary communication module, including wiring and termination.
- 5.7.1.5 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.7.1.6 Create accounts and Link them to the relevant meter and apply the appropriate tariffs.
- 5.7.1.7 Test and commission the installation.
- 5.7.1.8 Reinstate power.

NEW SMART WATER METERS

5.7.2 Meter 1 – Replacement of the Existing Meter

- 5.7.2.1 Meter 1 is an existing installation inside a manhole located at Marine Drive (X=-50397.798, Y=-3754973.0459).
- 5.7.2.2 Decommission and remove the existing 200mm water meter.

- 5.7.2.3 Supply and install a new 200mm water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.7.2.4 Supply, install, mount and configure an automatic meter reading interface and establish connectivity for wireless communication.
- 5.7.2.5 Register the meter on both the billing server and the new Utility Management System.
- 5.7.2.6 Create an account and link to the meter and apply the appropriate tariffs.
- 5.7.2.7 Test and commission the installation.

5.7.3 Meter 2 – Replacement of the Existing Meter

- 5.7.3.1 Meter 2 is an existing installation inside a manhole located at Coode Crescent (X = -53337.09, Y = -3753933.312).
- 5.7.3.2 Decommission and remove the existing 200mm water meter.
- 5.7.3.3 Supply and install a new 200mm water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.7.3.4 Supply, install, mount and configure an automatic meter reading interface and establish connectivity for wireless communication.
- 5.7.3.5 Register the meter on both the billing server and the new Utility Management System.
- 5.7.3.6 Create an account and link to the meter and apply the appropriate tariffs.
- 5.7.3.7 Test and commission the installation.

5.7.4 Meter 3 – Installation of the AMR Interface

- 5.7.4.1 Meter 3 is an existing installation located at Eastern Mole Rd (X = -50727.224, Y = -3754976.206).
- 5.7.4.2 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication on the existing Mag Flo meters.
- 5.7.4.3 Register the meter on both the billing server and the new Utility Management System.
- 5.7.4.4 Create an account and link to the meter and apply the appropriate tariffs.
- 5.7.4.5 Test and commission the installation.

5.7.5 Meter 4 – Installation of the AMR Interface

- 5.7.5.1 Meter 4 is an existing installation located at Sturrock (X = -51040.0072, Y = -3754991.1866).
- 5.7.5.2 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication on the existing Mag Flo meters.
- 5.7.5.3 Register the meter on both the billing server and the new Utility Management System.
- 5.7.5.4 Create an account and link to the meter and apply the appropriate tariffs.
- 5.7.5.5 Test and commission the installation.

5.7.6 Meter 5 – Installation of the AMR Interface

- 5.7.6.1 Meter 5 is an existing installation located at L Berth (X = -51761.896, Y = -3754989.813).
- 5.7.6.2 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication on the existing Mag Flo meters.
- 5.7.6.3 Register the meter on both the billing server and the new Utility Management System.
- 5.7.6.4 Create an account and link to the meter and apply the appropriate tariffs.
- 5.7.6.5 Test and commission the installation.

5.7.7 Meter 6 – Installation of the AMR Interface

- 5.7.7.1 Meter 6 is an existing installation located at E Berth (X = -53149.662, Y = -3753812.876).
- 5.7.7.2 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication on the existing Mag Flo meters.
- 5.7.7.3 Register the meter on both the billing server and the new Utility Management System.
- 5.7.7.4 Create an account and link to the meter and apply the appropriate tariffs.
- 5.7.7.5 Test and commission the installation.

5.7.8 Replacement of Existing Water Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 13:

- 5.7.8.1 Decommission and remove the existing water meter.
- 5.7.8.2 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.7.8.3 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.7.8.4 Register the meter on both the billing server and the new Utility Management System.
- 5.7.8.5 Create accounts and link with the relevant meter and apply the appropriate tariffs.
- 5.7.8.6 Test and commission the installation.

Table 13: Shows the areas where the new smart water meters are to be installed.

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
1	NPA House out building (Plan room & toilet)	15	Polycop	15
2	Security hut - A Berth	20	Polycop	20
3	Corner A & B Berth tunnel.	20	Polycop	20

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
4	Ferro-marine - A Berth - Ablution	20	Polycop	20
5	Ferro-marine - A Berth - Admin office	20	Polycop	20
6	NPA House	150	uPVC	150
7	A Berth area.	20	Polycop	20
8	Corporate Affairs - B Berth	15	Polycop	15
9	IT - Opp Corp Affrs - vacant	25	Polycop	25
10	Training Centre	50	uPVC	50
11	Fresh Produce Term. (in manhole on B/C Berth)	25	Copper	25
12	Fresh Produce Term. (in manhole on B/C Berth)	80	uPVC	80
13	Fresh Produce Terminals Cape Town.	150	uPVC	150
14	Fresh Produce Terminals Cape Town. (On balcony)	150	uPVC	150
15	B-C Berth (Tunnel - sprinkler system) - FPT	50	uPVC	50
16	Fresh Produce Term. (Against wall-inside D Shed)	15	Polycop	15
17	Long Line Tuna Corporation (pty) Ltd	15	Polycop	15
18	Portside Stevedoring Services offices.	40	uPVC	40
19	SA Police / Dept.of Public Works	80	uPVC	80
20	South Arm Rd Security building	80	uPVC	80
21	CCC Municipal water meter at Dock Road.	15	Polycop	15
22	Transnet Projects RME (Bruce)	25	Copper	25
23	Svitzer Wijsmuller (inside Filing room)	25	Copper	25
24	Svitzer Wijsmuller	25	Copper	25
25	Bid freight.	25	Copper	25
26	SA Stevedores	25	Copper	25
27	SA Stevedores / Lighthouse Martinet Ind.Eng.CC	200	uPVC	200
28	Magmaster (Lighthouse) (INCOMING)	200	uPVC	200
29	Magmaster (Lighthouse) (REVERSE)	200	uPVC	200
30	Magmaster (Lighthouse) (NETT INCOMING)	40	uPVC	40
31	Lighthouse Services	50	uPVC	50
32	SA Stevedores (Melfra)	15	Polycop	15
33	Robben Marine / SA Stevedores	15	Polycop	15
34	Safbulk (pty) Ltd	25	Copper	25
35	Atltech (pty) Ltd - offices	15	Polycop	15

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
36	Atltech (pty) ltd - workshop	15	Polycop	15
37	Mission to seamen in SA	15	Polycop	15
38	Electrical workshop	40	uPVC	40
39	Elect. Depot Mess & Ablution.	25	Copper	25
40	Berthing Office	50	uPVC	50
41	P&O Ports Nationwide Cargo Terminal SA (pty) Ltd.	50	uPVC	50
42	Cowrie place (MPT) - Bon 1	50	uPVC	50
43	Cowrie place (MPT) - Bon 1	20	Polycop	20
44	Ship Society of SA / Port Services (pty) ltd - Bon 1	15	Polycop	15
45	Christelike Seemans Organisasie - D Mast Bon 1	15	Polycop	15
46	Marine Operations Manager - Dock Master Bon 1	15	Polycop	15
47	Dockland	15	Polycop	15
48	Control Point 26 (Spoornet)	15	Polycop	15
49	Security Hut (Heerengracht Entrance)	25	Polycop	25
50	Maritime Training (Ex Creche)	15	Polycop	15
51	Spoornet (Heerengracht Entrance)	15	Polycop	15
52	Die Evangelie aan die seelui.	50	uPVC	50
53	Training Centre for Seamen.	20	Polycop	20
54	Eastern deli	20	Polycop	20
55	SHEQ building	15	Polycop	15
56	Pirow St. Security building	50	uPVC	50
57	E-Berth Shed (Cold Store)	50	uPVC	50
58	E-Berth Shed (Passenger Terminal)	15	Polycop	15
59	E-Berth Shed (Passenger Terminal)	15	Polycop	15
60	E-Berth Shed (Passenger Terminal)	15	Polycop	15
61	E-Berth Shed (Passenger Terminal)	15	Polycop	15
62	F-Berth Security bldg.	15	Polycop	15
63	Weighbridge (F Berth)	20	Polycop	20
64	Duty Free Shop	20	Polycop	20
65	Heribi House	15	Polycop	15
66	SA Stevedores (Port Services) - ex gardener bldg	15	Polycop	15
67	Combi Terminal bldg.	20	Polycop	20
68	G-Berth Shed (New meter)	15	Polycop	15

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
69	G-Berth Shed (Against inside wall)	15	Polycop	15
70	G-Berth mess & ablution.	20	Polycop	20
71	G-Berth Quay office	15	Polycop	15
72	H-Berth Security kiosk	50	uPVC	50
73	H-Berth Shed	25	Copper	25
74	H-Berth Shed	25	Copper	25
75	H-Berth mess & ablution	25	Copper	25
76	J-Berth mess & ablution	50	Steel	50
77	J-Berth Shed	15	Polycop	15
78	J-Berth Shed	15	Polycop	15
79	J-Berth store & Toilets	20	Polycop	20
80	Operations Rail to rail control block offices	25	Copper	25
81	Forklift depot	20	Polycop	20
82	L-Berth Mess & Ablution bldg	20	Polycop	20
83	L-Berth Security bldg.	15	Polycop	15
84	J-Berth Security kiosk	80	uPVC	80
85	Commercial Cold Store (Duncan Dock) (pty) ltd	50	uPVC	50
86	Commercial Cold Store (Duncan Dock) (pty) ltd	50	uPVC	50
87	SAS Unitie M-Berth	15	Polycop	15
88	SAS Unitie M-Berth	15	Polycop	15
89	Security hut (M-Berth)	15	Polycop	15
90	Boss marine	15	Polycop	15
91	Resource Ballast	15	Polycop	15
92	RCYC Water supply to ships.	15	Polycop	15
93	Security hut. - Repair Pier?	100	uPVC	100
94	RCYC (inside repair area)	50	uPVC	50
95	RCYC (inside repair area)	50	uPVC	50
96	RCYC (entrance - inside)	50	uPVC	50
97	RCYC (entrance - outside)	15	Polycop	15
98	RCYC (kitchen area)	25	Copper	25
99	Sailing School (RCYC)	15	Polycop	15
100	International Yacht Brokers Cape (pty) ltd	150	uPVC	150
101	Spoornet (opposite RCYC)	15	Polycop	15
102	Globe Engineering Works (pty) ltd	50	uPVC	50

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
103	Misplon bridge Security building	15	Polycop	15
104	JJ van Greunen	15	Polycop	15
105	De Beers	15	Polycop	15
106	Harbour Weld	20	Polycop	20
107	Fusion Hydraulics CC	20	Polycop	20
108	MRH	20	Polycop	20
109	NNA	20	Polycop	20
110	SGB Scaffolding	20	Polycop	20
111	Hazard Marine CC	15	Polycop	15
112	Marine manager CC Propnet	15	Polycop	15
113	Quantum leap	15	Polycop	15
114	Cape Diving (Pty) Ltd	15	Polycop	15
115	NPA Staff SDD ablution (Grant Walker-Dockmaster)	25	Copper	25
116	Dock Master's office	15	Polycop	15
117	ALBATROSS (trevshan)	25	Copper	25
118	Globe Engineering (office block & Ablution).	25	Copper	25
119	Supply pipe for lessees in SSD area.	15	Polycop	15
120	Security hut SSD boom entrance	15	Polycop	15
121	The Pure Cane Molasses Co.	80	uPVC	80
122	The Pure Cane Molasses Co.	80	uPVC	80
123	Elekt. Werkwinkel	15	Polycop	15
124	Taipei Liaison office	50	uPVC	50
125	Taipei Liaison office	50	uPVC	50
126	Taipei Liaison office	50	uPVC	50
127	South East Marine services (pty) ltd	25	Copper	25
128	Nautilus (pty) ltd	15	Polycop	15
129	Nautilus (pty) ltd	15	Polycop	15
130	Nautilus (pty) ltd	15	Polycop	15
131	Marine Slops (pty) ltd	15	Polycop	15
132	Albatross Offshore Services	20	Polycop	20
133	To be confirmed	50	Steel	50
134	Elgin Brown Hamer (pty) ltd	15	Polycop	15
135	Security hut SSDb	100	uPVC	100
136	Watermain feeding Landing Wall.	80	uPVC	80

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
137	Crossberth Cold Stores (PTY) LTD	80	uPVC	80
138	Crossberth Cold Stores (PTY) LTD	25	Copper	25
139	Globe Engineering Works (pty) ltd	50	uPVC	50
140	Feedline to Caltex area.	15	Polycop	15
141	Security hut Tanker basin	15	Polycop	15
142	Astron Energy (PTY) LTD	15	Polycop	15
143	BP, Caltex, SA Energy Co, Shell (JBS)	20	Polycop	20
144	Fire Dept. Tanker basin 2 - NPA	50	uPVC	50
145	Fire Dept. (Steel scrap yard - Reclaimed Area).	15	Polycop	15
146	Astron Energy (PTY) LTD	15	Polycop	15
147	Astron Energy (PTY) LTD	15	Polycop	15
148	Pump room on Eastern Mole No.2	15	Polycop	15
149	Mess & Ablution on Eastern Mole No.2.	15	Polycop	15
150	Toilet on Eastern Mole No.2.	150	Steel	150
151	Telkom SA ltd	25	Copper	25
152	Telkom SA ltd	25	Copper	25
153	Standpipe TAP	25	Copper	25
154	FFS	15	Polycop	15
155	FFS	15	Polycop	15
156	Cape Town Bulk Storage (pty) ltd FFS	50	uPVC	50
157	Cape Town Bulk Storage (pty) ltd	15	Polycop	15
158	Elliott Basin security bldg	100	uPVC	100
159	Dorbyl Marine (pty) ltd.	80	uPVC	80
160	Dorbyl Marine (pty) ltd.	80	uPVC	80
161	Dorbyl Marine (pty) ltd (right next to workshop)	80	uPVC	80
162	Dorbyl Marine (pty) ltd (right next to workshop)	80	uPVC	80
163	Dorbyl Marine (pty) ltd (workshop) (inside building)	80	uPVC	80
164	Globe Engineering (fire main)	80	uPVC	80
165	Globe Engineering (domestic main)	25	Copper	25
166	Globe Engineering	100	uPVC	100
167	Elliott Basin ring feed meter	80	uPVC	80
168	Indo Atlantic Fishing (SHIPPING)	15	Polycop	15
169	Theodore Luis Camara	15	Polycop	15

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
170	Mechanical workshop	15	Polycop	15
171	Shop 24	15	Polycop	15
172	Shop 24 mess & ablution for general workers.	25	Copper	25
173	Farocean marine (Damen Shipping)	25	Copper	25
174	Bassticks	25	Copper	25
175	Damen Shipping (Back yard).	15	Polycop	15
176	Panama Jacks (pty) ltd	15	Polycop	15
177	Damen	50	uPVC	50
178	Royal Cape Yacht Club (meter that supplies yachts)	15	Polycop	15
179	Royal Cape Yacht Club (meter that supplies yachts)	15	Polycop	15
180	Royal Cape Yacht Club (members public toilet)	15	Polycop	15
181	Security hut Quay 500	15	Polycop	15
182	Quay 500 Polution.	150	uPVC	150
183	Ro-Ro Pier (Quay 500) Mountain side	150	uPVC	150
184	Ro-Ro Pier (Quay 500) Seaside	150	uPVC	150
185	WBHO Work site (Panama Jacks)	20	Polycop	20
186	Damen Shipping (Panama Jacks side)	15	Polycop	15
187	WBHO Container (Medite bldg.)	15	Polycop	15
188	Civil Store under BS bridge	100	uPVC	100
189	Crest Chemicals	100	uPVC	100
190	Crest Chemicals	100	uPVC	100
191	Lusitania Frozen Goods Container Road	25	Copper	25
192	Lusitania Frozen Goods Container Road	25	Copper	25
194	R.J.Sauthey (Scaffolding)	25	Copper	25
195	Old Container link (Grindrod Logistics) (SACD)	50	uPVC	50
196	Caltex service station Marine Drive/Astron Energy (PTY) LTD	15	Polycop	15
197	TCP (Ismail)	15	Polycop	15
198	Security gate NPA Paarden Eiland	25	Copper	25
199	Joint Bunkering Services Container Road	25	Copper	25
200	Shmidthauser	40	uPVC	40
201	Y & L Frozen Fish Enterprises Container Road	50	uPVC	50
202	Y & L Frozen Fish Enterprises Container Road	15	Polycop	15

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
203	M.M.Hilario	15	Polycop	15
204	BSD Weigh bridge	15	Polycop	15
205	BSD Weigh bridge	40	uPVC	40
206	Container Terminal drivers mess & ablution. (Reverse)	40	uPVC	40
207	Container Terminal drivers mess & ablution.	15	Polycop	15
208	Security bldg (Quay 700)	15	Polycop	15
209	WBHO Site office (Quay 700)	15	Polycop	15
210	SAPO ski-cabin	50	uPVC	50
211	Vehicle Testing Centre (old) (Kershaw 073 257 1736)	100	uPVC	100
212	Vehicle Repair Centre (Freight Dynamics)	25	Polycop	25
213	Container Fruit Terminal (inside Fire Control room)	80	uPVC	80
214	Helicopter Africa (pty) ltd	80	uPVC	80
215	Makhulu	80	uPVC	80
216	Blastrite (pty) ltd	15	Polycop	15
217	Road to Rail building	20	Polycop	20
218	Spoornet (Bay Road)	20	Polycop	20
219	Tryang Trading Import & Export (Pty) Ltd	20	Polycop	20
220	Optimal Maintenance services CC	15	Polycop	15
221	Raw Engineering CC	15	Polycop	15
222	Helicopter Heli Pad Cold Storage	150	uPVC	150
223	Transea Shipping Services (Pty) Ltd	150	uPVC	150
224	Etlin International (pty) ltd (Cape Cold Storage)	150	uPVC	150
225	Etlin International (pty) ltd (Cape Cold Storage)	150	uPVC	150
226	PIP Site main meter (Entrance)	150	uPVC	150
227	PIP Site main meter (Entrance)	150	uPVC	150
228	SACD PIP Site	50	uPVC	50
229	SACD PIP Site	50	uPVC	50
230	Eskom PIP site	300	uPVC	300
231	East Coast Containers	200	uPVC	200
232	CCC Municipal water meter at Marine Drive.	200	uPVC	200
233	Magmaster (INCOMING)	15	Polycop	15
234	Magmaster (REVERSE)	15	Polycop	15

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
235	Magmaster (NETT INCOMING)	15	Polycop	15
236	Two Oceans Boat Sales Marine Drive	15	Polycop	15
237	Province Log Cabins Marine Drive	100	uPVC	100
238	RME is occupying a site next to House of Cabin.	100	uPVC	100
239	Shop 17	100	uPVC	100
240	Shop 17	100	uPVC	100
241	Shop 17	150	uPVC	150
242	Shop 17	150	uPVC	150
243	Civil Depot watermain	150	uPVC	150
244	Civil Depot watermain	150	uPVC	150
245	Roro Control office & abl. BSD	20	Polycop	20
246	Old SACD site (TCP - Bert)	80	uPVC	80
247	New Container Entrance to Terminal	15	Polycop	15
248	Old Mediterranean Shipping building	15	Polycop	15
249	Quay 501 Container control office & abl. BSD	15	Polycop	15
250	TBC	20	Polycop	20
251	Quay 601 Container control office & abl. BSD	20	Polycop	20
252		15	Polycop	15
253	Quay 602 Container control office & abl. BSD	20	Polycop	20
254	TBC	15	Polycop	15
255	Quay 603 Container control office & abl. BSD	20	Polycop	20
256	Quay 604 Container control office & abl. BSD	20	Polycop	20
257	TBC	15	Polycop	15
258	Quay 602 Container control office & abl. BSD seaside	15	Polycop	15
259	Container Terminal building	150	uPVC	150
260	Chevron (Tanker Basin Cross Berth)	150	uPVC	150
261	Joint Bunkering Services (TBXB)	100	uPVC	100
262	Quay 502 Container control office & abl. BSD	15	Polycop	15
263	WBHO (Quay 613).	50	uPVC	50
264	WBHO (PIP Site)	50	uPVC	50
265	PIP Site (S a fence & Gate)	15	Polycop	15
266	WBHO (Area 340 B.S.D.).	50	uPVC	50

No.	Meter Location	Existing Pipe Size	Existing Pipe Material	New Meter Size (mm)
267	PIP site (Christopher Clement)	50	uPVC	50
268	Proticon Containers	20	Polycop	20
269	Q 501 (Security) Robben Eiland	50	uPVC	50
270	PIP SITE NEW SECURITY BLDG	20	Polycop	20
271	DAMEN SPRAY ROOM	20	Polycop	20
272	Etlin International (pty) ltd (Cape Cold Storage) Heli pad	20	Polycop	20
273	CONTAINER X-RAY	20	Polycop	20
274	SJW CIVILS	20	Polycop	20
275	Servest Marine	20	Polycop	20
276	Shounters Kiosk Blue Store	20	Polycop	20
277	Washing Bay TPT	20	Polycop	20
278	De Beers @ L-Berth	20	Polycop	20
279	Construction @ Eastern Mole	20	Polycop	20
280	Construction @ Eastern Mole	20	Polycop	20
281	Construction @ Eastern Mole	20	Polycop	20
282	Construction @ Eastern Mole	20	Polycop	20
283	Next to old Fire	20	Polycop	20
284	FFS New Buildings	50	uPVC	50
285	FFS New Buildings	50	uPVC	50
286	FFS New Buildings	50	uPVC	50
287	Next to bridge @ Eastern Mole	20	Polycop	20
288	Security bldg (Quay 500) new meter	20	Polycop	20
289	TBC	80	uPVC	80
290	Ams Construction (Ocean Road)	50	uPVC	50

EXISTING SYSTEMS AND INTEGRATION

5.7.9 The *Contractor* must develop an Application Programming Interface (APIs) to integrate the software with existing systems including linking the Utility Management Software to Transnets' Integrated Port Management System (IPMS) and SAP ERP (Enterprise Resource Planning) to transfer billing data (kilo Liters & Rand Value, kilowatts hours & Rand Value) on 15th of each month.

COMMUNICATION INFRASTRUCTURE

5.7.10 Communication Infrastructure Requirements

- 5.7.10.1 Design a fibre optic Local Area Network within the port boundary.
- 5.7.10.2 Trench to lay the fibre optic sleeves, trenching to minimum depth of 600mm and a width of 300mm.
- 5.7.10.3 Supply and install 110mm PVC pipe and chamber system for the fibre.
- 5.7.10.4 Supply and install fibre optic manholes where required.
- 5.7.10.5 The trenching for complete installation shall not exceed a total length of 13km. Backfill and reinstate existing surface and make good.
- 5.7.10.6 Supply and install 15 patch panels fully populated 48 pair with LC patch leads.
- 5.7.10.7 Supply, install and patch a total of 13km of 48 pair single mode fibre optic cable (652D).
- 5.7.10.8 Supply, install and configure 15 by 24 ports managed enterprise network switches.
- 5.7.10.9 Supply and install a 9U swing frame cabinet 900mm deep.
- 5.7.10.10 Link all electricity meters through the LAN to transmit data to the billing server for processing via the Utilities Management Software.

5.7.11 Wireless Communication Network for the water meters

- 5.7.11.1 All waters are to be fitted with an AMR interface (IoT devices) for logging of data and communicate to the closest gateway. The AMR interface shall have long range transmission and operate on low power.
- 5.7.11.2 Supply and install metering gateways including civil and structural works and all appurtenances.
- 5.7.11.3 Configure and integrate the gateways onto the LAN to transfer data to the server and Utilities Management Software.
- 5.7.11.4 Supply and install a server (Network & Application) to manage and control the network. The network server shall receive data and control messages from the gateways and process the data. The application server shall interface with the network server and shall store the data, perform analytics and enable integration with other systems.
- 5.7.11.5 Develop an Application Programming Interface (API) to allow the network to transmit relevant billing data to the billing server and Utilities Management Software.

5.7.12 Server

- 5.7.12.1 Supply, install and configure two 8-core (2.10GHz), 16GB, 8 x Hot plug 2.5in, smart array P408ia, 2 x 500W, rack mount billing servers.

5.7.12.2 Each server shall be supplied with four 1.2TB Hard Drives.

5.7.12.3 Supply and install the latest Microsoft SQL server (permanent license) for the management of data, storage and perform analytics via the Utilities Management Software.

5.7.13 Firewall

5.7.13.1 Supply, install, configure, and commission a Firewall for LAN. The *Contractor* shall ensure that old and new services going the Firewall are reinstated.

5.7.13.2 Setup DMZ and position a management workstation within DMZ.

5.7.14 Management Workstation

5.7.14.1 Supply, install and setup a Management Workstation (31.5 inch USB Hub Monitor, QHD, 60Hz, support Display Port Alt Mode with up to 90W Power Delivery, 1xHDMI, 1xRJ-45 (Ethernet 1 GbE, 4x Superspeed USB (5Gbps).

5.7.14.2 Setup rules for management workstation to control SCADA and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it.

5.7.14.3 Test and commission entire installation.

5.8 Port of Saldanha

Site Conditions

All Plants and Materials offered shall be rated for continuous operation under the following service conditions: (Port to inputs data)

Altitude	Sea level to +50m
Ambient air temperature	Max. 40 degrees Celsius; Min. – 5 degrees Celsius
Humidity	As high as 86%
Lightning conditions	10 strikes per year as listed in SABS codes
Atmosphere	Highly saline with heavy corrosive industrial, chemical and dust-laden nature. Frequent heavy rains driven by winds reaching speeds of 100km/h and above.
Water supply pressure	between 2.0 – 6.0bar

NEW SMART ELECTRICITY METERS

5.8.1 Mini-Sub 3 -Fire & Clinic Building (3 phase, 400V)

- 5.8.1.1 Supply, install, mount and configure a new smart electricity meter with communication module, including wiring and termination.
- 5.8.1.2 Meter to be fixed to the Mini-Sub LV panel and all CT's installed as per requirements.
- 5.8.1.3 Supply and install one (01) media converters.
- 5.8.1.4 Supply, install, splice and terminate new single mode fibre optic to the Mini-Sub.
- 5.8.1.5 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.1.6 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.1.7 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.1.8 Test and commission the installation.
- 5.8.1.9 Reinstate power.

5.8.2 Hostels – Main LV DB (3 phase, 400V)

- 5.8.2.1 Supply, install, mount and configure a new smart electricity meter with communication module, including wiring and termination.
- 5.8.2.2 Meter to be fixed to the LV DB and all CTs installed as per requirements.
- 5.8.2.3 Supply and install one (01) media converters.

- 5.8.2.4 Supply, install, splice and terminate new single mode fibre optic.
- 5.8.2.5 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.2.6 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.2.7 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.2.8 Test and commission the installation.
- 5.8.2.9 Reinstate power.

5.8.3 Meter Room Main LV DB Panel (Floor Standing) – Bayvue Centre (3 phase, 400V)

- 5.8.3.1 Supply, install, mount and configure 3x new smart electricity meters with communication module, including wiring and termination.
- 5.8.3.2 Meters to be fixed to the LV Distribution Board, fixed behind the front facing panel with space for visuals on the LCD screen, and all CTs installed as per requirements.
- 5.8.3.3 Supply and install three (03) media converters.
- 5.8.3.4 Supply, install, splice and terminate new single mode fibre optic.
- 5.8.3.5 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.3.6 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.3.7 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.3.8 Test and commission the installation.
- 5.8.3.9 Reinstate power.

5.8.4 Recreation Centre – Main LV DB (3 phase, 400V)

- 5.8.4.1 Supply, install, mount and configure a new smart electricity meter with communication module, including wiring and termination.
- 5.8.4.2 Meter to be fixed to the LV Distribution Board and all CTs installed as per requirements.
- 5.8.4.3 Supply and install one (01) media converters.
- 5.8.4.4 Supply, install, splice, and terminate new single mode fibre optic.
- 5.8.4.5 Establish connectivity; Link the meter to the billing server and the new Utility Management System.
- 5.8.4.6 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.4.7 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.4.8 Test and commission the installation.
- 5.8.4.9 Reinstate power.

5.8.5 Mini-Sub 1 – Bayvue Centre (3 phase, 400V)

- 5.8.5.1 Supply, install, mount and configure 2x new smart electricity meter with communication module, including wiring and termination.
- 5.8.5.2 Meters to be fixed to the mini-sub LV panel and all CTs installed as per requirements.
- 5.8.5.3 Supply and install two (02) media converters.
- 5.8.5.4 Supply, install, splice, and terminate new single mode fibre optic.
- 5.8.5.5 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.5.6 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.5.7 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.5.8 Test and commission the installation.
- 5.8.5.9 Reinstate power.

5.8.6 Meter Room Main LV DB Panel (Floor Standing) – Port Control (3 phase, 400V)

- 5.8.6.1 Supply, install, mount and configure 2x new smart electricity meters with communication module, including wiring and termination.
- 5.8.6.2 Meters to be fixed to the LV panel, fixed behind the front facing panel with space for visuals on the LCD screen, and all CTs installed as per requirements.
- 5.8.6.3 Supply and install two (02) media converters.
- 5.8.6.4 Supply, install, splice, and terminate new single mode fibre optic.
- 5.8.6.5 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.6.6 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.6.7 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.6.8 Test and commission the installation.
- 5.8.6.9 Reinstate power.

5.8.7 OSSB Mini-Sub – OSSB Port Terminal (3 phase, 400V)

- 5.8.7.1 Ensure the relevant circuits has been isolated and it is safe to commence with work.
- 5.8.7.2 Supply, install, mount and configure a new smart electricity meter with communication module, including wiring and termination.
- 5.8.7.3 Meter to be fixed to the mini-sub LV panel, and all CTs installed as per requirements.
- 5.8.7.4 Supply and install one (01) media converter.

- 5.8.7.5 Supply, install, splice, and terminate new single mode fibre optic.
- 5.8.7.6 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.7.7 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.7.8 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.7.9 Test and commission the installation.
- 5.8.7.10 Reinstate power.

5.8.8 Wash Bay Mini-Sub – Port Terminal Entrance (3 phase, 400V)

- 5.8.8.1 Ensure the relevant circuits has been isolated and it is safe to commence with work.
- 5.8.8.2 Supply, install, mount and configure a new smart electricity meter with communication module, including wiring and termination.
- 5.8.8.3 Meter to be fixed to the mini-sub LV panel, and all CTs installed as per requirements.
- 5.8.8.4 Supply and install one (01) media converter.
- 5.8.8.5 Supply, install, splice, and terminate new single mode fibre optic.
- 5.8.8.6 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.8.7 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.8.8 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.8.9 Test and commission the installation.
- 5.8.8.10 Reinstate power.

5.8.9 FMA Site Substation – FMA Distribution (Switchgear) (3 phase, 11 kV)

- 5.8.9.1 Supply and install a new standalone metering panel next to the existing 11kV switchgear, for housing of the new meter.
- 5.8.9.2 Supply, install, mount and configure a new smart electricity meter with communication module, including wiring and termination.
- 5.8.9.3 Meter to be fixed to the new metering panel, and all CTs installed and terminated to the incoming 11kV supply cable.
- 5.8.9.4 Supply and install one patch panel and one network switch.
- 5.8.9.5 Supply, install, splice, and terminate new single mode fibre optic.
- 5.8.9.6 Configure the network switch.

- 5.8.9.7 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.9.8 Create an account and link to the meter and apply the appropriate tariffs.
- 5.8.9.9 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.9.10 Test and commission the installation.
- 5.8.9.11 Reinstate power.

5.8.10 Meters to be Linked to the billing server and new Utility Management System

- 5.8.10.1 Provision for fibre optics and network integration is required at the locations listed in Table 13.
- 5.8.10.2 Establish connectivity; Link the meters to the billing server and the new Utility Management System.
- 5.8.10.3 Create accounts and link with the relevant meters and apply the appropriate tariffs.
- 5.8.10.4 If the GSM network is used, the data sim cards will be free issued to the Contractor.
- 5.8.10.5 Test and commission.

Table 14: Shows the location where the exist smart electricity meters are to be link to the new UTS.

No.	Meter Location	Type of Circuit	Meter Quantity
1.	Substation G –Shore Supply 5	3 Phase	01
2.	Substation G –Shore Supply 7	3 Phase	01
3.	Substation G –Shore Supply 8	3 Phase	01
4.	Substation G –Shore Supply 9	3 Phase	01
5.	Substation G –Shore Supply 10	3 Phase	01
6.	SAMSA Main DB – Office Building	3 Phase	01

NEW SMART WATER METERS

5.8.11 Replacement of Existing Water Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 14:

- 5.8.11.1 Decommission and remove the existing water meter.
- 5.8.11.2 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.8.11.3 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.

5.8.11.4 Register the meter on both the billing server and the new Utility Management System.

5.8.11.5 Create accounts and link with the relevant meter and apply the applicable tariffs.

5.8.11.6 Test and commission the installation.

Table 15: Shows the areas where the new smart water meters are to be installed.

Meter No.	Meter Location	Existing Pipe Size (mm)	Existing Pipe Material	Installation Type	Meter Size (mm)
M1	Municipal Main Meter	Unknown	UPVC	Inside a Manhole	300
M2	Fire / Clinic 2	Unknown	UPVC	Inside a Manhole	75
M3	IDZ Area 1	Unknown	UPVC	Inside a Manhole	200
M4	Kumba	Unknown	UPVC	Inside a Manhole	50
M5	Security	Unknown	Polycop	Inside a Manhole	15/22/28 /32
M6	Customs	Unknown	Polycop	Inside a Manhole	15/22/28 /32
M7	THB Shipping	Unknown	Polycop	Inside a Manhole	15/22/28 /32
M8	Tippler 1&2	Unknown	UPVC	Inside a Manhole	200
M9	Washbay	Unknown	HDPE	Inside a Manhole	75
M10	New Security Bld	Unknown	UPVC	Inside a Manhole	75
M11	Haul Road Security	Unknown	Polycop	Inside a Manhole	22
M12	Sunrise	Unknown	Asbestos Cement	Inside a Manhole	100
M14	Tippler 3 Stockpile RO Supply	Unknown	UPVC	Inside a Manhole	160
M15	Tippler 3 Main Line	Unknown	UPVC or HDPE	Inside a Manhole	160
M18	MPT Main	Unknown	Asbestos Cement	Inside a Manhole	150
M19	MPT Admin	Unknown	Asbestos Cement	Inside a Manhole	100
M20	MPT Quay	Unknown	UPVC	Inside a Manhole	160
M21	Sampling Plant	Unknown	UPVC	Inside a Manhole	50
M22	RO Plant 1	Unknown	UPVC	Inside a Manhole	75
M23	RO Plant 2	Unknown	UPVC	Inside a Manhole	160
M25	OPCSA	Unknown	Asbestos Cement	Inside a Manhole	100
M26	IOT Shop	Unknown	Polycop	Inside a Manhole	22
M28	Iron Ore Jetty	Unknown	Asbestos Cement	Inside a Manhole	100
M30	OSSB 1 - Old North Supply	Unknown	Asbestos Cement	Inside a Manhole	100
M31	OSSB 2 - Southern Supply	Unknown	UPVC	Inside a Manhole	100

Meter No.	Meter Location	Existing Pipe Size (mm)	Existing Pipe Material	Installation Type	Meter Size (mm)
M32	Sokhana	Unknown	UPVC	Inside a Manhole	75
M33	FMA	Unknown	UPVC	Inside a Manhole	75
M35	Municipal Bayvue	Unknown	Galvanised Steel	Inside a Manhole	200
M36	Municipal SCH	Unknown	Asbestos Cement	Inside a Manhole	150
M37	SAMSA	Unknown	Asbestos Cement	Inside a Manhole	75
M40	Yacht Port	Unknown	Asbestos Cement	Inside a Manhole	100
M43	Caisson 6 - Vessel Meter	Unknown	Steel	In Caisson	75
M44	Caisson 9 - Vesel Meter	Unknown	Steel	In Caisson	75
M45	Caisson 11 - Vessel Meter	Unknown	Steel	In Caisson	75
M47	Main Entrance Garages	Unknown	Polycop	Inside a Manhole	15/22/28 /32
M49	Bayvue Rec Centre	Unknown	UPVC	Inside a Manhole	75

5.8.12 Replacement of Existing Above Ground Water Meters

The *Contractor* shall perform the following activities on all the meters listed in Table 15:

- 5.8.12.1 Decommission and remove the existing water meter.
- 5.8.12.2 Supply and install a new water meter compatible with AMR technology including all necessary couplings, bolts, sealants etc.
- 5.8.12.3 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.12.4 Register the meter on both the billing server and the new Utility Management System.
- 5.8.12.5 Create accounts and link with the relevant meter and apply the applicable tariffs.
- 5.8.12.6 Test and commission the installation.

Table 15: Shows the areas where the new smart water meters are to be installed.

Meter No.	Meter Location	Existing Pipe Size (mm)	Existing Pipe Material	Installation Type	New Meter Size (mm)
M27	Berthing Services	Unknown	Polycop	Above Ground	22
M29	SFF Terminal	Unknown	Steel	Above Ground	75
M46	SFF Fire Hydrant	Unknown	Steel	Above Ground	75

5.8.13 Meter 13 – New Below Ground Water Meter Installation

- 5.8.13.1 Meter 13 is a new proposed below ground installation to be positioned at IDZ Area 2.
- 5.8.13.2 The existing pipe material is UPVC.
- 5.8.13.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.13.4 Saw cut approximately 4.7x1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.13.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7x1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.13.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.13.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.13.8 Supply and install No. 02x 200mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.13.9 Supply and install No. 02x 200mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.13.10 Supply and install a 200mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.13.11 Supply and install a 200mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.13.12 Supply and install an 200mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.13.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.13.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.13.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.13.16 Test and commission the installation.

5.8.14 Meter 16 – New Below Ground Water Meter Installation

- 5.8.14.1 Meter 16 is a new proposed below ground installation to be positioned at Stockpile 1.
- 5.8.14.2 The existing pipe material is UPVC.
- 5.8.14.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.14.4 Saw cut approximately 4.7x1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.14.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7x1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.14.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.14.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.14.8 Supply and install No. 02x 200mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.14.9 Supply and install No. 02x 160mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.14.10 Supply and install a 160mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.14.11 Supply and install a 160mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.14.12 Supply and install an 160mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.14.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.14.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.14.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.14.16 Test and commission the installation.

5.8.15 Meter 17 – New Below Ground Water Meter Installation

- 5.8.15.1 Meter 17 is a new proposed below ground installation to be positioned at Stockpile 2.
- 5.8.15.2 The existing pipe material is UPVC.
- 5.8.15.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.15.4 Saw cut approximately 4.7x1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.15.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7x1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.15.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.15.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.15.8 Supply and install No. 02x 200mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.15.9 Supply and install No. 02x 160mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.15.10 Supply and install a 160mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.15.11 Supply and install a 160mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.15.12 Supply and install an 160mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.15.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.15.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.15.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.15.16 Test and commission the installation.

5.8.16 Meter 34 – New Below Ground Water Meter Installation

- 5.8.16.1 Meter 34 is a new proposed below ground installation to be positioned at TNPA Bayview Precinct.
- 5.8.16.2 The existing pipe material is UPVC.
- 5.8.16.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.16.4 Saw cut approximately 4.7x1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.16.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7x1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.16.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.16.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.16.8 Supply and install No. 02x 110mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.16.9 Supply and install No. 02x 110mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.16.10 Supply and install a 110mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.16.11 Supply and install a 110mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.16.12 Supply and install an 110mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.16.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.16.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.16.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.16.16 Test and commission the installation.

5.8.17 Meter 38 – New Below Ground Water Meter Installation

- 5.8.17.1 Meter 38 is a new proposed below ground installation to be positioned at Port Control.
- 5.8.17.2 The existing pipe material is UPVC.
- 5.8.17.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.17.4 Saw cut approximately 4.7x1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.17.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7x1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.17.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.17.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.17.8 Supply and install No. 02x 50mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.17.9 Supply and install No. 02x 50mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.17.10 Supply and install a 50mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.17.11 Supply and install a 50mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.17.12 Supply and install an 50mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.17.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.17.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.17.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.17.16 Test and commission the installation.

5.8.18 Meter 39 – New Below Ground Water Meter Installation

- 5.8.18.1 Meter 16 is a new proposed below ground installation to be positioned at Club House.
- 5.8.18.2 The existing pipe material is HDPE.
- 5.8.18.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.18.4 Saw cut approximately 4.7x1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.18.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7x1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.18.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.18.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.18.8 Supply and install No. 02x 40mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.18.9 Supply and install No. 02x 40mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.18.10 Supply and install a 40mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.18.11 Supply and install a 40mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.18.12 Supply and install an 40mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.18.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.18.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.18.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.18.16 Test and commission the installation.

5.8.19 Meter 41 – New Below Ground Water Meter Installation

- 5.8.19.1 Meter 41 is a new proposed below ground installation to be positioned at Marine Services.
- 5.8.19.2 The existing pipe material is asbestos cement.
- 5.8.19.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.19.4 Saw cut approximately 4.7x1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.19.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7x1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.19.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.19.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.19.8 Supply and install No. 02x 100mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.19.9 Supply and install No. 02 x 100mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.19.10 Supply and install a 100mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.19.11 Supply and install a 100mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.19.12 Supply and install an 100mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.19.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.19.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.19.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.19.16 Test and commission the installation.

5.8.20 Meter 42 – New Below Ground Water Meter Installation

- 5.8.20.1 Meter 42 is a new proposed below ground installation to be positioned at Lighthouse Services.
- 5.8.20.2 The existing pipe material is UPVC.
- 5.8.20.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.20.4 Saw cut approximately 4.7 x 1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.20.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7 x 1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.20.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.20.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.20.8 Supply and install No. 02 x 110mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc. gaskets, bolts, sealants etc.
- 5.8.20.9 Supply and install No. 02 x 110mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.20.10 Supply and install a 110mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.20.11 Supply and install a 110mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.20.12 Supply and install an 110mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.20.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.20.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.20.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.20.16 Test and commission the installation.

5.8.21 Meter 48 – New Below Ground Water Meter Installation

- 5.8.21.1 Meter 48 is a new proposed below ground installation to be positioned at OSSB – New Northern Supply.
- 5.8.21.2 The existing pipe material is UPVC.
- 5.8.21.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.21.4 Saw cut approximately 4.7 x 1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.21.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7 x 1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.21.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.21.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.21.8 Supply and install No. 02 x 160mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.21.9 Supply and install No. 02 x 160mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.21.10 Supply and install a 160mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.21.11 Supply and install a 160mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.21.12 Supply and install an 160mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.21.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.21.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.21.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.21.16 Test and commission the installation.

5.8.22 Meter 50 – New Below Ground Water Meter Installation

- 5.8.22.1 Meter 50 is a new proposed below ground installation to be positioned at Infrastructure Depot.
- 5.8.22.2 The existing pipe material is UPVC.
- 5.8.22.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.22.4 Saw cut approximately 4.7 x 1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.22.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7 x 1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.22.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.22.7 Construct a new water meter manhole with overall size 2.66x1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.22.8 Supply and install No. 02 x 110mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.22.9 Supply and install No. 02 x 110mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.22.10 Supply and install a 110mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.22.11 Supply and install a 110mm In-line strainer, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.22.12 Supply and install an 110mm water meter, flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.22.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter-reading device and establish connectivity for wireless communication.
- 5.8.22.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.22.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.22.16 Test and commission the installation.

5.8.23 Meter 51 – New Below Ground Water Meter Installation

- 5.8.23.1 Meter 16 is a new proposed below ground installation to be positioned at Bayvue Admin Building.
- 5.8.23.2 The existing pipe material is UPVC.
- 5.8.23.3 Proof trench and verify the pipe material, depth and pipe size before procuring any material for the installation.
- 5.8.23.4 Saw cut approximately 4.7 x 1m wide in 50mm premix and hack up and remove including layer works and re-instate to match existing once all work is complete.
- 5.8.23.5 Excavate in earth in varying depths but not exceeding 1.5m deep, approximately 4.7 x 1m wide to expose existing water pipe including all necessary risk of collapse, backfilling and compaction and cart away of surplus material from site.
- 5.8.23.6 Cutting off approximately 4.5m of pipe including fitting of flanges on both ends of exposed pipe.
- 5.8.23.7 Construct a new water meter manhole with overall size 2.66m x 1.66m and varying depths not exceeding 2.53m deep including all necessary additional excavations, risk of collapse, blinding, manhole base, stone bedding, 230mm brickwork, backfilling, concrete cover slab, including breaking openings on both ends for new pipe and cart away of surplus material all in accordance with drawings and specifications.
- 5.8.23.8 Supply and install No. 02 x 110mm diameter steel pipes each approximately 1.4m in length, flanged on both ends and fitted on either end of manhole to existing flanged asbestos pipes and in new manholes including sealing off ends of manholes, support/thrust blocks, etc., gaskets, bolts, sealants etc.
- 5.8.23.9 Supply and install No. 02 x 110mm spool pieces in varying lengths flanged on both ends and fixed to meter & valves including all necessary, gaskets, bolts, sealants etc.
- 5.8.23.10 Supply and install a 110mm swing check valve flanged on both ends and fixed to new-flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.23.11 Supply and install a 110mm In-line strainer, flanged on both ends and fixed to new- flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.23.12 Supply and install an 110mm water meter, flanged on both ends and fixed to new- flanged pipes including all necessary gaskets, bolts, sealants etc.
- 5.8.23.13 Supply, install, mount and configure a smart IP68 automatic data logger and meter- reading device and establish connectivity for wireless communication.
- 5.8.23.14 Register the meter on both the billing server and the new Utility Management System.
- 5.8.23.15 Create an account and link to the meter and apply the applicable tariffs.
- 5.8.23.16 Test and commission the installation.

EXISTING SYSTEMS AND INTEGRATION

- 5.8.24** The *Contractor* must develop an Application Programming Interface (APIs) to integrate the software with existing systems including linking the Utility Management Software to Transnets' Integrated Port Management System (IPMS) and SAP ERP (Enterprise Resource Planning) to transfer billing data (kilo Liters & Rand Value, kilowatts hours & Rand Value) on 15th of each month.

COMMUNICATION INFRASTRUCTURE

5.8.25 Communication Infrastructure Requirements

- 5.8.25.1 Design a fibre optic Local Area Network within the port boundary.
- 5.8.25.2 Trench to lay the fibre optic sleeves, trenching to minimum depth of 600mm and a width of 300mm.
- 5.8.25.3 Supply and install 110mm PVC pipe and chamber system for the fibre.
- 5.8.25.4 Supply and install fibre optic manholes where required.
- 5.8.25.5 The trenching for complete installation shall not exceed a total length of 10km. Backfill and reinstate existing surface and make good.
- 5.8.25.6 Supply and install 10 patch panels fully populated 48 pair with LC patch leads
- 5.8.25.7 Supply, install and patch a total of 10km of 48 pair single mode fibre optic cable.
- 5.8.25.8 Supply, install and configure 10 by 24 ports managed enterprise network switches.
- 5.8.25.9 Supply and install a 9U swing frame cabinet 900mm deep.
- 5.8.25.10 Link all electricity meters through the LAN to transmit data to the billing server for processing via the Utilities Management Software.

5.8.26 Wireless Communication Network for the water meters

- 5.8.26.1 All waters are to be fitted with an AMR interface (IoT devices) for logging of data and communicate to the closest gateway. The AMR interface shall have long range transmission and operate on low power.
- 5.8.26.2 Supply and install metering gateways including civil and structural works and all appurtenances.
- 5.8.26.3 Configure and integrate the gateways onto the LAN to transfer data to the server and Utilities Management Software.
- 5.8.26.4 Supply and install a server (Network & Application) to manage and control the network. The network server shall receive data and control messages from the gateways and process the data. The application server shall interface with the network server and shall store the data, perform analytics and enable integration with other systems.
- 5.8.26.5 Develop an Application Programming Interface (API) to allow the network to transmit relevant billing data to the billing server and Utilities Management Software.

5.8.27 Server

- 5.8.27.1 Supply, install and configure two 8-core (2.10GHz), 16GB, 8 x Hot plug 2.5in, smart array P408ia, 2 x 500W, rack mount billing servers.
- 5.8.27.2 Each server shall be supplied with four 1.2TB Hard Drives.
- 5.8.27.3 Supply and install the latest Microsoft SQL server (permanent license) for the management of data, storage and perform analytics via the Utilities Management Software.

5.8.28 Firewall

- 5.8.28.1 Supply, install, configure, and commission Firewalls per port for LAN. The *Contractor* shall ensure that old and new services going the Firewall are reinstated.
- 5.8.28.2 Setup DMZ and position a management workstation within DMZ.

5.8.29 Management Workstation

- 5.8.29.1 Supply, install and setup a Management Workstation (31.5 inch USB Hub Monitor, QHD, 60Hz, support Display Port Alt Mode with up to 90W Power Delivery, 1xHDMI, 1xRJ-45 (Ethernet 1 GbE, 4x Superspeed USB (5Gbps).
- 5.8.29.2 Setup rules for management workstation to control SCADA and provide dashboards whilst second LAN on machine connects to Transnet Data Network. Management station needs to be on Transnet domain and have relative Transnet Policies applied to it
- 5.8.29.3 Test and commission entire installation.

5.9 Head Quarter (HQ) Central Remote Viewing

The *Contractor* shall make provision for remote viewing from Head Office through Transnet Corporate Network. This must be achieved by utilising all the management workstation within each port DMZ. Create dashboards to view utility consumption of each port and generate reports at HQ Level, see dashboard samples attached.

5.10 Advance Metering Infrastructure (AMI)

This section covers the requirements for the Automated Meter Reading (AMR) technology to be used in collecting water consumption on the water reticulation network installed in each port. AMR devices will collect and transmit the water meter data directly to Gateways that will then route it further via the TNPA Engineering Local Area Network (LAN) to the billing server in the port. All devices must be covered by at least 2 to 3 gateways that can read data from that device, the devices shall have a redundancy factor of 2.

5.10.1 Private Long Range Wireless Area Network

- 5.10.1.1 The *Contractor* shall investigate, design and install a private wireless communication network that will allow reading of the water meters remotely and transmit the water meter data via Gateways that will then route the data further via the TNPA Engineering Local Area Network (LAN) to the billing server in the port and upload the data into the new Utility Management System using Microsoft enterprise SQL server database.
- 5.10.1.2 The wireless network shall have long-range communication (up to 10km), ultra low power and deep indoor penetration.
- 5.10.1.3 Each gateway/ receiver shall have the capability to support up to 1000 devices/ meters.
- 5.10.1.4 The wireless communication network solution shall be robust and secure ICASA approved open non-proprietary radio frequency protocols which optimize and enhance communication range and lengthen battery life meters (built-in radio), meter interface units and gateways shall be preferred.
- 5.10.1.5 The wireless communication system shall seamlessly integrate with existing systems in the ports. The AMR solution shall communicate via an open protocol such as TCP/IP, Modbus etc.
- 5.10.1.6 Gateways are to be linked back to the servers via the Local Area Network.
- 5.10.1.7 The wireless network shall be easy to install, manage and maintain.
- 5.10.1.8 The network system shall have the capabilities to be monitored via a dashboard and have the ability to trace the water data back through the system to the meter. Timestamps should reflect when the meter took its reading and where the data was held. Each reading should be uniquely tied to the meter it came from to avoid the possibility of confusion.
- 5.10.1.9 If communication fails for a period (failed batteries, network outage/congestion), the system should be able to retrieve missed data from the meter itself. In addition, the system shall allow for a handheld (Drive by or Walk by) device to be used to pick-up data or collect meter readings should any communication failure occur.
- 5.10.1.10 The communication network shall operate on a license free spectrum (No ICASA License).
- 5.10.1.11 The wireless network solution shall have no monthly or yearly subscriptions. Cloud solutions will not be considered.

5.10.2 AMR Gateways and Communication

- 5.10.2.1 Gateways are to be used to collect data from the meters and upload to the billing server via the LAN network. The gateways shall be easy to install and configure and shall be compatible with LoRa, Wi-Fi, Fiber (RTU), Ethernet and GSM/GRPS/LTE.
- 5.10.2.2 The Gateway shall communicate in the unlicensed managed 868 MHz range with all the AMR modules in its assigned area and must be capable to cover up to 8 km radius.
- 5.10.2.3 The gateway data collectors shall collect data from the devices and send the data to the billing server. The transmission interval shall be adjustable between 30 minutes to 24 hours.

- 5.10.2.4 Gateway shall be of a compact and robust design to receive meter data in periodic intervals and transfer this data via ethernet into the Billing Software or other TNPA approved platform.
- 5.10.2.5 The gateways shall be configurable via fixed IP address for on the Local Area Network.
- 5.10.2.6 Gateways/ receivers shall have the capability to support up to 1000 devices/ meters.
- 5.10.2.7 The gateways shall be PoE (Power over Ethernet) or AC or solar powered unit with optional battery backup.
- 5.10.2.8 The minimum Protection Class shall be IP65.

5.10.3 Automatic Meter Reading (AMR) Interface

- 5.10.3.1 The meter interface shall be Hall Effect sensors, reed switches are to be avoided due to their mechanical nature and the danger of physical break.
- 5.10.3.2 The meter interface shall have a communication range of up to 10km open environment and at least 5km range urban and must be compatible with Wi-Fi, Fibre (RTU), Ethernet and GSM/GRPS/LTE connection.
- 5.10.3.3 The interface shall be LoRa certified.
- 5.10.3.4 The device shall be powered by a battery and it shall be replaceable and serviceable batteries. The battery life shall be between 5 to 10 years or more. (extended battery pack)
- 5.10.3.5 The AMR interface shall be capable to give the following:
 - Meter ID
 - Meter Address
 - Meter Reading in (kL)
 - Meter Reading Date
 - Low Battery Alert
 - High Flow Alert
 - Low Flow Alert
 - Tamper Alert
 - Meter Error Alert
 - Back Flow Alert

5.11 Fiber Optic Backbone Local Area Network

The *Contractor* shall establish a 1 Gig backbone single mode fiber 1310nm network with redundant ring configuration at each port that will interconnect various devices (i.e., Electricity Meters, AMR Gateways, Servers and Management Workstation). The fiber optic installation shall be carried out in accordance with "Annexure E: Project Specification Fiber Cable 08-2025". The fiber network shall have core redundancy in the following areas:

- Fiber/ path redundancy

- Hardware redundancy

Network equipment shall conform to the following standards:

5.11.1 Managed Network Switches

- 5.11.1.1 Each port Local Area Network shall be based on the layer 3 catalyst 9200L, 24 port, 4x1G uplink and catalyst 9200L, 12 port, 2x1G uplink managed enterprise network switches as well as TP Link converter modules.
- 5.11.1.2 The Contractor shall develop the network switch topology with a ring configuration. TNPA requires switched 10/100/1000 Ethernet at all end nodes locations. Each connection must support both the 10BaseT ,100BaseT and 1000BaseT standards. Core network connections must support Gigabit Ethernet in order to provide the bandwidth required.
- 5.11.1.3 Network switches shall be installed in substations and administration buildings unless otherwise specified.
- 5.11.1.4 RJ45 Cat 6 shielded cabling shall be used for wiring "Field Devices" to the switch.
- 5.11.1.5 The Contractor in collaboration with the Employer shall issue the,
 - a) IP, Gateway, Subnet mask and domain addresses of the "Field Devices" that will be programmed on all devices.
 - b) VLAN setting
- 5.11.1.6 Test and commission the entire installation and confirm that all network switches are online and communicating on the LAN.

5.11.1 Patch Panels

Supply and install 24 Core fiber optic patch panels with subscriber connector (SC) pigtails.

5.11.2 Rackmount Chassis

Rackmount chassis designed to accommodate 12 TP-Links media converters shall be supplied for central power where multiple media converters are used.

5.11.3 Equipment Cabinet

- 5.11.4.1 Wall mounted cabinets shall conform to the following standards:
 - a) Shall be of the swing frame type.
 - b) Shall be reversible (swing in both directions).
 - c) Shall have a weight carrying support between the cabinet housing and the frame to ensure that the cabinet lock does not carry any weight in the locked position.
 - d) Dimensions 9U.

- e) Fitted with a set of two punched profiles.
- f) Fitted with two high performance ball bearing low noise fans fitted on the sides of the cabinet. One fan shall expel air from the cabinet and the other impels air into the cabinet.
- g) Fitted with a lockable tinted Safety flexi glass door. The frame and the door shall be lockable with the same key. Two keys shall be supplied for each cabinet.
- h) The cabinet shall be powder coated.
- i) Shall be fitted with a 5 way metal power duct with a circuit breaker.
- j) Shall have cable entries at the bottom and top of the box.

5.11.4.2 All cabinet shall be mounted level. After installation both the door and the cabinet shall be able to open at least 90 degrees.

5.11.4.3 All cabinets shall be fitted with blank panels in all un-utilized positions (1U Blanking Panels) and Brush Panels.

5.11.4.4 All cabinets shall be marked with a label.

5.11.4.5 All labels shall be permanent and printed black on white background.

5.11.4.6 The cabinets shall be mounted at least 2m or as high as the ceiling allows.

5.11.4 **Network Monitoring Software**

5.11.5.1 Supply and install a network monitoring software that monitors system status, availability, speed, uptime, health, network devices and traffic.

5.11.5.2 The software shall be able to monitor over 1000 devices.

5.11.5.3 The license for the software shall be a perpetual license.

5.12 **Smart Utility Management Software Solution**

This section covers the requirements for the utility management software to be deployed at each port for managing both water and electricity consumption within the port. The data collected from the meters will be stored in the servers using SQL server database. The stored data will be analysed on the server and available for display via the Utility Management Software Solution graphical user interface (Dashboards). No cloud-based solutions will be accepted.

5.12.1 **Development of Smart Utility Management Software Solution**

5.12.1.1 Development, installation, testing and commissioning of a smart utility management software solution. The software solution to be developed shall be able to retrieve water and electricity data from various software and be able to monitor, perform analysis and store TNPA's metering data.

5.12.1.2 The software solution shall:

- a) Provide TNPA with a web-based centralised utilities management software to capture, process and visualise TNPA's water and electricity data per port.
- b) Have easy to use interface with drop down menus, tabs and dashboards.
- c) Automatically import data from other software systems or remote devices
- d) Perform energy and water consumption forecasting.
- e) Provide modular software design that is easily customisable and highly scalable system.
- f) User configured system with ability to extract and import data on high consumption users for energy and water consumption (e.g., top 10 in graphical and table format as well as generating of reports)

5.12.1.3 Electricity and Water Consumption Analysis

The software solution shall be capable to perform broad analysis of energy/water data including electricity/water analysis and create comparison tables at port level as well as Operating Division level.

The following energy data is to be visualised, but not limited to:

- a) Electrical Energy Consumption (kWh),
- b) Maximum Demand (kVA)
- c) Power Factor (positive and negative kVARs)
- d) Load Profiling (Graph for kWh used vs Budgeted kWh – hourly, daily, weekly, monthly and yearly).
- e) Power Quality Capabilities

The following WATER data is to be visualised, but not limited to:

- a) Average flow rate in kL
- b) Accumulative kL
- c) Current month kL usage
- d) Current month to date kL usage
- e) Night flow vs Day flow analysis
- f) Line Pressure Monitoring
- g) Leak Detection Alarming

5.12.1.4 Financial Analysis

Perform financial analysis, monitor budgets and analyse energy in terms of cost. The following cost summary be accessible and be visualised, but not limited to:

- a) Rands/ kWh
- b) Rand/kL
- c) Budget kL vs Actual Usage
- d) Budget kWh vs Actual Usage inclusive of recoveries
- e) Variances
- f) Hourly average usage (kL & kWh)
- g) Total kWh/kL cost
- h) Budget Costs
- i) Tariff configuration (Water & Electricity)
- j) Tariff Analysis (Water & Electricity)
- k) Losses and Unrecovered Revenue

5.12.1.5 Dashboards:

Software dashboards shall be in accordance with "Annexure D – Dashboards on the Smart Utilities Management Software".

The software shall have the following capabilities:

- a) The software solution shall be capable to bring together essential energy and water information on a single page.
- b) Provide information in different formats, graphs, tables, charts and trending analysis.
- c) Have the capability to view up to four screens at once with automatic updates.

5.12.1.6 Alerts and Reports

- a) The system shall be configurable to generate automatic energy alarms distributed by email and SMS to the relevant people.
- b) Pre-set and automatically generate energy report on set intervals or periods [day(s), week(s), month(s), year(s)] with calendar plot.
- c) The system shall have flexible and easy to use reporting functionality with the ability to produce reports in a variety of formats, (i.e. Excel, PDF, Word, csv, xml e.t.c) as well as being printed.
- d) Users must be able to compile and implement new reports to their own design without having to revert to the service provider/ developer.
- e) Create benchmarking reports based on user defined standards.

- f) Compare bill values against collected meter data in graphical format to verify and identify anomalies.
- g) Logging of all software malfunctions and system errors.

5.12.1.7 System Integration and Operating System

- a) The system shall be able to handle operation on desktop devices with a modern Operating System and shall be accessible on mobile.
- b) The support OS shall include, but not be limited to:
 - o Windows,
 - o Android,
 - o iOS
- c) The solution shall be stable, reliable and performant, having a high level of user availability.
- d) The solution shall allow electronic transmission of information and data storage using industry accepted standards of communication, methods as well as be aligned to the relevant Transnet standards for data exchange and transmission.
- e) The solution shall be highly configurable by TNPA staff without the need to revert to the service provider/ software developers of the solution. This includes, configuration of workflow, processes, data elements, user preferences, display columns and reports.
- f) The solution shall be based upon proven and industry standard technologies.
- g) The solution shall be able to receive data from multiple connectivity points (Ethernet, Wi-Fi, or GSM).

5.12.1.8 User Access and Security

- a) The solution must provide suitable security to control access to the functionality. Access must be role and user based. The system must allow for security and password rules, where possible be integrated with the domain security for TNPA internal Users.
- b) Users shall have the ability to self-manage their profile online.

5.12.1.9 Software

- a) The solution must be able to run on an industry-recognised server platform, for example Microsoft Server 2012 R2 (or above) for server or similar.
- b) The database used by the solution should be a recognised industry-standard enterprise database, for example Microsoft SQL Server 2012 (or above), or similar.
- c) The solution must run on a minimum user PC operating system of 64-bit Windows 10, etc. and above.

- d) The solution must be able to communicate with the following office software used by TNPA:
 - Microsoft Office Professional Suite 2013 and above.
 - Microsoft Exchange 2010 and above.
 - SharePoint 2013 and above is compatibility required with Office suite, existing billing systems as per Annexures, SCADA/ IoT, maintenance and utility management software.
- e) The user interface shall accessible via commonly used browsers such as Chrome, Safari, Firefox, E and at a minimum be compatible with Microsoft Edge/ Internet Explorer 11 or later versions.
- f) The solution must have the role of Administrator. This role will perform restricted tasks within the solution such as, but not limited to, the following:
 - Creating new users.
 - Removing users.
 - Applying user permissions.
 - Configuration of the solution.
- g) The software must be South African based and fully supported in SA and have office or support functionality in at least the major cities in SA (i.e., Durban, Cape Town, Johannesburg, Pretoria, Bloemfontein, or Port Elizabeth).

5.12.1.10 Geographical Information System (GIS) or Supervisory Control and Data Acquisition (SCADA)

The software shall have an integrated Geographical Information System or similar to SCADA for monitoring of the "Field Devices".

The GIS shall include the following information:

- a) Device I.D
- b) Co-ordinates
- c) Last Communication
- d) Active Alerts
- e) IP Address
- f) Routing to gateway
- g) Current Reading

The dashboard view shall show:

- a) Current and average readings for a period,
- b) Active alerts,
- c) Last seen.
- d) The GIS/Map shall have all devices shown (gateways, water meters, pressure devices and Electricity Meters).

5.13 Technical specification of the Water Meter

5.13.1 Water Meter:

- 5.13.1.1 All meters are to be SANS 1529-1:2006 as well as Trade Metrology Act, 1973 (Act 77 of 1973) compliant.
- 5.13.1.2 The meter shall comprise of a 9-digit analog display for consumption (m3) and status information.
- 5.13.1.3 Have a built-in radio AMR capabilities.
- 5.13.1.4 The meter shall have a dial compatible with a High Resolution Interface (HRI)
- 5.13.1.5 Detect continuous water leaks.
- 5.13.1.6 Offer two communication modes, fixed radio network and mobile read (Walk-by/ Drive-by)
- 5.13.1.7 Protection Class IP68
- 5.13.1.8 Maximum working pressure 1600kPa
- 5.13.1.9 In all cases, the tenderer shall give a full description of the meter offered. Corrosion resistant materials shall be employed throughout and parts that are in contact with the water flowing through shall be non-toxic and non-tainting.
- 5.13.1.10 The meter body must be manufactured from cast iron and powder coated with a fusion bonded epoxy to a minimum dry thickness of 150 microns.
- 5.13.1.11 Meter installation position shall be horizontal.
- 5.13.1.12 The water meter shall be clearly and indelibly marked with the following information:
 - a) Name or trademark of the manufacturer.
 - b) Meter serial number where first two digits indicate year of manufacture.
 - c) Direction of flow on both sides of the body
 - d) Unit of measurement
 - e) Meter type and size
 - f) Maximum admissible pressure
 - g) Pressure loss class

- h) Temperature class
- i) Metrological approvals and flow values

- 5.13.1.13 All mechanical meters supplied in terms of this contract shall perform to accuracy of better than $\pm 2\%$ error over the meters' operating range.
- 5.13.1.14 All meters supplied shall be AMR compatible and ready to receive a data capture device.
- 5.13.1.15 The water meters shall allow for the data interface and pulse outputs to be easily mounted afterwards without breaking any meter seals.

5.14 Technical specification of the Electricity Meter

5.14.1 Electricity Meter

All smart electricity meters supplied shall have the capabilities to measure different electrical parameters such as but not limited to Active Energy (kWh/MWh), Reactive Energy (kVARh/MVARh), Apparent Energy (kVAh/MVAh) etc. in a three (3) phase, three or four wire 50 Hz network.

Specification of the meter:

- Frequency: 50Hz $\pm 2\%$
- Accuracy: Class 0.5S Active Energy (kWh), Class 1.0 Reactive Energy (kVARh)
- Voltage 3 x 58/100...240/415V
- Current: 1/5A
- Maximum continuous current: 200% In
- Other data: Instantaneous values
- Switching: Internal clock
- Outputs: 5 Input, 6 outputs contacts
- Standard: IEC 60687 & IEC 61035
- Data output: LCD,

Meter construction

- Display: Programmable 8-digit liquid crystal display and shall be capable to display while un-powered.
- Figure height: 8mm
- Construction: Anti static, glass fibre re-enforced plastic

Communication

The meter must be compatible with Wi-Fi, Fibre, Ethernet and GSM/GRPS/LTE connection.

5.15 Guarantee

- 5.15.1 The *Contractor* shall provide a 12-month guarantee/ warranty period post Completion per port as well as to ensure all business requirements and functionality are operational and accepted by the *Employer*.
- 5.15.2 The *Contractor* is required to develop a maintenance regime for both the meter and the electronics that will ensure all guarantees uphold for the full guarantee period.

6 List Of Drawings

6.1 Drawings issued by the *Employer*

Drawings

SECTION 2

7 Management and start up

7.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Kick-Off Meeting	Once-off	Microsoft (MS) Teams	<i>Project Manager</i> (and appropriate delegates), <i>Supervisor</i> , and <i>Contractor</i> (appropriate key persons)
Overall contract progress and feedback	Bi-Weekly	Microsoft (MS) Teams	<i>Employer</i> , <i>Project Manager</i> (and appropriate delegates), <i>Supervisor</i> , and <i>Contractor</i> (appropriate key persons)
Technical Meetings	Bi-Weekly	Microsoft (MS) Teams	<i>Project Manager</i> (and appropriate delegates), <i>Supervisor</i> , and <i>Contractor</i> (appropriate key persons)
Risk Register and Compensation Events	As and When required	Microsoft (MS) Teams	<i>Project Manager</i> (and appropriate delegates), <i>Supervisor</i> , and <i>Contractor</i> (appropriate key persons)
Issues on Site	As and when required	On Site	CM, <i>Project Manager</i> , <i>Supervisor</i> and the <i>Contractor</i>

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the works. Records of these meetings are to be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

All meetings are to be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register are not to be used for the purpose of confirming actions or instructions under the contract as these are to be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

7.2 Documentation Control

- 7.2.1 The control, maintenance and handling of documents and drawings, using a suitable document control system, remain the sole responsibility of the *Contractor*.
- 7.2.2 All contract correspondence is issued through document control. All hardcopy communication will be delivered to the *Employer* via the Document Controller. In the event of urgent communication,

electronic communication can be transmitted to the relevant Document Controller assigned to the Project and hardcopy to follow.

- 7.2.3 Each supplier of documentation and data to the Project is responsible for ensuring that all documentation and data submitted conforms to the Project Standards and data Quality requirements in terms of numbering, uniqueness, quality, accuracy, format, completeness and currency of information. Data not meeting the Project Standards and data Quality requirements will be cause for rejection and returned to the Contractor for corrective action and re-submission.
- 7.2.4 Should any change be made to documentation or data, which has already been submitted to the Project, then new or revised documentation or data shall be issued to replace the outdated information.
- 7.2.5 It is the responsibility of all Project participants undertaking work on the Project to ensure they obtain and comply with the relevant requirements to suit their deliverables and Scope of Works.
- 7.2.6 The Contractor is to ensure that the latest versions of the required application software and a suitable 'IT' Infrastructure is in place to support the electronic transmission of documentation.
- 7.2.7 Electronic files submitted to the Project shall be clear of known viruses and extraneous "macros". The supplier of documentation is required to have, at all times, the latest generation of virus protection software and up-to-date virus definitions.
- 7.2.8 The Contractor shall be responsible for the supply of all Supplier/Subcontractor/Manufacturer, etc. documentation and data related to their package of work and shall ensure that these Suppliers have the capability to supply the necessary documentation and data in the required time-frame and quality prior to awarding sub-orders.
- 7.2.9 The required number of copies shall as a minimum be three (3) (1 x original + 2 x hard copies), with the corresponding PDF and 'Native' file formats upon final submission.
- 7.2.10 The Contractor shall apply "wet signatures" to the original Documentation before scanning the signed original and prior to formal submission to the Project.
- 7.2.11 Final issues of all documentation shall be supplied to the Project in "wet signature" format along with the associated corresponding electronic 'native files' and PDF renditions.
- 7.2.12 The Contractor shall during the Covid-19 Pandemic issue documents electronically to the identified document controller, accompanied by a transmittal which clearly indicates the purpose of the submission.
- 7.2.13 The *Contractor* shall ensure adequate resources are available to manage and execute the Document Control function as per the requirements of the Project.

7.3 Health and Safety Requirements

- 7.3.1 The *Contractor* complies with the following SMP: All health and safety matters associated with the *works* will be dealt with in accordance with Occupational Health & Safety Act, 1993 (Act No. 85 of 1993) and the Transnet National Ports Authority Health and Safety Specifications attached to this Works Information.
- 7.3.2 The Contractor shall prepare, implement and administer the Contractor's Health and Safety Management Plan (CHSMP). The Health and Safety Management Plan must provide a systematic method of managing hazards and implementing control measures.
- 7.3.3 The Contractor shall prepare and submit the Occupational Health & Safety file to the Project Manager for review and acceptance.
- 7.3.4 Pre-employment medical examinations as well as exit medicals will be required and must further include for chest X-rays. These medical examinations must be carried out by a registered Occupational Health practitioner. All costs associated will be to the Contractor's account.
- 7.3.5 The Contractor ensures that its Sub-contractors comply with the CHSMP and relevant statutory requirements of the Occupational Health & Safety Act, 1993 (Act No. 85 of 1993).
- 7.3.6 The roles and responsibilities of the various personnel acting on behalf of the Project Manager with respect to the SMP and health and safety issues are as stated in the paragraphs following:
- 7.3.7 The Construction Manager is responsible (in the context of the SMP only) for health and safety on the Site and Working Areas and reports to the Project Manager.
- 7.3.8 The Construction Manager specific tasks (in the context of the SMP) are:
- a) Implement the *Employers* safety management system.
 - b) Monitor Contractor's compliance to the CHSMP.
 - c) Ensure risk is at an acceptable level.
 - d) Ensure the Contractor's workforce and Construction Management Team is competent.
 - e) The Contractor performs the works having due regard to the HSSP.
 - f) The HSSP is:
- 7.3.9 The Project Site Safety Manager (PSSM) is responsible for ensuring that the Contractor complies with the SMP. The PSSM acts on behalf of the Project Manager.
- 7.3.10 The Project Site Safety Manager (PSSM) specific tasks are:
- a) Ensure that the overall project safety requirements are complied with.
 - b) Provide guidance on safety related issues arising during the execution of the project.

7.3.11 The *Contractor* shall submit a Safety, Health and Environmental (SHE) file showing the *Contractor's* adherence to the OHS Act and all legislative requirements. The SHE plan prepared before award of work must be signed and approved by the *Employer's* Legal & Compliance Department. Thereafter the *Contractor* shall be required to attend a safety induction. The *Contractor* shall pay special attention and compliance to Transnet National Ports Authority SHE Specification, a copy of which is included with this tender. Documentation required includes;

- SHE Plan
- Method Statement
- Risk Assessment

7.3.12 The SHE File is to be kept on Site at all times. The file has to contain amongst others:

- Principal Contractor Organogram
- Letter Of Good Standing with Compensation Fund
- General Liability Insurance (Summary of Policy)
- Notification Letter of Construction Work ~ Department Of Labour (If Applicable)
- Appointments (Inclusive of legal appointments)
- Contractor Induction: Employees and Visitors
- Principal Contractor's SHEQ Policy
- Health & Safety Plan
- Fall Protection Plan inclusive of Fall Protection Risk Assessment (If Applicable)
- Risk Assessments (inclusive of action plan to manage controls)
- Method Statements
- Safe Operating Procedures
- Incidents / Accidents Register and Investigation Report Template
- Emergency Contact Telephone Numbers
- Contractor Site Emergency Plan (For Site establishment)
- Business Continuity Plan Including Emergency Plan
- Documented Proof of Daily Toolbox Safety Talks/ DSTI
- Inspections Checklist
- All Registers
- Welfare Facilities arranged
- Electrical Compliance (COC) (If Applicable)
- Communication Plan
- Training Records and Competency Certificates
- Employee Personal Profile Dossier completed
- Staff Medical Certificates (Must correspond with Employee Personal Dossier)
- Employee Personal Profile Dossier completed
- Environment Management Plan

7.3.13 Clients Obligation

- Client SHE Specification
- Induction Indemnity Form completed
- Induction Attendance Register
- List of legal Permits and Authorisation completed
- Pre-site Hand over Inspection Checklist
- Site access certificate completed
- Mandatory Agreement (TIMS Section 37(2) Agreement)

7.3.14 Asbestos that forms part of structure of building or on premises

7.3.12.1 Handling of Asbestos Cement Products

In order to ensure that the handling, altering, cleaning, preparation for painting or removal of any asbestos cement products, is carried out in a safe, uniform and appropriate manner as required by the Asbestos Abatement Regulations 2020, framed under the Occupational Health and Safety Act (Act No. 85 of 1993) and the Environment Conservation Act, 1989 (Act No 73 of 1989), the *Contractor* will either:

- a) Acquire the services of an Asbestos Approved Inspection Authority in order to train their employees and draw up **Plan of Work**. It must comply with requirements of Regulation 15;
- b) Acquire the services of a Registered Asbestos Removal *Contractor*. **The services of the AAIA must be acquired by the awarded Contractor for the project;**
- c) Keep all records on the SHE File relating to asbestos management on site and that includes proof of training, air monitoring results, etc. which will be handed over to the **TNPA Project Leader** upon completion of the work / contract;
- d) Provide an up-to-date inventory of asbestos in place, as contemplated in regulation 4, when asbestos work is planned;
- e) Ensure that an asbestos risk assessment, as contemplated in regulation 5, is carried out prior to asbestos work;
- f) Ensure that a written safe work procedure is developed and followed by employees.

7.3.12.2 Disposal of Asbestos Cement Products

The *Contractor* shall ensure that all Asbestos Cement Products are disposed at an **Asbestos disposal site (approved for disposal of hazardous material)** that means a site specifically designated for the purpose of asbestos disposal in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).

7.4 Environmental constraints and management

The *Contractor* complies with the following Construction Environmental Management Plan (CEMP):

- 7.4.1 The *Contractor* performs the *works* and all construction activities within the Site and Working Areas in accordance with the provisions of the environmental management plan guidelines as contained in the *Employer's* Standard Environmental Specifications.
- 7.4.2 The Contractor performs the works and all construction activities within the Site and Working Areas having due regard to the environment and to environmental management practices as more particularly described within the Standard Environmental Specification (SES) and Project Environmental Specifications (PES).
- 7.4.3 The SES describes the minimal acceptable standard for environmental management for a range of environmental aspects commonly encountered on construction projects and sets environmental objectives and targets, which the Contractor observes and complies.
- 7.4.4 The PES describes more particularly the environmental standards applicable to the works, the Site and the Working Areas and sets out variance (including additions) to the SES. The PES may require higher minimal standards than those described in the SES as may be required by the Project Manager or Others.
- 7.4.5 The overarching obligations of the Contractor under the CEMP before construction activities commence on the Site and/or Working Areas is to provide an environmental method statement for a particular construction operation at the Site and/or Working Area by the Contractor and where requested by the CM and to comply with the following:

The *Contractor* shall identify the kinds of environmental impacts that will occur as a result of his activities and a method statement describing how each of those impacts will be avoided, prevented or managed so that the standards set out in this documents are achieved.

The EMP must include, but not limited to the following sections detailing the environmental aspects and possible impacts and management controls (mitigation measures) pertaining to the risks listed in the section:

- Site establishment including *Contractor's* Site camp
- Protection of sensitive/no-go areas
- Management of hazardous chemicals and flammable substances
- Pollution control & Spill response
- Waste Management
- Environmental education and awareness
- Protection of marine species and birds
- Removal of project waste

- Decommissioning of Site camp
- Contractor's SHE Officer
- Monitoring and auditing and
- Record keeping

7.4.6 The *Contractor* shall ensure that his management, foremen and the general workforce, as well as all suppliers and visitors to Site have attended the Induction Programme prior to commencing any work on Site. If new personnel commence work on the Site during construction, the *Contractor* shall ensure that these personnel undergo the Induction Programme and are made aware of the environmental specifications on Site.

7.4.7 The Contractor must appoint a sufficient number of named assistants to the CSHEO to monitor environmental issues e.g. litter, spills, illegal activities, fence patrol, dust etc. These appointments, along with details of the individuals being appointed and job descriptions, must be sent to the Project Manager for his approval.

7.4.8 During the installation period, the Contractor complies with the following:

7.4.8.1 A copy of the SES, and the relevant PES shall be available on Site, and the *Contractor* shall ensure that all the personnel on Site including Subcontractors and their staff as well as suppliers are familiar with and understand the specifications contained in the SES as amended by the PES.

7.4.8.2 Method statements that are required during construction must be submitted to the *Project Manager* for approval at least 20 days prior to the proposed commencement of the activity. Emergency construction activity method statements may also be required. The activities requiring method statements cannot commence if they have not been approved by the *Project Manager*.

7.4.8.3 Where applicable, the Contractor shall provide job-specific training on an ad hoc basis when workers are engaged in activities, which require method statements.

7.4.8.4 The Contractor shall ensure that any Materials delivery drivers are informed of all procedures and restrictions (e.g. which access roads to use, no go areas, speed limits, noise, etc) required by the CEMP before they arrive at Site and off load any Materials.

7.4.8.5 The list below is a list of some of the other issues that the Contractor must ensure he has planned for to meet the requirements of the environmental specifications. It is not a comprehensive list but serves as a guide:

- a) Workshop and maintenance of Plant
- b) Protection of historical and archaeological artefacts

- 7.4.8.6 The Contractor complies with environmental inspections and audits which will be conducted by the Employer's environmental officers during the execution of the project, detailed requirements of the audits to be agreed with the successful tenderer after award.
- 7.4.8.7 The Contractor ensures that all personnel on Site including Subcontractors and their staff are familiar with and understand the requirements of the CEMP.

7.5 Quality Assurance Requirements

- 7.5.1 The *Contractor* shall have, maintain and demonstrate its use to the *Project Manager* (and/or the *Supervisor*) to satisfy the requirements of the documented Quality Management System to be used in the performance of the *works as per the General Quality Requirements for Contractors and Suppliers : TNPA-QUAL-REQ-014.1*
- 7.5.2 The *Contractor* submits his Quality Management System documents to the *Project Manager* as part of his programme under ECC Clause 31.2 to include details of:
- Project Quality Plan for the contract.
 - Quality Control Plans (QCP's).
 - A schedule of internal audits during the contract.
- 7.5.3 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.
- 7.5.4 The *Project Manager* indicates those documents required to be submitted for either information, review or acceptance and the *Contractor* indicates such requirements within his register of documents. The register shall indicate the dates of issue of the documents with the *Project Manager* responding to documents submitted by the *Contractor* for review or acceptance within the *period for reply* prior to such documents being used by the *Contractor*.
- 7.5.5 The Quality Plan means the *Contractor's* statement, which outlines strategy, methodology, resources allocation and Quality Control co-ordination activities to ensure that the *works* meet the standards stated in the *Works* Information.
- 7.5.6 The Quality Control Plans shall identify all inspection, test and verification requirements to meet Contractual obligations, specifications, drawings and related details including destructive, non-destructive testing, witness and hold points.

7.6 Programming Constraints

- 7.6.1 All construction activities and sequencing of the works shall be planned as per the programming and method of construction outlined in this document.

This document contains the engineering and construction activities for all eight ports. The ports have been organized into three main regions: Eastern, Central and Western, each with its own distinct characteristics and specialized services. The Eastern region includes Durban and Richards Bay. The Central region consists of East London, Ngqura and Port Elizabeth. The Western region is composed of Mossel Bay, Cape Town and Saldanha.

The Contractor is required to have construction/ installation Teams per region (Eastern, Central and Western) and the Teams are to be subdivided into two i.e., one for the supply and installation of water meters and one for the supply and installation of electricity meters. These installations shall take place simultaneously. The *Contractor* is required to provide all necessary resources, tools and equipment to support this strategy. These requirements shall be included in the *Contractor's* schedule by the *Contractor*.

Eastern Region		
a.	Port of Richards Bay	Team One - Water Team Two - Electricity
b.	Port of Durban	Team Two - Electricity
Central Region		
c.	Port of Port Elizabeth	Team One - Water Team Two - Electricity
d.	Port of East London	Team One - Water Team Two - Electricity
e.	Port of Ngqura	Team One - Water Team Two - Electricity
Western Region		
f.	Port of Cape Town	Team One - Water Team Two - Electricity
g.	Port of Saldanha	Team One - Water Team Two - Electricity
h.	Port of Mossel Bay	Team One - Water Team Two - Electricity

- 7.6.2 The *Contractor* shall be aware that the *works* will be conducted in operational areas hence the programme shall accommodate delays due to operational related challenges such as traffic.
- 7.6.3 The *Contractor* shows on each programme he submits to the *Project Manager*, the requirements of the [CEMP, SES, PES and SMP state others as required] as described in the Works Information, together with the associated environmental method statements.
- 7.6.4 The *Contractor* shows on each programme he submits to the *Project Manager*, the requirements of Health and Safety issues need to be highlighted on the programme], design requirements refer to paragraph design issues / activities on the programme], procurement requirements and construction operations on the programme, but the *Project Manager* might require various mandatory statements (e.g.) in relation to Equipment design and/or assembly / dismantling].

- 7.6.5 The *Contractor* complies with the *Employer's* programme (Key Dates provided) when he submits his first programme.
- 7.6.6 The *Contractor* complies with the *Employer's* programme {i.e. estimated project duration of ninety–six weeks [twenty four months]} inclusive of public holidays, builder's break [i.e. 16 December – 10 January] and known special non-working days} when he submits his first programme.
- 7.6.7 Furthermore, the number of days in excess of the number of working days anticipated to be lost, due to climatic conditions are already included on the estimated project duration.
- 7.6.8 The *Contractor* presents his first programme and all subsequently revised programmes (see ECC Clauses 31.2 and 32.1) in hard copy format and soft copy format.
- 7.6.9 The *Contractor* uses Primavera for his programme submissions or a similar programme software package equivalent to Primavera subject to the prior written notification and acceptance by the *Project Manager*.
- 7.6.10 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.
- 7.6.11 It is incumbent upon the *Contractor* to submit a level-4 schedule/programme clearly showing the project duration and critical path for approval within 14 days of the award of this contract. The schedule/programme is to be discussed and agreed between the *Contractor* and *Sub-Contractor's* prior to submission, this must be subject to discussion and review by the *Project Manager*. No claim for an extension of time or acceleration must be entertained by *Project Manager* due to any failure of the *Contractor* and *Sub-Contractor(s)* to accommodate one another.
- 7.6.12 The *Contractor's* proposed construction programme must be in a bar chart form.
- 7.6.13 The *Contractor* must submit his programme within the time stated (14 days) above, to the *Project Manager* for acceptance. The programme must be in the form of a bar chart or any other time-activity form acceptable to the *Project Manager* and must clearly show:
- The proposed rate of progress in order to complete the *works* within the required period as tendered, showing the various activities, their durations and proposed re-sourcing levels (major plant and labour) for each element of the *works*. Sufficient detail must be provided to enable the *Project Manager* to be able to gauge construction progress.
 - The sequence of activities and any dependencies (time or resource related) between them.
 - The critical path activities.
 - Key dates/information, etc. in respect of work to be carried out or to be provided by others.
 - The anticipated value of work to be done during each month i.e. monthly cash flows.
 - Other information specifically required by the *Project Manager*.

- The *Contractor* shows on each revised programme he submits to the *Project Manager* a resource histogram showing planned versus actual progress, deviations from the accepted Programme and any other remedial actions proposed by the *Contractor*.
- The *Contractor* must submit programme report information to the *Project Manager* at mutually agreed intervals in addition to the intervals for submission of revised programmes.

NB: The *Contractor's* performance shall be strictly monitored on the provided and mutually agreed and accepted programme.

7.6.14 The *Contractor's* monthly programme narrative report includes:

- Level 4 Project Schedule – showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted Programme.
- 2-week Look ahead Schedule - showing two separate bars for each task i.e. the primary bar must reflect the current forecast dates and the secondary bar the latest Accepted Programme.
- S-curves – reflecting the actual percentage complete versus the planned percentage for the overall contract.
- Detailed progress report
- Details of activities running late, indicating what steps have been or must be taken to ensure that the work is completed within the specified time.
- A report on all labour, plant and materials on site.

7.6.15 When drawing up the programme, the *Contractor* must, inter alia, take into consideration and make allowance for:

- Expected weather conditions and their effects.
- Known physical conditions or artificial obstructions.
- The accommodation and safeguarding of public, traffic and *Employer's* assets.
- Dealing with, altering and installing services.
- The reasonable requirements and programmes of the *Employer*.
- All other actions required in terms of this contract.

7.6.16 The following details must be submitted together with the programme:

- The number of working hours per day, working days per week, assumed holiday or shut down periods on which the programme is based.
- The overall labour and major plant resource levels on which the programme is based.
- The detailed Traffic Management Plan during Installation, Testing and Commission.

- 7.6.17 The *Contractor* must base his initial programme of work on the scope of work as described in the Works Information, project specification and the Bill of Quantities. This programme must be reviewed on a regular basis by the *Contractor* in accordance with changing circumstances, delays and amendments to the work ordered by the *Project Manager*.
- 7.6.18 Minor revisions to the accepted programme may be introduced from time to time by mutual agreement between the *Contractor* and the *Project Manager*. Should there be any major revision required in the programme, this can only be implemented through a written instruction to the *Contractor* by the *Project Manager* and subsequently a revised programme must be submitted within two weeks of receipt of such an instruction.
- 7.6.19 It should be noted that it is in the *Contractor's* interest to provide a comprehensive programme giving as much information as possible about the times allowed for the various activities as well as resources or other limitations affecting the programme, since the accepted programme may be used to evaluate any claims in terms of the general conditions of contract for extensions of time.
- 7.6.20 Acceptance of the programme merely constitutes an acknowledgement by the *Project Manager* that the Accepted Programme represents a contractually compliant, realistic and achievable depiction of the *Contractor's* intended sequence and timing of construction of the *works*.
- 7.6.21 Acceptance of the programme does not relieve the *Contractor* of his duties in the terms of the contract obligations.
- 7.6.22 Acceptance does not turn the *Contractor's* programme into a contract document or mandate that the works should be constructed exactly as set out in the Accepted Programme.
- 7.6.23 Acceptance does not turn the *Contractor's* programme into a contract document or mandate that the works should be constructed exactly as set out in the Accepted Programme.
- 7.6.24 The *Contractor* must submit to the *Project Manager*, at least three working days before each monthly site meeting copies of the following:
- The contract programme with progress charts and programme graphs updated to reflect the planned versus actual progress to date.
 - The *Contractor* shall update the program and supply the progress reports to show actual and expected progress compared to the latest agreed Accepted Program. Progress information may be verified by the *Project Manager* at any stage.
 - A summary of progress on site over the month preceding the site meeting. The report must be in the form of a detailed narrative to the contract programme.
 - Details of activities running late, indicating what steps have been or must be taken to ensure that the work is completed within the specified time.
 - A report on all labour, plant and materials on site.

7.7 Contractor's management, supervision and key people

7.7.1 The *Contractor* shall a detailed organogram of his people and shows how they will be utilised under this contract. The resource proposal (organogram) shall as a minimum, include the quantity of staff and details of their role and responsibilities and line of communication.

7.7.2 Key Personnel-:

- a) *Project Manager*
- b) *Contracts Manager*
- c) *Construction Manager x 03 (One for each region)*
- d) *Planner*
- e) *Document Controller*
- f) *Quality Officer*
- g) *Safety Manager*
- h) *Safety Officer x 03 (One for each region)*
- i) *Electrical/ Electronic/ Software Engineer*
- j) *Civil Engineer*
- k) *Network Architect Specialist*
- l) *Information Security Specialist*
- m) *Plumber*
- n) *Master/ Installation Electrician*

7.7.2.1 The *Contractor* is required to provide all the key personnel for the full duration of this Contract, none of these persons will be replaced by a person of lesser ability or qualification.

7.7.2.2 All personnel engaged to carry out work on the Project must have the necessary skills and knowledge and be competent to perform the task for which they have been employed.

7.8 The Contractor's Invoices

7.8.1 When the *Project Manager* certifies payment (see ECC Clause 51.1) following an assessment date, the *Contractor* complies with the *Employer's* procedure for invoice submission.

7.8.2 The invoice must correspond to the *Project Manager's* assessment of the amount due to the *Contractor* as stated in the payment certificate.

7.8.3 The invoice states the following:

Invoice addressed to Transnet SOC Ltd;
Transnet SOC Limited's VAT No: 4720103177;
Invoice number;
The *Contractor's* VAT Number; and
The Contract number
The invoice contains the supporting detail

7.8.4 The invoice is presented either by email or by hand delivery.

Invoices submitted by email are addressed to:

Sphelele.Ngcobo@Transnet.net

For the attention of Sphelele Ngcobo

Invoices submitted by hand are presented to:

Transnet National Ports Authority

237 Mahatma Gandhi Road

1st Floor Queen Warehouse

Durban

4001

For the attention of Sphelele Ngcobo

The invoice is presented as an original.

Transnet ICT Operational Technology (OT) Systems Standard

Version Number	<i>V1.0</i>
Effective Date	<i>6 months from approval date</i>
Next Review Date	<i>Two years from the final approval date.</i>
Standard Owner	<i>Xolani Lukhele: GM GICT Governance, Risk and Security</i>
Signature	
Standard Sponsor	<i>Pandelani Munyai: Group Chief Information Officer</i>
Signature	p.p Acting GCIO 
Date Approved	<i>25/04/2025</i>

Recommended by Standard Owner and Standard Sponsor:

I hereby acknowledge that a search has been conducted and that the Standard is not duplicated or in conflict with any other Transnet Standards.

	Name	Designation	Approval Signature	Date	E-Mail	Contact Number
Owner	Xolani Lukhele	GM: GICT Governance, Risk and Security		Apr 1, 2025	Xolani.Lukhele@transnet.net	066 195 3363
Sponsor	Pandelani Munyai	Group Chief Information Officer	p.p. Acting GCIO 	25/04/2025	Pandelani.Munyai@transnet.net	011 308 3071

Final Approval

Governance Structure: ICT Architecture Review Council

30 April 2025

Date Approved

Summary of Version Control

Version Number	Effective Date	Summary of Changes
<i>1.0</i>	<i>March 2025</i>	<i>First OT Standard approved.</i>

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1. BACKGROUND

An important element of protecting the Transnet resources is controlling and managing the ability of users to access and modify resources and the information stored within them. Therefore, user management gives Transnet the ability to control, monitor and protect information resources availability, integrity, and confidentiality.

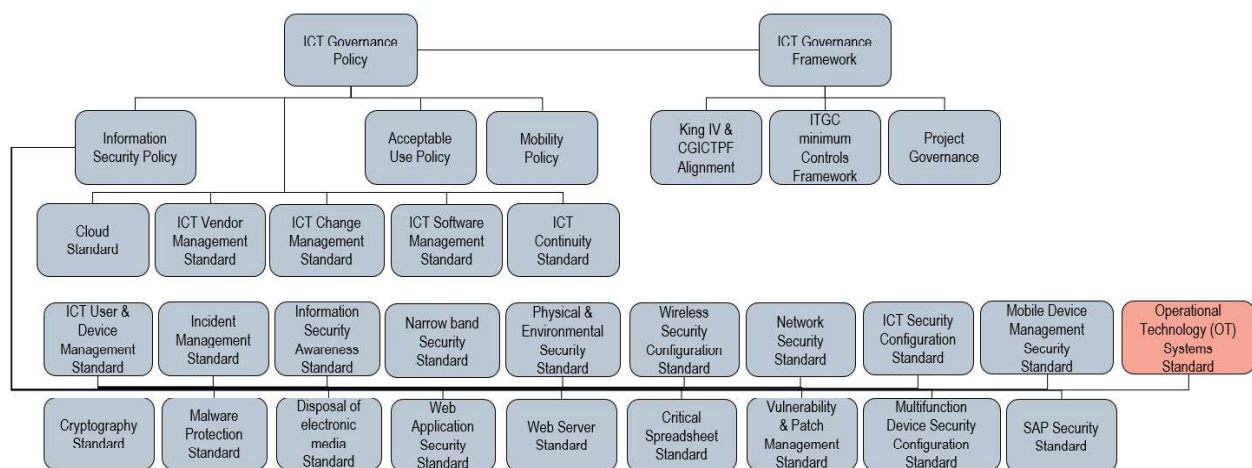
Operational Technology (OT) involves hardware and software that directly monitor and control physical devices and processes. As OT systems integrate more with IT, they become vulnerable to cyber threats, requiring stricter security measures. This OT Standard aims to establish consistent guidelines and controls for protecting OT environments, ensuring secure and reliable operations. It supports best practices to safeguard OT systems, mitigate risks, and ensure regulatory compliance within our IT infrastructure.

2. PURPOSE

The purpose of this document is to identify and monitor the controls associated with the Operational Technology (OT) or Supervisory Control and Data Acquisition (SCADA) or OT environment at Transnet. Whilst it is management’s responsibility to ensure the effectiveness, efficiency, and sustainability of core operational controls, as part of the annual Internal Audit Plan, TIA will perform audit testing to ensure compliance with the OT controls. This will further strengthen the management and execution of the control activities within the OT environment. This will support Transnet’s vision and objectives.

Within the context of the Transnet Information Security Management System (ISMS), The Operational Technology (OT) Systems Standard supports the defined IT Security Policy which in turn supports the ICT Governance Policy and ICT Governance Framework as depicted below:

ICT Framework, Policies & Standards



3. SCOPE

- Identification of critical processes within the OT environment, including SCADA components.
- Identification of critical activities underpinning the above processes.
- Allocation of responsible persons assigned to the above critical activities.
- Identification of critical controls to support the achievement of above activities.
- Collation and alignment of all relevant supporting documentation (SOPS, policies, directives, templates etc).
- Site visits to assess the level of compliance to the above critical controls once implemented.
- Roll out of control self-assessment to assess Management's view of the extent of compliance to the above critical controls.

4. DEFINITION & ABBREVIATIONS

For ease of reference words, expressions and abbreviations used in the standard are defined below:

BUE: Business Unit Executive – A senior manager responsible for the operational and strategic management of a specific business unit within the organization.

CCTV: Closed-Circuit Television – A security camera system used for monitoring and surveillance of physical areas to ensure safety.

DBA: Database Administrator – An IT professional responsible for installing, maintaining, and securing database systems to ensure data integrity and performance.

DMZ: Demilitarized Zone – A network segment that acts as a buffer between an internal network and external networks (such as the internet) to enhance security.

IDS: Intrusion Detection System – A security solution that monitors network traffic for suspicious activities and potential cyber threats, alerting administrators of any detected anomalies.

IPS: Intrusion Prevention System – A security system that not only detects but also actively blocks or mitigates potential cyber threats to prevent unauthorized access and attacks.

OT: Operational Technology – Control systems used to manage industrial processes, including SCADA systems, PLCs, and other industrial control devices.

PCITR: OT Incident Response Team – A specialized team responsible for handling and mitigating cybersecurity incidents related to operational technology.

PLC: Programmable Logic Controller – A ruggedized industrial computer used for automation and control of machinery and processes in manufacturing and infrastructure systems.

Process Control: The use of automated control systems, including PLCs and SCADA, to monitor and manage industrial processes to ensure efficiency, safety, and reliability.

SCADA: Supervisory Control and Data Acquisition – A system used for remote monitoring and control of industrial processes, such as power plants, water treatment facilities, and manufacturing operations.

SOP: Standard Operating Procedures – A set of step-by-step instructions designed to ensure consistent and efficient execution of processes within an organization.

TIA: Transnet Internal Audit – The internal auditing division of Transnet responsible for evaluating financial, operational, and compliance risks within the organization.

TCP/IP: Transmission Control Protocol / Internet Protocol – A fundamental set of networking protocols that enable communication over the internet and other networks.

RTU: Remote Terminal Unit – A field device used in SCADA systems to collect data from sensors and send control signals to connected equipment.

5. ROLES AND RESPONSIBILITIES

5.1. ICT Architecture Review Council

- Responsible for the approval of all Transnet ICT standards.

5.2. Information Security, Governance, Risk and Compliance Committee

- Responsible to manage and co-ordinate Transnet Group ICT risk mitigation and governance activities across the Group and to co-ordinate activities regarding the protection of Transnet's information assets. The council is responsible for recommending Transnet ICT standards to the ICT Architecture Review Council.
- Participate in the development and maintenance of the standard and the related procedures.

5.3. GM: GICT Governance, Risk and Security

- Owner of this standard.
- Reviews and supports waivers that have been compiled for exception from compliance with this standard.
- Provide strategic direction, resources, and oversight for OT security initiatives.
- Approve policies, allocate resources, monitor compliance, and review risk assessment reports to support OT security and compliance.

5.4. Operating Division Information Security Liaison

- Facilitate the implementation of the standard in the OD by communicating the requirements, providing technical assistance with implementation, and reporting adherence to the standard.
- Collaborate with OT personnel to implement and enforce security measures across IT and OT systems.
- Perform joint security assessments, monitor for cyber threats, and assist in developing incident response protocols specific to OT systems.
- Ensure OT processes comply with internal policies and regulations.
- Conduct compliance reviews, report compliance status, and provide recommendations to align OT practices with regulatory requirements.

5.5. Vendor Manager

- Ensure that the approved standard is communicated to the vendor for implementation / compliance.

5.6. Network Administrator

- Manage secure network architecture for OT environments, including segmentation from IT systems where necessary.
- Ensure network security measures (firewalls, access controls) are in place, monitor network traffic, and resolve network-related OT issues.

5.7. Transnet Operating Division ICT and OT Stakeholders

- Provide comments on and input to the draft standard on a timely basis.
- Implement and maintain compliance with the standard.

5.8. OT System Administrator

- Maintain and support OT systems to ensure their availability, integrity, and performance.
- Configure, update, and monitor OT hardware and software, manage access controls, and ensure OT systems are patched and updated as per the standard.

6. CONTROL OBJECTIVES & FRAMEWORK:

6.1. Network Architecture

Objective: Ensure that OT systems and network architecture for each site are fully documented, and critical safety processes have been considered.

Requirements	Frequency
6.1.1. Document all OT systems on site, including those not directly connected to the OT network. Update and review annually.	At minimum Annually or if changes required.
6.1.2. Compile a comprehensive network diagram showing all connections for all key components of the OT environment including external connections.	
6.1.3. Minimize TCP/IP connections to the OT environment.	
6.1.4. Implement and regularly monitor dedicated infrastructure for mission-critical or safety-critical systems.	
6.1.5. Review and remove unnecessary TCP/IP connections between safety systems and OT systems (e.g. emergency shut down systems).	

6.2. OT systems are protected from other systems

Objective: Safeguard OT systems from other systems using appropriate firewalls and configurations.

Requirements	Frequency
6.2.1. Connections between OT systems and other systems are appropriately protected, e.g. with firewall and demilitarised zone (DMZ) architecture.	Once off / Change
6.2.2. Firewalls with solid documented configuration rule base are deployed and in line with business requirements.	

6.3. Remote Access

Objective: Restrict, manage, and regularly review remote access to OT systems.

Requirements	Frequency
6.3.1. All remote access connections are documented and approved.	Once Off
6.3.2. An inventory of all remote access connections and types is maintained (e.g. virtual private network or modems).	Annually or Change
6.3.3. Appropriate authentication mechanisms (e.g. strong authentication) for remote access connections are implemented.	Once Off
6.3.4. Conduct regular reviews to ensure there are no unauthorised remote access connections.	Quarterly
6.3.5. Implement procedures for enabling and disabling remote access connections.	As and when required
6.3.6. Perform security reviews of all third parties having remote access to the control systems in accordance with the plan.	Annually
6.3.7. Remote access computers are appropriately secured (e.g. anti-virus, antispam and personal firewalls).	Annually

6.4. Virus Protection

Objective: Protect the OT environment against viruses and external threats.

Requirements	Frequency
6.4.1. OT systems are protected with anti-virus software on workstations and servers. Where anti-virus software cannot be deployed other protection measures should be implemented (e.g. gateway anti-virus scanning or manual media checking).	Once off and Annual review
6.4.2. Accreditation and configuration guidance is obtained from OT system vendors prior to deployment of such software.	Once off / change
6.4.3. Ensure antivirus software remains up to date.	Monthly

6.5. E-mail and Internet Access

Objective: Minimize and restrict email and internet access to protect the environment from external threats.

Requirements	Frequency
6.5.1. All email and internet access from OT systems / network is disabled or minimised.	Once Off and reviewed annually

6.6. Systems hardening and security features

Objective: Harden OT systems and activate necessary security features for OT systems. OT systems are not required to be compliant with the Transnet Security Configuration Standard or Centre for Internet Security (CIS) Compliance but are subject to the requirements below.

Requirements	Frequency
6.6.1. Harden systems to prevent network-based attacks. Unused services and ports (e.g. embedded web servers, SNMP) have been removed or disabled in the operating systems and applications to prevent unauthorised use.	Review at minimum annually / Change
6.6.2. All required ports, services, and protocols in use by devices (especially embedded devices such as PLCs and RTUs) are understood and documented.	
6.6.3. All built-in system security features are considered, documented, and enabled (where appropriate).	
6.6.4. Use of removable storage media (e.g. USB memory sticks) is restricted (where possible) and if possible removable storage media are not used. Where use of removable storage media is necessary, procedures are in place to ensure these are checked for malware prior to use.	As and when required

6.7. Backup and Recovery

Objective: Ensure that effective backups and recovery procedures are in place to safeguard critical data.

Requirements	Frequency
6.7.1. Effective backup and recovery procedures are documented and in place and are appropriate for the identified electronic and physical threats relevant to the business. These should be reviewed and tested regularly. (Programs, settings, and any necessary data).	Once off and review annually.
6.7.2. Backups are stored securely on and off-site locations in accordance with the documented plan.	Every backup
6.7.3. Integrity of backups are tested regularly by way of a full restore process. Test results are documented and retained.	Annually

6.8. Physical Access

Objective: Restrict physical access to master terminal units (MTUs) and remote terminal units (RTUs) location

Key Controls	Frequency
6.8.1. Implement physical security protection measures to protect OT systems and associated networking equipment from physical attack and local unauthorised access. A combination of protection measures is in place. (These could include drive locks, tamper proof casing, secure server rooms, access control systems and CCTV.)	Once off / Annually
6.8.2. Log and review access control activities for electronic control systems and maintain access registers for non-electronic/key-controlled areas.	Monthly

6.9. Monitoring

Objective: Regular system monitoring of OT infrastructure (processes, network, field devices) are performed for unusual behaviour.

Requirements	Frequency
6.9.1. Establish and maintain an OT Cyber Threat Intelligence capability to identify, assess, and respond to emerging cyber threats targeting OT environments.	When available / minimum annually
6.9.2. Real-time monitoring of OT systems must be performed to identify unusual behaviour. This can be performed via one of the following: • Integration into the Transnet SIEM solution. • IDS and IPS. • Alerts from Anti-malware solutions. • Alternative compensating controls.	On going
6.9.3. A defined suite of control system log files is reviewed and analysed regularly. Important log files are backed up and protected from unauthorised access or modification.	Monthly
6.9.4. Where feasible, automated threat intelligence integration with security controls should be adopted to enhance threat detection and response capabilities.	Once Off

6.10. Wireless networks and connections

Objective: Ensure that wireless networks are minimised, and wireless connections are regularly monitored and reviewed.

Requirements	Frequency
6.10.1. Wireless networks are minimised. Where wireless networks/systems/connections are used a thorough risk assessment is carried out that considers both operational and security risks.	As and when required
6.10.2. Wireless systems are secured and correctly configured using industry best practises. Regular verifications are made to determine whether industry best practice has moved on.	As and when required
6.10.3. Wireless connections are regularly monitored and reviewed.	On going

6.11. Patch Management

Objective: Ensure Vendor certified security patches are implemented.

Requirements	Frequency
6.11.1. Processes for deployment of security patches are implemented. These processes are supported by deployment and audit tools.	Once off
6.11.2. Patching processes make allowance for vendor certification of patches, where possible testing of patches prior to deployment and a staged deployment process to minimise risk of disruption from the change.	Per risk assessment
6.11.3. Where security patching is not possible or practical, alternative appropriate protection measures are considered.	As and when required

6.12. Password Policies

Objective: Ensure that password policies for OT systems are defined and implemented; applicable users, strength of passwords and expiration times are specified.

Requirements	Frequency
6.12.1. A password policy for all OT systems is aligned to the Transnet User and Device Management Standard. Passwords are changed frequently, but where this is not possible or practical, alternative appropriate controls are considered.	Once Off / Reviewed annually
6.12.2. Regularly review all access rights and decommission old accounts.	Monthly
6.12.3. Default vendor password is changed where possible from the default settings.	Once off
6.12.4. For systems or functions where passwords may not be deemed necessary (e.g. view only mode), exception / compensating controls are documented (e.g. for control room staff).	Once off / Reviewed annually
6.12.5. For critical functions (such as program changes, system configuration, etc) stronger authentication methods are used.	Once off

6.13. Security Framework

Objective: Ensure that a security framework for OT system is documented and communicated to all relevant stakeholders.

Requirements	Frequency
6.13.1. A full inventory of OT systems and hardware/software components is documented either manually or where possible automated.	Once off / Change
6.13.2. All OT system documentation is secured and access limited to authorised personnel.	Once Off / Reviewed annually

6.14. Resilient Infrastructure

Objective: Ensure that a resilient infrastructure with necessary facilities is installed to protect the OT system.

Requirements	Head Office
6.14.1. Systems are installed using appropriate infrastructure, such as redundant networks.	Once off / Change
6.14.2. Equipment resides in environmentally controlled areas as per the requirements of the ICT Physical and Environmental Security Standard.	Once Off / Change
6.14.3. Where necessary fire suppression systems are installed to protect control systems.	Once off

6.15. Vulnerability and Risk Assessment

Objective: Ensure that vulnerabilities and Risks to OT system are managed and minimised.

Requirements	Frequency
6.15.1. A vulnerability management system is implemented to ensure vulnerabilities are kept to a minimum in the OT environment.	Once off or when practical
6.15.2. A risk assessment for the OT environment is performed according to the Transnet enterprise risk management (ERM) methodology.	Annually

6.16. User Access

Objective: Ensure that new employees and terminated employees are managed in the OT environment.

Requirements	Frequency
6.16.1. Procedures are implemented that ensure new starters receive the appropriate accounts, authorisation levels and security training when they join an OT team.	Ongoing
6.16.2. User management procedures are documented and implemented in line with the requirements of the Transnet User and Device management standard to ensure, user accounts are deactivated, and passwords are changed when personnel leave OT teams or when team members change roles and responsibilities.	Ongoing

6.17. Change Management

Objective: Ensure that changes to the OT systems are managed and all data conversions are formally managed in accordance with the System Development Lifecycle Methodology and Change and Release Management Procedure.

Requirements	Frequency
6.17.1. All systems are subject to strict change control processes. Security assessments are included in these processes. It may be necessary for changes to be assessed and approved by multiple change control processes (e.g. a firewall modification might be subject to both IT and plant change management processes).	Monthly
6.17.2. Where applicable, data conversions are performed in accordance with the approved management release procedure.	As and when required
6.17.3. Where technically feasible and without compromising the stability of operational processes, OT Systems must implement a system-generated change log to track modifications to configurations, parameters, and software. In cases where older systems do not support this functionality, appropriate alternative measures, such as manual logbooks or external version control solutions, must be considered.	Once Off

6.18. Incident Management

Objective: Ensure that response capabilities to OT system are understood and managed.

Requirements	Frequency
6.18.1. An OT Incident Response Team (PCIRT) is implemented that provides the foundation for effective monitoring, analysis and managing response to alerts and incidents. The PCIRT must be involved at every step in the process of monitoring a situation, analysing changes to threats and initiating appropriate responses. Membership is drawn from a variety of sources with representatives from a number of business areas, including OT, SCADA, automation teams, IT security, IT infrastructure, Business management (BUE), Operations, Legal, Customer Services, Corporate media (for external media communication).	Once off
6.18.2. Response and continuity plans are established - Establishing formal response management processes ensures any changes to risks are identified as early as possible and any required corrective action undertaken speedily.	When change occurs
6.18.3. Plans are regularly maintained, tested, and that lessons learned are incorporated.	Annually

6.19. Awareness and Training

Objective: Ensure that security awareness and skills are improved by performing ongoing staff training.

Requirements	Frequency
6.19.1. A needs assessment must be performed to support a detailed plan for the delivery of awareness and training content to OT administrators and users.	Once Off / Change
6.19.2. Awareness programs must be in place for key OT stakeholders (e.g. administrators, engineers, and end users) as per the Transnet ICT Information Security Awareness Standard.	As and when required
6.19.3. Provide all relevant stakeholders with training sessions regarding the procedures and their roles and responsibilities to safeguard OT systems.	On going
6.19.4. Training is established - IT personnel to develop an appreciation and understanding of the OT systems and their operating environments, highlighting differences between security of OT systems and IT security. Develop IT security skills within OT teams and provide appropriate IT support services to these teams.	As and when required

6.20. Third Party Management

Objective: Ensure that third parties applicable to OT system are managed.

Requirements	Frequency
6.20.1. All third parties, including vendors and service providers are identified and clearly documented, as well as all other links in the supply chain associated with OT systems. The following questions have been considered: i. Who is system vendor? ii. Who provides support? iii. How is support provided? iv. What service level agreements exist? v. Which sub-contractors are involved?	On going
6.20.2. Security clauses are detailed in all procurement contracts prior to agreements; the following has been considered: i. Engage with all vendors on ongoing basis to ensure any current and future discoveries of vulnerabilities within the systems supplied are identified and promptly notified to the user. ii. Request vendors to provide security guidance for their current control systems and a security roadmap for future system development. iii. Ensure all vendors incorporate appropriate anti-virus protection within their OT systems. iv. Establish with the vendor an effective software patching process. v. Agree with the vendor system hardening procedures for OT systems in operation. vi. Identify all component technologies (e.g. databases) used within OT systems to ensure all vulnerabilities are managed. vii. Undertake regular security reviews and audits of all vendors.	Once off / As required

6.21. Project Management

Objective: Ensure that the OT projects are managed using recognised methodology.

Requirements	Frequency
6.21.1. i. Security architect / subject matter expert (head office vs terminal level) is identified ii. Security and governance requirements are built into procurement contracts iii. Security and governance requirements are built into design specifications iv. Security and governance throughout the development life cycle is reviewed regularly v. System design includes security reviews (including risk assessment of interface and interaction with existing systems) vi. System testing vii. System handover (training, documentation – paper & electronic, maintenance beyond handover) viii. Disposal ix. Systems standardisation / harmonisation x. Asset care and life cycle - develop policy for maintaining proper support of system (plan/schedule maintenance, consult with customers, regular software update, licenses up to date, etc) xi. System architecture to allow parts of system to be shut down independently (modular).	Once off

6.22. Governance framework

Objective: Ensure that an effective framework is implemented to govern the OT environment.

Requirements	Frequency
6.22.1. An effective governance framework provides clear roles and responsibilities, an up-to-date policy, and standards for managing OT security risks, and assurance that this policy and standards are being followed.	Once off

6.23. Strategy

Objective: Ensure that the OT strategies and organisational strategies are aligned.

Requirements	Frequency
6.23.1. An OT strategy has been formulated and is updated at least annually, but more frequently if necessitated by organisational changes.	Annually or as required
6.23.2. The OT strategy is aligned to the strategic objectives of Transnet Ltd.	Annually or as required

6.24. Steering Committee

Objective: Ensure that the OT Steering Committee governs the OT function.

Requirements	Frequency
6.24.1. An OT Governance body exists and meets according to the requirements of its terms of reference (TOR) to monitor and govern the OT function.	As per TOR

6.25. Central Configuration Repository

Objective: Ensure that management regularly reviews integrity of central configuration repository.

Requirements	Frequency
6.25.1. The configuration manager performs a verification of the integrity of configuration records on at least a quarterly basis.	Annually

6.26. Segregation of Duties

Objective: Ensure that OT duties are segregated to prevent staff from having conflicting responsibilities.

Requirements	Frequency
6.26.1. Management monitor compliance with the Segregation of Duties Policy on an ongoing basis: (i) Confirmation of compliance with the requirement for segregation of development, testing and production for each system supporting key OT services. This includes confirmation that no OT staff have production access to applications supporting key services. (ii) Confirmation that the roles of user account management, system administrators, DBAs and programmers are appropriately segregated. (iii) Confirmation that the compliance function is independent of operational OT functions.	Annually / Change

6.27. Vendor Management

Objective: Ensure that relationships with vendors are managed in accordance with organisational policies and procedures.

Requirements	Frequency
6.27.1. All OT acquisitions comply with Transnet Procurement Policy, including procurement requirements for contract management and Transnet Group standards for acquisition of hardware and software.	Once off
6.27.2. Vendors (including its employees) are held as accountable as Transnet employees for compliance with all policies, procedures and standards while working within Transnet OT environment.	On going
6.27.3. Contracts exist to formalise all key relationships with current OT service providers.	Once off
6.27.4. A reconciliation of contracts and licensing agreements to the software configuration management database is performed at least annually where applicable.	Annually

6.28. Data Protection and Privacy

Objective: To ensure the confidentiality, integrity, and security of sensitive information within the OT environment, the following protection measures must be implemented:

Requirements	Frequency
6.28.1. Protection of Personal Information (i) Where personal information is processed, adequate protection measures must be in place to prevent unauthorized access, modification, or disclosure as per the requirements of the Protection of Personal Information Act. (ii) Access to personal information must be restricted to authorized personnel using role-based access controls (RBAC) or equivalent security mechanisms. (iii) Encryption and secure storage must be applied where feasible to protect personal data at rest and in transit. (v) Logging and monitoring must be enabled to detect and respond to unauthorized access or misuse of personal information.	Once off / Ongoing
6.28.2. Protection of Data-in-Transit (i) Critical data-in-transit must be encrypted as per the requirements of the Transnet ICT Cryptography Standard. (ii) Communication channels between OT devices, control systems, and external networks must be secured to protect sensitive operational data. (iii) Network segmentation must be implemented to separate critical OT traffic from less secure IT and external networks. (iv) Remote access to OT systems must be secured using VPNs, Multi-Factor Authentication (MFA), and encrypted sessions to prevent unauthorized access.	Once Off

7. EXCEPTIONS

The OT Standard has been developed to ensure a consistent approach across Transnet ICT divisions for minimizing security risks and effectively managing OT environments. Any exemptions from compliance with this standard must be approved by the ISGRC Committee and accompanied by a comprehensive risk analysis and mitigating controls. This analysis must outline the specific circumstances that prevent full implementation of the standard and detail the compensating controls established to address any resulting risks.

8. REFERENCES

The Standard must be read in conjunction with the following related internal documents, external documents, and regulatory requirements:

8.1. INTERNAL DOCUMENTS:

- ICT Information Security Policy
- ICT Governance Framework
- IT General Controls Framework
- ICT User and Device Management Standard
- ICT Continuity Standard
- ICT Information Security Awareness and Training Standard
- ICT Network Security Standard
- ICT Security Configuration Standard
- ICT Vulnerability and Patch Management Standard
- ICT Physical and Environmental Security Standard
- ICT Cryptography Standard

8.2. EXTERNAL DOCUMENTS:

- King IV: Report on Corporate Governance.
- The Protection of Personal Information Act, 2013 (Act No 4 of 2013).

9. VIOLATIONS OF THE STANDARD

Each employee is responsible for complying with the Standard requirement on information handling. Violation of any provision of this Standard may result in any of the following:

- Total or partial limitation of an employee's or third party's access to some or all of Transnet's systems.
- Appropriate corrective measures in terms of the Transnet Disciplinary Code and Procedures and/or any other applicable policy.
- Initiation of legal action by Transnet including, but not limited to, criminal or civil prosecution under the applicable law.
- Transnet requiring the violator to provide restitution for any improper use of service.
- Cancellation of contracts with third parties.

TRANSNET



TRANSNET UTILITIES MANAGEMENT

User Name

0123456

Password

Dashboard

>> Ports

> Richards Bay

> Water

> Electricity

PORT OF RICHARDS BAY



Infrastructure Utility Recoveries – Current Month – May 2026

Utility	Water Received, kl	Water Recovered, kl	Variance, kl	Variance %
Water	205997	49571	156426	75

Infrastructure Utility Recoveries – Year To Date (Cumulative)

Utility	Water Received, kl	Water Recovered, kl	Variance, kl	Variance %
Water	377341	93271	284070	75

Infrastructure Utility Recoveries – Current Month – May 2026

Utility	Electricity Received, kWh	Electricity Recovered, kWh	Electricity Internal Usage, kWh	Variance %
Electricity	5 429 493.00	4 343 594.40	1 085 898.60	0

Infrastructure Utility Recoveries – Year To Date (Cumulative)

Utility	Electricity Received, kWh	Electricity Recovered, kWh	Electricity Internal Usage, kWh	Variance %
Electricity	14 628 744.00	11 702 995.20	2 925 748.80	0

Port Usage



Dashboard

>> Ports

> Richards Bay

> Water

> Electricity

PORT OF RICHARDS BAY



No of Main Intake Point (Municipality)

15

Accounts

250

Usage on Main Intakes (Municipality) -KL

521 562

Total Port Usage - KL

521 381

Port Usage



Dashboard

Internal TNPA Consumption - KL

50 365

Total Consumption for Tenants - KL

265 790

Consumption of other ODs -KL

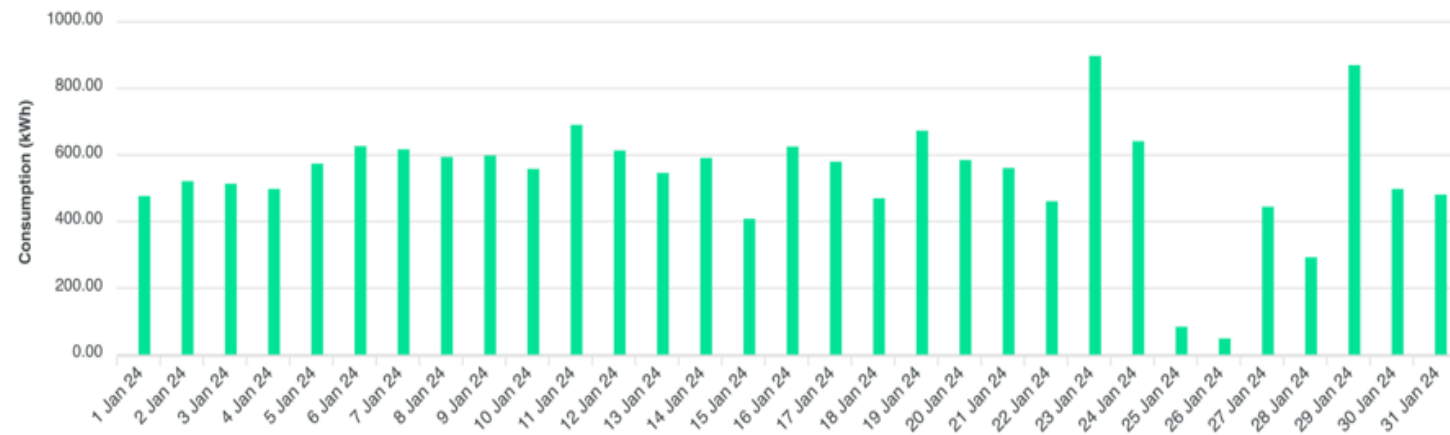
114 216

Shipping Water - KL

91 191

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 1 Main Intake Points (Municipality)

3

Accounts

65

Usage on Main Intakes (Municipality) -KL

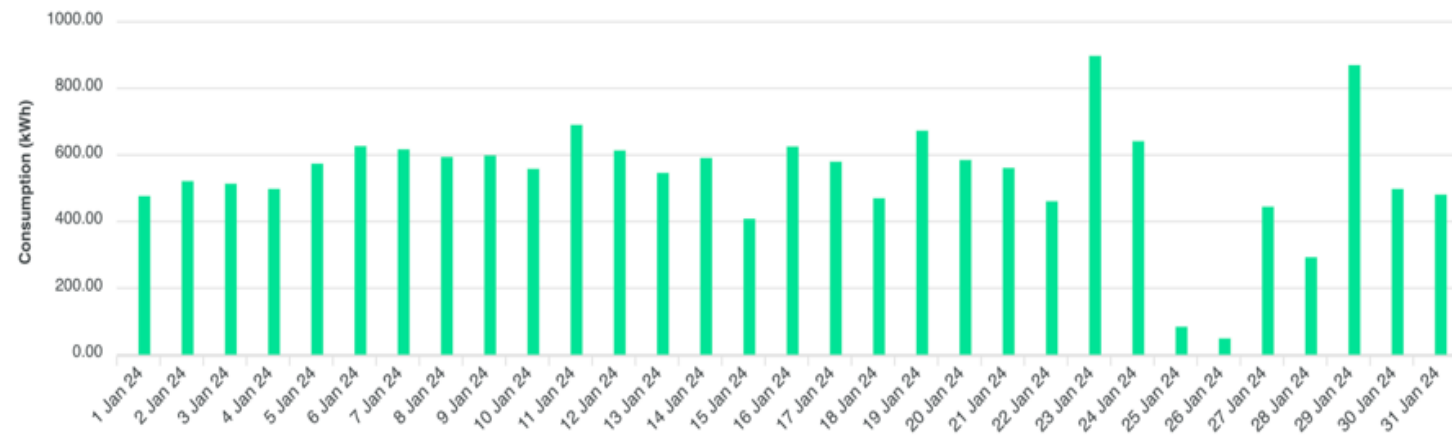
10 000

Total Zone 1 Usage - KL

5 000

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 2 Main Intake Points (Municipality)

3

Accounts

15

Usage on Main Intakes (Municipality) -KL

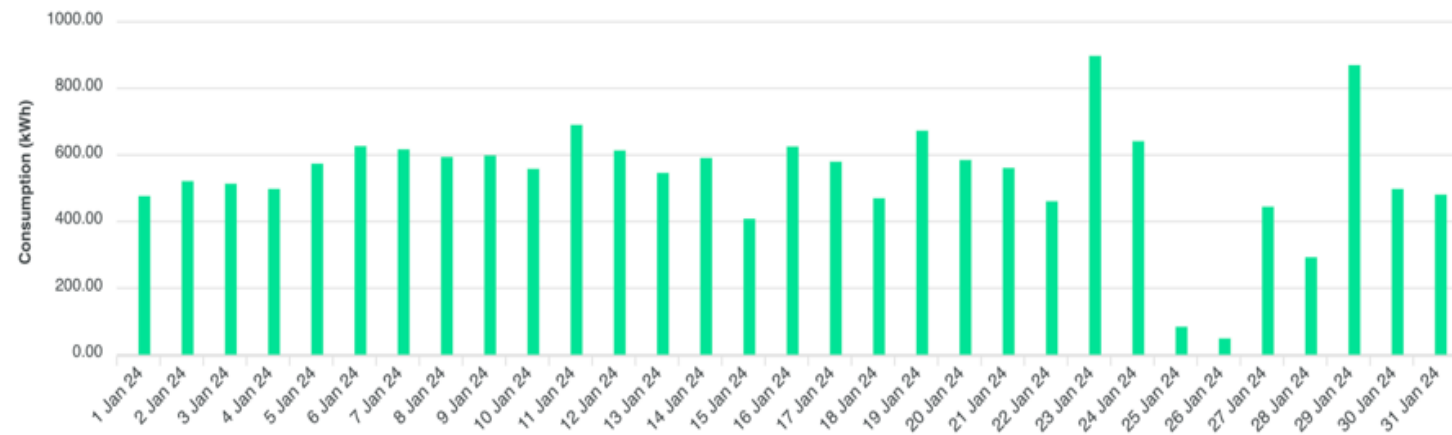
3 456

Total Zone 2 Usage - KL

2 500

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 3 Main Intake Points (Municipality)

3

Accounts

55

Usage on Main Intakes (Municipality) -KL

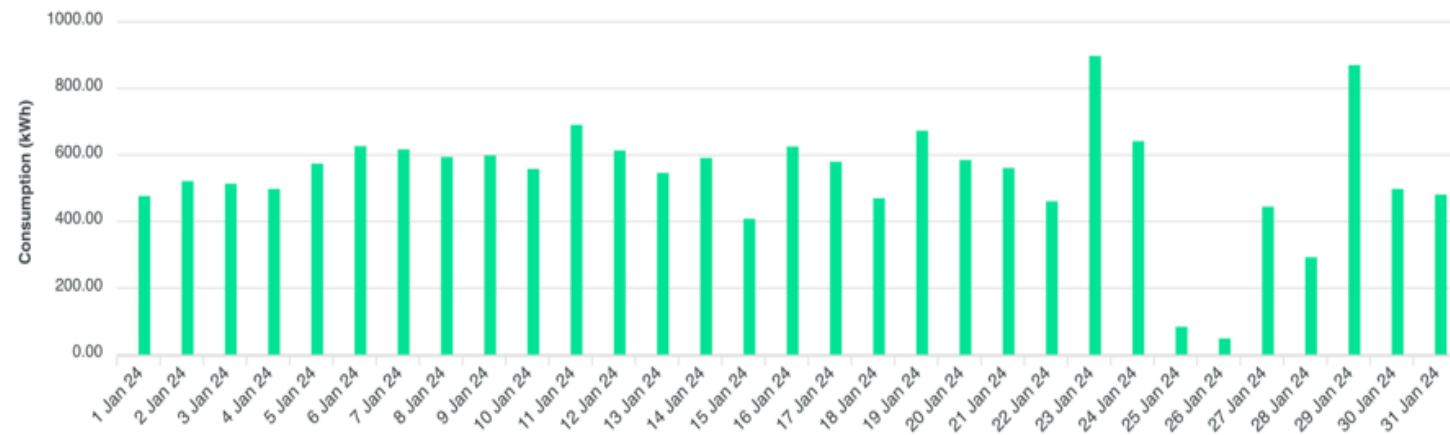
95 978

Total Zone 3 Usage - KL

88 963

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 4 Main Intake Points (Municipality)

3

Accounts

42

Usage on Main Intakes (Municipality) -KL

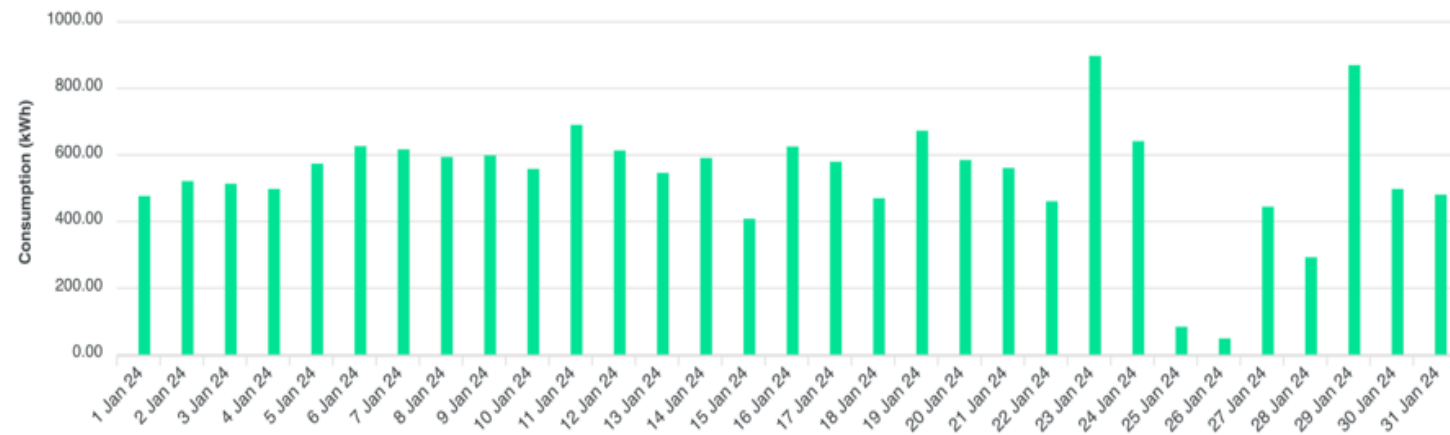
102 753

Total Zone 4 Usage - KL

101 357

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 5 Main Intake Points (Municipality)

3

Accounts

65

Usage on Main Intakes (Municipality) -KL

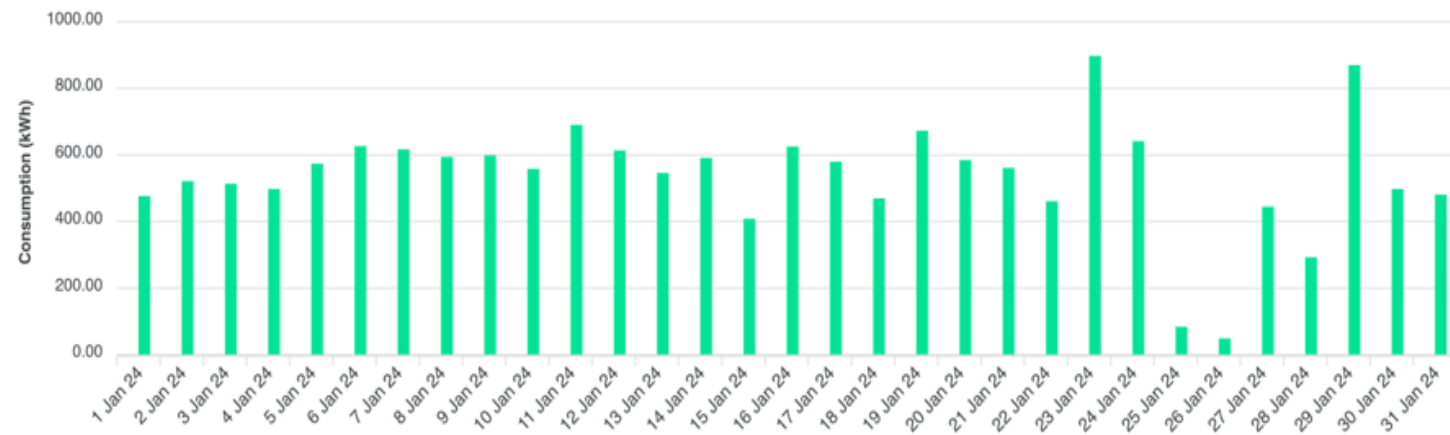
99 147

Total Zone 5 Usage - KL

98 951

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 4 Main Intake Points (Municipality)

3

Accounts

65

Usage on Main Intakes (Municipality) -KL

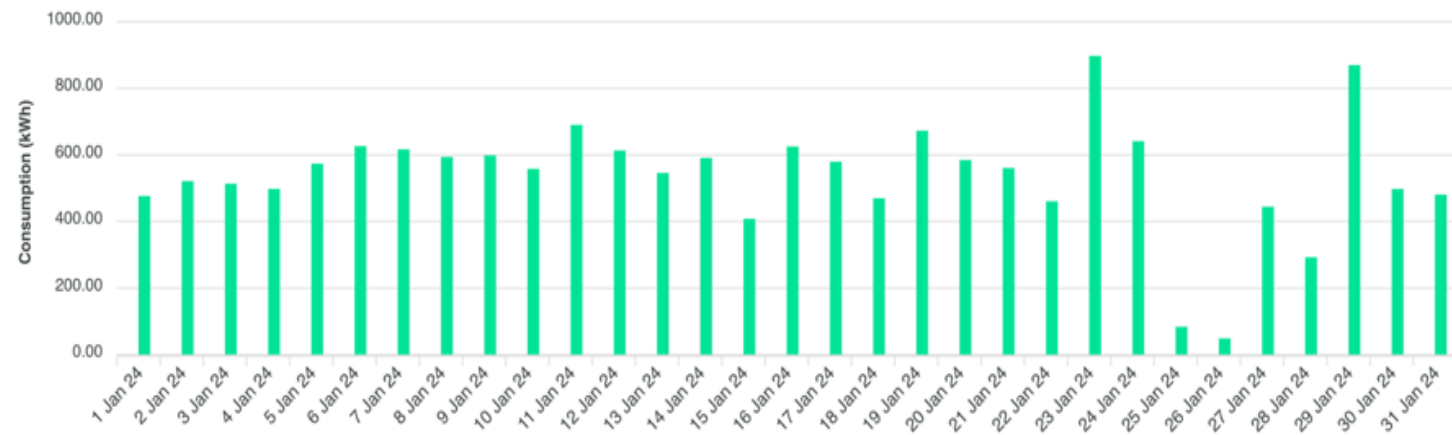
10 000

Total Port Usage - KL

5 000

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 1 Total Consumption - KL

50 365

Zone 2 Total Consumption - KL

265 790

Zone 3 Total Consumption - KL

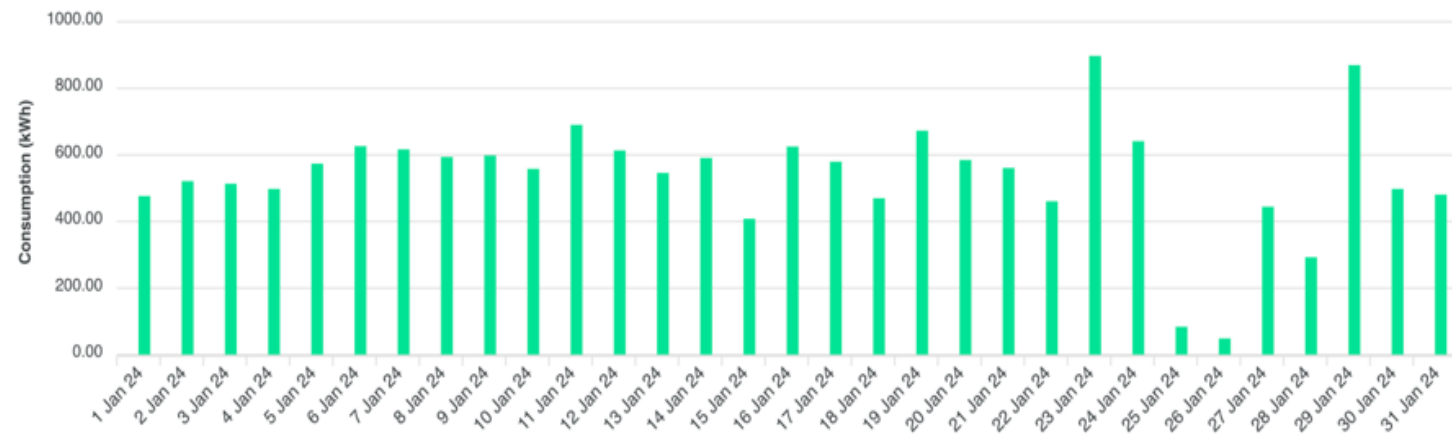
114 216

Zone 4 Total Consumption - KL

91 191

Utility Usage – Water

 Zone 1  Zone 2  Zone 3  Zone 4



Dashboard

Zone 1 Internal TNPA Consumption - KL

50 365

Zone 1 Total Consumption for Tenants - KL

265 790

Zone 1 Consumption of other ODs -KL

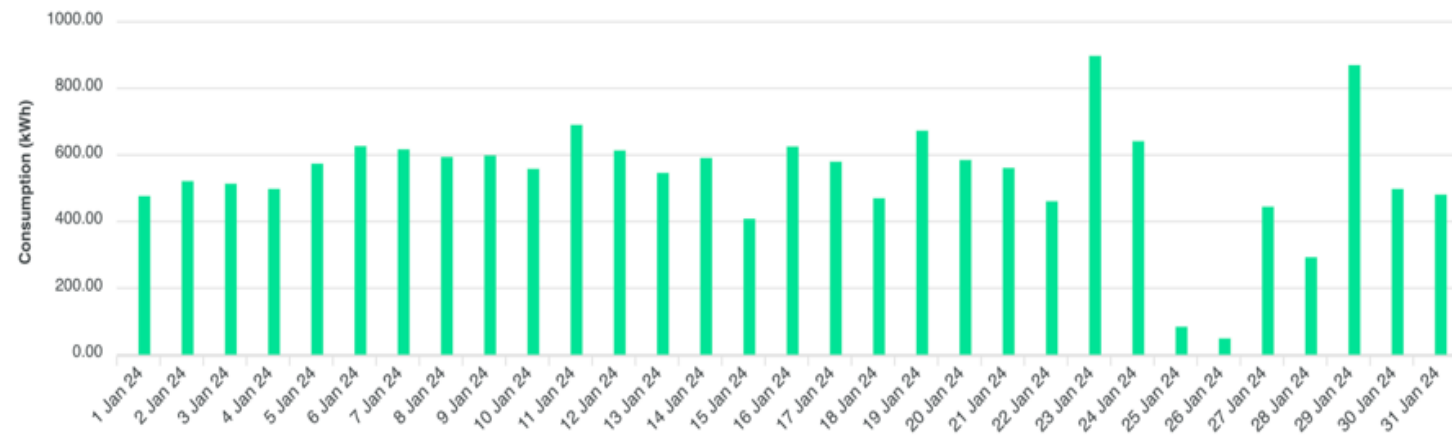
114 216

Zone 1 Shipping Water - KL

91 191

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 2 Internal TNPA Consumption - KL

50 365

Zone 2 Total Consumption for Tenants - KL

265 790

Zone 2 Consumption of other ODs -KL

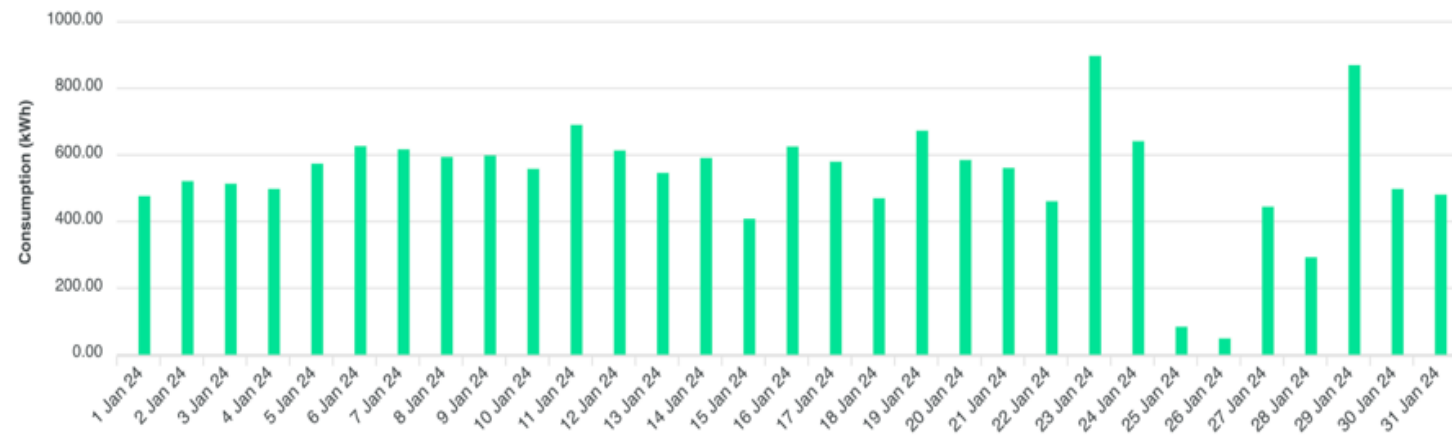
114 216

Zone 2 Shipping Water - KL

91 191

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 3 Internal TNPA Consumption - KL

50 365

Zone 3 Total Consumption for Tenants - KL

265 790

Zone 3 Consumption of other ODs -KL

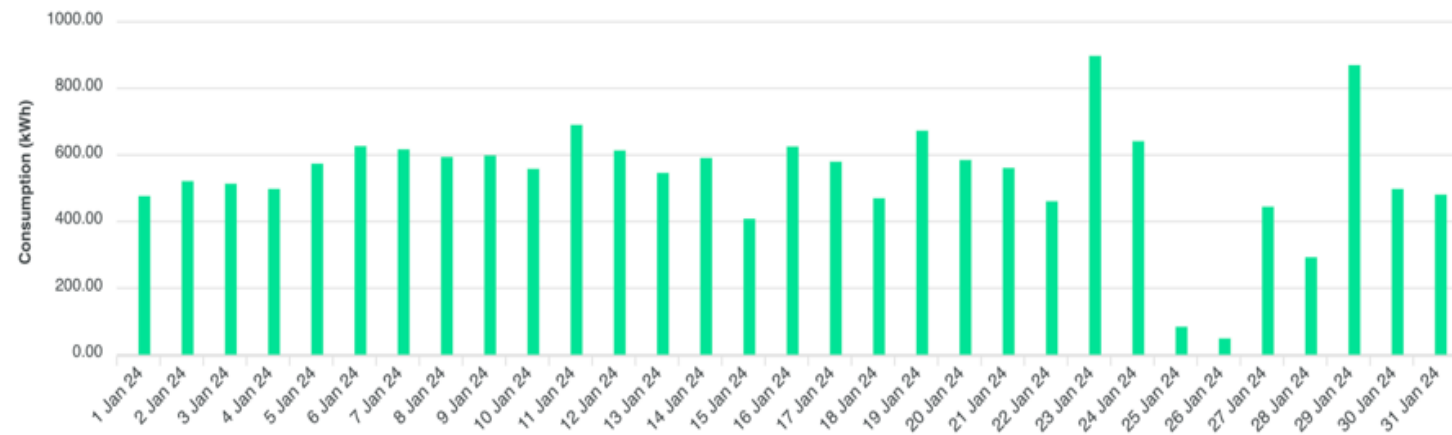
114 216

Zone 3 Shipping Water - KL

91 191

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

Zone 4 Internal TNPA Consumption - KL

50 365

Zone 4 Total Consumption for Tenants - KL

265 790

Zone 4 Consumption of other ODs -KL

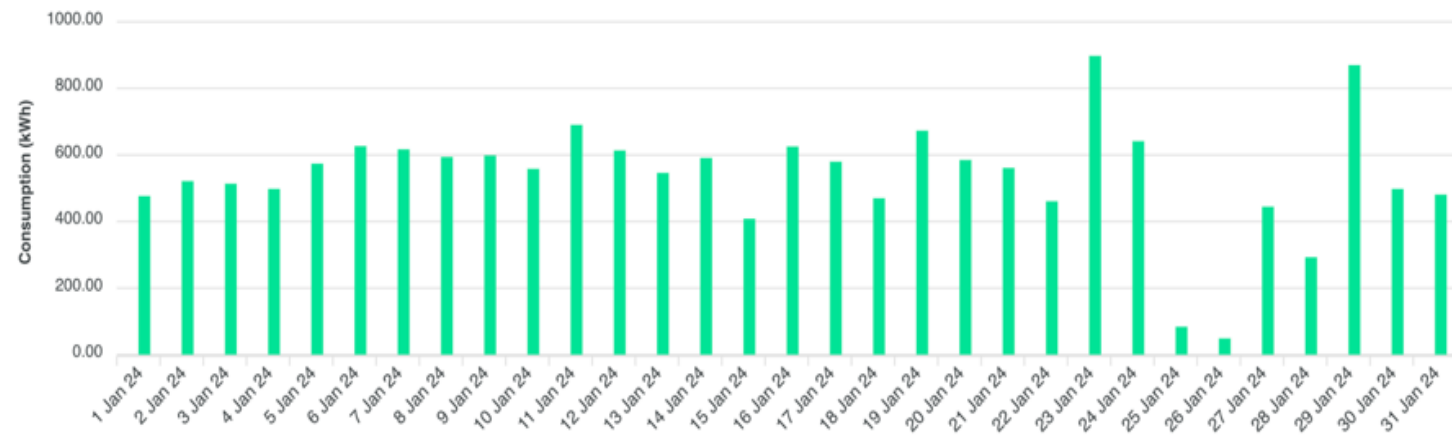
114 216

Zone 4 Shipping Water - KL

91 191

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

>Tariff Setup

>Account Setup

>Data Entry

>History Report

>Generate Bills

Start Date

01/05/2024

End Date

31/06/2024

History Report

The history report shall be able to generate both individual account or as a Group (TNPA, Tenant, ODs, Shipping and Municipality)

The shall be generated either in Excel, PDF or Word.

Individual Account:

☒

Select Group:

TNPA

☐

Tenants

☐

ODs

☐

Shipping

☐

Consumption

Account	Months	Usage (KL)
Queens Warehouse	31/05/2024	5214
Queens Warehouse	30/06/2024	5369
Queens Warehouse	31/07/2024	5578

Financials

Account	Months	Rands
Queens Warehouse	31/05/2024	R 10 485
Queens Warehouse	30/06/2024	R 10 738
Queens Warehouse	31/06/2024	R 11 056

Dashboard

Meters - No of Main Intake Points (Municipality)

15

Number of Meters

15

Online Meters

0

Offline Meters

x

Meter Points	Status	Utility	Pressure	Reading	Actions
Zone 1 – A Berth			2.81 b	5,648.83 kL	
Zone 1 – B Berth			3.11 b	71.88 kL	
Zone 1 – Bay Terrace			3.58 b	29.62 kL	
Zone 2 – Maydon Wharf			2.96 b	59.97 kL	
Zone 3 – Ship Repair			2.37 b	113.73 kL	

Dashboard

>Tariff Setup

>Account Setup

>Data Entry

>History Report

>Generate Bills

- Statements

Start Date

01/04/2019

End Date

30/04/2019

Monthly Statement

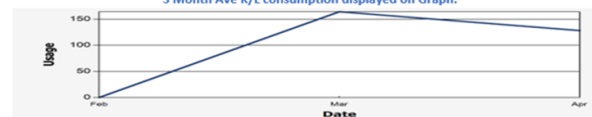
Bill To: 800A-African Marine Solutions Group
Address: Property Accounts TNPA Meters
Customer No. 4822
Debit_DLSIM3216_81723
Contract No. 70010568



Account-No:

Tariff Level:	Meter	Supply from	Meter Size
Bill Start Date:	01 April 2019	Meter number	C-DJA0577
Bill End Date:	30 April 2019	AMR Serial number	TBA
African Marine Solutions Group			
Meter Number C-DJA0577			
Current Reading:	9651.000	Last Reading:	9523.000
Reading Date:	05 April 2019	Reading Date:	05 March 2019
Meter Number: C-DJA0577			
Charge Label	Charge Description	Charge Detail	Charge Value
Customer Consumption	R29.12 / kl	128.00 kl	R 3 727.36
Sewerage @ 90% Usage	R8.21 /kl	128.00 kl	R 946.79
Connection Charge Per / Day	R 22.62 kl	29	R 655.98
Sewerage cost Per / Day	R 19.46 kl	29	R 564.34
Meter Total:			R 5 893.47

3 Month Ave K/L consumption displayed on Graph:

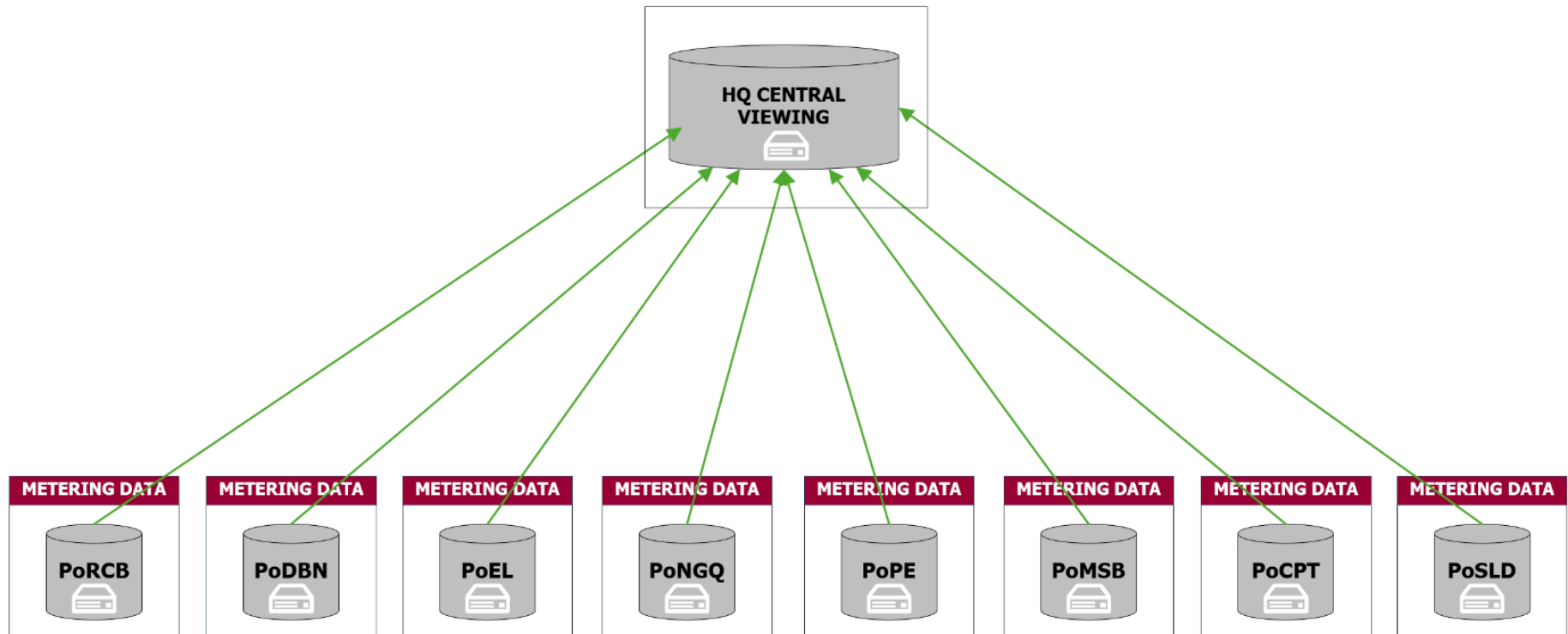


Last 12 months actual K/L consumption per month:

January	XXXXX.XX K/L	February	XXXXX.XX K/L	March	XXXXX.XX K/L
April	XXXXX.XX K/L	May	XXXXX.XX K/L	June	XXXXX.XX K/L
July	XXXXX.XX K/L	August	XXXXX.XX K/L	September	XXXXX.XX K/L
October	XXXXX.XX K/L	November	XXXXX.XX K/L	December	XXXXX.XX K/L

Statement Generated: 04/09/2019 13:41

HEAD QUARTER (HQ) CENTRAL REMOTE VIEWING DATA COLLECTION



TRANSNET



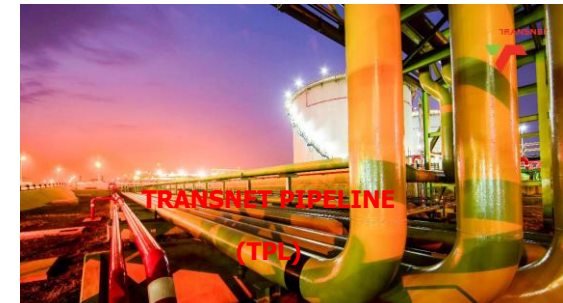
TRANSNET UTILITIES MANAGEMENT

User Name

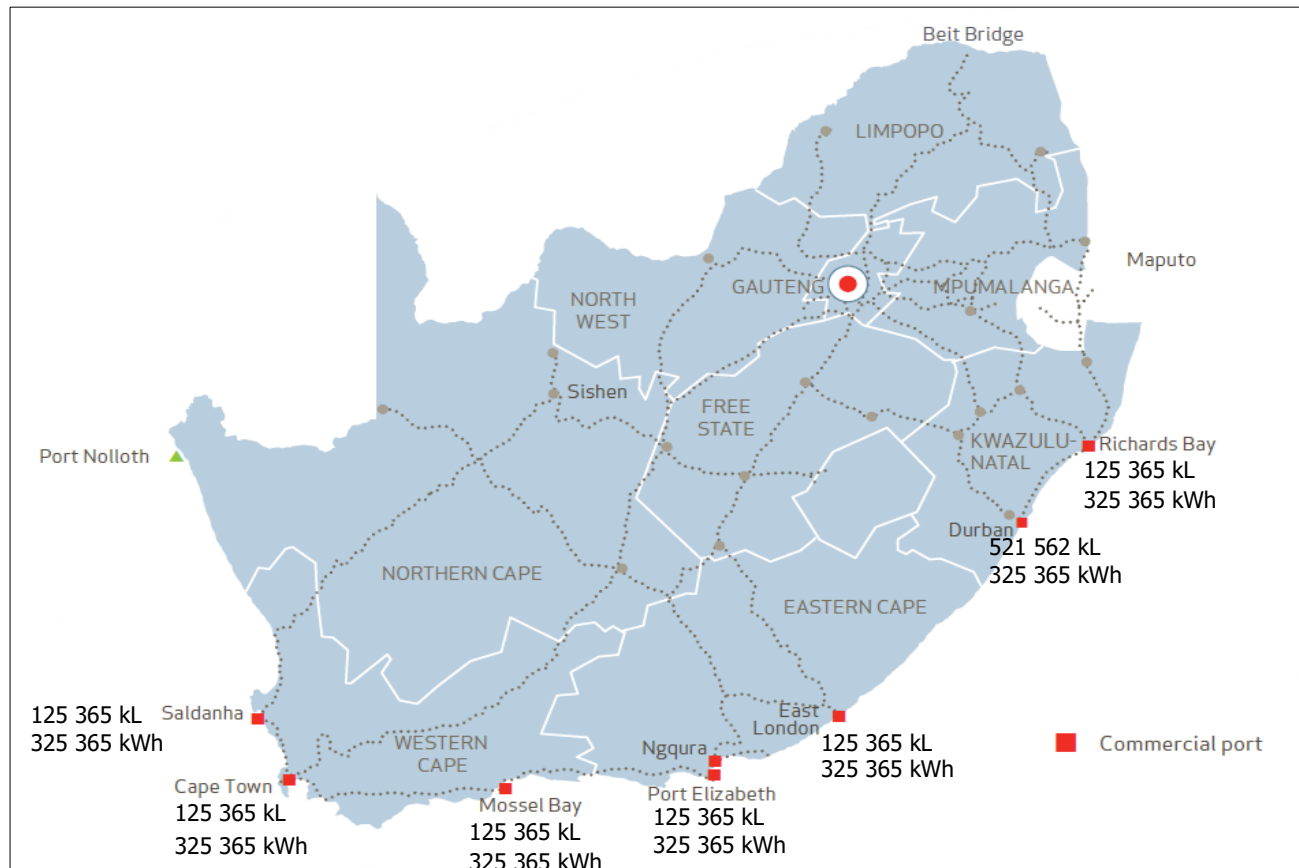
0123456

Password

TRANSNET GROUP



TRANSNET NATIONAL PORTS AUTHORITY



EASTERN REGION

- RICHARDS BAY
- DURBAN
- DREDGING SERVICES

CENTRAL REGION

- EAST LONDON
- NGOURA/HO
- LIGHTHOUSES
- PORT ELIZABETH

WESTERN REGION

- MOSSEL BAY
- CAPE TOWN
- SALDANHA BAY

 Dashboard

>> Ports

TRANSNET NATIONAL PORTS AUTHORITY



Usage on Main Intakes (Municipality) - KL

12 658 978

Usage of Tenants and Other ODs - KL

9 127 182

Usage of TNPA - KL

2 531 796

Total Usage - KL

11 658 978

Port Usage



Dashboard

>> Ports

> Richards Bay

> Water

> Electricity

> Durban

> East London

> Ngqura/HQ

> Port Elizabeth

> Mossel Bay

> Cape Town

> Saldanha Bay

PORT OF RICHARDS BAY



No of Main Intake Point (Municipality)

15

Accounts

250

Usage on Main Intakes (Municipality) -KL

521 562

Total Port Usage - KL

521 381

Port Usage



Dashboard

Internal TNPA Consumption - KL

50 365

Total Consumption for Tenants - KL

265 790

Consumption of other ODs -KL

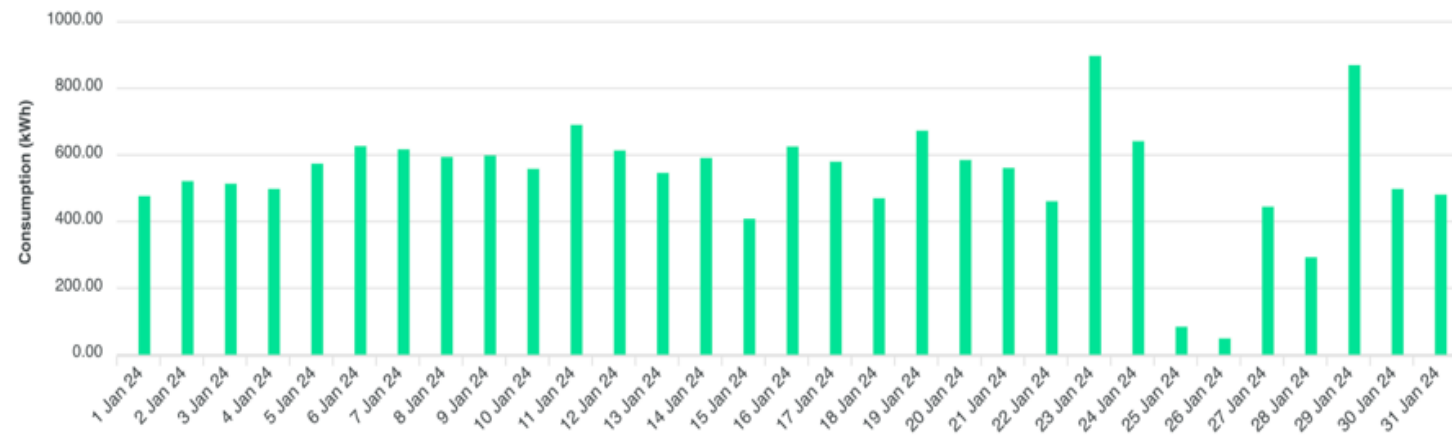
114 216

Shipping Water - KL

91 191

Utility Usage – Water

 TNPA  Tenants  Shipping  ODs



Dashboard

>> Ports

- > Richards Bay
 - > Water
 - > Electricity
- > Durban
- > East London
- > Ngqura/HQ
- > Port Elizabeth
- > Mossel Bay
- > Cape Town
- > Saldanha Bay

PORT OF RICHARDS BAY



No of Main Intake Point (Municipality)

3

Accounts

55

Usage on Main Intakes (Municipality) - kWh

521 562

Total Port Usage - kWh

521 381

Port Usage



Dashboard

Internal TNPA Consumption - kWh

50 365

Total Consumption for Tenants - kWh

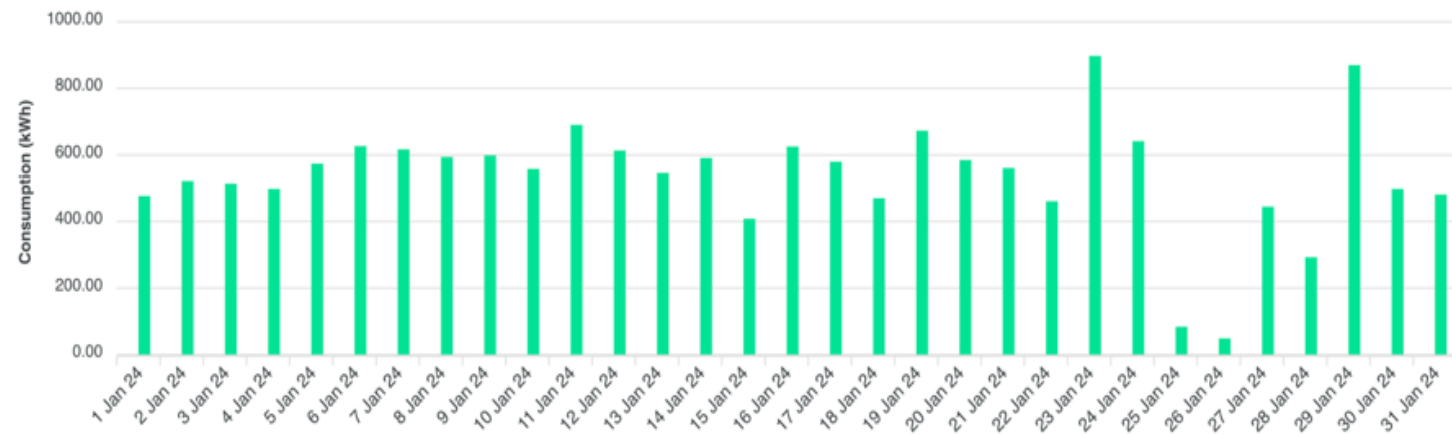
265 790

Consumption of other ODs -kWh

114 216

Utility Usage – Electricity

 TNPA  Tenants  Shipping  ODs



Dashboard

>Tariff Setup

>Account Setup

>Data Entry

>History Report

>Generate Bills

Start Date

01/05/2024

End Date

31/06/2024

History Report

The history report shall be able to generate both individual Port or as a Group- All Ports (TNPA, Tenant, ODs, Shipping and Municipality)

The shall be generated either in Excel, PDF or Word.

Individual Account:

☒

Select Group:

TNPA

☐

Tenants

☐

ODs

☐

Shipping

☐

Consumption

Account	Months	TNPA Usage (KL)	Rands
Port of Richards	31/05/2024	5214	R 10 485
Port of Richards	30/06/2024	5369	R 10 738
Port of Richards	31/07/2024	5578	R 11 056

Dashboard

> Tariff Setup

> Account Setup

> Data Entry

> History Report

> Recoveries

Start Date

01/04/2019

End Date

30/04/2019

Select Group



Select All



Utility Recoveries

Infrastructure Utility Recoveries – Current Month – May 2026

Utility	Water Received, kl	Water Recovered, kl	Variance, kl	Variance %
Water	205997	49571	156426	75

Infrastructure Utility Recoveries – Year To Date (Cumulative)

Utility	Water Received, kl	Water Recovered, kl	Variance, kl	Variance %
Water	377341	93271	284070	75

Infrastructure Utility Recoveries – Current Month – May 2026

Utility	Electricity Received, kWh	Electricity Recovered, kWh	Electricity Internal Usage, kWh	Variance %
Electricity	5 429 493.00	4 343 594.40	1 085 898.60	0

Infrastructure Utility Recoveries – Year To Date (Cumulative)

Utility	Electricity Received, kWh	Electricity Recovered, kWh	Electricity Internal Usage, kWh	Variance %
Electricity	14 628 744.00	11 702 995.20	2 925 748.80	0

SPECIFICATION FOR FIBER OPTICAL STANDARDS FOR HANDLING; INSTALLATION; TERMINATION; JOINTS AND TESTING

REVISIONS		
REV	DATE	APPROVED
00	21/08/2025	

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6. CALCULATION OF THE LOSS BUDGET	11
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1. SCOPE

This specification cover Transnet National Port Authority requirements for handling, installation, termination, joints and testing for cabling networks that use fiber optic cables and related components to carry signals for communications.

2. BACKBONE LAN CABLE TYPE

This Tender calls for the installation testing and commissioning of 48 core long span single mode fiber optical 1310nm network (LAN) for the following Ports:

- a) Richard Bay
- b) East London
- c) Ngqura
- d) Port Elizabeth
- e) Mossel Bay
- f) Cape Town
- g) Saldanha

The Contractor shall establish a backbone network with redundant ring at each port that interconnects various devices. The network should act as the central pathway for data exchange and provide a reliable and high-speed connection between the various devices.

Special requirements:

- Installing full drum lengths of cables without any splicing joints in cable length except if joint is to connect to new full drum length "drum length shall be deemed to be 5000m per drum"
- Fiber cable installation in ground:
 - Where cable is installed next to the Ports security fence concrete coulomb in ground it will be placed 500mm below ground level and inside an inner orange thick wall blow tube pipe, that will be placed inside a 110mm perverted pipe.
 - Pipe will be laid in a 6mm dia max sifted bedding of excavated trench sand 100 thick on base and 100mm above pipe above the pipe
 - Above this last layer of sifted sand danger tape will be installed and then

trench can be back filled

- Compaction of excavation will be done in 150 mm layers
- No stone or object larger than 1/2 coronation brick will be used in backfill material this will form part of the soil removal quantity
- Manhole to manhole will be maxim 500M
- All 90 deg bends or direction change will be done in Manholes
- No Manholes will be installed within 1 meter of any road or driveway
- After compaction all material and excess sand rubble will be removed from site.

In each manhole at least 5 full coils of cable shall be left for maintenance/repairs in future if required.

3. INSTALLING FIBER OPTIC CABLE

- 3.1. Follow the cable manufacturer's recommendations for installing the fiber optic cable. The manufacturer may have specific instructions on its installations.
- 3.2. Check the cable length to make sure the cable being pulled is long enough for the run to prevent having to splice fiber and provide special protection for the splices.
- 3.3. Try to complete the installation in one pull. Prior to any installation, assess the route carefully to determine the methods of installation and obstacles likely to be encountered.
- 3.4. Never directly pull on the fiber itself. Fiber optic cables have aramid yarn for pulling. Fiber optic cable should only be pulled by these strength members. Any other method may put stress on the fibers and harm them.
- 3.5. Swivel pulling eyes should be used to attach the pulling rope or tape to the cable to prevent cable twisting during the pull.
- 3.6. Do not exceed the maximum pulling load/tension rating. On long runs pulled in conduit, it may be necessary to use lubricants. Make certain they are compatible with the cable jacket. If possible, use an automated puller with tension control and/or a breakaway pulling eye. On very long runs, pull from the middle out to both ends or use an automated fiber puller at intermediate points for a continuous pull. Know and observe the maximum recommended load rating of the cable manufacture data sheets.

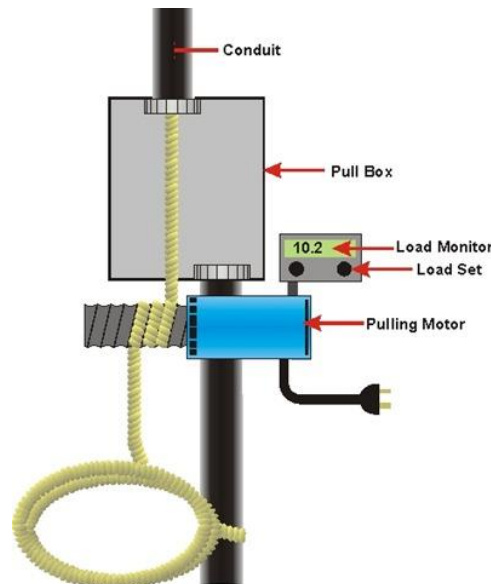


Figure 1: Automated puller with tension control

Bend Radius

- 3.7. Do not exceed the cable bend radius. Fiber optic cable can be broken when kinked or bent too tightly, especially during pulling. Fiber is stronger than steel when you pull it straight, but it breaks easily when bent too tightly. These will harm the fibers, maybe immediately, maybe not for a few years, but you will harm them and the cable must be removed and thrown away.
- 3.8. If no specific recommendations are available from the cable manufacturer, the cable should not be pulled over a bend radius smaller than twenty (20) times the cable diameter.
- 3.9. After completion of the pull, the cable should not have any bend radius smaller than ten (10) times the cable diameter.

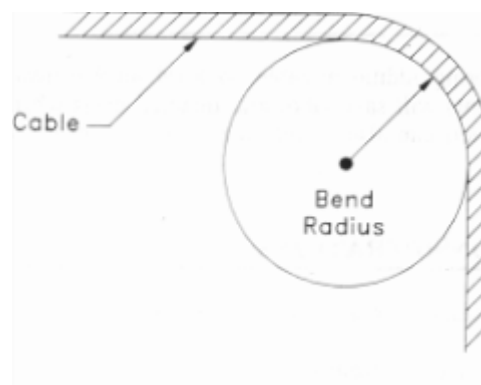


Figure 2: Cable bend radius illustration

- 3.10. Always roll the cable off the spool instead of spinning it off the spool end. This will put a twist in the cable for every turn on the spool! Never twist the fiber cable. Putting a twist in the cable can stress the fibers.

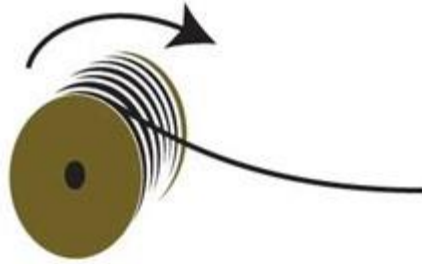


Figure 3: Roller cable off the spool to prevent twisting

- 3.11. Pull, do not push cables. Pushing can result in violation of the bend radius, Monitor the supply reel. Monitoring the supply reel during installation is necessary to prevent violation of minimum bend radius.



Figure 4: Roller cable off the spool to prevent twisting

- 3.12. Communicate along the path of installation. When installing long runs, communicate and monitor along the path of the installation. Fiber cables can and do jump from unmonitored pulleys. The minimum crew should have one person monitoring the pulling equipment, one monitoring the supply reel, and one coordinating all involved in the installation.
- 3.13. Plan the Installation. Create a detailed, written plan of installation. You can eliminate 95% of the problems installers can encounter by simply creating this plan. The plan should include equipment and supplies, fiber cable specification, location of equipment, testing requirements, data forms for testing, personnel experience level and assignment, installation methods, identification of potential obstructions.
- 3.14. Use fiber optic cable lubricant. Lubricate the cable when installing in conduits. Lubrication reduces the pulling load and the chance of breakage. The lubricant has to be compatible with the cable jacket material.
- 3.15. Use the figure 8 technique. Divide long pulls into several shorter pulls, using "figure 8" technique for storing cable at the intermediate locations. The cable is placed on the ground in a figure 8 pattern. This pattern is large, at least 10-20 feet from top to bottom of the pattern. When all the cable is placed in this pattern, the pattern is

lifted and flipped over, so that the loose end is on top. This loose end is pulling into the ext section of conduit or duct. This technique prevents twisting in the cable.

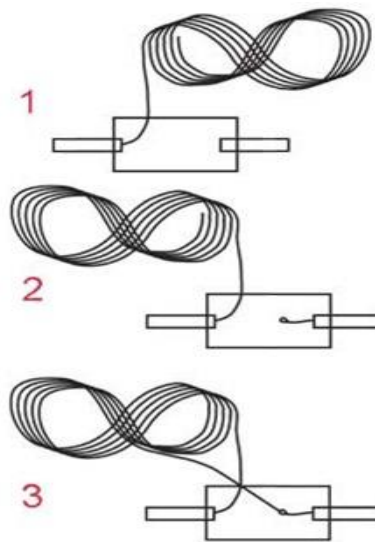


Figure 5: Use "figure 8" loops to protect the cable when pulling

- 3.16. Comply with vertical rise limits. Know and observe the maximum vertical rise distance limit. Exceeding this limit can result in fiber breakage, excess attenuation, and, in loose tube cables, fibers sliding from cables. Cables in vertical installations that are longer than the vertical rise limit must be tied off at distances less than this limit. Loose tube cables must be looped.
- 3.17. Allow for thermal expansion and contraction. In outdoor installations, a common practice of 2.5 foot sag for 150 foot span is good for thermal expansion and contraction. Failure to allow for thermal expansion can result in increased attenuation and breakage of fibers
- 3.18. For tough installations, use loose buffer tube fiber cables. Loose tube cables can be more forgiving of abuse than tight buffer cables. The reason is that the excess length of fiber in the buffer tube and the ability of fiber to move from low stress region to higher stress region
- 3.19. Observe the temperature operating range. Install a cable in locations in which the temperature range imposed is within the temperature operating range. Violation of the temperature operating range can result in excessively high attenuation
- 3.20. Cap or seal water blocked cables. Cap off or seal the ends of cables with water blocking gel or grease. These materials can flow out of the cable, causing maintenance problems in cable end boxes

-
- 3.21. Protect fibers and buffer tubes. Confine fibers and buffer tubes in protective structures, such as splice trays and cable end boxes. Fibers and buffer tubes do not have sufficient strength to resist breakage due to normal handling of copper cables.
 - 3.22. Loop vertically installed loose tube cables. Install vertical, unfilled, loose tube cables with loops to prevent the fiber from slipping to the bottom of a vertical run. If this happens, attenuation can increase, and fibers eventually break.
 - 3.23. Check continuity and attenuation. Check the continuity and attenuation of the cable before each operation. These checks should be performed as-received/before installation, after installation, after splicing, and after connector installation.
 - 3.24. Mark cable as "TNPA Electrical Fiber Optic Cable". Mark cable as "TNPA Electrical Fiber Optic Cable" in all locations in which it can be easily reached. Such marking will alert electricians to the nature of the cable and identification.
 - 3.25. Make As-Built Data files per substation. Keep this data available to those who will perform maintenance and troubleshooting. These data logs should include both insertion loss measurement and OTDR measurements.
 - 3.26. Leave service loops. Leave cable and fiber service loops everywhere. You will regret not doing so. Service loops allow you to pull excess cable or fiber into a location where you have experienced a problem. It is much cheaper to pull in a service loop than to replace an entire run of fiber cable. A small amount of slack cable (20-30 feet) can be useful in the event that cable repair or relocation is needed.
 - 3.27. Safety precaution – no food, drink or smoke. Do not eat, drink, or smoke in any area in which bare glass fiber is created. Bare glass fibers can cause splinters which are very difficult to find and remove.
 - 3.28. Safety precaution – do not look into fiber without checking status. Never look into a fiber cable or connector unless you know for sure that there is no laser light in the fiber. For extensive work with fiber optics, safety glasses with IR filter is recommended.
 - 3.29. Segregate or isolate the work area. Rope off or otherwise isolate the area of cable installation to prevent access to unauthorized or untrained personnel. This will avoid safety problems such as fiber splinters and unintentional abuse.
 - 3.30. For direct burial installations, the cable should lie flat in a trench, free of any large stones or boulders that may deform the cable.
 - 3.31. Avoid placing cable reels on their sides or subjecting them to shock from dropping.
 - 3.32. Ensure that the proper cable length has been installed before cutting off excess cable.

-
- 3.33. After the fiber optic cable is installed into a duct or innerduct, end plugs should be installed to provide an effective water seal. The ducts and inner ducts should be kept free of debris and maintained watertight at all times.
 - 3.34. Ducts and inner ducts should be sized to meet present and future cable installation requirements. A maximum 40% fill ratio is a good rule of thumb to follow for duct size.
 - 3.35. The fiber pulling rope or tape should be sequentially marked (foot or meter) for easy identification of distance.
 - 3.36. The pulling tape should have a rating for greater than maximum anticipated pulling tension.
 - 3.37. Before the start of any cable pull, all ducts and cable vaults should be carefully inspected for damage or deterioration, and to address any safety concerns.
 - 3.38. The electric spark generated by a fusion splicer can cause an explosion when flammable gases are present. Fusion splices should therefore not be used in vaults
 - 3.39. To minimize cable tensions, reel vault locations should be set near the sharpest bend locations. Pulling and reel locations should also be set at corner vaults where possible.
 - 3.40. Identify Lightwave equipment that will be used and ensure that the equipment will function properly with the fiber cable being installed.
 - 3.41. When an outdoor rated fiber cable enters a building, it should be spliced to an indoor-type fiber cable within 50 feet from the cable entrance to meet NEC code.
 - 3.42. If future cable pulls in the same duct or conduit are a possibility, the use of innerduct to sectionalize the available duct space is recommended. Without this sectionalization, additional cable pulls can entangle an operating cable and could cause an interruption in service.
 - 3.43. Cables should be tested after shipping. Damage to cabling can occur during shipping or installation. Failing to test fiber cabling after it is delivered is a common mistake made by installers the fiber optic cable should also be tested three separate times during an installation: on the reel, the splicing test, and the final acceptance testing.
 - 3.44. Extreme caution should be observed when performing an aerial installation. The proper personnel should be contacted so that they are on the site when work is performed near high-voltage lines.
 - 3.45. Cables that are installed in the vicinity of high-voltage power lines should be grounded, including all-dielectric cables and before it enters into the termination box.

- 3.46. On runs from 40m to 100m, use proper lubricants and make sure they are compatible with the cable jacket.
- 3.47. On runs over 100m, use proper lubricants and pull from the middle out to both ends.
- 3.48. Always use a swivel pulling eye because pulling tension will cause twisting forces on the cable.



Figure 6: Swivel pulling eye

- 3.49. For cables using aramid yarn and a fiberglass central member, a pulling grip should be used. The strength member should be attached independently. This can be accomplished by weaving the strength member into the fingers of the grip and then taping it together. All strength members should be gripped equally to ensure proper distribution of tension.

4. FIBER OPTIC TERMINATION

- 4.1 All terminations must be of the right style, installed in a manner that provides low light loss and reflectance at the fiber joint, and is protected against the expected environment, dirt or damage while in use.
- 4.2 Fiber optic connectors shall be ST, however, on existing installations it should be compatible with the current hardware and system electronics (e.g. SC, ST, LC)
- 4.3 Fiber termination onto ST pig tails on termination strip.
- 4.4 Should the cable connectors be different from the electronics, hybrid patch leads shall be used for connecting the cable or linking the electronics.
- 4.5 Core to core termination shall correspond on each end of the cable 1 on left must be 1 on left on the other end.
- 4.6 Source / destination numbering shall be used for all cables and termination points.
- 4.7 Fiber optic termination shall be terminated using fusion splices creating a permanent joints between two fibers.
- 4.8 Fusion splicing should not be performed on a dusty or explosive atmosphere as the electric arc may cause an explosion or fire.
- 4.9 Splice performance shall be within industry standard limits.

5. TESTING THE INSTALLED FIBER OPTIC CABLE

- 5.1 Perform continuity testing of optical fibers using a visual fibers tracer, visual fault locator. Trace the fiber from end to end through any interconnections to ensure that the path is installed in accordance with the requirements in applicable standards and that polarization and routing are correct and documented.
- 5.2 OTDR shall be used to verify the quality of the installation or for troubleshooting. End to end tests of fiber optic cable loss include the losses caused by splices. Fiber optic cable losses shall be performed using an OTDR to analyse the loss of individual components (fibers, connectors and splices) in the cable.
- 5.3 Test results shall be printed and filed in hardcover ring file and left in each corresponding termination swing frame unit.

6. CALCULATION OF THE LOSS BUDGET

- 6.1 Calculation of the loss budget for the fiber optic link should be done as part of the initial design of the links to provide an assurance that the links will support telecommunications equipment intended for use on the links.
- 6.2 The table below depicts the attenuation coefficients given from TIA-568 considering the worst-case and typical industry results. The table below shows typical loss for each component in an installed link.

Fiber Type	Wavelength (nm)	Max Attenuation Coefficient Per TIA-568 (dB/km)	Attenuation Coefficient (typical)(dB/km)
50/125	850	3.5	3
	1300	1.5	1
62.5/125	850	3.5	3
	1300	1.5	1
Singlemode (Premises)	1310	1.0	0.5
	1550	1.0	0.5
Singlemode (Outside Plant)	1310	0.5	0.4
	1550	0.5	0.3
		Max Loss TIA-568	Typical Loss (dB)
Connection (2 mated connectors)		0.75	0.3 (Adhesive/ polish)
			0.5-0.75 (prepolished/splice)
			0.75 (Single ferrule multifiber)

Splice (fusion or mechanical)	0.3	0.05 (fusion) 0.3 (mechanical)

7. PROPOSED CABLE ROUTE.

- 7.1 The Contractor shall together with the Project and Port Engineers determine the most feasible path and links to create a Ring Network and map the path on the port layout.
- 7.2 Develop a cable route plan and network topology and produce layout drawings for review and acceptance.
- 7.3 Perform GRP scanning on the proposed cable route to determine any potential clashes with existing underground services.

8. PRE-INSTALLATION CHECKLIST

No.	Description	Yes	No
1.	Main point of contact/Project Manager chosen		
2.	Link route chosen, permits obtained		
3.	Link communications requirements set		
4.	Equipment and component requirements set and vendors chosen		
5.	Link route chosen, permits obtained		
6.	Cable plant components and vendors chosen		
7.	Coordination with facilities and electrical personnel complete		
8.	Documentation completed and ready for installation, preliminary restoration plans ready		
9.	Test plan complete		
10.	Schedule and start date set for installation, all parties notified		
11.	Components ordered and delivery date set, plans made for receiving materials (time, place,) arrange security if left outside or on construction site		
12.	Contractor/installer chosen and start date set		
13.	Link route tour with contractor(s)		
14.	Construction plans reviewed with contractor(s)		
15.	Components chosen reviewed with contractor(s)		
16.	Schedule reviewed with contractor(s)		
17.	Safety rules reviewed with contractor(s)		
18.	Excess materials being kept for restoration reviewed with contractor(s)		
19.	Test plan reviewed with contractor(s)		
Before starting the installation:			
20.	All permits available for inspection		
21.	Site prepared, power available		
22.	All components on site, inspected, 24-hour security arranged if necessary		
23.	Contractor available		
24.	Relevant personnel notified		
25.	Safety rules posted on the job site(s) and reviewed with all supervisors and installation personnel		
During the installation			
26.	Inspect workmanship at every step		
27.	Daily review of process, progress, test data		
28.	Immediate notification and solution of problems, shortages, etc.		
DD			

	Inspect workmanship		
	Review test data on cable plant		
	Set up and test communications system		
	Update and complete documentation		
	Update and complete restoration plan		
	Store restoration plan, documentation, components, etc.		

ANNEXURE A

STATEMENT OF COMPLIANCE

- 1 The tender submitted herewith complies fully with the requirements of this specification.
- 2 The tender submitted herewith complies generally with this specification, but deviates on the following points:

SIGNATURE OF TENDERER.....

DATE.....

TRANSNET HEALTH AND SAFETY SPECIFICATION

PROJECT NAME : THE SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS
WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE ENTIRE
PORT SYSTEM

SIGNATORIES:

Prepared by:	<u>Terrence Vilakazi</u> Health and Safety Practitioner	 _____	<u>26/03/2026</u> Date
Approved by:	<u>Jabulani Maluleke</u> Health and Safety Agent	 _____	<u>26/03/2026</u> Date
Accepted by:	<u>Sphelele Ngcobo</u> Project Manager	 _____	<u>26/ 03/ 2026</u> Date

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1. Purpose

This specification development guideline identifies and encompass the working behaviours and safe work practices that are expected of all Transnet SOC Ltd employees, Contractors, Consultant, Visitors and Suppliers, that will be engaged on the project of supply and installation of smart meters with a software solution (utilities management) across the entire port system.

The specification has been developed in accordance with the requirements of the Occupational Health and Safety Act and its Regulations, mainly Construction Regulation 5(1)(b) as well as any other applicable legislation. The Contractor must comply with this Client's health and safety specification and related legislation and address it in their site specific health and safety plan. It is the principal contractor's responsibility to ensure that all sub-contractors comply fully with all legal requirements as well as the requirements of this specification.

This Health and Safety Specification will be reviewed and updated periodically and/or as and when necessary) to address and / or include:

- Changes in legislation;
- Client requirements;
- Leading practices; and
- Lessons learnt from incidents.

2. Scope

This Specification applies to the supply and installation of smart meters with a software solution (utilities management) across the entire port system project and to all persons working on or visiting this project. The requirements specified in this document are applicable to the contractor as well as any sub-contractors that may be appointed by Transnet as an Employer. It is the contractor's responsibility to ensure that all sub-contractors comply fully with all legal requirements as well as the requirements of this health and safety specification.

The scope to be carried out under this Contract includes but is not limited to the following items of work as summarised below which covers supply, installation, configuration, integration, design of communication networks [Local Area Network (LAN) & Private Wireless Network e.g. Radio Frequency (RF)], testing and commissioning of a utilities management solution across all ports:

- Supply, install, configure, test and commission smart energy meters for measurement of different electrical parameters listed elsewhere in the document including Active Energy (kWh/MWh), Reactive Energy (kVArh/MVArh), Apparent Energy (kVAh/MVAh) etc.

- Supply, install, configure, test and commission smart water meters for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis.
- Supply, install, configure, test and commission all necessary AMR/AMI communication modules, transceivers, repeaters, gateways etc. All equipment to be supplied shall be of the latest AMR/AMI technologies.
- Design, develop, install, integrate (with existing systems in each port or lack thereof), test and commission a new utilities management software solution across all ports.
- Perform all the works, procurement, installation, testing and supervision to ensure compliance with the *Employer's* Works Information and all applicable standards.
- Design, supply and installation of networks (i.e. LAN and Wireless) including trenching, manholes, sleeves etc..
- Updating of as-builts, operating and maintenance manuals,
- Maintenance Contract:
During the Defects Liability Period the Contractor shall undertake all system repairs, service and maintenance requirements including provision of manpower and consumables.
- Provision of the critical spares where required.
- Provision of training on the AMR and Utilities Management Software Solution.

3. Definitions

Acceptable Risk

A risk that has been reduced to a level that can be tolerated having regard for the applicable legal requirements and the Health and Safety Policy adopted for the project.

ALARP (As Low As Reasonably Practicable)

The concept of weighing a risk against the sacrifice needed to implement the measures necessary to avoid the risk. With respect to health and safety, it is assumed that the measures should be implemented unless it can be shown that the sacrifice is grossly disproportionate to the benefit.

Applicant (Permit to Work)

A person requesting permission to perform work for which a Permit to Work is required. Applicants must be authorised (in writing) to receive (or accept) Permits to Work and must be competent to do so by virtue of their training, experience and knowledge of the area or plant in which the work is to be performed.

Authorised Person (Permit to Work)

A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the nominated project management representative to issue Permits to Work within

the scope of his designation. A person may only be appointed to issue Permits to Work if he has undergone training and has been assessed and found competent in systems, plant and equipment operation within the scope of his designation.

Barricade

A temporary structure that is erected as a physical barrier to prevent persons from inadvertently coming into contact with an identified hazard.

Battering

Sloping the sides of an excavation to a predetermined angle (usually less than the natural angle of repose) to ensure stability.

Benching

The creation of a series of steps in the sides of an excavation to prevent collapse.

Consequence

The outcome of an event expressed qualitatively or quantitatively.

Contractor

An Employer (Organization) or a person who performs **ANY** work and has entered into a legal binding business agreement contract to supply a product or provide services to Transnet. This applies to the Suppliers, Vendors, and Consultants, Service providers or Contractors performing construction work

NB: A Contractor is an employer in his/her own right

Competent Person

A person who has in respect of the work or task to be performed the required knowledge, training, experience and as per act cr2014.

Construction Supervisor

A competent person responsible for supervising construction activities on a construction site

Clearance Certificate

A signed declaration by an Isolation Officer that a specified hazardous energy source associated with a particular system, plant or item of equipment has been isolated in accordance with an approved Isolation and Lockout Procedure.

Discipline Lock (many locks with a restricted number of identical keys)

Attached at a Lockout Station or at a Local Isolation Point in order to lock out a system, plant or equipment. A Discipline Lock (e.g. A Low Voltage Electricity Discipline Lock) is owned by an Isolation Officer who has been authorised in writing to isolate and lockout a particular hazard (e.g. Low voltage electricity).

Equipment Lock (many locks with one unique key)

Attached directly to pieces of equipment in order to lock them out. Equipment Locks may only be used by Isolation Officers who have been authorised in writing to perform isolation and lockout procedures. The key must have a solid key ring that fits over an Isolation Bar.

Excavation

Any man-made cut, cavity, pit, trench, or depression in the earth's surface formed by removing rock, sand, soil or other material using tools, machinery, and / or explosives. Tunnels, caissons and cofferdams are specifically excluded and are not addressed in this standard.

First-Aid Injury (FA)

A first-aid injury is any one time treatment and any follow up visit for observation of minor scratches, cuts, burns, splinters and the like which do not normally require medical care. Such treatment is considered to be first aid even if administered or supervised by a medical practitioner. First aid includes any hands on treatment given by a first aider. (E.g. Band-Aid, washing, cleansing, pain, relief). The following procedures are generally considered first aid treatment:

- Application of Antiseptics.
- Application of Butterfly adhesive dressing or sterile strips for cuts and lacerations.
- Administration of tetanus shot(s) or booster(s). However, these shots are often given in conjunction with more serious injuries, consequently injuries requiring these shots may be recordable for other reasons.
- Application of bandages during any visit to medical personnel.
- Application of ointments to abrasions to prevent drying or cracking.
- Inhalation of toxic or corrosive gas, limited to the removal of the employee to fresh air or the one time administration of oxygen for several minutes.
- Negative X-Ray diagnosis.
- Removal of foreign bodies not embedded in the eye if only irrigation is required.
- Removal of foreign bodies from a wound if procedure is uncomplicated, for example by tweezers or other simple technique.
- Treatment for first degree burns.
- Use of non-prescription medications and administration of single dose of prescription medication on first visit for any minor injury or discomfort.

Hazard

A source of potential harm in terms of human injury or ill health, or a combination of these.

Hierarchy of Controls

A sequence of control measures, arranged in order of decreasing effectiveness, used to eliminate or minimise exposure to workplace health and safety hazards:

- Elimination – Completely removing a hazard or risk scenario from the workplace.
- Substitution – Replacing an activity, process or substance with a less hazardous alternative.
- Isolation (Engineering) Controls – Isolating a hazard from persons through the provision of mechanical aids, barriers, machine guarding, interlocks, extraction, ventilation or insulation.
- Administrative Controls – Establishing appropriate policies, procedures and work practices to reduce the exposure of persons to a hazard. This may include the provision of specific training and supervision.
- Personal Protective Equipment – Providing suitable and properly maintained PPE to cover and protect persons from a hazard (i.e. Prevent contact with the hazard).

Isolation and Lockout Procedure

A plant or equipment-specific procedure that describes the method, and sequence to be followed, for rendering equipment, plant and systems safe to work on.

Isolation Bar

A device used at a Lockout Station to which anyone is able to attach a Personal Lock making it impossible for an Isolation Officer to remove the key to the Equipment Locks, thus preventing the de-isolation of a system, plant or equipment while it is still being worked on. A Discipline Lock must always be the first lock attached to an Isolation Bar and last to be removed.

Isolation Officer

A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the nominated project management representative to perform isolation and lockout procedures. A person may only be appointed as an Isolation Officer if he has undergone training and has been assessed and found competent in the isolation and lockout of systems, plant and equipment within the scope of his designation.

Incident

An event (or a continuous or repetitive series of events) that results or has the potential to result in a negative impact on people (employees, contractors and visitors), the environment, operational integrity, assets, community, process, product, legal liability and / or reputation.

Likelihood

A description of probability or frequency, in relation to the chance that an event will occur.

Lost Time Injury (LTI)

Any occurrence that resulted in a permanent disability or time lost from work of one day/shift or more.

If an employee is injured and cannot return to work in the next shift (will ordinarily miss one whole shift), and the department brings the employee in to only receive treatment by the Supervisor/ Return to Work Coordinator in that shift, this is still considered an LTI.

Lost Time Injury Frequency Rate (LTIFR) - Number of LTI's multiplied by 1 million or 200,000 and divided by labour hours worked.

Light Vehicle

A vehicle that:

- Can be licensed and registered for use on a public road;
- Has four or more wheels, and seats a maximum of 12 adults (including the driver);
- Requires the driver to hold only a standard civil driving licence; and
- Does not exceed 4.5 tonnes gross vehicle mass (GVM), which is the maximum loaded mass of the motor vehicle as specified by:
 - ♦ The vehicle's manufacturer; or
 - ♦ An approved and accredited automotive engineer, if the vehicle has been modified to the extent that the manufacturer's specification is no longer appropriate.

Examples of light vehicles include passenger cars, four-wheel drive vehicles, sports utility vehicles (SUVs), pick-ups, minibuses, and light trucks.

Any vehicle falling outside of this definition must be considered mobile equipment.

Medical Treatment Injury (MTI)

A work injury requiring treatment by a Medical Practitioner and which is beyond the scope of normal first aid including initial treatment given for more serious injuries. The procedure is to be of an invasive nature (e.g. Stitches, removal of foreign body).

The following procedures are generally considered medical treatment:

- Application of sutures (stitches).
- Cutting away dead skin (surgical debridement).
- Loss of consciousness due to an injury or exposure in the work environment.
- Positive X-Ray diagnosis (fractures, broken bones etc.).
- Removal of foreign bodies embedded in the eye.
- Removal of foreign bodies from the wound by a physician due to the depth of embedment, size or shape of object or the location wound.
- Reaction to a preventative shot administered because of an occupational injury.
- Sprains and strains - series (more than one) of hot and cold soaks, use of whirlpools, diathermy treatment or other professional treatment.
- Treatment of infection.
- Treatment for second or third degree burns
- Use of prescription medications (except a single dose administered on first visit for minor injury or discomfort.)

Mobile Equipment

A vehicle (wheeled or tracked) that generally requires:

- The driver to hold a specific state or civil license; or
- The operator to hold a nationally recognized certificate of competency.

Examples of mobile equipment include, but are not limited to, dump trucks, water trucks, graders, dozers, loaders, excavators, forklifts, tractors, back-actors, bobcats, mobile cranes, tele-handlers, drill rigs, buses and road-going trucks.

Near Hit

An incident that has occurred that did not result in any injuries, illnesses, environmental or property damage but had the potential to cause an injury, illness, environmental or property damage.

Personal Lock

A single lock with one unique key controlled by the owner. Used for personal protection.

Regulation

In the context of this guideline, 'Regulation(s)' refers to the Construction Regulations, 2014 required by Section 43 of the Occupational Health and Safety Act 85 of 1993, published under Government Notice R 84 in Government Gazette 37305 of February 2014.

Risk

A combination of the likelihood of an occurrence of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event or exposure.

Risk Assessment

A process of evaluating the risk arising from a hazard, taking into account the adequacy of any existing control measures, and deciding on whether or not the risk is acceptable.

Risk Management

The systematic application of management policies, processes and procedures to identifying hazards, analysing and evaluating the associated risks, determining whether the risks are acceptable, and controlling and monitoring the risks on an ongoing basis.

Total Occupation

An occupation for a period when trains are not to traverse the section of line covered by the occupation.

Work Permit

A combined written application and authority to proceed with work on or near dead electrical equipment.

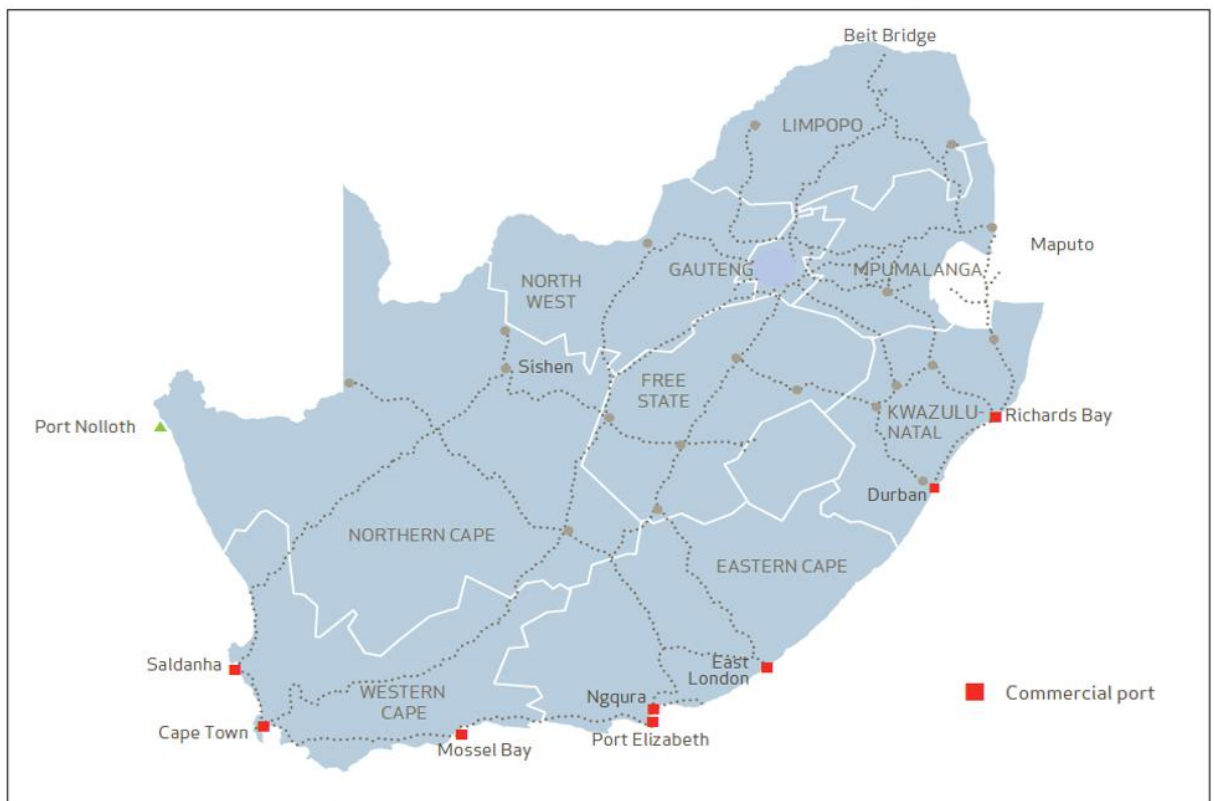
4. Abbreviations

Abbreviation	Meaning given to the abbreviation
DSTI	Daily Safety Task Instruction
CR	Construction Regulations, 2014
CWP	Construction Work Permit
EPC	Engineering Procurement and Construction
EPCM	Engineering Procurement and Construction Management
HIRA	Hazard Identification and Risk Assessment
IMS	Integrated Management System
MS	Management System
OHS Act	Occupational Health and Safety Act No. 85 of 1993
PC	Principal Contractor
SOC	Safety Observation and Conversation
TNPA	Transnet National Port Authority
VFL	Visible Felt Leadership
OHS	Occupational Health and Safety
DoEL	Department of Employment and Labour
SACPCMP	The South African Council for Project and Construction Management Professions.
MSDS	Material Safety Data Sheet

5. Location

All operated by Transnet National Ports Authority, which provides port infrastructure, Real Estate, Marine, Dredging and Lighthouse services. All the Ports are 24 hours operational. Work to be carried out will be undertaken in operational areas. The proposed installations will take place at the eight commercial seaport:

- a. Port of Richards Bay.
- b. Port of Durban.
- c. Port of East London.
- d. Port of Ngqura.
- e. Port of Port Elizabeth.
- f. Port of Mossel Bay.
- g. Port of Cape Town.
- h. Port of Saldanha.



6. HS Management Plan

The contractor must prepare, implement and maintain a project-specific SHE Management Plan. The plan must be based on the requirements set out in this specification as well as all applicable legislation. It must cover all activities that will be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning.

The plan must demonstrate the contractor's commitment to HEALTH AND SAFETY and must, as a minimum, include the following:

- A copy of the contractor's **Health and Safety Policy**; in terms of the OHS Act section 7
- Procedures concerning **Hazard Identification and Risk Assessment**, including both Baseline and Task-Based Risk Assessments;
- Arrangements concerning the identification of applicable **Legal and Other Requirements**, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel;
- Details concerning **Health and Safety Objectives** – a process must be in place for setting objectives (and developing associated action plans) to drive continual improvement;
- Details concerning **Resources, Accountabilities and Responsibilities** – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a Project Manager, Health and Safety Officers, Supervisors, Health and Safety Representatives, and First Aiders;
- Details concerning **Competence, Training and Awareness** – a system must be in place to ensure that each employee is suitably trained and competent, and procedures must be in place for identifying training needs and providing the necessary training;
- **Communication, Participation and Consultation** arrangements concerning health and safety, including Safety Observations and Coaching, Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards;
- **Documentation and Document Control** – project-specific documentation required for the effective management of health and safety on the project must be developed and maintained, and processes must be in place for the control of these documents;
- Processes and procedures for maintaining **Operational Control**, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment and light vehicles, lifting operations, hazardous chemical substances, etc.;
- **Emergency Preparedness and Response** procedures;

- **Management of Change** – a process must be in place to ensure that health and safety risks are considered before changes are implemented;
- **Sub-contractor Alignment** procedures – a process must be in place for the assessment of sub-contractors and suppliers with regard to health and safety requirements and performance (before any contract or purchase order is awarded);
- **Measuring and Monitoring** plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. Noise, dust, etc.) In order to determine the effectiveness of control measures;
- **Incident Reporting and Investigation** procedures describing the protocols to be followed with regard to incident reporting, recording, investigation and analysis;
- **Non-conformance and Action Management** procedures concerning the management of corrective actions;
- **Performance Assessment and Auditing** procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and
- Details concerning the **Management Review** process followed to assess the effectiveness of health and safety management efforts.

Prior to mobilisation, the Contractor Project Specific Health and Safety Management Plan must be forwarded electronically, and as a hard copy, to the Client's Health and Safety Agent (CHSA) for review and approval. The plan will be audited for completeness and, if found to be adequate, will be accepted and approved. Work may not commence until the plan has been accepted and approved.

Should it be identified that the contractor has overlooked a high risk activity, and the plan is not aligned to Transnet Specification, the plan will not be approved by CHSA.

7. Policy

The contractor must develop, display and communicate a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety as required by OHS Act of 1993, 7(3). These values and objectives must be endorsed by the contractor's management representatives and must be consistent with those adopted for the project.

The policy must be signed and dated, and must be reviewed annually. The policy must commit to:

- Compliance with all applicable legal requirements in the TNPA Legal Register
- The effective management of health and safety risks;

- The establishment of measurable objectives for improving performance, and the provision of the necessary resources to meet these objectives;
- The prevention of incidents; and
- Achieving continual improvement with regard to health and safety performance.

All employees of the contractor as well as the employees of any sub-contractors that may be appointed by the contractor must be made aware of the policy. This must be done through Health and Safety Induction Training and Toolbox Talks (refer to Sections 11 and 12).

A copy of the policy must be displayed in each meeting room and on each notice board.

8. Hazard Identification and Risk Assessment.

Detailed hazard identification and risk assessment processes must be followed for all work to be performed as well as for all associated equipment and facilities as required by the Construction regulation of 2014, regulation 9(1) – (7).

The client will provide a baseline risk assessment informing contractor on the hazards and risks on site. Contractor must ensure that effective procedures and risk assessment systems are in place to control hazards and to mitigate risks to levels that are as low as is reasonably practicable.

The risk assessment processes must be applied to:

- The full life cycle of the project;
- Routine and non-routine activities;
- Planned or unplanned changes (refer to Section 16);
- All employees, sub-contractors, suppliers and visitors; and
- All infrastructure, equipment and materials.

The risk assessment processes and methodologies must be appropriate for the nature and scale of the risks, and must be implemented by competent persons.

The process of analysing and managing risk must include the following:

- Establishing the context of the risk assessment;
- Identifying hazards and determining possible risk scenarios (unwanted events);
- Evaluating risks and assigning ratings (classification);
- Recording the risk analysis in a risk register;
- Managing risks according to their classification (prioritising for action);
- Identifying and implementing control measures (through the application of the Hierarchy of Controls) to ensure that risks are managed to levels that are as low as is reasonably practicable (ALARP);

- Developing action plans for reducing risk levels (where possible);
- Verifying the completion of actions;
- Re-evaluating the risks and classifications as appropriate; and
- Reviewing and updating the risk register.

8.1 Task-Based Risk Assessments

The contractor must carry out detailed project-specific Task-Based Risk Assessments which must be reviewed and approved by the Client's Project Health and Safety Manager and Contract Manager prior to the commencement of any work.

The risk assessment process must be facilitated by a competent person who has been appointed in writing in terms CR 9 sub regulation (1). The contractor's site management representatives, supervisory personnel, technical experts (as required) and workforce personnel directly involved with the task being examined must participate in the risk assessment process. An attendance register must be completed and retained.

Please Note: Under no circumstances may a Contractor Health and Safety Officer perform a risk assessment in isolation. The active participation of all persons referred to above is mandatory.

A Task-Based Risk Assessment must at least:

- Be accompanied by a Work Method Statement (describing in sufficient detail how the specific job or task is to be performed in a logical and sequential manner);
- Provide a breakdown of the job or task into specific steps;
- Identify the hazards and potential risk scenarios associated with each step;
- Include consideration of possible exposure to noise, heat, dust, fumes, vapours, gases, chemicals, radiation, vibration, ergonomic stressors, or any other occupational health hazard or stressor;
- Describe the control measures that will be implemented to ensure that the risks are managed to levels that are as low as is reasonably practicable; and
- Assign an initial risk rating (without taking any control measures into consideration) and a residual risk rating (taking the identified control measures into consideration) to each risk scenario.

A Task-Based Risk Assessment must be reviewed and, if necessary, updated:

- On an annual basis (as a minimum);
- When changes are made to the associated Work Method Statement; and
- Following an incident.

8.2 Pre-Task Hazard Assessments

A pre-task hazard assessment must be completed whenever a change is identified while carrying out an activity. Any deviation from what was discussed during the Daily Safe Task Instruction (prior to the activity commencing), or anything that was not discussed, constitutes a change.

Before carrying out the particular task that involves the identified change, a few minutes must be spent identifying the hazards and risks associated with that task as well as suitable control measures.

9. Legal and Other Requirements

The Contractor must comply with the requirements of all applicable legislation as well as Transnet and project-specific standards and procedures as amended from time to time.

The Contractor must compile and maintain a register of all legal and other requirements applicable to the work that will be carried out and / or services that will be provided. This register must be updated regularly to ensure that it remains relevant.

Applicable laws and standards must be appropriately communicated to all employees of the contractor (as well as the employees of any sub-contractors that may be appointed by the contractor) through training, Toolbox Talks, and Daily Safe Task Instructions.

10. Objectives

In order to drive continual improvement, the contractor must set project-specific objectives, and must develop improvement action plans to achieve these objectives. The contractor's objectives must be aligned with the objectives set for the project as a whole as required by the Construction regulations of 2014, regulation 7.

Eliminating hazards, minimising risks, preventing incidents, injuries and illnesses, and ensuring legal compliance must be the primary considerations for setting objectives.

When setting objectives, consideration must be given to the following:

- Leading indicators such as inspection findings, audit findings, hazard reporting, and observations;
- Lagging indicators (i.e. Incidents including Near Hits);
- Leading practices and lessons learnt; and
- Injury frequency rates with due understanding that the goal is "no harm".

The objectives must be specific and measurable. The improvement action plans must specify the resources (both human and financial) required to achieve the objectives, the person's responsible,

and realistic timeframes for completion. The contractor must ensure that adequate resources are allocated and that progress towards meeting the objectives is monitored regularly.

The objectives and associated improvement action plans must be documented and must be communicated to all contractor employees. Furthermore, to ensure that the objectives remain relevant, they must be reviewed on a quarterly basis and whenever significant change has taken place on the project (i.e. Changes to activities, scope of work, operating conditions, etc.).

Performance reviews must be carried out at quarterly intervals to assess and document performance against these personal or team objectives.

If a reward or incentive scheme is introduced, it must be designed in such a manner that health and safety performance is not compromised in order to maximise financial reward.

11. Resources, Accountabilities and Responsibilities

- a) The Contractor must adequately allocate resources, responsibility and accountability to ensure the effective implementation, maintenance and continual improvement of the contractor's Health and Safety management system on the projects required by Construction regulation Of 2014, regulation 7(2)(c).
- b) For each role that carries health and safety accountability and / or responsibilities (including legislative requirements), a role description detailing the accountability and / or responsibilities must be documented.
- c) All appointments (i.e. the assignment of specific SHE responsibilities to individuals in accordance with legal or project requirements) must be done in writing. Documented proof of each appointment (i.e. a signed appointment letter) must be retained.
- d) Contractor should not discharge any legal responsibilities to employees who are not legally appointed.
- e) The contractor must comply with the requirements of all applicable legislation concerning health and safety related appointments and delegations for the project.
- f) A Organogram specific to the project must be documented and maintained. All roles that carry SHE accountability and / or responsibilities must be included, and all individuals that carry health and safety appointments must be clearly identified.
- g) The provision of dedicated professionals on the project must be appropriate for the nature and scale of the work to be carried out.
- h) The contractor is solely responsible for carrying out the work under the contract whilst having the highest regard for the health and safety of all persons on the project site(s).

- i) Health and safety is the responsibility of each and every individual on the project site(s), but in particular, it is the responsibility of the contractor's management team who must set the tone.
- j) Visible commitment is essential to providing and maintaining a safe workplace. The contractor's managers and supervisors at all levels must demonstrate their commitment and support by adopting a risk management approach to all health and safety issues. These individuals must consistently take immediate and firm action to address violations of health and safety rules, and must actively participate in day to day activities with the objective of preventing harm.
- k) The contractor's management representatives are responsible and accountable for health and safety performance on the project. Key responsibilities include the following:
 - Preparing, implementing and maintaining a risk-based Health and Safety Management Plan specific to the work that will be carried out (refer to Section 5);
 - Establishing, implementing and maintaining health and safety programmes and procedures to ensure that all work is carried out in compliance with the requirements of this specification, the contract, and all applicable legislation;
 - Establishing, implementing and maintaining effective hazard identification and risk management processes and procedures to ensure that all reasonably foreseeable hazards are controlled in order to minimise risk (refer to Section 7);
 - Providing the resources necessary to meet the requirements of this specification (refer to Section 10);
 - Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety, and that these responsibilities are clearly communicated and understood (refer to Section 10);
 - Establishing, implementing and maintaining a system for ongoing training and assessment of skills and competence (refer to Section 11);
 - Establishing, implementing and maintaining procedures to ensure that only qualified and competent personnel are permitted to work on the project site(s) (refer to Section 11);
 - Establishing, implementing and maintaining effective communication and consultative processes concerning health and safety for the duration of the contract (refer to Section 12);
 - Maintaining operational control for the protection of all persons on the project site(s) as well as the public (refer to Section 14);
 - Establishing, implementing and maintaining effective emergency preparedness and response procedures (refer to Section 15);

- Establishing, implementing and maintaining effective management of change processes and procedures (refer to Section 16);
 - Establishing, implementing and maintaining effective incident reporting and investigation processes and procedures (refer to Section 19);
 - Establishing, implementing and maintaining effective auditing and inspection processes and procedures (refer to Section 21); and
 - Formally reviewing the contractor's Health and Safety Management System annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements (refer to Section 22).
- l) All costs associated with meeting these responsibilities shall be borne by the contractor.
- m) Any cost associated with any work stoppage due to non-compliance with a health and safety requirement shall be for the contractor's account.

11.1 Contractor Construction Manager

The Contractor must appoint a competent Construction Manager who shall be responsible for the successful and safe completion of all work to be carried out by the contractor as required by the Construction regulations of 2014, regulation 8(1).

Competency/ Training

- Registered with SACPCMP as a Professional Construction Manager
- IRCON
- Legal Liability
- Hazard Identification and Risk Assessment(HIRA)

The Contractor's Project Manager shall be responsible for:

- Ensuring that a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety on the project is in place and is communicated to all contractor and sub-contractor employees;
- Ensuring that all applicable legal and project health and safety requirements are identified and complied with at all times;
- Ensuring that effective hazard identification and risk management processes are established and implemented for all work to be carried out by the contractor;
- Participating in the Baseline Risk Assessment for the contractor's scope of work (prior to site establishment);
- Participating in (and approving) all Task-Based Risk Assessments conducted for the work to be carried out by the contractor;
- Driving the achievement of agreed health and safety objectives;

- Ensuring that the necessary resources are made available for the effective implementation of the contractor's Health and Safety Management Plan;
- Ensuring that all work is adequately and competently supervised;
- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety (assigned in writing), and that these responsibilities are clearly communicated and understood;
- Ensuring as far as is reasonably practicable that each contractor and sub-contractor employee is competent to perform his role, and has received appropriate workplace health and safety training and instruction;
- Managing all appointed sub-contractors with regard to health and safety performance;
- Establishing and maintaining effective communication and consultative processes to ensure that all contractor and sub-contractor employees are kept up to date with regard to health and safety information (e.g. Incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.) And that feedback is provided promptly regarding issues and / or concerns raised;
- Participating in the project's Visible Felt Leadership (VFL) programme;
- Chairing monthly Contractor Health and Safety Meetings and attending monthly Site Health and Safety Meetings;
- Implementing programmes that encourage continual improvement and providing recognition for suggestions made by contractor and sub-contractor employees;
- Implementing the contractor's Health and Safety Management Plan and associated Safe Work Procedures;
- Acting consistently and strictly against any contractor or sub-contractor employee who transgresses a health and safety rule or requirement;
- Ensuring that an effective management of change process is in place;
- Implementing, testing and maintaining an effective Emergency Response Plan for all contractor and sub-contractor activities, and ensuring that the plan is adequately resourced;
- Ensuring that workplace exposure of contractor and sub-contractor employees to hazardous substances or agents is measured and monitored to determine the effectiveness of controls and compliance with legal (and project) requirements;
- Ensuring that all incidents are reported without delay and are investigated thoroughly;
- Participating in investigations into significant incidents;
- Ensuring that accurate health and safety statistics are maintained, and that health and safety performance reports are compiled as required;

- Providing the necessary resources for regular health and safety audits and inspections to be conducted, and supporting the auditing process;
- Participating in health and safety audits, and carrying out workplace inspections;
- Ensuring that corrective actions (arising from incident investigations, audits, inspections, etc.) Are implemented, and that adequate resources are provided for this purpose; and
- Participating in an annual review of the contractor's Health and Safety Management System.

11.2 Contractor Health and Safety Officers

The contractor must appoint a full-time Health and Safety Officer for the duration of the contract who is registered with the SACPCMP (The South African Council for Project Construction Management Professions) as Construction Health and Safety Officer or Manager **per site (No sharing of Health and Safety officer).**

The Health and Safety Officer must be on site when work commences at the start of the day and must remain on site until all activities for that day (including the activities of sub-contractors) have been completed. A Health and Safety Officer must be present during all shifts, so if work is carried out over more than one shift per day, the contractor must make provision for an additional Health and Safety Officer.

Each Contractor Health and Safety Officer shall be responsible for:

- Reviewing all applicable legal and project health and safety requirements and providing guidance to contractor and sub-contractor personnel (particularly the contractor's Project Manager) to help ensure compliance at all times;
- Assisting with the implementation of effective hazard identification and risk management processes for all work to be carried out by the contractor;
- Participating in the Baseline Risk Assessment for the contractor's scope of work (prior to site establishment) and ensuring that identified control measures are implemented;
- Participating in all Task-Based Risk Assessments conducted for the work to be carried out by the contractor and ensuring that identified control measures are implemented;
- Conducting contractor health and safety induction training for all contractor and sub-contractor personnel;
- Compiling and maintaining all health and safety related documents and records required of the contractor;
- Communicating relevant health and safety information to contractor and sub-contractor personnel (e.g. Incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.);

- Carrying out Safety Observations and Coaching (one per day);
- Evaluating (on a daily basis) the content of the Daily Safe Task Instructions (DSTI's) conducted by the contractor's appointed supervisors, and attending at least one DSTI each day;
- Attending monthly Contractor and Site Health and Safety Meetings;
- Assisting with the implementation of the contractor's Health and Safety Management Plan and associated Safe Work Procedures;
- Carrying out Planned Task Observations on an ad hoc basis;
- Assisting with the implementation, testing and maintenance of an effective Emergency Response Plan for all contractor and sub-contractor activities;
- Responding to workplace incidents (as appropriate);
- Participating in incident investigations;
- Maintaining accurate health and safety statistics (for the contractor and all sub-contractors), and compiling health and safety performance reports as required;
- Auditing the health and safety management system and workplace activities of the contractor and each sub-contractor on a monthly basis to assess compliance with the project health and safety requirements; and
- Tracking and reporting on the implementation of corrective actions (arising from incident investigations, audits, inspections, etc.).

The contractor must ensure that each Health and Safety Officer is adequately equipped to enable him to perform his duties effectively. Each Health and Safety Officer must be provided with the following:

- A computer with access to all necessary systems, including access to e-mail and the internet;
- A mobile telephone on contract or with adequate pre-paid airtime; and
- A vehicle where required or instructed by a nominated project management representative (depending on the size and location of the project site(s)).

A Health and Safety Officer must over and above the SACPCMP registration as an Officer or Manager; be computer literate, fluent in English, and must have the following minimum qualifications, training and experience:

- At least 5 years' experience as a Health and Safety Officer on construction projects;
- Minimum NQF level 6 National Diploma Health and Safety or Environmental Health
- Training on Hazard Identification and Risk Assessment (HIRA), Incident Investigation, Construction Regulation, Legal Liability training course with accredited health and safety service provider as a minimum qualification ;

- Experience and appropriate training with regard to implementing and maintaining a health and safety management system compliant with national legislation or an international standard;
- Experience and appropriate training with regard to construction related hazard identification and risk management processes;
- Competence, experience and relevant training with regard to incident investigation procedures and causation analysis;
- Health and safety auditing experience and training;
- A valid First Aid certificate of competency;
- Fire prevention and protection training; and
- A valid Driving Licence (light motor vehicle).
- Registered as a Health and Safety Officer or Health and Safety Manager with SACPCMP depending on the size of the project and on the risk.

Before placing a Health and Safety Officer on the project site(s), the contractor must forward a copy of the person's CV to the nominated project management representative or to the Programme Health and Safety manager for review and acceptance. A proposed candidate may be rejected should he not meet the experience and / or qualification requirements, or due to poor work performance on previous projects.

11.3 Contractor Supervisors

The contractor must ensure that all project and / or construction works are supervised at all times by an adequate number of qualified, competent and appointed supervisors who have experience in the type of work being carried out as required by Construction regulations of 2014, regulation 8(7).

No work may be carried out without an appointed supervisor being physically present in the work area and daily safety task instruction.

Each Contractor Supervisor shall be responsible for:

- Ensuring that all work carried out under his supervision is done so in accordance with the requirements of all applicable legislation, rules, standards, specifications, plans and procedures;
- Participating in Baseline and Task-Based Risk Assessments;
- Ensuring that all employees under his supervision are made aware of the hazards, risk scenarios and control measures identified in relevant risk assessments;
- Ensuring that the control measures stipulated in all relevant risk assessments are in place and are implemented fully for all work carried out under his supervision;

- Ensuring that all employees under his supervision conduct pre-task hazard assessments when necessary;
- Driving the achievement of health and safety objectives set for his team;
- Ensuring that the necessary written appointments are in place for each employee under his supervision (e.g. First aider, mobile crane operator, etc.);
- Ensuring that all employees under his supervision attend all required training;
- Ensuring that no employee carries out any work that he is not competent to perform or has not been appointed to perform;
- Identifying training needs within his team;
- Carrying out Safety Observations and Coaching (one per day);
- Conducting a weekly Toolbox Talk with his team;
- Leading a Daily Safe Task Instruction discussion with his team;
- Attending Health and Safety Meetings as required;
- Maintaining a Health and Safety Management Information Notice Board in the work area for which he is responsible;
- Recording, on a daily basis, a description of the day's activities as well as a breakdown (by occupation) of the personnel on site under his supervision (e.g. 5 bricklayers, 2 carpenters, 3 welders, 22 general workers, and 1 supervisor);
- Ensuring that all Safe Work Procedures applicable to the work carried out under his supervision are adhered to and are fully implemented;
- Maintaining discipline and taking the necessary action whenever an employee under his supervision does not adhere to a rule or requirement;
- Carrying out Planned Task Observations (one per day);
- Ensuring that emergency response procedures are understood by all employees under his supervision and that these procedures are followed in the event of an emergency;
- Reporting all incidents immediately, participating in incident investigations, communicating the lessons learnt to all employees under his supervision, and implementing corrective actions where required; and
- Carrying out workplace health and safety inspections.

Each supervisor must accept these responsibilities in writing as part of his appointment.

Each supervisor must be equipped with a mobile telephone to ensure that effective communication can be maintained for the duration of the contract.

11.4 Health and Safety Representatives

The team of employees on site must have a health and safety representative deployed on the project site(s), a Health and Safety Representative must be elected and appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor must ensure that an adequate number of Health and Safety Representatives (at a minimum ratio of one Health and Safety Representative per 50 employees) are elected and appointed to effectively represent all site personnel as required by the OHS Act 85 of 1993, section 17 - 18.

Each Health and Safety Representative must attend an accredited training course for health and safety representatives. The cost of this training shall be for the contractor's account.

The contractor must make the necessary allowances for the Health and Safety Representatives to carry out their duties as specified in the applicable legislation.

The contractor must ensure that an appropriate sticker is affixed to the safety helmet of each Health and Safety Representative for identification purposes.

11.5 First Aiders

If 10 or more employees are deployed on the project site(s), at least one trained and competent First Aider must be in place and must be appointed. Taking into consideration the number of employees deployed, the geographical area in which the work is taking place, the different work disciplines, and the shift pattern (if applicable), the contractor must ensure that an adequate number of First Aiders (at a minimum ratio of one First Aider per 50 employees) are in place and have been appointed to administer first aid treatment should this be required.

First Aid training must be done through an accredited training institution. The cost of this training shall be for the contractor's account.

The contractor must ensure that an appropriate sticker is affixed to the safety helmet of each First Aider for identification purposes.

11.6 Duties of Principal Contractor

As per the Construction regulations of 2014, regulation 7(1) – (8) a Principal Contractor and Contractor must:

- Provide and demonstrate to the client a suitable, sufficiently documented and coherent site specific health and safety plan, based on the client's documented health and safety specifications contemplated in CR 5(1)(b), which plan must be applied from the date of

commencement of and for the duration of the construction work and which must be reviewed and updated by the principal contractor as work progresses;

- Open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, which must be made available on request to an inspector, the client, the client's agent or a contractor; and
- On appointing any other contractor, in order to ensure compliance with the provisions of the Act-
- Provide contractors who are tendering to perform construction work for the principal contractor, with the relevant sections of the health and safety specifications contemplated in CR regulation 5(1)(b) pertaining to the construction work which has to be performed;
- Ensure that potential contractors submitting tenders have made sufficient provision for health and safety measures during the construction process;
- Ensure that no contractor is appointed to perform construction work unless the principal contractor is reasonably satisfied that the contractor that he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely;
- Ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993;
- Appoint each contractor in writing for the part of the project on the construction site
- Ensure that a copy of his or her health and safety plan contemplated in paragraph (a),
- As well as the contractor's health and safety plan contemplated in CR 7 sub-regulation (2)(a), is available on request to an employee, an inspector, a contractor, the client or the client's agent;
- Hand over a consolidated health and safety file to the client upon completion of the construction work and must, in addition to the documentation referred to in CR 7 sub-regulation (2)(b), include a record of all drawings, designs, materials used and other similar information concerning the completed structure;
- In addition to the documentation required in the health and safety file in terms of paragraph (c)(v) and CR 7 sub-regulation (2)(b), include and make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being principal contractor, the agreements between the parties and the type of work being done; and
- Ensure that all his or her employees have a valid medical certificate of fitness specific to the Construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

11.7 Duties of Contractor (Sub-Contractor)

A contractor must -

- Prior to performing any construction work provide and demonstrate to the principal contractor a suitable and sufficiently documented health and safety plan, based on the relevant sections of the client's health and safety specification) and provided by the principal contractor), which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the contractor as work progresses;
- Open and keep on site a health and safety file, which must include all documentation required and must be made available on request to an inspector, the client, the client's agent or the principal contractor;
- Before appointing another contractor to perform construction work be reasonably satisfied that the contractor that he or she intends to appoint has the necessary competencies and resources to perform the construction work safely;
- Co-operate with the principal contractor as far as is necessary to enable each of them to comply with the provisions of the Act; and
- As far as is reasonably practicable, promptly provide the principal contractor with any information which might affect the health and safety of any person at work carrying out construction work on the site, any person who might be affected by the work of such a person at work, or which might justify a review of the health and safety plan.

Where a contractor appoints another contractor to perform construction work, the duties that apply to the principal contractor apply to the contractor as if he or she were the principal contractor.

A contractor must take reasonable steps to ensure co-operation between all contractors appointed by the principal contractor to enable each of those contractors to comply with these Regulations.

No contractor may allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

A contractor must ensure that all visitors to a construction site undergo health and safety induction training pertaining to the hazards prevalent on the site and must ensure that such visitors have the necessary personal protective equipment.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor;

A contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

11.8 Management and supervision of Construction work

A principal contractor must in writing appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

A principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: Provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of this regulation.

Where the construction manager has not appointed assistant construction managers as in the opinion of an inspector, a sufficient number of such assistant construction managers have not been appointed, that inspector must direct the construction manager in writing to appoint the number of assistant construction managers indicated by the inspector,

No construction manager appointed may manage any construction work on or in any construction site other than the site in respect of which he or she has been appointed.

A contractor must, after consultation with the client and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time or part-time construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site: Provided that, where the question arises as to whether a construction health and safety officer is necessary, the decision of an inspector is decisive.

No contractor may appoint a construction health and safety officer to assist in the control of health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered with a statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor.

A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of any such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties in terms of this regulation.

No construction supervisor appointed under may supervise any construction work on or in any construction site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated on all the relevant construction sites, the appointed construction supervisor may supervise more than one site.

11.9 Operational legal appointment letters

The contractor must ensure other legal appointment letter are compiled and be submitted with the Contractor compliance plan, below is some appointment required as per the legislation, the appointment letters varies based on the project;

- OHS Act Sec 16(2)
- Sec 17,18,19 SHE Representative
- GSR 3(4) First Aider
- GAR 9(2) Incident investigator
- GMR 2(1) Supervisor of machinery
- GMR 2(7) Assistant Supervisor of machinery
- CR 4(1)(c) Principal Contractor
- CR 8(1) Construction Manager
- CR 8(2) Assistant Construction Manager
- CR 8(7) Construction Supervisor
- CR 8(8) Assistant Supervisor of construction work
- CR 8(5) Construction Health and Safety Officer
- CR 9(1) Construction Risk Assessor
- CR 10(1)(a),(b) Fall protection plan
- Developer
- CR 10(2)(d) Inspector of fall arrest system
- CR 14(2) Scaffolding Supervisor

- DMR 17(2),18 Inspector of lifting machinery
- CR17(8) Material hoist Inspector
- CR 19(2)(g)(i) Explosive powered tool issuer
- CR 23(1)(k) Construction vehicle and mobile plant Inspector
- CR 24(d) Temporary Electrical Installation Controller
- CR 24(e) Temporary Electrical Installation Inspector
- CR 28(a) Stacking and storage Supervisor
- CR 29(h) Fire extinguisher inspector
- EMR 8(8) Appointment for electrical installation in hazardous location- Master Electrician (Inspector)
- EIR 9 Installation Electrician appointment

12. Competence, Training and Awareness

Each employee (including sub-contractor employees) must be suitably trained and competent, and must understand the health and safety hazards, risks and control measures associated with his work as required by the OHS Act 85 of 1993,(14)

The contractor must implement systems and procedures to ensure that:

- The necessary competencies required by employees are identified (by occupation), along with selection, placement and any training requirements;

Please Note: Specific competency profiles and selection criteria (fitness for work) must be developed for all roles where significant health or safety risk exists.

Please Note: A formal training needs analysis must be carried out based on the competency profiles and a training matrix must be developed for the project.

Roles requiring technical certification, registration or licensing are identified and documented, and these roles are filled only by suitably qualified personnel;

- Minimum core health and safety skills required by employees in leadership and supervisory roles are identified and suitable training is provided including hazard identification and risk assessment, incident investigation, and health and safety interactions (i.e. Observation and coaching techniques);
- Competency-based training is provided and it includes operational controls (procedures and work instructions), management of change, and emergency response;
- All employees hold and maintain the required competencies (including appropriate qualifications, certificates and licences) and are under competent supervision;
- A site-specific induction and orientation programme that highlights health and safety requirements, procedures, and significant hazards, risks and associated control

measures is in place for all new employees and visitors (understanding must be assessed);

- Personnel are trained and / or briefed on new or amended standards, rules, safe work procedures, risk assessments, etc.;
- Refresher training is carried out as required (e.g. Re-induction following an absence from site);
- Records of education, qualifications, training, experience and competency assessments are maintained on site for all employees; and
- The effectiveness of training is reviewed and evaluated.

Prior to the commencement of any work, including mobilisation and site set-up activities, the contractor must provide, to the satisfaction of the nominated project management representative, current documentation verifying that the contractor's employees, as well as the employees of any appointed sub-contractors, are competent and have the necessary qualifications, certificates, licences, job skills, training and experience (as required by this specification and applicable legislation) to safely carry out the work that is to be performed.

The Contractor and sub-contractor must ensure that the following training takes place:

- Health and safety induction training pertaining to the hazards prevalent on the site at the time of entry
- Training for all persons required to erect, move or dismantle temporary works structures and instruction to perform those operations safely
- Training of employees working from a fall risk position
- Training to work or to be suspended on a platform which includes at least:
 - how to access and egress the suspended platform safely;
 - how to correctly operate the controls and safety devices of the equipment;
 - information on the dangers related to the misuse of safety devices; and
 - information on the procedures to be followed in the case of-
 - an emergency;
 - the malfunctioning of equipment; and
 - the discovery of a suspected defect in the equipment;
 - an instructions on the proper use of body harnesses.
- Training for all operators of construction vehicles and mobile plant.

A contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor;.

Please Note: Only certified copies of certificates, licences, etc. Will be accepted.

An Employee Profile (dossier) must be completed for each employee who will be performing work on site. All documentation pertaining to an employee's competence (i.e. certified copies of qualifications, certificates and licences as well as proof of job skills, training and experience) must be maintained in this dossier.

If it is determined through observation that an employee is not yet competent to carry out a particular task in a safe and capable manner, the employee will be required to cease work immediately and must either be reassigned or be retrained at the contractor's expense.

The contractor must provide proof that the training institutions and trainers that are used are appropriately registered with a governing authority (a trainer's registration certificate or registration number alone will not be adequate). The following must be made available for verification purposes:

- Proof of registration of the training institution including the training programmes that the institution is accredited to provide; and
- For each trainer, proof of competency and registration for the specific training programmes presented.

Foreign qualifications held by employees in health and safety critical roles must be verified against the requirements of local legislation.

12.1 Induction Training

Each employee must attend all mandatory Induction Training applicable to the project. No employee will be permitted to enter any project work site until he has attended this training. Each employee must carry proof that he has completed the induction training and may be removed from a site if such proof cannot be produced on request, this as required by the Construction regulations of 2014, regulation 7(5).

Furthermore, employees must attend (where applicable) Area-Specific Training pertaining to the particular hazards identified in the area(s) where the employees will be working. No employee will be permitted to enter a work area until he has attended the relevant area-specific training.

All visitors must receive a visitor induction briefing before entering any project work site. However, this induction does not permit a visitor to enter a site unescorted. Visitors must be accompanied at all times by an appropriately senior employee who has been fully inducted.

12.2 Specific Training and Competency Requirements

The following specific training and competency requirements must be complied with.

Please Note: An employee must be trained, assessed and found competent before he will be given authorisation to perform certain tasks or fill certain roles.

Table 11-1: Specific Training and Competency Requirements

Training	Applicable To
Health and Safety Induction	All employees
Safety Observations and Coaching (Safety Interactions)	All employees
Risk Assessment*	All managers and supervisors
Incident Investigation*	All managers and supervisors
Safety Leadership	All managers and supervisors
Legal Liability*	All managers and supervisors
Health and Safety Rep*	All elected Health and Safety Representatives
First Aid Levels 1, 2 and 3*	All nominated First Aiders
Fire Fighting (Fire Extinguisher Use)*	All employees
Working at Height*	All employees using a safety harness
Confined Spaces	All Confined Space Entry Officers and Standby Persons
Permit to Work	All Authorised Persons (i.e. Permit issuers) and all Applicants (i.e. Employees who will be applying for permits)
Isolation and Lockout	All Authorised Persons (i.e. Persons who authorise work that requires Isolation and Lockout), all Isolation Officers, and all Applicants (i.e. Persons who request permission to work on systems or equipment requiring Isolation and Lockout)
Defensive Driving*	All drivers of light motor vehicles (for work purposes)
Gravel Road Driving*	All drivers of light motor vehicles driven on gravel roads (for work purposes)
Off Road Driving*	All drivers of four-wheel drive vehicles driven off road (for work purposes)
Mobile Equipment Site Licence	All mobile equipment operators
Confined Space Entry	All Employees
Working with Asbestos	Approved Asbestos Contractor

Training requirements marked with an * must be arranged through accredited external training institutions by the contractor.

13. Communication, Participation and Consultation

The contractor must establish and maintain effective communication and consultative processes (allowing for a two-way dialogue) for the duration of the project to ensure that:

- All personnel are kept up to date with regard to health and safety matters (e.g. Hazards and risks, incidents and lessons learnt, leading practices, performance against objectives, etc.);
- General health and safety awareness levels are kept high;
- Prompt feedback is given to personnel with regard to health and safety issues or concerns that they raise; and
- Relevant, and often critical, health and safety related information (e.g. Design changes, instructions, reporting of hazardous conditions or situations, etc.) Is effectively disseminated.

This must be achieved as follows:

13.1 Toolbox Talks

The contractor must prepare a Toolbox Talk on a weekly basis and must share it with all personnel for which the contractor is responsible (including all sub-contractors). Toolbox Talks must address health and safety issues that are relevant to the work performed on the project site(s) and must include information and / or knowledge sharing, lessons learnt from incidents that have occurred, information concerning specific hazards and / or risks and control measures to prevent injury, etc.

Attendance records must be kept and maintained in the contractor's health and safety file.

13.2 Daily Safe Task Instructions (DSTI's)

A Daily Safe Task Instruction (DSTI) is a pre-start discussion amongst the members of a work team, led by the appointed supervisor, aimed at anticipating hazards and potential risks associated with the activities planned for the day or shift, and ensuring that the necessary control measures are in place to prevent incidents.

At the start of each day or shift, prior to the start of any work, each appointed supervisor must inspect the work area for which he is responsible and ensure that it is safe. He must then conduct a DSTI with his work team specifically concerning the tasks that they will be performing during the course of the day or shift. The relevant Task-Based Risk Assessment for the activity must be used as the basis for the discussion. The correct work method must be reiterated and the identified hazards, risks and control measures must be discussed with the team (each team member must be given the opportunity to contribute and participate in the discussion).

Any team member arriving late must first be taken through the information that was discussed (work method, hazards, risks and control measures) before being permitted to start working. If the work method changes after activities have already begun, the DSTI must be revisited and updated with the team, and the changes must be signed off by the relevant Contractor Health and Safety Officer.

Every member of the work team must sign the DSTI attendance register. The attendance records must be kept and maintained in the contractor's health and safety file.

The contractor's Health and Safety Officer must evaluate the content of the DSTI's daily to ensure that they are task-specific. Furthermore, the Health and Safety Officer must attend at least one DSTI per day prior to the start of work. The Health and Safety Officer may not lead the DSTI discussions, as this is the responsibility of the appointed supervisor.

13.3 Suggestions

All employees must be encouraged to submit suggestions to enhance health and safety management on the project site(s). A process must be in place for documenting, evaluating, implementing (as appropriate), archiving and recognising the improvement ideas.

13.4 Meetings

13.4.1 Contractor health and safety (OHS Act Section 19)

The contractor must schedule and consistently hold monthly health and safety meetings. These meetings must be chaired by the contractor's Project Manager and the following persons must be in attendance:

- Contractor and sub-contractor management representatives;
- Contractor and sub-contractor supervisors;
- Contractor and sub-contractor appointed Health and Safety (Employee) Representatives;
- Contractor and sub-contractor Health and Safety Officers; and
- The relevant Project Health and Safety Advisor.
- The meeting must address the following as a minimum:
 - New incidents for the period and corrective actions taken or to be taken;
 - Implementation status of outstanding actions associated with previous incidents;
 - SOC's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
 - Results of any audits, inspections (including H&S Rep inspections) or site visits carried out;

- A look ahead to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. That are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

The contractor must compile minutes of each meeting and attendance records must be kept. These records must be maintained in the contractor's health and safety file.

13.4.2 Site Meetings

In addition to the Contractor Meetings, the Project will schedule monthly Site Meetings that the contractor must attend. These meetings will be chaired by the Contract Manager and the following persons must be in attendance:

- Contractor management representatives;
- Contractor Health and Safety Officers;
- Contractor Environmental Officer
- Contractor Quality Management
- The Project Health and Safety Manager;
- Project Health and Safety Advisors; and
- Client representatives (ad hoc).

The meeting will address the following as a minimum:

- Feedback from the contractor concerning health and safety performance for the period;
- New incidents for the period and corrective actions taken or to be taken;
- Implementation status of outstanding actions associated with previous incidents;
- SOC's, PTO's and DSTI's carried out for the period and action required to correct trends identified;
- Results of any audits, inspections or site visits carried out;
- A look ahead to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Risk Assessments, Safe Work Procedures, etc. That are outstanding or due for review (as well as the quality of these documents); and
- Any other health and safety related matter.

13.5 Performance Boards

The contractor must provide and maintain a Performance Board to be approved by the nominated project management representative and to be positioned at the entrance to the contractor's site office area. This board must display the following information as a minimum:

- The contractor's logo;
- Current manpower (heads) on site;
- Man-hours worked for the current month and project to date;
- Lost Time Injury Frequency Rate (LTIFR);
- Dates of last injuries (FAI, MTI and LTI);
- Number of hours worked since the last recorded LTI; and
- Names and contact telephone numbers for the appointed Project Manager and the Health and Safety Officers.

13.6 Management Information Notice Boards

The contractor must provide, for each appointed supervisor, a portable Health and Safety Management Information Notice Board to be placed in the work area. The following information and documentation, as a minimum, must be posted on these boards:

- The relevant Method Statements, Risk Assessments and Safe Work Procedures for the work that is being performed that day;
- The DSTI for the day;
- The most recent Toolbox Talk;
- Where applicable, all required permits and permissions for the work that is being performed;
- Material Safety Data Sheets (MSDS's) for any chemical substances being used;
- The health and safety objectives for the work team;
- Details of the last incident involving the work team;
- The most recent weekly health and safety report (refer to Section 21);
- Emergency procedures;
- A site plan indicating evacuation routes and emergency assembly point locations;
- First Aider names and contact telephone numbers; and
- The appointed supervisor's contact details.
- Involvement (Other)

The participation of all contractor (and sub-contractor) employees in activities that promote improvements in health and safety performance must be encouraged. In particular, this must include their appropriate involvement in:

- Hazard identification, risk analysis and determining control measures;
- Incident investigation; and
- Reviewing policy and objectives.

All regulations, instructions, signage, etc. Must be communicated in a language understood by all employees.

Health and safety personnel must be actively involved in planning activities so that they have the opportunity to highlight hazards and risks associated with upcoming work well in advance to ensure sufficient time to arrange and / or implement the necessary control measures.

14. Documentation and Document Control

The contractor must develop and maintain project-specific documentation required for the effective management of health and safety on the project.

All documents related to the contractor's health and safety management system must be effectively controlled.

The document control process must:

- Provide for the review, revision and version control of documents;
- Uniquely identify documents (as appropriate) to control their use and function;
- Require approval of the documents for adequacy prior to issue;
- Clearly identify changes and record the status of any revisions to documents; and
- Provide for the effective distribution of documents to, and where necessary the timely removal of obsolete documents from, all points of issue and use.

The contractor must establish a process for the systematic control of health and safety records and related data. Controls must be in place for the creation, receipt, secure storage, maintenance, accessing, use and disposal of such records and data.

Each record must be legible, identifiable and traceable, and must contain adequate information and data for its purpose.

The confidentiality and security of records and data must be maintained in a manner that is appropriate for the nature of the records and data, and in accordance with any applicable data or privacy protection legislation.

Personal information originating from medical surveillance and occupational hygiene monitoring must be reported in a form that respects the privacy of the individual, but enables management to fulfil their duty of care obligations to employees. The names of individuals must not be disclosed without their written authorisation.

Retention periods for all records (based on legal requirements and / or knowledge preservation considerations) must be established and documented in accordance with applicable legislation.

14.1 Contractor compliance File Requirements

The contractor must compile and maintain a file containing all necessary compliance related documentation. The client should provide construction work permit and to be kept on site at all times. The contents of the file will be audited by a Project Health and Safety Client Representative on a monthly basis.

Required documentation includes, but is not limited to, the following:

- Letter of Good Standing from the Workman's Compensation Commissioner (where applicable) must have dol stamp;
- Proof of Public Liability Insurance;
- Scope of Work under the contract;
- List of Contacts and their Telephone Numbers;
- Health and Safety Policy;
- Health & Safety Management Plan;
- Legal Register;
- Organisational Chart for the project;
- Appointment Letters (appointment of the contracting company, and appointments for all persons with health and safety related responsibilities);
- Notifications to the relevant authorities that construction work is in progress;
- Baseline and Task-Based Risk Assessments;
- Health and Safety Objectives, and associated Improvement Action Plans;
- Safe Work Procedures, Work Instructions and Work Method Statements;
- Planned Task Observations;
- Fall Protection Plan (for work at height);
- A dossier (Equipment Profile) for each fuel-driven vehicle or machine;

- Inspection Registers, Forms and Checklists (e.g. For portable electrical tools, ladders, safety harnesses, light vehicles, mobile equipment, lifting equipment and lifting tackle, first aid boxes, fire extinguishers, etc.);
- PPE Issue Registers;
- Material Safety Data Sheets;
- Emergency Response Procedures;
- Incident Records;
- A dossier (Employee Profile) for each employee containing:
 - a. A copy of the employee's Identity Document or Passport;
 - b. Certificate of Fitness (Pre-Employment Medical Examination);
 - c. Proof of Induction Training;
 - d. Other Training Records;
 - e. Copies of Qualification Certificates and / or Certificates of Competency; and
 - f. Copies of Licences;
- Meeting Minutes;
- Health and Safety Performance Reports;
- Copies of Inspection and Audit Reports; and
- Daily Safe Task Instructions (DSTI's) and Toolbox Talks.

The Principal contractor must ensure that an equivalent file is compiled and maintained by each appointed sub-contractor.

15. Construction Work Permit

The Transnet appointed Construction Health and Safety Agent will apply for and obtain the Construction Work Permit prior to the commencement of any construction work on the project. The application will be made by submitting the required documentation together with proof of payment as per Regulation Gazette No. 11465 dated 29 July 2022 to the Department of Employment and Labour (DoEL). A copy of the permit, upon receipt from DoEL, will be issued by Transnet to the Principal Contractor. The Principal Contractor must conspicuously display the permit at the entrance to the site for which that number is assigned. The Principal Contractor must keep a copy of the permit in the health and safety file for inspection.

NB: No construction work must commence or carried out before the CWP and number has been issued and assigned.

16. Operational Control

For project operations and activities, the contractor shall implement and maintain:

- Operational controls, as applicable to the organization and its activities;

- The organization shall integrate those operational controls into its overall OH&S Management System;
- Controls related to purchased goods, equipment and services;
- Controls related to contractors and other visitors to the workplace;
- Documented procedures, to cover situations where their absence could lead to deviations from the OH&S policy and the objectives;
- Stipulated operating criteria where their absence could lead to deviations from the OH&S policy and objectives.

16.1 Safe Work Procedures

The contractor must develop, document and implement Safe Work Procedures for all activities involving significant health or safety risk. These procedures must detail the control measures required to effectively manage the health and safety risks associated with the work activities.

Each Safe Work Procedure must be consistent with the Task-Based Risk Assessment completed for the activity.

Every person engaged in an activity for which a Safe Work Procedure has been developed must receive suitable training on the procedure.

Furthermore, the contractor must develop, document, communicate and implement formal procedures, work instructions and / or programmes for the operation, maintenance, inspection and testing of all plant and equipment (including protective systems and devices) brought onto the project site(s).

16.2 Management Participation and involvement CR 8

16.2.1 Visible Felt Leadership (VFL) and Safety Observations and Coaching (SOC's)

The Principal Contractor's supervisory personnel (i.e. Managers and supervisors) must participate in the project's Visible Felt Leadership (VFL) programme. Each manager and each supervisor must, as part of his normal duties, perform Safety Observations and Coaching (SOC's). The intention of this programme is to encourage interaction between supervisors and workers concerning health and safety matters in order to:

- Reinforce behaviours consistent with standards, procedures and management system requirements;
- Correct behaviours inconsistent with standards, procedures and management system requirements; and

- Verify whether employees have the necessary training, certification, equipment, etc.

16.2.2 Planned Task Observations

All contractor, management supervisors must perform Planned Task Observations (PTO's) to verify that the control measures that have been identified in Safe Work Procedures (and associated Risk Assessments) are being adhered to and are being properly implemented, and to provide guidance where deviations are noted.

Each supervisor must complete at least one PTO per day involving one or more employees in his work team.

When an unsafe act or condition is identified, the supervisor must coach the work team to correct the act or condition in line with the Safe Work Procedure.

Where valid changes to the work method are identified, the supervisor must ensure that the Safe Work Procedure and Risk Assessment are updated to reflect the current practice.

Project representatives will carry out PTO's on contractor employees on an ad hoc basis. Should deviations from the contractor's Safe Work Procedures be observed, the work may be stopped until these deviations are rectified.

16.3 General Rules of Conduct

All persons are required to conform to the following rules of conduct while on the site.

The following acts are prohibited:

- Engaging in practical jokes, horseplay, scuffling, wrestling, fighting, or gambling;
- Assault, intimidation, or abuse of any person;
- Insubordination towards any supervisor or manager;
- Refusing to carry out a reasonable and lawful instruction concerning health and safety;
- Entry into any restricted area (including barricaded areas), unless authorised to do so by the responsible person;
- Unauthorised use / operation of any equipment or machinery;
- Negligently, carelessly or wilfully causing damage to any property;
- Destroying or tampering with safety devices, signs, or signals;
- The use of water from fire hydrants or hose reels for any purpose other than extinguishing a fire;
- The wilful and unnecessary discharging of fire extinguishers;
- Refusing to give evidence or deliberately making false statements during incident investigations;
- Bringing alcohol, drugs, or any other intoxicating substance onto site;

- Bringing a firearm, ammunition, or any other offensive weapon onto site;
- Bringing animals onto site;
- Running, except in an emergency;
- The use of an ipod (or similar) whilst working on site;
- Sleeping on the job;
- Building fires on site, unless in a suitably constructed barbequing facility; and
- Pouring / pumping / flushing any substance (chemical / hydrocarbon / waste water) into a storm water drain, onto bare soil, or into any area where the substance is not effectively contained.

Any of the above actions may result in the temporary or permanent removal of the offending person(s) from site, as well as possible prosecution. The decision of the nominated project management representative shall be final and binding in respect of any dispute that may arise from the interpretation of these requirements.

Transnet will not get involved in contractor disciplinary rules and procedures. The contractor will simply be informed (with reasons) that the offending employee(s) will be denied access to the project site. Once the contractor has been informed, the employee(s) must be removed from the site immediately.

16.4 Site Access

The contractor may not hire any security services for the project site unless authorisation has been obtained in writing from a nominated project management representative.

16.4.1 Access Control

The contractor must comply with all access control, procedures and systems applicable to the project site.

Failure to comply with these requirements will be viewed as a serious safety breach and may result in the permanent removal of the individual(s) / contracting company from site or suspension without payment.

Access will be controlled as follows:

- The access will be strictly controlled and managed
- Contract period access – an access card valid for the full contract period will be issued to an individual once the following requirements have been met:
 - Completion of a pre-employment medical examination;
 - Completion of all required project induction training;

- Completion of special training / licensing if applicable (e.g. Driving/operating Licence); and
- Provision of proof of job / trade-specific qualifications, licences, training, Experience and competency (as required).

Note: No access card will be issued unless proof of identification is provided (i.e. an identity document or a valid passport). For foreign labour, an access card will only be issued if a valid work visa is produced.

Note: A driving licence will not be accepted as proof of identification.

16.4.2 Trespassing

The contractor must ensure that no employee (including sub-contractor employees) trespasses on any land lying beyond the boundaries of the project site.

If instructed by a nominated project management representative to do so, the contractor must remove any employee who fails to comply with this requirement from the project.

The contractor's activities must be confined to the specified construction areas, and access to these areas may only be by means of specified routes.

All required barricading (fencing) must be erected and maintained by the contractor.

16.4.3 Visitors

Visitors (including reps and suppliers) must be advised in advance of the mandatory Personal Protective Equipment (PPE) requirements for the site, and must arrive with all of this PPE.

Upon arrival, all visitors must report to the Security Office where they must sign in.

All visitors must undergo a visitor induction briefing before entering the site.

A visitor access card will be issued to each visitor on conclusion of the induction briefing.

Whilst on site, visitors must be accompanied at all times by an appropriately senior employee who has been inducted fully. The visitor(s) must be met at the Security Office, and when the visit is over, must be escorted back to the Security Office.

When leaving the site, each visitor must return his or her visitor access card to the security personnel posted at the entrance / exit. A visitor will not be permitted to leave the site until he or she produces the access card that was issued.

Note: Visitors are not permitted to perform any work on site.

Note: Any request (typically made by a government official) to carry out a site inspection must be referred to the nominated project management representative. The contractor

must not arrange any such inspection without prior approval from the nominated project management representative.

16.4.4 Alcohol, Drugs and Other Intoxicating Substances

The contractor must ensure that all personnel under his authority do not at any time enter the site or perform any work whilst under the influence of alcohol, a drug, or any other intoxicating substance.

Selling or possessing drugs, alcoholic beverages or any other intoxicating substance on the site is strictly prohibited.

A drugs and alcohol testing program will be implemented. Persons entering the site will be randomly tested. Any person who tests positive for alcohol or drug consumption will be subject to disciplinary action and shall be permanently removed from the site.

Any person have the opportunity to rather report that he/she is under the influence before accessing the project site – in these case the employee may only be send home for the day by the responsible project manager representative but will then be tested for the following five days (each day) on his return to the project site. If it is found that the same person is frequently reporting that he/she is under the influence before even accessing the project site. It shall be the responsibility of the nominated project management representative to take disciplinary action and remove such a person's form the project site.

Should the actions and / or demeanour of an employee suggest possible narcosis or drunkenness, the employee must be removed from the site. This may be done without testing.

Note: All personnel involved in an incident / accident must immediately be subjected to an alcohol test and a drug test as part of the investigation.

16.4.5 Firearms, Ammunition and Offensive Weapons

Firearms, ammunition, and offensive weapons of any kind are strictly prohibited. No person may enter /shall not be permitted to enter the site carrying any such item.

16.4.6 Vehicles

All vehicles brought onto site must meet the safety requirements stipulated in Section 15.6. Each vehicle to be used on site must be inspected and approved by the nominated project management representative before a site access permit will be issued for the vehicle / equipment.

No vehicle shall be permitted to enter the site unless it is duly authorised. Access permits are vehicle-specific and may not be transferred between vehicles.

The contractor must allow any vehicle that is brought onto site (including privately owned vehicles) to be searched at any time while on the premises, or when entering or leaving the premises.

The contractor is solely responsible for the safety and security of all vehicles (including private vehicles) that he brings onto the site.

All road-going vehicles used by the contractor on the site must be roadworthy and registered with the relevant traffic authority.

A vehicle will not be permitted to enter the site in an un-roadworthy condition. Access will be denied if, for example:

- The vehicle has a defective exhaust system;
- A serious oil or fuel leak is evident;
- The vehicle has unsafe bodywork or is carrying an unsafe load;
- The vehicle is fitted with extraneous or non-standard equipment;
- Passengers are not seated properly;
- The vehicle is not fitted with a seat belt for each occupant; or
- The vehicle has any obvious mechanical defect;
- Pre-inspection requirements are not met.

Overloaded vehicles will not be permitted to enter the site.

The driver / operator of any vehicle / mobile equipment must carry a copy of his appointment with him at all times. Each driver / operator must:

- Comply with all site / project rules and regulations pertaining to traffic and the safe operation of vehicles / mobile equipment;
- Obey all road signs;
- Obey all instructions given by security or emergency services personnel;
- Remain within the boundaries of the site; and
- Ensure that the vehicle that he is operating is never overloaded, and that loads are always properly secured.

In the interest of safety, only the minimum number of vehicles required by the contractor to complete the work under the contract will be permitted to enter the site.

When not in operation, the contractor's vehicles / mobile equipment must be parked within the boundaries of his lay-down area or yard.

Parking is only permitted in designated parking areas.

All cars are parked on site at the owner's risk.

In the event of a vehicle accident on site, the driver(s) must report the incident immediately and must remain at the scene until a nominated project management representative arrives, or until a nominated project management representative authorises him to leave (unless, of course, the driver requires medical attention).

16.5 Mobile Equipment and Light Vehicles

All Contractors must ensure all applicable legislation concerning mobile equipment and light vehicles are complied with at all times.

Each contractor must provide evidence to the nominated project management representative that all light vehicles and mobile equipment to be used on the project (including, but not limited to, lift and carry cranes (or mobi-lifts), mobile cranes, forklifts, mobile elevating work platforms (e.g. Cherry pickers), tractors, dozers, dump trucks, haul trucks, graders, excavators, loaders, back-actors, drill rigs, and road-going cars, light delivery vehicles, and trucks) comply with the requirements of all applicable legislation. This evidence must be provided prior to the equipment being brought onto the project site. The contractor remains responsible for meeting this requirement even if the equipment to be used is leased or provided by a sub-contractor (i.e. not owned directly by the contractor).

An Equipment Profile (dossier) must be compiled for each light vehicle and each item of mobile equipment to be used on the project site.

All mobile equipment and light vehicles (used for work purposes) must be subject to a risk assessment compiled. The assessment must:

- Involve operators and maintenance personnel who will use and work on the equipment; and
- Address all aspects of safe operation including handling, driver vision, brake failure, tyre blow out, and access and egress for operators and maintenance personnel.

Each light vehicle and each item of mobile equipment must be serviced and maintained as prescribed by the manufacturer of the vehicle or equipment.

No major repairs or services may be carried out on site.

No repairs may be carried out by a driver or operator. Only suitably qualified and competent persons may carry out repair work.

An appropriate pre-operation safety check based on a risk assessment must be carried out for each light vehicle or item of mobile equipment driven or operated for work purposes. For each vehicle or equipment type, an approved checklist must be in place (and must be used). The pre-operation check must include, but not be limited to, inspection and / or testing of the following safety critical features:

- Brakes (testing method must be provided);
- Wheels and tyres (including the spare);
- Lights and indicators;
- Steering;
- Seats and seat belts; and
- Windscreen and windows, including windscreen wipers and washers.

Should any critical feature be defective or damaged, the vehicle or equipment may not be operated until it has been fully repaired.

Supervisors must review the completed checklists on a daily basis to satisfy themselves that there are no major deficiencies that could place a driver or operator at risk.

No person may drive or operate any light vehicle or item of mobile equipment without authorisation.

All drivers and operators must be appointed in writing by the contractor's Project Manager.

No driver or operator may be appointed without proof that the individual has been trained, tested and found competent, or is currently licensed.

The appointment letter must specify the type of vehicle or equipment for which authorisation is being given and must clearly confirm that the driver or operator:

- Is 18 (eighteen) years of age or older;
- Has undergone a medical examination and has been declared fit for work by an occupational medical practitioner; and
- Has received suitable training and has been found competent, or is in possession of a valid driving licence issued by a state, provincial or civil authority that is applicable to the class of vehicle or equipment that is to be driven or operated.

The principal accountability for preventing accidents and incidents lies with the driver or operator of a light vehicle or item of mobile equipment, as he is in full control of any given situation at any given time. It must be stressed to each driver and each operator that safety is his prime responsibility – this must be clearly instructed and understood.

Drivers and operators must be empowered to stop driving or operating immediately should an unsafe condition arise, and refuse to drive or operate any light vehicle or item of mobile equipment that is defective and / or has any inoperative safety features. Similarly, a supervisor must never force a driver or operator to drive or operate a defective vehicle or item of equipment.

If a driver or operator does not adhere to the site rules and regulations, his appointment must be withdrawn and he must not be permitted to continue with his duties. If necessary, site access will be denied (either temporarily or permanently) to any driver or operator who is deemed to not be adhering to site requirements.

No person may drive or operate a light vehicle or item of mobile equipment if he suffers from a medical condition that places both him and those around him at risk of injury.

A fit-for-work policy must be in place, incorporating clearly defined maximum levels of drugs (including prescribed medication) and alcohol permitted in the system of a driver or operator.

Daily alcohol testing and random drug testing must be carried out.

Supervisors must regularly check on the physical condition of drivers and operators during the course of a shift.

A system must be in place to manage driver fatigue.

No eating or drinking is permitted while driving or operating a light vehicle or item of mobile equipment.

A mobile phone, whether hands-free or not, may only be used by the driver or operator of a light vehicle or item of mobile equipment when the vehicle or equipment is stationary and in a safe location.

Behaviour-based observations and coaching must include the operation of light vehicles and mobile equipment.

A site-specific traffic management plan must be compiled and submitted to the nominated project management representative for approval. The plan must include, but not be limited to, the following:

- Segregation of pedestrians, light vehicles, and mobile equipment where possible (using barriers where feasible);
- Systems to control the movement of mobile equipment in areas accessible to pedestrians, the movement of mobile equipment into and out of workshops, and pedestrian and light vehicle movement around mobile equipment;

- Setting of appropriate speed limits for vehicle types, road surfaces and environmental conditions;
- Installation and maintenance of road traffic control signs;
- Right-of-way rules (including overtaking restrictions);
- Overtaking protocols;
- Clear communication protocols for interactions between all vehicles and equipment;
- Procedures for light vehicles and / or mobile equipment entering hazardous or restricted areas;
- Standards for safe following distances based on operational circumstances, environmental conditions and near sight (blind spot) limitations of mobile equipment;
- The minimum safe distance to be maintained between light vehicles and mobile equipment (i.e. 50 metres unless positive contact is made);
- Designated parking areas for mobile equipment and light vehicles, including parking associated with maintenance areas;
- Parking procedures (e.g. Safe parking distances, safe parking locations, requirements for reverse parking, etc.);
- Systems to control approaching, refuelling, parking, boarding and disembarking mobile equipment (a driver or operator must exit the cabin and must disembark the vehicle or equipment entirely when his direct involvement with maintenance or servicing is not required);
- Guidelines for abnormal road conditions (e.g. Heavy rain, fog, or high winds) providing "go / no go" criteria and contact details for the person(s) responsible for making the "go / no go" decisions;
- Truck loading and unloading procedures to avoid material or objects falling from the vehicle;
- Guidelines for wide or abnormal loads including offsite transport; and
- Systems to control mobile equipment use in the vicinity of overhead power lines.

The design and layout of the road system (including entrance and exit points, intersections and other potential points of interaction between pedestrians, light vehicles and mobile equipment) must be reviewed periodically.

A risk assessment must be carried out prior to any changes being made to traffic movements or road systems.

Designated walkways (both indoors and outdoors) must be provided for pedestrians, and pedestrians must make use of these walkways. Good lighting must be provided along all

walkways, particularly at road junctions. Wherever possible, rigid barricading must be used to separate pedestrians from moving light vehicles and / or mobile equipment.

No pedestrians are permitted on haul roads (or as far as this can reasonably be achieved in situations where a haul road runs through an area occupied by a local community). All personnel must be transported to site and must be dropped off at a designated area.

Controls must be in place to ensure the safety of people working on roads, including those working on broken-down vehicles.

High visibility clothing must be worn by all persons at all times whilst on the project site. Speed limits and traffic rules must be reviewed regularly and must be rigorously enforced. Local traffic rules must be complied with at all times.

Pedestrians and cyclists must give way to light vehicles and / or mobile equipment except at pedestrian crossings.

All light vehicles and mobile equipment must give way to emergency vehicles.

Pedestrians and light vehicle drivers must be made aware of the blind spots associated with mobile equipment.

The driver or operator of a light vehicle or item of mobile equipment must stop the vehicle or equipment and sound the horn before proceeding at blind corners, where his view of the path or intended path is obstructed, and when entering or leaving a building.

Whenever a light vehicle or item of mobile equipment is stopped or parked, the handbrake (if applicable) must be applied.

Measures (such as chocking or the use of ditches or trenches) must be in place for the immobilisation of parked mobile equipment.

A parked light vehicle must be chocked in situations where the vehicle would roll forwards or backwards if placed in neutral with the handbrake disengaged.

No light vehicle or item of mobile equipment may be left unattended with the engine running or with a key in the ignition.

No light vehicle or item of mobile equipment may be parked so as to cause an obstruction to any roadway, passage or access way.

No light vehicle or item of mobile equipment may be parked within 50 metres of a loading or off-loading point.

Light vehicles and mobile equipment must be loaded safely. All loads must be secure and must be within the load limit of the vehicle or equipment. A load must be properly secured

before the vehicle or equipment is set in motion. Adequate precautions must be taken for any overhanging load.

No unauthorised light vehicle or item of mobile equipment may enter a restricted area or building.

16.5.1 Light Vehicles

All Contractors must ensure that Light vehicles have the following minimum safety features:

- Fixed seats and suitable seat (safety) belts for all occupants (i.e. Driver and all passengers);
- Roll-over protection for all vehicles intended to be driven on dirt or steep roads;
- Cargo barriers and load restraints for all vehicles designed for carrying loads (other than passengers), or that are unable to have cargo separated from the occupant-carrying space of the vehicle; and
- An air bag on the driver's side, and where available as a manufacturer fitted item, a passenger's air bag;
- A Reverse Alarm.

All Contractors must ensure that Light vehicles that interact with mobile equipment are equipped or fitted with:

- Systems that enable positive communication with the equipment operators (e.g. A two-way radio);
- A high visibility flag (e.g. A whip flag or buggy whip);
- An amber flashing light (revolving or strobe);
- Reflective taping; and
- High visibility signage (i.e. Vehicle call numbers) facilitating easy and positive identification from a reasonable distance.

Note: Call number signs and reflective tape (magnetic or adhesive) must be applied to the front, back and sides of each vehicle.

All Contractors must ensure that Light vehicles carry:

- Emergency roadside triangles or beacons (three of either);
- Chock blocks for preventing uncontrolled movement of the vehicle when parked;
- A flashlight;
- A fire extinguisher (2.5kg DCP);
- A first aid kit; and

- Survival or emergency equipment (e.g. a vehicle recovery kit) suitable for the operating environment.

A change management process must accompany all vehicle modifications, including the attachment of any equipment. Examples of changes or modifications include, but are not limited to, any change or modification:

- Made to the overall structure or design of the vehicle body;
- Made to the original manufacturer-fitted type of tyres or wheels;
- Made to the suspension system of the vehicle;
- Made to the mechanical system of the vehicle;
- That may adversely alter the centre of gravity of the vehicle;
- That alters the load carrying capacity of the vehicle; and
- That may affect the ability of the vehicle to withstand a crash (e.g. the fitment of a "bull bar").

Vehicle selection must be based on a risk assessment where consideration is given to the tasks, the application, the environment, roll-over protection and the rating of sturdiness in the event of a crash.

All Contractors must have a formal inspection and preventative maintenance system in place to ensure that vehicles are maintained in a safe and roadworthy condition at all times and, as a minimum, are serviced in line with the vehicle manufacturer's service schedule.

Should any safety critical feature be defective or damaged, the vehicle must be withdrawn from service until it has been fully repaired. Inspection and maintenance must be undertaken on critical features such as:

- Wheels and tyres (including the spare);
- Steering, suspension and braking systems;
- Seats and seat belts;
- Lights, indicators and reflectors;
- Windscreen and windows, including windscreen wipers and washers;
- The vehicle structure itself; and
- Other safety-related items on the vehicle body, chassis or engine, including instrumentation.

Persons may only be transported in vehicles equipped with manufacturer fitted or approved seats and seat belts.

Seat belts must be worn by all occupants of a light vehicle (i.e. the driver and all passengers) at all times.

Only the driver and one passenger are permitted in the cab (front) of a light delivery vehicle.

No personnel may be transported in the load-bin of a light delivery vehicle, even if the vehicle is fitted with a canopy. Only tools and equipment may be transported in the load-bin. Furthermore, no persons may be transported in a trailer behind a vehicle.

A pre-operation vehicle safety check and familiarisation system must be in place and must be used by the driver. An approved checklist must be used. All vehicle faults that are recorded must be attended to immediately.

All Contractors must have systems in place to ensure that risks associated with vehicle journeys are managed and controlled. The systems must include, but not be limited to:

- Formulation of journey management plans prior to the commencement of new or changed travel activities;
- Identification and monitoring of the risks associated with the various routes, intersections, etc. In order to minimise the overall exposure;
- Assessment and communication of changed environmental and road conditions at the time of travel;
- Outlining of actions required in the event of an emergency (e.g. Collision or breakdown); and
- Provision to manage driver fatigue.

Light vehicle running lights (low-beam headlights) must be switched on at all times when the vehicle is in operation.

All Contractors must have a system in place to ensure that drivers receive adequate training to ensure that the vehicle intended to be operated or driven can be operated or driven safely. As a minimum, training must include:

- Behaviour-based defensive driving principles;
- Vehicle familiarisation, taking into account the handling dynamics of the vehicle, maximum number of passengers, load limits and various features;
- Loading and restraining principles where the vehicle to be operated is designed for carrying cargo loads;
- Education and awareness concerning driving and travel risks that may be encountered within the environment where the vehicle may be operated or driven, and the requirements pertaining to traffic rules and speed limits;
- Securing (locking) equipment to prevent unauthorised use;

- Emergency crash and breakdown procedures; and
- Basic mechanical principles, including how to change a tyre and perform an adequate pre-operation check.

A system must be in place to ensure that persons operating any equipment associated with a light vehicle (e.g. Vehicle-mounted cranes and winches) are suitably trained and competent.

16.5.2 Mobile Equipment

All Contractors must ensure that Mobile equipment have the following minimum safety specifications:

- Fixed seats and seat belts for all occupants;
- Adequate lighting, including headlights, tail, turn and brake lights, and an amber flashing light (revolving or strobe);
- An identified isolation and lockout point;
- Adequate walkways, railings, steps and grab handle combinations, and boarding facilities including an alternative path of disembarking in the event of an emergency;
- Collision-avoidance technology and / or procedures;
- A reversing alarm or warning device;
- Chock blocks for preventing uncontrolled movement of rubber-tyred equipment when parked;
- A horn;
- Effective windscreen wipers;
- Effective guarding on accessible moving parts;
- A speedometer (if the mobile equipment is capable of exceeding the lowest applicable speed limit);
- High visibility signage (i.e. Mobile equipment call numbers) facilitating easy and positive identification from a reasonable distance; and
- A security system to prevent unauthorised operation.

Mobile equipment must have the following minimum safety specifications, unless a risk assessment stipulates otherwise:

- Approved or certified roll-over protection;
- Fail-to-safe brakes;

- A fire detection and suppression system capable of being activated from both ground level and cabin level (for certain types of mobile equipment, a suitably sized fire extinguisher may be adequate);
- A non-handheld two-way radio or another form of communication;
- Falling object protection (a protective structure over the operator cabin);
- An enclosed and tight-sealing air-conditioned cabin with suitable protective glass; and
- A means of moving supplies and personal items into and out of the operator cabin that enables an operator to continuously maintain three points of contact while boarding and disembarking the equipment (e.g. A backpack or shoulder strap bag).

When purchasing or hiring equipment, the ergonomics of the cabin must be considered, specifically with regard to the seating, operator controls and retrofitted devices.

Fleet and control consistency must be considered in order to minimise the possibility of operator error when changing machines.

For all new (to site) and modified mobile equipment, a formal risk-based selection and acceptance process must be followed prior to the equipment being used on site.

Selection of equipment, and any modification, must be subject to a rigorous change management process.

An inspection and maintenance programme must be in place for all mobile equipment.

A procedure and checklist system, including a brake functionality test, must be in place for pre-operation inspection by the operator. Registers must be maintained and audited, and must be kept on the machine.

Procedures must be in place to ensure that mobile equipment is only operated on sufficiently stable surfaces and on gradients that are within the limits of safe operation.

Seat belts must be used in all cases, by all occupants. Apart from the driver or operator, only an appointed flagman may be transported in mobile equipment (with the exception of buses) and **only if** the equipment is fitted with a passenger seat. No passengers are permitted on a lift and carry crane (or mobi-lift), mobile crane, forklift, mobile elevating work platform (e.g. A cherry picker), tractor, dozer, dump truck, grader, excavator, loader, back-actor, drill rig, or similar.

Risk assessments must be carried out as part of the planning process for mobile equipment operations and associated activities, and must consider the following:

- Maintenance activities;

- Risks associated with loading, unloading, towing and recovering mobile equipment; and
- The risk of fire.

Procedures must be in place for the safe isolation and lockout of mobile equipment.

Where two or more items of mobile equipment must be operated in proximity to each other, or where an item of mobile equipment must be operated in proximity to persons on foot, a risk assessment involving all persons who will be working in the area must be conducted prior to the work commencing. The risk assessment must be approved by the nominated project management representative. In such a work area:

- No item of mobile equipment may be driven to within 5 metres of another item of mobile equipment without the operator first making eye contact with, and signalling his intentions to, the other operator who must acknowledge that he understands and that it is safe to proceed.
- No person on foot may work or be positioned within 5 metres of an item of mobile equipment that is in operation. Before approaching mobile equipment on foot, a person must make eye contact with, and clearly signal his intentions to, the operator of the equipment. The operator must cease to operate the equipment, and must indicate that he understands and that it is safe to approach.

In certain circumstances (determined through risk assessment), mobile equipment may only move and operate with dedicated flagmen in place:

- Where flagmen are used, it must be ensured that the flagmen, mobile equipment operators, and all other personnel working in the vicinity of the mobile equipment, receive suitable training with regard to signals and signalling to ensure effective communication. The training must be formal and recorded, and competency must be tested.
- A flagman and the mobile equipment operator that he is directing must maintain eye contact. The flagman must never position him/her self where the equipment operator cannot see them.
- Should a mobile equipment operator lose sight of his flagman, he must stop his activities immediately until contact has been re-established.

Site-specific induction must be carried out prior to a mobile equipment operator starting work on site. Area-specific induction must be carried out prior to an operator starting work in a new area on site.

Operators must report conditions and practices that do not conform to procedure.

16.5.3 Training and Licensing

No person may drive a light vehicle or operate an item of mobile equipment unless he has been trained, tested and found competent, or is currently licensed to drive or operate that specific vehicle or item of equipment.

The training must address hazards and risks assessed for:

- That vehicle; and
- The tasks for which it is to be used.

No person may be appointed to drive a light vehicle or operate an item of mobile equipment unless he is in possession of a valid medical certificate of fitness (issued by an occupational medical practitioner).

Each person required to drive a light vehicle or operate an item of mobile equipment on the project site must have a project-specific site licence or appointment to drive or operate that vehicle or item of equipment.

A system must be in place to ensure that the renewal of licences is based on an assessment of competency to drive and / or operate the vehicle or equipment. The frequency of assessment must either be annual, or derived from a risk assessment for each vehicle or equipment type.

No training of drivers or operators may be carried out on site unless authorised by a nominated project management representative.

Each person working on or visiting the project site must receive appropriate project-specific induction training concerning road safety and site vehicle hazards.

Driver must be in position of valid certificate, licence and trained by an accredited service provider.

16.6 Signs and Notices

The contractor must ensure that all required safety signs and notices are prominently displayed in accordance with the applicable legislation and good safety practice.

Signs and notices must be in English as well as any other language(s) commonly spoken on the project site.

All symbolic signs must comply with the applicable national standards.

No person may deface or damage any safety sign or notice. No person may remove or alter any safety sign or notice unless authorised to do so.

16.7 Machinery

The contractor must ensure that all plant and equipment brought onto the site is:

- Appropriate for the type of work to be performed
- Approved, inspected, tested, numbered and tagged (if appropriate) before being brought onto site
- Properly maintained in accordance with the manufacturer's recommendations; and
- Placed on a register and checked at least once per month or as required by the applicable legislation.

The contractor must supply, at his cost, all items of plant and equipment necessary to perform the work and must maintain all items in good working order.

Should any plant or equipment become inoperable for a period that is having or will have a significant impact on the work schedule, the contractor must, on instruction from the nominated project management representative, remove the out of service plant or equipment and replace it with similar fully operational plant or equipment at no additional cost.

No item of plant or equipment delivered to site for use on the contract may be removed from the site prior to the completion of the contract without approval in writing from the nominated project management representative.

Items of plant or equipment brought onto site by the contractor or his sub-contractors may be inspected by a nominated project management representative. Should the nominated project management representative determine that any item is inadequate, faulty, unsafe or in any other way unsuitable for the safe and satisfactory execution of the work for which it is intended, the contractor must, on instruction from the nominated project management representative, immediately remove the item from the site and replace it with a safe and adequate substitute. In such a case, the contractor or his sub-contractor shall not be entitled to additional payments or deadline extensions in respect of any delay caused.

16.8 Barricading

All applicable legislation concerning barricading must be complied with at all times.

Each contractor required to erect barricading on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

Barricading must be erected to:

- Prevent persons from making contact with an identified hazard;

- Provide warning of the existence of a hazard;
- Prevent unauthorised access (by people, vehicles and mobile equipment) into an area where a hazard exists or where a hazardous activity is being carried out;
- Define the boundaries of a hazardous location and / or restricted area; and
- Allow a work team to perform hazardous tasks without persons unfamiliar with the hazard(s) accessing the area.

Although not limited to these situations, barricading must be erected or installed:

- Around excavations (trenches, pits, etc.) (refer to the Excavation Standard);
- To protect openings and edges (to prevent persons from falling, all openings and edges associated with floors, stairs, and the open sides of buildings and structures during the course of construction must be protected by sturdy, rigid barriers capable of withstanding a force of at least 110 kilograms applied in any direction at any point) (refer to the Working at Heights Standard);
- To prevent access into areas where overhead work is in progress;
- To route vehicles safely through (or around) construction areas; and
- To protect members of the public who may be in the vicinity of a work or construction site (by preventing access).

In all cases, the erection of barricading must be a temporary measure. It must only remain in place until the hazard is eliminated or the potentially dangerous situation is rectified.

A barricade must present a sturdy physical barrier to entering an area. Therefore, plastic cones, post and chain systems, "danger tape" and "snow netting" will not be accepted as barricading and may only be used for the purposes of low risk demarcation.

For example, snow netting may be used for the demarcation of lay down areas.

Acceptable forms of barricading include:

- Hoarding panels (no less than one metre in height) that can be securely fastened together to form a fence line may be used. Hoarding panels may be constructed from a variety of materials (e.g. wooden board, steel sheeting, wire mesh on a steel frame, etc.)
- Wire mesh fencing (no less than one metre in height with sturdy posts spaced at intervals of no more than 3 metres) may be used in certain circumstances, e.g. Around excavations.
- Sturdy, rigid, and securely fixed (i.e. bolted, welded, clamped, etc.) Metal guard rails may be used, particularly for protecting openings, holes and edges associated with

floors, platforms, walkways, etc. The top rail must be positioned at a height of one metre above the working surface, and a mid-rail must be provided.

- Concrete Jersey barriers must be used for the routing of traffic and when work is being conducted in or alongside a roadway.
- Regardless of the type of barricade used, the following requirements must be met:
- The installation, alteration and removal of barricades must be supervised by a competent person;
- The barricading must be uniformly and intelligently configured;
- The barricading must be stable, conspicuous and effective;
- The barricading must completely surround the work or hazardous area;
- General access requirements around the work or hazardous area (such as pedestrian walkways, operational access, or general thoroughfares) must be taken into consideration when erecting a barricade;
- The extent of the area that is barricaded must be kept to a minimum so as not to unnecessarily restrict access to other areas. If access routes to other areas are blocked by the barricade, alternative routes must be identified and signposted
- All barricaded areas must have properly designated points of entry and exit for persons and / or vehicles. Each pedestrian access point must be fitted with a self-closing gate. A sign indicating, "DESIGNATED ACCESS POINT – AUTHORISED PERSONNEL ONLY", must be fitted to each gate;
- Additional signage providing warning of specific hazards (e.g. falling objects, electricity, etc.) Including, "NO UNAUTHORISED ENTRY", must be attached to all gates and, where required, to the barricading itself. The signage must be visible from all angles and must be large enough to be read from a distance of 10 metres;
- Barricading must be clearly visible at all times (day and night). If necessary, flashing warning lights must be used;
- Tags must be attached to the barricading displaying the name and cell phone number of the person responsible for the barricade, and specifying the reason for the barricading and the date on which it is scheduled to be removed;
- Should a person require access to a barricaded area, authorisation must be obtained from the person responsible for the erection of the barricade. The hazards that are present and the Personal Protective Equipment that must be worn within the barricaded area must be communicated to the person seeking access;
- Each barricade must be listed in a register, and each must be inspected daily to ensure that it is still intact and that its positioning is still effective;
- All barricades must be properly maintained and repaired as required;

- When the work has been completed and the hazard has been eliminated, all barricading must be removed without delay. A barricade may not be left in place if no hazard exists;
- Before a barricade is removed (allowing general access), the area must be inspected by the person responsible for the work that was carried out, to ensure that the area is once again safe. If applicable, the person accepting the area back for general use shall do so on completion of his own safety inspection;
- Authorisation to remove (or modify) a barricade may only be granted by the person responsible for the erection of the barricade.

16.9 Excavations

All applicable legislation concerning excavation work must be complied with at all times.

Each contractor carrying out excavation work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

All excavation work must be properly planned. Site-specific conditions and hazards must be considered, including traffic, overhead and buried utilities, proximity to nearby structures, soil properties, presence of surface and / or ground water, position of the water table, and weather conditions.

Excavation work may only be carried out under the personal supervision of a competent Excavation Supervisor who has been appointed in writing.

Before any excavation work is carried out, a Permit to Work authorising the activities must be obtained.

Similarly, no person may enter an excavation unless a Permit to Work has been issued providing authorisation for specific tasks to be carried out within the excavation.

Before issuing a Permit to Work for excavation works, the Authorised Person (i.e. Permit issuer) must verify that:

- A detailed Risk Assessment has been conducted for the work to be performed;
- A Safe Work Procedure is in place; and
- No buried services are present in the area where the excavation works are to be carried out.

As a minimum, the Risk Assessment must consider hazards and risks associated with:

- A person being trapped or buried as a result of an excavation collapsing;
- A person being struck by an object falling into an excavation;
- A person falling into an excavation;

- A person being exposed to a hazardous atmosphere within an excavation (i.e. An oxygen deficiency, explosive or flammable gases, and / or harmful concentrations of a contaminant);
- Contact with belowground services; and
- Mobile equipment and / or light vehicle movement in proximity to an excavation.

On a plan (drawing) of the work area, the contractor must accurately indicate the position and dimensions of each intended excavation in order for it to be determined whether or not buried services would (or may) be encountered, such as electrical cabling, communications cabling, gas, fuel, potable water, fire water, effluent, sewage, or storm water pipelines.

In addition to a desk top review of existing drawings, a field survey must be carried out to verify the presence or absence of buried services. The positioning of all known belowground services must be accurately demarcated in the field before any excavation work commences.

Should there be any uncertainty, a pipe or cable locator must be used to determine if buried services are present, and if so, the positioning of the services.

If buried services are identified (or are suspected to be present) then the excavation plan must be altered if necessary to avoid these services. If the excavation plan cannot be altered then safe work methods (e.g. careful excavation by hand) must be specified and measures (e.g. Isolation and lockout of the service) must be put in place to minimise risk to personnel and prevent damage to the service(s).

Machinery may not be used to excavate material lying within one metre of any belowground service (i.e. Cable or pipe).

Excavation work that is carried out must be limited to what is described in the Permit to Work. All controls, precautions and restrictions identified in the Permit to Work (and Risk Assessment) must be strictly observed and fully implemented. The Excavation Supervisor must discuss these controls, precautions and restrictions with all persons who will be carrying out the work.

All excavation work must be carried out by persons who have been trained and are competent to perform the work.

All personnel working in or near any excavation must wear high visibility protective clothing. Unexpected structures (e.g. Tanks, brick work, concrete work, etc.) Or services (e.g. Cables, pipe lines, etc.) As well as unusual conditions (e.g. inconsistent materials, voids, etc.) That are encountered during excavation work must be reported immediately. All work must cease until the nominated project management representative provides authorisation to continue.

If an excavation is more than 1.2 metres deep and people have to enter it, then the sides of the excavation must be suitably battered, benched, or shored, unless a registered professional geo-technical engineer confirms in writing that there is no risk of the excavation collapsing (i.e. That the sides of the excavation are stable without battering, benching or shoring).

If the sides of an excavation are battered (sloped), then this must be done at an angle that is suitable for the given soil conditions (to be determined by a registered professional geo-technical engineer).

When it is not possible to batter (or bench) the sides of an excavation to a safe angle, then the sides of the excavation must be suitably shored. Shoring may only be installed, altered or removed under the personal supervision of a competent person using a predetermined safe method. Only approved shoring systems and equipment may be used. Shoring requirements must always be determined and designed by a competent person for the specific conditions encountered at the excavation site.

All material removed from an excavation (spoil) must be placed no closer than three times the depth of the excavation away from the edges of the excavation.

The profile of this spoil must be flattened out to prevent the material from being washed back into the excavation by rain water.

Scaling must be carried out on the sides of all excavations to remove loose material.

Protective shields or barriers must be erected (when required) between the sides of an excavation and the work area in order to protect employees from falling, rolling or slumping rock, soil, or materials.

Persons may not work on the faces (sides) of battered (sloped) or benched excavations at levels above other persons.

Tools, equipment and materials may not be placed within two metres of the edges of an excavation. Alternatively, a suitable retaining device may be used to prevent tools, equipment and materials from falling, rolling or sliding into an excavation.

No vehicle or item of mobile equipment is permitted near an edge of an excavation.

Mobile equipment may not operate in or near an excavation whilst persons are working within the excavation.

To ensure that adjacent structures (such as buildings, walls, or sidewalks) remain stable during excavation work, support systems such as shoring, bracing, or underpinning must

be provided if required. Excavation below or near the base or footing of any foundation or retaining wall is prohibited unless:

- A support system (designed by a registered professional geo-technical or
- Structural engineer) is provided, such as underpinning; or
- A registered professional geo-technical engineer determines that the structure is far enough away from the excavation that no hazard exists.

To prevent persons and / or mobile equipment from accidentally falling into an excavation and to prevent unauthorised entry into an excavation, rigid barricading must be erected around every excavation that is deeper than 500mm. Warning signage must be prominently displayed and, if necessary, flashing warning lights must be used at night.

The barricading must remain in place for as long as the hazard (i.e. the excavation) exists. Sections of barricading around an excavation may only be removed (and then only temporarily) to enable excavation work to continue (refer to the Barricading Standard).

For each excavation more than 1.2 metres deep, safe means of access and egress (e.g. Ladders, steps or ramps) must be provided for persons working in the excavation. Safe entry and exit points must be located every 15 metres along the side(s) of an excavation (i.e. an exit point must not be more than 7.5 metres away from any person working in the excavation).

If a hazardous atmosphere exists within any excavation (i.e. an oxygen deficiency, the presence of explosive or flammable gases, and / or harmful concentrations of a contaminant) or if there is a possibility that a hazardous atmosphere may develop, then the excavation must be declared a confined space. Furthermore, an excavation must be considered a confined space if any risk of entrapment or engulfment exists. If an excavation is declared a confined space then all precautions and requirements pertaining to confined spaces must be implemented and complied with (refer to the Confined Spaces Standard).

Internal combustion engines may not be used in or near the edge of an excavation unless the exhaust emissions are ducted away or suitable mechanical (forced air) ventilation is used to maintain a safe atmosphere within the excavation.

Any water and / or sludge present within an excavation must be removed completely before any work commences in the excavation.

Using ditches, dykes, sumps and pumps, or other suitable means, surface water must be prevented from entering an excavation and areas lying adjacent to an excavation must be adequately drained.

If equipment is used to prevent water from entering an excavation or to prevent water accumulation within an excavation, then the equipment must be monitored by a competent person to ensure that it remains operational and effective.

Suitable lighting must be provided in and around any excavation in which work must be carried out at night.

A high standard of housekeeping must be maintained in and around all excavations.

Tools that are not in use, and materials that are no longer required, must be removed from an excavation to prevent these items from causing injury or being lost (buried).

A register of all excavations must be compiled and maintained.

A competent person (i.e. an appointed Excavation Supervisor) must inspect each excavation as well as the areas around it:

- At the start of each day (or shift) before work commences within the excavation;
- After any alteration is made to the excavation or shoring;
- After rainfall;
- After any blasting activity carried out in the vicinity of the excavation; and
- After any event that may have affected the strength or stability of the excavation or the shoring.

An excavation must be inspected for collapses, signs of instability, failures or signs of overloading of protective systems and equipment, hazardous atmospheres, water accumulation, and any other hazardous condition that may arise.

The sides of an excavation as well as the surface of the ground around the excavation must be carefully inspected for signs of instability including fissures (cracks), slumping, and bulging. Shoring must be carefully inspected for signs of overloading (e.g. Distortion).

If a hazardous condition is identified, no person may enter the excavation until suitable corrective actions have been taken and / or suitable controls have been put in place to either eliminate the hazard or reduce the risks to acceptable levels.

A record of each inspection (including date, time, findings, and signature of the Excavation Supervisor who carried out the inspection) must be captured in the excavations register. Each inspection record must include a declaration as to whether the excavation is safe to work in or not.

All excavations must be monitored closely throughout each work day (or shift) by the Excavation Supervisor.

If an excavation has been declared a confined space, a safety observer (who will be able to initiate emergency response procedures if required and identify the location of any trapped or buried persons in the event of a collapse) must be stationed at ground level outside of the excavation whenever work is being carried out in the excavation.

If a hazardous condition is identified while work is being carried out in an excavation, then all persons in the excavation must be evacuated to safety without delay.

Under no circumstances may a person work alone in an excavation that is more than 1.2 metres deep without at least one other person being present in the immediate vicinity of where the work is being carried out.

Excavations must be backfilled as soon as possible, and the material used (usually the original material) must be properly compacted.

Where belowground services are present, the material used to backfill an excavation must be such that the services will not be damaged.

A layer of a material that is dissimilar to the general backfill material must be placed immediately above any buried service.

An excavated area must be restored to its original condition if at all possible.

Use of Explosives

All excavation work must be carried out without the use of explosives.

Explosives may not be brought onto the site or be used without written authorisation from the nominated project management representative.

If blasting operations are unavoidable, the contractor must:

- Provide a justification and obtain approval from the nominated project management representative;
- Strictly observe the provisions of all applicable legislation; and
- Carry out a detailed risk assessment covering the transportation, handling, storage and use of the explosives.

No explosives or detonators may be stored on site.

Detonators and other explosives must never be carried in the same box.

16.10 Cranes and Lifting Equipment

All applicable legislation concerning cranes and lifting equipment must be complied with at all times.

Each contractor carrying out lifting operations on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

16.10.1 Design, Manufacturing and Safety Features

Before any crane or hoist is operated on the project premises (i.e. New to site), it must be formally accepted (authorised) by the nominated project management representative. The acceptance process must be based on an inspection and risk assessment, and must take the crane's or hoist's safety features and cabin ergonomics (if applicable) into account. The same process must be followed before any crane or hoist is returned to service following any modification or repair.

Note: An Equipment Profile (dossier) must be compiled for each crane.

As a minimum, the design and manufacturing of each crane or hoist used on the project premises must comply with the requirements of the relevant ISO standard. In countries where the requirements of a national standard are more stringent than the requirements of the relevant ISO standard, the national standard must apply.

The Safe Working Load (SWL) must be clearly indicated on each crane, hoist, and item of lifting equipment.

If the safe working load (rated capacity) of a crane varies with the conditions of use (i.e. varies with the angle of the boom and the boom length) then the manufacturer's load chart(s) indicating the crane's rated capacity at various boom lengths and angles must be available in the crane cabin. If the crane has a single load chart, it must be displayed in a position visible to the crane operator. If the crane has numerous load charts, they must be easily accessible to the operator.

For each crane or hoist, the manufacturer's operating manual must be available to the operator.

The load chart(s) and operating manual for a crane or hoist must be in a language understood by the operator.

All lifting hooks must be fitted with a safety latch to prevent the load from accidentally detaching.

Each crane or hoist must be fitted with a load cell (with the mass of the load displayed in the visual range of the operator) and a load limiting device to prevent the crane or hoist from being operated outside of its safe working limits.

Where practicable, each crane must be equipped with an upper hoist limit switch (or anti two-block device) to prevent the hook block from colliding with the drum, and a lower hoist limit switch to prevent the rope on the drum from unwinding completely. These systems must provide both a visual and an audible alarm to the operator.

Under no circumstances may any limit switch or warning device be bypassed, disconnected, or adjusted in order to lift a load higher (or to lower a load lower) than the respective switches allow. Limit switches MAY NOT be adjusted to stop the hoist at a particular height under normal operating conditions – these are safety devices, and as such, should not be used as operating tools.

Under no circumstances may a load limiting device be bypassed or disconnected in order to lift a load that exceeds the rated capacity of the crane. Load limiting devices MAY NOT be used to “measure” or “test” the mass of a load – these are safety devices, and as such, should not be used as operating tools.

Each overhead travelling crane (including cranes operated using a manual chain drive) must be fitted with an audible travel alarm or an equivalent warning device.

Anti-collision devices must be fitted to prevent motorised overhead travelling cranes from colliding with each other (where two or more cranes run on the same track) and from colliding with the track end stops or other structures.

For a vehicle-mounted crane, the operator control station must be located in a position protected from swinging loads and from the crane jib.

A fall protection system must be provided for the assembly, dismantling, operation, maintenance and inspection of any crane where falling from height is identified as a hazard.

Each crane should be fitted with a stability monitoring device to prevent it from toppling over.

Only items of lifting equipment (tackle) that have been designed and manufactured with adequate factors of safety may be used on site. The following minimum factors of safety (with respect to the Safe Working Load) must be met:

- Ten (10) for natural-fibre ropes;
- Six (6) for synthetic-fibre ropes or woven webbing;
- Six (6) for steel-wire ropes;

- Five (5) for steel chains; and
- Four (4) for high-tensile or alloy steel chains.

Note: An excavator may not be used to lift a load unless all of the requirements of this standard (as would apply to a crane) have been met, and authorisation has been granted by the relevant Project Manager and Health and Safety Manager.

16.10.2 Planning and Risk Assessment

For each critical lift that must be carried out on site, a documented and detailed lift plan and risk assessment must be prepared to address all associated hazards.

Only suitably qualified, competent and experienced persons (lift planners) may evaluate critical lifts and prepare lift plans.

The lifting supervisor, crane operators, riggers and spotters responsible for carrying out a critical lift must have input into the lift plan and risk assessment and must be consulted before these documents are finalised.

All lift planners, lifting supervisors, crane operators, riggers and spotters (safety observers) must be appointed in writing.

No critical lift may commence until the lift plan and risk assessment have been authorised by the nominated project management representative and a Permit to Work has been issued.

Critical lifts include:

- All multiple (including dual) crane lifts;
- Lifts where the operational arcs of two or more cranes can overlap;
- Lifts over operating facilities where this may endanger personnel;
- Lifts over or adjacent to power lines;
- Any lift carried out in close proximity to equipment or a vessel containing a flammable or toxic substance;
- Lifts where the centre of gravity of the load could change;
- Any lift where the total weight on the hook exceeds 20 tonnes;
- Lifts near the rated capacity of the crane (i.e. Exceeding 85% of the rated capacity at the working radius);
- Any lift when the wind speed (including gusting) exceeds 30 kilometres per hour;
- Lifts involving a man basket (safety cage);
- Lifts to and from water;

- Lifts requiring specialised equipment or involving complicated lifting or rigging configurations;
- Lifts requiring non-standard rigging or slinging techniques;
- Lifts involving the simultaneous use of more than one hoist on the same crane; and
- Any other lift deemed to be critical by the nominated project management representative, or assessed as critical during a risk assessment.

The lift plan for a critical lift must include:

- General Information – crane manufacturer, crane model, items to be lifted, and reason for lift;
- Lift Data – load weight, lifting block and hook weight, hoist rope weight, rigging weight, total weight, height of lift, radius of lift, surface area of load, and centre of gravity of load;
- Rigging Data – sling material (chain, wire rope, or synthetic), sling diameter, sling length, sling configuration, sling capacity, hook type, shackle size and capacity;
- Lift Computation – boom length, jib length, radius of lift, crane capacity as configured, size of outrigger footplates, and wind speed;
- Proximity to Power Lines and Process Areas – mobile cranes working in proximity to energised power lines must operate under a Permit to Work, which must define exclusion zones and spotter duties;
- Local Hazards and Controls – including the route for the crane, ground stability, proximity of people or equipment, and agreed communication method; and
- Diagrams (sketches) – a rigging diagram, and a crane set-up diagram illustrating the positioning of the crane(s) in relation to surrounding structures and the initial and final positions of the load (including crane boom movement).

Lifts that are not subject to detailed lift plans (i.e. Lifts that are not considered critical) must nevertheless be subject to a risk assessment, and be properly planned and executed.

The use of a crane-suspended man basket (safety cage) may only be considered when all other avenues to safely perform the work (e.g. Scaffolding, mobile elevating work platform, etc.) Have been exhausted (refer to the Working at Heights Standard).

Cranes used to lift or suspend personnel must be approved as suitable for this purpose.

If a crane must be operated in proximity to energised overhead power lines (or any other exposed electrical conductors) then minimum clearance distances (specified by the electrical power utility or the nominated project management representative) must be observed.

Whenever possible, power lines must be de-energised and isolated while lifting operations are carried out (refer to the Electrical Safety Standard).

16.10.3 Operation

At the start of every day or shift, the operator of a crane or hoist must carry out a pre-operation safety check using a prescribed checklist.

The specific requirements of the pre-operation safety check (and associated checklist) must be based on:

- A risk assessment that addresses all aspects of safe operation of the crane or hoist; and
- The inspection recommendations of the manufacturer.

As a minimum, the pre-operation safety check must include:

- A thorough visual inspection of all wire ropes, chains, hooks and safety latches, hook blocks, sheaves, hydraulic hoses, electrical cables, and the general condition of the crane or hoist;
- Checks to confirm the serviceability of the operating controls;
- Tests to confirm the correct operation of all limit switches, emergency shutdowns, load indicators, alarms and other safety devices; and
- A thorough visual inspection of all lifting equipment (tackle) to be used.

The operator must:

- Check for any loose or missing parts;
- Make sure that the wire rope (or chain) of the hoist is properly seated in its drum and sheave grooves without any slack or overlapping;
- Operate each control to make sure it functions properly, releases immediately, and does not stick. Each control must be labelled to indicate its function;
- Listen for any unusual mechanical noises and look for any jerky movements while operating the crane and / or hoist several feet in each direction that it travels;
- Check the functionality of the upper and lower hoist limit switches (if applicable) by slowly raising and then lowering the block to trip the respective switches;
- Check all hooks. Hooks must not be cracked, stretched, bent or twisted. Each hook must have a safety latch that automatically closes the throat of the hook. If the latch is bent, has a broken spring, or is otherwise damaged, it must be repaired before use. Hooks must rotate freely in the block assembly without any "grinding" felt or heard;

- Check the wire rope by lowering the block to its lowest level and looking for the following signs of damage:
 - Reduced rope diameter. This may indicate that the rope has been stretched, has lost its inner core support, or has worn outside wires;
 - Broken wire strands (any number);
 - Kinked, crushed, cut, or “bird caged” wiring, or wiring with heat damage.
- Check all chains for damage including wear at contact points, cracks, or distorted links (bent, twisted or stretched). All mechanical coupling links must be inspected to ensure that the linking pins are secure and in good condition. The capacity rating of each chain must be adequate for the load and the attachment method;
- Check the condition and capacity of wire rope and synthetic web slings. Capacity ratings must be legible on the manufacturer’s label. The capacity of the sling being used must be adequate for the load and the attachment method. A sling must be replaced immediately if it is excessively worn.

The operator must report any fault, defect or damage to his supervisor immediately.

A crane or hoist must not be operated if any safety device is out of order or defective, or if any rope, chain, hook or other component is worn or damaged.

Completed checklists must be made available (on request) for inspection by the nominated project management representative. Wherever possible, these checklists must be kept with the crane or hoist.

All lifting operations must be supervised by suitably qualified, competent and experienced supervisors.

An effective method of communication between the crane operator and those assisting with the lift must be in place. This must be documented and approved by the nominated project management representative.

Documented Safe Work Procedures must be in place to ensure the following:

- Access into an area where lifting operations are being carried out must be restricted. Such an area (i.e. where there is a risk of a load falling and striking a person) must be barricaded and only authorised persons may enter (i.e. those directly involved with the lifting operations). Warning signage must be conspicuously displayed;
- Where a load is being moved from one location to another (i.e. The lifting operations are not being carried out in a discrete area that can be barricaded), measures must be taken to ensure that all persons in the path of the suspended load are made aware

of the approaching hazard and that they move, and remain, well clear of it. All persons potentially affected must be given warning before the load is lifted;

- A lift must be directed and controlled by a single person (a suitably qualified, competent and experienced rigger);
- Dedicated spotters must be in place during lifting operations to observe and provide warning (if necessary) to prevent incidents and ensure that safety protocols are adhered to;
- Before commencing with a lift, it must be verified that the load being lifted is both within the rated capacity of the crane (or hoist) and lifting equipment and within the limits set out in the lift plan and / or risk assessment. The rated load capacities of the crane, hoist, rope, chains, slings or other components may never be exceeded;
- Only certified lifting equipment (tackle) may be used to lift a load;
- No equipment (tackle) that has been used for towing may be used for lifting operations;
- Only an approved material box (skip box) may be used for lifting loose items or materials;
- Before commencing with a lift, it must be verified that no safety devices (including load limiting devices) have been bypassed, overridden or disconnected;
- To prevent the load from swinging as it is lifted, the hoist must be centred over the load (when using slings or chains) or positioned directly above the lifting point of the load;
- Hoisting ropes must be kept vertical. No side loading of a crane boom is permitted (i.e. A crane may not be used to make a side pull);
- Two full wraps of rope must remain on the hoisting drum at all times. If a lower hoist limit switch has been fitted, and it is working correctly, it should not be possible to lower the block below the point where less than two full wraps of rope are on the drum;
- Before commencing with a lift, it must be verified that all rigging connections are correct and secure. Slings, chains, or other lifting devices must be fully and securely seated in the saddle of the hook;
- Slack must be removed from the slings, chains and / or hoisting ropes before lifting the load. It must be ensured that multiple lines are not twisted around each other and that the hoist rope is not wrapped around the load;
- To ensure that the load is properly secured and balanced, it must initially only be lifted a few centimetres. Slings must be repositioned if required;

- Before moving a suspended load, it must be lifted high enough to clear all obstructions. The load must only be lifted to the height necessary to clear obstructions, and no higher;
- Directional movement must be made smoothly and deliberately (there must be no sudden acceleration or deceleration of the moving load). Abrupt, jerky movements of the load in any direction must be avoided;
- Tag lines must be used in situations where a load needs to be steadied or guided while suspended;
- When using tag lines to steady or guide a suspended load that is being moved using a mobile crane, personnel on foot must remain in sight of and in communication with the crane operator at all times, must never walk between the crane and the load, and must remain clear of the load and the crane at all times (at least 5 metres). The load must be moved at a slow walking speed;
- A suspended load must be monitored closely at all times;
- If a crane operator's view of a suspended load is unavoidably obscured (completely or partially), or if a suspended load is unavoidably obscuring (completely or partially) a crane operator's view, then suitably positioned spotters must be in place to provide guidance to the crane operator;
- A load MAY NOT be moved over, or be suspended above, any person or any occupied building. No person may walk beneath, or position health and safety below, a suspended load;
- No person may pass or work beneath the boom of a crane;
- No person may be positioned between a suspended load and a solid object where there is a risk of being crushed should the load swing;
- No person may be positioned within the radius of the boom of a crane unless directly involved with the lift;
- Under no circumstances may any person ride on a crane's hook or on a load;
- No load may be left suspended unless the operator is at the controls and is monitoring the load. In such a situation, the load must be kept as close as possible to the ground or floor to minimise the possibility of injury should the load drop;
- The controls of a crane or hoist may never be left unattended while a load is suspended. If it becomes necessary to leave the controls, the operator must lower the load to the ground or floor;
- With the exception of pick-up and carry operations, no lifting may be carried out using a mobile crane unless the outriggers have been deployed and are locked in position;

- Load spreaders or packing under the outriggers must be used irrespective of the underfoot conditions;
- Before a mobile crane is moved into position to carry out a lift, the area must be inspected by a suitably qualified person who must verify that the underfoot conditions are satisfactory;
- When using a mobile crane, slewing to test the effectiveness of the outriggers must be carried out prior to commencing with a lift;
- Slew pins must be securely in place while a mobile crane is travelling;
- Unauthorised use of a crane or hoist must be prevented by removing the keys, locking the cabin, isolating the controls, etc. When lifting operations have been completed;
- When not in use, lifting equipment must be stored off the ground and must be protected from the elements (rain, harsh sunlight, etc.) And contamination (dust, solvents and other chemicals) in order to prevent damage and / or deterioration.

A crane or hoist or an item of lifting equipment may only be used for the purposes for which it was designed.

16.10.4 Inspection, Testing and Maintenance

Any crane or hoist brought onto the project premises must have a current test certificate and record of inspection as well as a suitable checklist (derived from the crane or hoist manufacturer's inspection recommendations) for use by the operator(s) when carrying out pre-operation safety checks.

An Equipment Profile (dossier) must be compiled for each crane.

A register of all cranes, hoists and lifting equipment (tackle) brought onto the project premises must be compiled and maintained.

Each crane, hoist and item of lifting equipment must have a unique identification code or number, which must be referenced in the register.

For each crane, hoist and item of lifting equipment, the following documentation must be kept on site and must be made available (on request) to the nominated project management representative for inspection:

- Test records and certificates;
- Inspection records;
- Maintenance records; and
- Details of any modifications or repairs made.

All cranes, hoists and lifting equipment must be inspected, tested and confirmed fit for purpose (i.e. Safe for use):

- Before being operated or put into service;
- Before being returned to service following any repair or modification; and
- Periodically as follows (unless local regulations require examination more frequently):
 - Each crane or hoist (including all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices that form an integral part of the crane or hoist) must be thoroughly examined by a competent, experienced and appointed person every 6 months;
 - Each crane or hoist must be subjected to an annual performance test (i.e. A load test) by a competent, experienced and appointed person; and
 - All lifting equipment (tackle) must be thoroughly inspected by a competent, experienced and appointed person every 3 months.
 - The system of inspection and testing must provide verification that each crane or hoist is able to function to its design specifications, and must verify the integrity of:
 - Mechanical and electrical components;
 - Controls;
 - Cables and all lifting attachments;
 - Structural components including boom, hoist, brakes, wheels, hooks, baskets, outriggers, hook-blocks and rails; and
 - Load limiting devices, hoist limit switches, alarms or warning devices, and other safety devices and control systems (including independent fail-safe braking systems, devices to stop the crane or hoist such as a dead man's switch, and emergency shut-off switches).

A preventative maintenance system must be in place to ensure that all cranes and hoists are maintained in a safe and serviceable condition.

For any crane or hoist, all inspections, testing, maintenance and repairs must, as a minimum, be carried out in compliance with the requirements and specifications of the manufacturer as well as all applicable regulatory requirements (in terms of both the frequency of inspection, testing and maintenance, and the physical condition of the crane or hoist).

Repairs to a crane or hoist may only be carried out by competent persons. After repairs have been made, the crane or hoist must be tested and recertified fit for purpose (unless the repairs did not affect the integrity of the lifting mechanism).

Any modification to a crane or hoist must be subject to the approval of the original equipment manufacturer and a rigorous change management process.

Each item of lifting equipment (tackle) must be tagged following each quarterly (3-monthly) inspection. Details of these inspections must be recorded in the lifting equipment register which must be made available to the nominated project management representative on request.

The following colour coding system must be used for the tagging of all lifting equipment:

Table 15-1 colour coding system for lifting equipment

Quarter	Tag colour
January – march	Blue
April – June	Red
July – September	Green
October – December	Yellow

The tag placed on an item of lifting equipment must be traceable to an entry in the lifting equipment register where the following information concerning the inspection of that item of equipment must be recorded:

- Item description;
- Unique item identification code or number;
- Item owner;
- Item location;
- Date of inspection;
- Name and signature of competent person who carried out the inspection; and
- Any comments concerning the inspection.

Any item of lifting equipment that is found to be damaged or defective must be removed from service (and tagged, "out of service") immediately and must then either be repaired and recertified (if possible) or destroyed to prevent further use.

Similarly, any lifting equipment that is known (or is suspected) to have been overloaded must be removed from service immediately and destroyed to prevent further use.

If an item of lifting equipment is removed from service or destroyed (scrapped), this must be indicated in the lifting equipment register.

Any item of lifting equipment without a tag or with an out-of-date inspection may not be used.

16.10.5 Training and competency

Only suitably trained, competent and experienced persons who have been authorised in writing by the contractor's project manager are permitted to:

- Evaluate and plan critical lifts;
- Supervise lifting operations;
- Operate cranes and hoists;
- Use lifting equipment, and rig (sling) loads;
- Provide signals for controlling lifts; and
- Inspect, maintain or test cranes, hoists and lifting equipment.

Each operator must meet the competency requirements for the particular class or type of crane or hoist to be operated. Depending on the project location and applicable legislation, operators may need to hold a certificate of competency issued by a recognised training institution.

16.11 Working at heights

All applicable legislation concerning work performed from an elevated position must be complied with at all times.

Fall prevention or fall protection measures must be in place whenever the potential exists for a person to fall from height.

16.11.1 Ladders

All ladders used on site must be of sound construction and adequate strength.

Only non-conductive ladders made of wood or fibreglass may be used for electrical work or work being performed in proximity to energised electrical equipment. Metal ladders and ladders with metal reinforcing may not be used.

The use of makeshift ladders is forbidden.

All ladders must be numbered, listed in a register, and inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register).

Before using a ladder, the user must inspect it for damage.

Ladders with missing, broken, cracked or loose rungs, split stiles, missing or broken spreaders (stepladders) or any other form of damage or defect may not be used.

A damaged ladder must be removed from service (and tagged, "Out of Service") without delay and must then either be repaired (if possible) or destroyed to prevent further use.

Persons must receive instruction in the correct use and proper care of ladders.

Ladders may only be used as a means of access and egress. The use of ladders as working platforms is prohibited, except for inspection and carrying out minor tasks (i.e. light work and short duration) such as changing a light bulb.

Ladders may not be positioned horizontally and used as walkways or runways or as scaffolding.

All portable ladders must be fitted with non-skid safety feet (or some other means to prevent the base of the ladder from slipping) and the feet must always be placed (stand) on a firm level surface.

The use of bricks, stones, wood or any other material to level the stiles of a ladder is prohibited.

Ladders may not be placed on movable bases such as boxes, tables, trucks, etc.

The base or foot of a ladder must always be secured to prevent it from slipping. The ladder must be held by an assistant if the base cannot be secured in any other way (e.g. tied off).

A straight ladder must extend at least one metre above its support (or above the working platform that it is providing access to). The top of the ladder must be tied off (or otherwise secured to its support) to prevent accidental movement.

A straight ladder must be placed at a safe angle, i.e. tilted at a ratio of approximately 4:1, meaning that the base of the ladder must be one metre away from the wall (or other vertical surface) for every four metres of height to the point of support.

A stepladder may never be used as a straight ladder. A stepladder must be opened fully and the spreaders must be locked securely.

When using an extension ladder, at least four rungs must always overlap at the centre of the ladder.

Ladders may not be joined together unless they have been specifically designed and manufactured for that purpose.

A suspended ladder (i.e. not standing on a base) must be attached in a secure manner to prevent undue swinging or swaying, and to ensure that it cannot be displaced.

A ladder may not be placed against a window, glass or any other material which is unlikely to withstand the force exerted on it by the top of the ladder.

A ladder may not be placed in front of a door or window that opens towards the ladder unless the door or window has been locked or barricaded.

When a ladder is used near an entrance or exit, the base of the ladder must be barricaded.

Materials and / or equipment may not be placed in close proximity to the base or landing of any ladder.

When ascending or descending a ladder, a person must always face the ladder and use both hands (i.e. maintain three points of contact).

Nothing may be carried up or down a ladder if it prevents the person from holding on to the ladder with both hands. Tools must always be properly secured. This can be achieved by attaching them to the wrist using lanyards or placing them in a tool belt around the waist. Tools and materials may also be carried in a bag over the shoulder or hoisted to the landing using a tool bag and rope.

Only one person at a time may use (i.e. be positioned on) a ladder.

No person may stand or step above the third rung from the top of a straight ladder or above the second highest step of a stepladder.

Overreaching from a ladder is prohibited. If the target is not within comfortable reach, the person must climb down and reposition the ladder.

No person may run up or down a ladder, or jump from the lower rungs or steps to the ground.

All ladders must be properly maintained and cared for.

Ladders must be stored under cover and should be hung in a horizontal position from several brackets.

No ladder may be left lying on the ground or be left exposed to the weather. A ladder left lying on the ground presents a tripping hazard and it may be damaged by vehicles running over it.

No ladder may be left in such a position where it may fall over, be accidentally knocked over, or be blown over by the wind.

Ladders may not be painted, as the paint may conceal damage, defects, labels or other markings.

Instead of paint, clear varnish or wood oil may be used to preserve wooden ladders.

Ladders must be kept clean, as dirt may conceal damage or defects. Oil or grease accumulation on the rungs of a ladder may cause a person to slip.

Before making use of a ladder, each person must make an effort to remove mud, oil, grease, etc. from his boots.

16.12 Permit to Work

All personnel must comply with the Permit to Work system applicable to the project.

A Permit to Work must be obtained before carrying out any work that involves:

- A hazardous energy source or system, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic) – isolation and lockout may be required;
- Confined space entry;
- Working at height where there is an energy source;
- A critical lifting (issued by Engineer/designer after load test carried out);
- Hot work outside of designated workshops;
- Excavation; or
- A service (e.g. water supply, fire suppression systems, etc.).

Note: A Permit to Work may only be issued by an Authorised Person, and may only be received (or accepted) by an appointed Applicant (see Definitions). – HS Practitioner per project to establish which permits applicable and determine who is responsible for permits to be issued as per Project Scope.

Each Permit to Work that is issued must make reference to an approved Task-Based Risk Assessment for the work that is to be carried out.

The Permit to Work system that is employed must incorporate the following basic procedures:

- Prior to meeting with the Authorised Person, the Applicant must familiarise themselves with all of the hazards associated with the system, plant, equipment, structure or area on or in which the work must be performed. He must also consider the risks

that may arise as a result of the tasks that will be carried out. A Task-Based Risk Assessment must be in place;

- The Applicant must then request permission to carry out the work and must meet with the Authorised Person to discuss and document the scope of the work as well as the hazards, risks and associated control measures. Isolation and lockout requirements must be identified (if applicable). The isolation and lockout process must be initiated by the Authorised Person who must contact the necessary Isolation Officers.

Note: The Applicant must ensure his own safety and that of his team, and has the right to accompany the Isolation Officers to verify that all of the necessary locks have been fitted to all of the isolation and lockout points in accordance with the applicable plant or equipment-specific Isolation and Lockout Procedure.

- Once all of the necessary isolations have been completed and the necessary Clearance Certificates have been issued by the Isolation Officer(s) (if applicable), and the Authorised Person is satisfied that the system, plant, equipment, structure or area is safe to work on or in provided all identified precautions are observed by the Applicant, then he must issue (sign) the Permit to Work to the Applicant;
- The Applicant must accept (sign) the Permit to Work. If equipment has been isolated, the Applicant must attach his Personal Lock to the relevant Isolation Bar (or Local Isolation Point) and must ensure that every other person working on the isolated equipment also attaches his or her Personal Lock to the Isolation Bar (or Local Isolation Point) before starting any work;
- Before commencing with any work, the Applicant must discuss the hazards, risks, control measures, precautions and limitations as stated in the Permit to Work (and associated Task-Based Risk Assessment) with all personnel who will be carrying out the work. A register must be kept and all persons must sign the register once they have been briefed by the Applicant;
- The work performed must be limited to what is described in the Permit to Work;
- When a particular employee has completed his work, he must sign the personnel register to this effect and (if applicable) must remove his Personal Lock from the Isolation Bar (or Local Isolation Point);
- Once all work is complete, the Applicant must:
 - Ensure that all machine guards have been replaced;
 - Ensure that all tools and materials have been removed from the work area;
 - Ensure that the work area is clean and tidy;
 - Ensure that all Personal Locks (including his) have been removed from the

- Isolation Bar or Local Isolation Point (if applicable);
- Inform the Authorised Person that the work has been completed; and
- Sign off the Permit to Work.
- Once the work is complete and the Applicant has signed off the Permit to Work, the Authorised Person must:
 - Ensure that the relevant Isolation Officers perform all of the necessary de-isolations (if applicable);
 - On completion of the de-isolations, sign off the Permit to Work accepting the system, plant, equipment, structure or area back for service; and
 - Inform all relevant personnel that the system, plant, equipment, structure or area is ready to use.
 - Where the work must continue over more than one shift, the Permit to Work must be reviewed at every shift change by an Authorised Person. If the scope of work has changed, the permit must be cancelled and a new permit must be issued.

If any of the original conditions or precautions pertaining to the work is not being complied with, is no longer adequate or is no longer applicable, the Authorised Person must cancel the Permit to Work and must ensure that all work stops until full compliance with either the original or amended (as required) conditions and precautions is achieved and a new permit has been issued.

The Applicant must ensure that the Permit to Work (including the personnel register) is kept where the work is being carried out (i.e. posted on a portable Health and Safety Management Information Notice Board) and that the work is monitored against the permit conditions.

All Permit to Work records must be retained and must be made available for inspection when required.

The implementation of the Permit to Work system applicable to the project must be audited on a regular basis by a nominated project management representative. Furthermore, planned task observations must be carried out periodically.

Note: In addition to obtaining Permits to Work as and when required for specific hazardous activities (identified in this standard), each contractor must obtain a General Work Authorisation from a nominated project management representative on a monthly basis. A General Work Authorisation is valid for one calendar month and authorises the contractor's planned work activities. In order to obtain a General Work Authorisation, the contractor

must provide a documented work plan for the month together with the necessary Task-Based Risk Assessments.

16.13 Isolation and Lockout

Isolation and lockout procedures that make it impossible to inadvertently energise any system, plant or equipment so isolated, must be in place for all work where hazardous energy sources exist, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic). These procedures must be strictly enforced.

All personnel must comply with the isolation and lockout system and procedures applicable to the project.

All Isolation and Lockout Procedures must incorporate the following basic requirements:

- The issuing of a formal Permit to Work for any work that requires the isolation of any system, plant or equipment;
- The use of defined Equipment, Discipline and Personal Locks (see Definitions), and multiple lockout systems (i.e. Isolation Bars and lockout hasps);
- Clear identification of all isolation and lockout points ensuring there is no duplication;
- Isolation of the main energy source;
- The use of slip plates or the blanking off of pipelines or ducting, in addition to the chaining and locking of valves, as determined by a risk assessment;
- Suitable methods of preventing the movement of equipment; and
- Methods to test the effectiveness or completeness of the isolation.

Note: No work may commence on a system, plant or equipment until a Permit to Work has been issued by an Authorised Person.

Note: A Permit to Work may only be issued by an Authorised Person once all required Clearance Certificates have been issued by appointed Isolation Officers.

The isolation and lockout system that is employed must incorporate the following basic procedures:

- In accordance with a system, plant or equipment-specific Isolation and Lockout Procedure, an appointed Isolation Officer(s) must isolate all points that need to be isolated in order to render the system, plant or equipment safe to work on. An Equipment Lock (and a suitable, highly visible warning tag) must be attached to each isolation point;

- On completion of an isolation (and lockout), the Isolation Officer must clear the area of all persons and must then carry out tests to ensure that the isolation is effective. This may be done by pressing a start button or by asking a control room operator to try to start the equipment. Special care must be taken to ensure that the attempted starting of the equipment has not been deactivated by another interlock forming part of the system, or by a different up-stream isolation. Alternatively, appropriate equipment may be used to test for energy (e.g. voltage verification or continuity tests).

Note: In the case of electrical isolation, a test for voltage must be carried out, after the switching device, to ensure the absence of voltage.

- The Isolation Officer must place the key to the Equipment Locks on an Isolation Bar (at a Lockout Station) and must then attach a Discipline Lock (to prevent the key from being removed) before issuing a Clearance Certificate;
- The Discipline Lock must remain in place when handing over to subsequent shifts. All Discipline Locks for a particular discipline (e.g. low voltage electricity) must be keyed-alike so that any Isolation Officer appointed for that discipline (and issued with a key) can open any of the Discipline Locks used for that discipline.

This enables an Isolation Officer to de-isolate equipment that may have been isolated by another Isolation Officer during an earlier shift. Appointed Isolation Officers for a particular discipline are the only persons permitted to hold keys to the Discipline Locks used for that discipline.

Note: Local isolations do not require the use of Equipment Locks (a Discipline Lock may be attached to the Local Isolation Point by the Isolation Officer, followed by the necessary Personal Locks).

Note: For local isolations, if the Isolation Officer is the only person who will be working on the isolated equipment, then he must attach his Personal Lock to the Local Isolation Point.

- Once all required Discipline Locks are in place (i.e. attached to the Isolation Bar) and all Clearance Certificates have been issued, the Permit to Work may be issued by the Authorised Person;
- Each person who will be working on the isolated system, plant or equipment must then attach his or her Personal Lock to the Isolation Bar before starting any work (including the Isolation Officer, if he intends to work on the isolated unit);
- The attachment of a Personal Lock to the Isolation Bar prevents the removal of the key to the Equipment Locks even if the Discipline Lock is removed;

- When called (by an Authorised Person) to de-isolate the system, plant or equipment (on completion of the work under the Permit to Work), the Isolation Officer must ensure that all Personal Locks have been removed from the Isolation Bar before removing the Discipline Lock and the key to the Equipment Locks;
- Before removing the Equipment Locks and de-isolating the energy source, the Isolation Officer must inspect the system, plant or equipment that was worked on to ensure that it is safe to perform the de-isolation. This includes guard inspections, housekeeping, ensuring that all doors and covers are in place, and most importantly, ensuring that no persons are present;
- Once all Equipment Locks have been removed and the system, plant or equipment is safe for use, the Isolation Officer must cancel the Clearance Certificate and inform the Authorised Person that the unit has been de-isolated.

Where a system, plant or equipment is sequence interlocked and a hazard could be created through the inadvertent start up or shut down of a system, plant or equipment lying before or after the unit to be worked on, then that system, plant or equipment must also be isolated and locked out.

Redundant or out of service equipment must, in addition to being isolated and locked out using the relevant Discipline Lock, be fitted with a tag indicating why it is out of service, who performed the lockout, and the hazards associated with that equipment.

Where it is necessary to work on live equipment for the purposes of commissioning, testing, adjusting and sampling, such work must be carried out in accordance with a written Safe Work Procedure and controls must be in place to prevent unauthorised access into the work area.

The implementation of the isolation and lockout system and procedures applicable to the project must be audited on a regular basis by a nominated project management representative. Furthermore, planned task observations must be carried out periodically.

16.13.1 Personal Locks

A Personal Lock must be such that it can only be unlocked by the person to whom it belongs. Combination locks may not be used.

A Personal Lock, as well as the key(s) to the lock, must be kept under the exclusive control of the person to whom the lock belongs.

A Personal Lock must be issued to each person who requires one, and the person's details must be clearly and permanently engraved directly onto his Personal Lock. Alternatively, a

thick durable plastic identification tag may be used that clearly displays the company's name, the employee's name, the employee's company number, and a contact telephone number (the tag must be securely fastened to the Personal Lock). Where the above is hand written, it must be done using a permanent marker pen and it must be legible.

Each person issued with a Personal Lock must be trained and certified competent in the correct use of such a lock.

A Personal Lock may NEVER be removed by anyone other than the person to whom it belongs, except if the removal (cutting) of the lock is authorised by the nominated project management representative (in the absence of this person, authorisation can only escalate upwards). Furthermore, the removal of the lock must be done under the personal supervision of the nominated project management representative, and in accordance with a written procedure. The removal (cutting) of a Personal Lock may be required if the person who applied the lock is unable or unavailable to remove it on completion of the work (e.g. lost his key, failed to remove his lock before going home, etc.).

16.14 Electrical Safety

All electrical work must be carried out by competent personnel in accordance with all legal requirements, codes, design criteria and safety standards applicable to the project.

Each contractor carrying out electrical work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

All persons who will be carrying out electrical work must be certified against the requirements of job and equipment-specific electrical competency standards for the project, which must address job and equipment-specific Safe Work Procedures.

Each person potentially exposed to electrical hazards must receive electrical hazard training at the commencement of his employment on site and thereafter on an annual basis. The training must address the equipment and conditions specific to the area where the individual will be working. The training material must be documented and training records must be kept.

16.14.1 Electrical Installations

Each electrical installation (temporary or permanent) installed or worked on by a contractor must be inspected by a nominated project management representative to ensure that the installation complies with all statutory requirements, codes, design criteria and safety standards applicable to the project.

A nominated project management representative must approve all electrical work before the installation is energised. Any installation deemed unsatisfactory by a nominated project management representative must be removed, repaired or modified by the contractor at his expense.

For every permanent or temporary electrical installation, a certificate of compliance must be issued by a competent and appropriately qualified electrician. These certificates must be available for inspection.

Single line diagrams (with supporting documentation) must be produced and maintained for all electrical installations. This information must include system fault calculations, equipment details, electrical protection discrimination curves, and cable ratings.

Work on electrical installations (new installations, and modifications or repairs to existing installations) may only be carried out by qualified and authorised personnel (i.e. electricians).

Electrical safety devices (specifically, earth leakage protection and overcurrent protection) must be installed on all distribution circuits and the settings must be established by suitably qualified personnel.

A suitable numbering and / or labelling system must be used so that each circuit breaker or earth leakage device can be clearly and readily matched with the outlet or equipment that it protects.

To ensure the safety of the user, each distribution panel must be completely enclosed, must be of the dead-front type, and must be properly constructed and earthed.

All electrical cabling must be covered (e.g. in cable trenches) or elevated (in cable trays) to protect it from damage and to eliminate tripping hazards.

All permanent and temporary electrical installations (cabling, sockets, distribution panels, transformers, switchgear, etc.) must be inspected and tested by a competent and suitably qualified electrician on a monthly basis. The testing must include a grounding (earthing) continuity test and testing of the electrical safety devices. Details of these inspections and tests must be recorded in a register which must be made available to the nominated project management representative for inspection.

A rigorous Isolation, Lockout and Permit to Work system must be applied to all electrical work (i.e. work on electrical installations, machinery or equipment). All personnel must comply with the system and procedures applicable to the project.

Before any work on an electrical installation or equipment is carried out, the installation or equipment must be de-energised.

No electrical work may be performed live, regardless of the voltage, unless written approval is obtained from the nominated project management representative (a justification as to why it is necessary for the work to be carried out with the equipment in an energised state must be provided).

For all energised electrical work, a Safe Work Procedure must be in place and, with the exception of voltage testing and where no tools are used, a Permit to Work (specifically authorising energised electrical work) must be issued.

When carrying out any energised electrical work, approved electrically insulated gloves, blankets, mats and other protective equipment must be used.

Control centres, switchgear rooms, substations, generators, transformers, capacitor banks, and other similar electrical plant and equipment must be appropriately guarded and labelled and, with the exception of emergency shut-off mechanisms, must be made inaccessible to unauthorised personnel (i.e. plant or equipment of this nature must be positioned within rooms or fenced enclosures which must be kept locked).

Appropriate warning signage must be prominently displayed within, and at all entrances to, these rooms or enclosures. The signage must indicate that unauthorised persons are prohibited from entering, that unauthorised persons are prohibited from handling or interfering with any electrical plant or equipment, the procedure to be followed in the event of a fire, and the first aid procedure to be followed should a person suffer electric shock. Suitable fire-fighting equipment must be provided in all such rooms or enclosures.

All electrical panels must be kept locked (using keyed-alike padlocks). Keys may only be issued to authorised personnel.

All un-insulated (bare) or partially insulated conductors must be enclosed and protected to prevent accidental contact therewith. Measures must be taken to prevent unauthorised access and appropriate warning signage must be conspicuously displayed.

Only authorised persons may enter rooms or enclosures housing electrical plant or equipment, and only authorised persons may access electrical panels or cabinets, and cable ducts or trenches. If any work must be carried out in such an area or on such equipment, a Permit to Work must first be obtained from the nominated project management representative.

No connection to any electrical system may be made without prior approval and a valid Permit to Work from the nominated project management representative.

No electrical equipment or apparatus may be modified without written authorisation from the nominated project management representative.

Conductive ladders may not be used in proximity to non-insulated electrically energised lines or equipment.

All permanent and temporary electrical cables, whether energised or not, must at all times be handled as if they are energised.

Only appropriately certified intrinsically safe electrical equipment may be used in flammable or potentially explosive atmospheres such as in confined spaces.

Any equipment or structure on which electric charges may accumulate (such as storage tanks) must be grounded (earthed).

Lightning protection must be provided on all tall structures and buildings.

Grounding (earthing) and lightning protection systems and devices must be designed, engineered, selected and installed based on site-specific requirements.

Before carrying out any excavation work, a Permit to Work (specifically authorising the excavation activities) must be obtained from the nominated project management representative. Such a permit must not be issued until it has been verified that no buried hazards or services exist where the excavation work is to be carried out (refer to the Excavation Standard).

16.14.2 Arc Flash Safety

Depending on the scope and nature of the work, a documented arc flash protection programme must be in place that specifies:

- The methodology for calculating incident energies and determining flash protection boundaries; and
- The PPE required (specific to a task and the equipment on which the task is performed) and associated procedures to mitigate the hazard.

The method of calculation must be based on regional electrical code requirements, or if none exist, the Institute of Electrical and Electronics Engineers (IEEE) Standard 1584, or the United States National Fire Protection Association "Standard for Electrical Safety in the Workplace" (NFPA 70E), or published equivalent.

An Arc Flash Hazard Assessment must be carried out based on accurate and current data. All electrical cabinets where the potential for an arc flash hazard exists must be labelled in accordance with the hazard assessment and the potential incident energies calculated.

A process must be in place for updating the Arc Flash Hazard Assessment and labelling as changes and electrical upgrades occur that might affect the available short circuit current on the system.

In order to mitigate the hazard, Safe Work Procedures must be in place and all persons potentially exposed to arc flash hazards must be trained in these Safe Work Procedures and must be supplied with appropriate arc flash PPE.

16.14.3 High Voltage Power Lines

Before any mobile equipment (such as a crane, bulldozer, back-actor, boom truck or drill rig) is mobilised to a work site, an assessment must be carried out (including a thorough inspection of the work site and the access route) in order to clearly identify any overhead or underground power lines.

A system must be in place to mitigate the risks associated with working in close proximity to power lines and suitable measures must be taken to prevent personnel or equipment from coming into contact with power lines. Extreme caution must be exercised.

Where possible, exclusion zones (based on minimum clearance distances specified by the electrical power utility or the nominated project management representative) must be created with rigid barriers and warning signs.

Only in exceptional circumstances, and then only after a detailed method statement and risk assessment has been approved, all necessary mitigation or control measures are in place (including the use of a spotter), and a Permit to Work has been issued by the nominated project management representative, may equipment be operated within one boom length of energised overhead power lines. Suitable protective insulating barriers may need to be used.

If possible, the power lines must be de-energised and isolated while the work is carried out. All equipment operators and rigging personnel must be trained in the hazards and the applicable safe approach distances (exclusions zones) associated with overhead power lines.

A procedure must be in place for the evacuation of mobile equipment or a vehicle in the event of accidental contact with power lines. All operators must be trained in this procedure and must follow it implicitly.

Scaffolding may not be erected within 5 metres of power lines or overhead track equipment.

16.14.4 Portable Electrical Equipment

Prior to site establishment, each contractor must provide a complete inventory of all portable electrical equipment that he and his sub-contractors intend to use on the site (including plant, machines, appliances, generators, hand tools, lighting, extension cords, etc.). The nameplate data for each item of equipment must be included.

All portable electrical equipment to be used on the site must be supplied and maintained in a serviceable condition.

Any electrical equipment that is in poor condition or is not in proper operating order may not be used. Any electrical equipment that a nominated project management representative deems to be unsafe or unsuitable must be removed from site.

Electrical repair work or diagnostic work on electrical equipment may only be performed by personnel who are competent and authorised to perform this work (i.e. qualified electricians).

With the exception of double-insulated equipment, all electrical equipment must have an equipment grounding (earthing) conductor that connects the frame of the equipment being utilised to the grounding (earthing) conductor of the electricity supply system.

All electrical equipment and all electricity supply systems used (including generators) must be inspected and tested by a registered and competent electrician to ensure that all equipment is properly grounded (earthed).

All electrical equipment used on site must be supplied electricity through (i.e. must be protected by) an approved and tested residual current device (or earth leakage device or unit). If a socket outlet does not have a residual current device in the circuit, a portable residual current device must be used. Outlets without residual current device protection must be labelled as such.

Any electrical equipment that causes an earth leakage device to trip or deactivate the circuit may not be used again until an electrician has inspected and tested the equipment and has recorded in a register that the equipment is safe to use.

Interlocks may never be removed or modified, and fuse terminals may never be bypassed to keep current flowing in any circuit.

All generators must be fitted with suitable overcurrent protective devices (i.e. circuit breakers or fuses).

All generators must be used in compliance with the manufacturer's requirements. Any proposed modification to a generator must be authorised in writing by the manufacturer prior to the modification being made.

Each welding machine used on site must be fitted with a Voltage Reduction Device (VRD). If this is not practical (i.e. for arc welding processes other than stick welding), a dead man's (isolation) switch in the electrode circuit (operated by a trained observer) may be used as an alternative. All welding machines must be properly grounded (earthed).

All portable electrical hand tools used on the site must be double-insulated.

Electrical equipment must be disconnected or unplugged when not in use.

Portable lights must be stable and each light bulb must be protected by a substantial guard. Temporary festoon lighting must be double-insulated and must be supported at least 2.5 metres above the floor, if possible.

Handheld lights must be of the all-insulated type and must be extra low voltage (i.e. not exceeding 32V). 120V or 240V handheld lights are not permitted.

Any lighting used in hazardous locations (i.e. potentially explosive atmospheres, confined spaces, and damp or wet areas) must be operated at a maximum of 32 volts, unless earthed and protected by earth leakage devices.

No person may wear a watch or any jewellery, or carry any metal objects such as a lighter or keys, while working on any electrical system or equipment.

No person may work on or use electrical equipment if his clothing is wet or any part of his body is in contact with water.

No person may handle electrical equipment, equipment cords or extension cords with wet hands or if the floor or ground surface is wet.

Fire extinguishers filled with carbon dioxide must be used to fight electrical equipment fires (water may never be used). If possible, the electrical equipment should be de-energised before fire-fighting activities commence (refer to the Fire Protection and Prevention Standard).

When cleaning or performing maintenance work on an item of electrical equipment, the equipment must be unplugged.

Equipment may not be unplugged while that equipment is switched on. Nor may equipment be plugged into a receptacle (socket) with the equipment's switch turned on.

Electrical equipment that has a defective plug or wiring may not be used. Repair work to defective or damaged electrical equipment may only be carried out by a qualified electrician.

Extension cords may be used for temporary applications only. Permanent cabling must be installed for long-term needs.

Extension cords may not be run through doors, windows, ceilings or holes in walls.

An extension cord must be uncoiled completely before it is used.

An extension cord must be of sufficient current-carrying capacity to power the equipment that it is supplying electricity to. Cords must not be overloaded.

Extension cords must be unbroken and continuous (i.e. no joins or splices in the cord are permitted).

Extension cords may not be daisy-chained (i.e. one extension cord plugged into another extension cord).

Extension cords and equipment cords may not be modified to fit a receptacle (socket).

Two-conductor extension cords may not be used. A three-conductor extension cord (i.e. a grounded or earthed cord) must be used even if the equipment that it is supplying electricity to uses a two-prong plug.

Extension cords that are frayed, have insulation tears, cracks or abrasions, have exposed conductors, or have bent, broken or "spread" plug prongs may not be used.

Extension cords that will be used outdoors must have heavy duty insulation and must be weather and UV resistant.

All electrical equipment cords and extension cords must be covered or elevated to protect them from damage and to eliminate tripping hazards.

Each contractor is responsible for protecting his electrical equipment from the weather and from possible mechanical damage.

All portable electrical equipment (including generators) must be inspected, tested and tagged by a competent and appropriately qualified electrician on a monthly basis. Details of these inspections and tests must be recorded in a register which must be made available to the nominated project management representative for inspection.

The inspection and testing must include a continuity test of the grounding (earthing) conductor (as applicable) and a complete examination of the equipment or system to assure safe use.

The following colour coding system must be used for the tagging of all electrical equipment:

Table 15-2 Colour Coding System for Electrical Equipment

Month		Tag Colour	Month	Tag Colour
January		Red	July	Red
February		Blue	August	Blue
March		Orange	September	Orange
April		Green	October	Green
May		White	November	White
June		Yellow	December	Yellow

The tag placed on a piece of equipment must be traceable to an entry in a register where the following information concerning the inspection and testing of that piece of equipment must be recorded:

- Date of inspection and testing;
- Equipment description;
- Equipment owner;
- Equipment location;
- Name, signature and licence number of the electrician who carried out the inspection and testing; and
- Comments concerning the inspection and testing, and details of any repair work carried out or required.

Any item of electrical equipment that does not pass an inspection or test must be removed from service (and tagged, "Out of Service") immediately and must then either be repaired (if possible) or removed from site.

Any item of electrical equipment without a tag or with an out-of-date inspection or test may not be used.

Any item of electrical equipment found without a tag or with an out-of-date inspection or test must be removed from service until it has been inspected and tested. If it is found that more than one item of equipment being used by a contractor has not been inspected and tested as required, all work with electrical equipment must be stopped until it can be demonstrated to the satisfaction of the nominated project management representative that the contractor's systems and controls are adequate and fully implemented.

In addition to the formal monthly inspections and testing carried out by an electrician, electrical equipment (particularly extension cords, portable hand tools, welding machines, compressors and pumps) must be visually inspected by the user on a daily basis prior to

use. Users must be trained to look for cracks in casings, loose casings, outer cord sheathing that is not being held firmly in position at the equipment, cuts or cracks in cord or cable insulation, exposed conductors, damaged plugs or sockets, and missing covers. Damage and / or defects must be reported immediately.

Personnel must immediately stop using and report any electrical equipment or machinery that is shocking, sparking, overheating or smoking. Corroded outlets, switches and junction boxes must also be reported.

16.15 Confined Spaces

Entry into a confined space occurs when a person's whole body, upper body or head is within the confined space. This is not intended to prevent an authorised, competent person from inserting only his arm into the space to test for hazards using appropriate monitoring equipment. Precautions must be taken to prevent persons from being overcome by atmosphere escaping from the confined space.

Before any person enters a confined space, a detailed risk assessment must be carried out, including the need for an authorised person to assess such things as oxygen levels, contaminants, temperature extremes and concentration of flammable substances.

As a minimum the risk assessment shall address the following:

- Isolation and lockout procedures required for chemical substances, mechanical or electrical energy, steam, pressure, heat, gases, liquids and solids;
- Venting, purging, draining and cleaning prior to entering the confined space;
- Hazards created by carrying out particular tasks or through the use of chemical substances in the confined space. Task-Based (or Issue-Based) Risk Assessments and/or Written Safe Work Procedures must be available for work in confined spaces - in particular for abrasive blasting, welding, flame cutting, grinding, chemical/steam cleaning, rubber lining and painting;
- Entry, exit and escape routes as well as barricading;
- The electrical safety, intrinsic safety and other safety specifications of equipment to be used in the confined space (explosive atmospheres must be considered);
- The need to test for presence of toxic/asphyxiant substances, radioactivity, oxygen, temperature extremes and flammable substances prior to entry and during the performance of work;
- Provision of suitable mechanical ventilation and personal protective equipment e.g. lifejackets etc. and in particular the use of respiratory protection such as compressed air breathing apparatus; and

- A ventilation rate suitable for general use must take into account factors such as air contaminant type, rate of generation, rate of oxygen depletion, temperature, efficiency of ventilation distribution and contaminant removal from the breathing zone. Therefore each situation needs to be evaluated on its own merit by a risk assessment that will select a combination of ventilation method and respiratory protection that suits the particular circumstances. This must be achieved by consultation between competent operations personnel, engineers and a ventilation specialist.

Entry and work inside a permitted confined space must be controlled and regulated by the project Isolation / Lockout and Permit to Work control systems. The Authorised Person issuing the Permit to Work may only do so if the conditions applying to the specific confined space entry have been satisfied and documented.

As a minimum, the following must be included in the permitting process:

- Access barriers to prevent unauthorised entry;
- Isolation procedures for contaminants and other energy sources;
- The need for breathing apparatus / ventilation requirements;
- The sign-in and sign-out of all persons entering the confined space;
- Display of the permit;
- Communication procedures and/or equipment;
- Safety specifications of equipment to be taken into the confined space;
- Barricading of entrances and exits;
- Rescue plan and equipment;
- Standby person(s); and
- A completion and lock-in procedure (to ensure that space is evacuated and adequately secured).

The Permit to Work process must require competent rescue persons with suitable communication, rescue and firefighting equipment to be present where any of the following may exist:

- Compressed air breathing apparatus is required;
- There is a high risk of fires or explosions;
- The atmosphere can rapidly become unsafe for breathing purposes if the mechanical ventilation fails;
- There is a high risk of flooding or engulfment;

- Narrow tunnels or pipes are entered or where exit or escape routes cannot readily be accessed
- Work is done in remote areas; and
- A single person, who cannot be observed directly or is isolated from other workers, does the work.

Where testing for toxic/asphyxiate substances, radioactivity, oxygen, temperature extremes and other health hazards as well as for flammable substances is carried out, it may only be done by persons trained, tested and certified competent in writing to do so.

The ventilation method and quantity must be adequate to ensure oxygen levels and explosive or toxic gas levels remain within acceptable defined limits. Where ventilation is required, this must be covered by an approved documented procedure.

As a minimum standard, the volume of air pumped in and circulated in a confined space needs to be equivalent to 20 times the volume of the space per hour.

Where breathing apparatus or respiratory equipment is required, the contractor's Health and Safety Officer must be consulted with regard to the specification and selection of suitable equipment.

All persons required to use respiratory protection must be medically fit and trained in the correct use of the equipment.

Safe and convenient entry, exit and escape routes from the confined space must be provided where possible and practical. Where this cannot be achieved effectively, the risk assessment must determine if a competent rescue person must be on duty at the confined space when work is in progress.

Where a standby/rescue person is required, they will have no other duties and will be positioned outside the confined space entry point at all times while personnel are within the space.

16.16 Arc Welding

All welding machines must be fitted with voltage reducers.

The supply cable to every welding machine must be correctly rated and fitted with an approved plug to be used only with an approved matching plug socket.

The electrical circuit to every plug socket must be protected by a correctly rated circuit breaker and a supply voltage rated earth leakage unit.

Welding cables must be properly insulated and correctly rated for the welding machines on which they are to be used.

Welding cable terminals must either be covered with a properly designed, constructed and installed cover so that inadvertent human contact with the terminals is impossible, whether the cables are connected or not, or the welding cables must be fitted with insulated plugs so that inadvertent human contact with any live part is impossible when the cables are plugged into the machine. Also the plug socket should be such that when the cables are not plugged in, inadvertent contact with a live part of the socket is impossible.

Earth cable clamps and electrode holders must be of an approved type. Earth clamps and electrode holders must be fixed to welding cables with eye terminals and bolts.

All welding machines and safety devices must be subjected to regular planned maintenance and a monthly electrical inspection. The inspection must include a test to ensure that the voltage reducer is functioning properly, by measuring and confirming that the open circuit output voltage is reduced.

Before using a welding machine, the welder must ensure that he is wearing all the required and approved protective clothing and equipment:

- Persons assisting the welder must also wear all of the required personal protective
Welding hood;
- Leather welding gloves;
- Safety boots with steel toe protection;
- Flame resistant overalls; and
- Any other clothing or equipment necessary to perform his work safely and efficiently.
- Equipment.

When changing electrodes or moving the earth clamp, the welder or his helpers must wear gloves to avoid possible skin contact with live electrical parts and to prevent burns.

When attaching welding cables to the terminals of the welding machine, the welder or his helpers must wear gloves, or preferably, the machine should be switched off to avoid possible electric shock.

Helpers who may be holding the work piece being welded must wear gloves and protective goggles.

Where practicable the welder should place protective screens around the area where he is welding, to prevent injury to the eyes of passers-by.

The welder must ensure that the earth cable follows the shortest practical route between the welding machine and the work piece. The earth connection must be directly between the welding machine and the work piece and no building or other structure must form part of the earth return path.

As far as is practicable, the welder should avoid welding under wet or damp conditions. If this is unavoidable, the following precautions should be taken:

- Use only oil filled or other watertight type welding machine;
- Keep the electrode holder as dry as is practical;
- Keep as dry as possible. Stand on an elevated surface out of the water and wear watertight boots and a rain suit. Also ensure that the gloves are in good condition, free of holes.
- Under conditions that result in high perspiration levels, the following measures should be implemented:
 - Use an insulated electrode holder;
 - Change clothing regularly (if possible);
 - Use insulated material like rubber mats and/or timber tuck board to separate yourself from the work piece;
 - Wear dry gloves on both hands during welding;
 - Use fans and air-conditioning to reduce humidity and temperature; and
 - Use an observer capable of responding in an emergency.

When working inside metal vessels or under other conditions where parts of his body may come into contact with conducting surfaces, the welder must take precautions to insulate himself from such surfaces.

When working in confined spaces, the welder must take steps to ventilate the area to prevent inhalation of fumes, which may endanger his health and the health of any assistants.

Engine powered welding machines must not be used in any place that is not very well ventilated since the welder and his helpers may be overcome by carbon monoxide fumes.

The welder should take the necessary precautions when welding objects that may catch alight, explode or release poisonous fumes or gases.

16.17 Gas Welding and Burning

Welding or cutting torches and hoses shall not be connected to cylinders when stored.

When work is stopped and equipment is unattended, all valves at the gas and oxygen cylinders shall be closed. The hoses shall be bled and a check shall be made later for possible pressure build-up. Torches shall be removed from the hoses prior to putting them into the toolbox. Smoking SHALL NOT be permitted during this stopping procedure.

Special care shall be taken during overhead cutting and welding operations to safeguard and prevent falling sparks from starting a fire.

Warning signs shall be posted around and at each level below the area of each overhead welding or burning operation. Fire extinguishers shall be available and fire blankets shall be used for protection.

When welding or cutting, adequate ventilation must be ensured / provided.

Hoses shall be kept clear from passageways, ladders and stairs. When hoses are subject to damage, they shall be properly protected. Hoses shall be inspected daily.

Fire extinguishers shall be ready for instant use in locations where cutting is performed.

Flash-back arrestors must be fitted to all cutting torches at the torch and at the bottle (a total of four arrestors).

Lighting of the cutting and welding torches must only be done using a striker and not an open flame.

Soap Leak tests must be performed on all flash-back arrestors.

Hoses may only be secured using approved hose clips, and not by wire, cable ties or any other means.

Special care shall be taken when welding with respect to piping that has been painted, as toxic fumes may be emitted in some cases. The supervisor's advice should be sought prior to the above welding operations being carried out.

16.18 Compressed Gas Cylinders

The contractor must establish a suitable storage area for oxygen, acetylene, LPG and argon cylinders in compliance with the following requirements:

- The storage area must be located at least 10 metres away from any building, and must be well ventilated;
- The storage area must have a concrete floor;
- The storage area must be enclosed using wire mesh fencing (as this will ensure adequate ventilation). This enclosure must be kept locked. Access into the storage area must be limited and controlled;

- A protective covering or roof must be fitted to the enclosure to provide shade;
- The enclosure may not be used for the storage of any other materials / equipment, and must be kept completely free of all combustible materials at all times;
- Appropriate warning signage (i.e. "No Smoking" and "No Naked Flames") must be prominently displayed on the enclosure;
- A 9kg dry chemical powder fire extinguisher must be mounted near the entrance to the enclosure
- If electrical lighting is required, it must be of an approved intrinsically safe type;
- Oxygen, acetylene, argon and LPG cylinders must be stored separately in the enclosure. Furthermore, full and empty cylinders must be separated. Separate storage sections must be clearly designated within the enclosure for the different gas types, and for full and empty cylinders, i.e. oxygen – full, oxygen – empty, acetylene – full, acetylene – empty, etc.;
- When a cylinder is empty, the cylinder cap must be replaced to protect the valve. Empty cylinders must be clearly marked (there must be no need to open valves to check if cylinders are full or empty);
- All cylinders must be stored in an upright position and must be secured in this position by chaining, strapping or clamping them individually to a wall, a cylinder trolley, rack or carrier, or some other rigid structure;
- Cylinders must be stored in rows (when necessary due to the number of cylinders) with aisles between the rows to facilitate easy and rapid removal in the event of a fire;
- Oxygen cylinders may never be stored near highly combustible materials, particularly oil and grease, or near fuel gas cylinders. When in storage, oxygen cylinders must be separated from fuel gas (LPG and acetylene) cylinders by a distance of 6 metres or by a 2 metre high wall made of fire-resistant material;
- The total quantity of gases stored on site must be limited to a 2 week supply.

Compressed gas cylinders must always stand upright (i.e. when being used, stored or transported) and must be properly and individually secured to prevent them from falling over.

Cylinders must be protected from flame, heat and from being struck by moving equipment and falling objects.

When handling gas cylinders (whether full or empty), care must be taken to prevent sudden impacts.

Whenever a cylinder is not in use, the protective cap must be in place to prevent the valve from being damaged.

Gas cylinders may not be carried, dragged, rolled or slid across a floor or surface.

When gas cylinders are to be moved / used, they must be placed in a proper cylinder trolley fitted with a 1.5kg dry chemical powder fire extinguisher.

Gas cylinders may not, under any circumstances, be used as rollers or work supports.

If transported by crane, hoist or derrick, compressed gas cylinders must be placed in a suitable cradle, net or skip box. Cylinders may NEVER be lifted using wire rope, fibre rope, a web sling or a chain sling. Before moving / transporting a gas cylinder, the regulator must be removed and the protective valve cap must be replaced.

Gas cylinders may not be taken into a confined space. Gas hoses that are run into a confined space must be removed during breaks.

Gas cylinders may not be placed on scaffolding.

Cylinder valve keys must be in place. If no suitable valve key is available then the cylinder may not be used. Nothing but the manufacturer-supplied key may be used to open the valve.

A flashback arrestor and a check valve (non-return valve) must be installed between the regulator and the hose and between the hose and the torch on the oxygen line and on the fuel (acetylene) line.

Connection fittings may not be forced and safety devices associated with cylinder valves or regulators may not be altered / tampered with.

Gas hoses may not be joined. Only approved hose connectors of the crimp type are permitted. Wire and jubilee clamps are prohibited.

Only high quality ancillary equipment may be used. This includes flashback arrestors, hoses, clamps, spindle keys, nozzles and torches.

Only trained and competent personnel may operate gas welding / cutting equipment and appliances.

When an employee opens the valve to a cylinder, he must stand to one side and open it slowly. Valves may never be left partly open – they must either be closed or be opened fully.

Leaking cylinders must immediately be removed from service and the workplace (if it is safe to do so).

Suitable firefighting equipment must be at hand wherever gas cylinders containing oxygen and / or fuel gas are being used.

Gas cylinders must be prevented from coming into contact with electrical circuits, e.g. welding leads. Never strike an arc on a cylinder.

Oxygen may only be used for the purpose for which it is provided. Do not use oxygen in pneumatic tools or tyres, as an explosion may occur.

Empty cylinders must immediately be marked as such and must be removed to the cylinder storage area at the end of each day / shift.

16.19 Electrically Powered Tools and Equipment

All powered hand tools, such as circular saws, drills, chainsaws, percussion tools, jigsaws etc., must be equipped with a constant pressure switch that will shut off the power when the pressure is released. (Exception: this requirement does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools).

Electrical power tools must be of the approved double-insulated type. The electric cord, pneumatic or hydraulic supply line of powered tools must not be used for hoisting or lowering of the tool.

Loose clothing, jewellery or gloves that could get caught in the tool must not be worn when operating powered tools. Operators of powered tools who have long hair must keep their hair tied up.

The power source must be disconnected from the tool before making any repairs, servicing, adjustments, or replacing attachments such as drill bits.

16.19.1 Angle Grinders

The following personal protective equipment must be worn when using angle grinders:

- Safety helmet;
- Gloves;
- Safety glasses (or safety goggles) and a full face shield (i.e. double eye protection);
- Overalls with long sleeves and long pants, avoid any form of loose clothing;
- Safety boots with steel toe protection;
- Hearing protection;
- Breathing apparatus where dust or fumes may be generated;

- Where grinding machines are used, a face shield is to be worn as extra protection to the safety glasses; and
- Certain tasks may require the use of a leather apron as determined by a risk assessment.

A 230mm angle grinder may not be used for free cutting purposes. Exceptions may be approved only if alternative methods evaluated proved more hazardous or no alternative exists. The risk assessment for the task must then specifically include mitigating measures to ensure the safest possible way of performing the task.

The use of 230mm angle grinders for grinding purposes is acceptable, however should this form of grinding be required, the 115mm or 125mm grinders would be preferable.

All angle grinders must have a dead man switch incorporated, with a pressure switch in the handle.

A 230mm electrical angle grinder unit must incorporate a soft start to reduce the starting strain and a braking system to reduce run on after the unit has been switched off.

All angle grinders must have a spindle lock to assist with changing the disc or grinding wheel.

Anti-vibration handles are recommended to further reduce the stress if used for extended periods.

Angle grinders must be equipped and operated with disc guarding at all times.

Angle grinder must not be stored with fitted discs, as this will lead to damaging of the discs.

Before use and mounting of discs it is essential to check the safety codes and specifications printed on the upper side of the disc. Such specifications include the following:

- Revolutions per minute (RPM). The allowable speed of the disc must be equal to or greater than the maximum achievable speed of the grinder;
- Physical dimensions of the disc must meet grinder specification; and
- The disc must be suitable for the material type to be cut / ground as indicated on the disk. Cutting discs must never be used for grinding and vice versa.
- It is critical that the correct disc mounting procedure is followed:
 - Check that the machine is plugged out;
 - Check the machine spindle, backup washer and thread;
 - Check the condition of spindle nut - ensure spanner drive holes are not elongated;

- Ensure spindle nut spanner is the tool recommended by machine manufacturers;
- Do not use a hammer, pipe or chisel to tighten the nut, or apply additional mechanical advantage to nut torque. A firm "nip" is sufficient to retain the disc;
- Ensure the spindle diameter is suited to disc bore. Excessive clearance will cause the machine to vibrate due to eccentricity;
- Check to see that the nut and backup washer do not "bottom out". This will result in the disc not being correctly clamped on the spindle;
- Ensure the spindle speed is marked on the grinder and that it is less than the allowable disc speed; and
- Fit the disc, with the metal ring or writing to the nut side.
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16.20 Pneumatically Powered Tools and Equipment

Pneumatic powered tools must only be driven by filtered compressed air with an in-line lubrication system, or be lubricated prior to use if there is no in-line lubrication system. When using pneumatic powered tools the designated tool pressure must be attained by the use of a regulator.

Pneumatic powered tools must be disconnected when not in use. They must not be disconnected from the air supply until all the residual pressure has been released or contained by a shut-off device. Hoses must not be kinked as a means of containment.

Employees operating pneumatic powered tools, and any potentially affected employee in the vicinity of use, must wear suitable personal protective equipment.

All rotary compressed air tools (e.g. drills) must have the rated revolution per minute (RPM) permanently marked on the casing. Only attachments of compatible RPM must be used with these machines.

The actual RPM of the tool must be checked every three months to ensure that the speed is as rated to manufacture specifications.

Pneumatic powered tools must be secured to the air supply hose by an approved positive means to prevent the tool from becoming accidentally disconnected. Safety clips or retainers must be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 kPa pressure at the tool, must have a safety device on the muzzle to prevent the tool from ejecting fasteners unless the muzzle is in contact with the work surface.

Compressed air must not be used for cleaning purposes except where reduced to less than 30 kPa, and then only with effective chip guarding and personal protective equipment in place. The 30 kPa requirement does not apply to concrete form, mill scale and similar cleaning purposes. The use of compressed air for cleaning purposes must be approved by the nominated project management representative. Compressed air must not be pointed at any part of the body or used for cleaning clothing.

Airless spray guns of the type which atomize paints and fluids at high pressures must be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released. A diffuser nut which will prevent high pressure, high velocity release while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection must be provided in lieu of the above.

Abrasive cleaning nozzles must be equipped with an operating valve, which must be held open manually to enable operation. A support must be provided on which the nozzle may be mounted when it is not in use.

16.21 Fuel Powered Tools and Equipment

Fuel powered tools must be shut down and allowed to cool before being refuelled, serviced, or maintained. Fuel must be transported, handled, and stored in approved fuel containers. Where possible, diesel driven engines must be used in preference to petrol driven engines. All fuel powered tools must be included on the contractor's Equipment Register and the register must be submitted to the nominated project management representative prior to the relevant work commencing.

When fuel powered tools are used in enclosed spaces, the space must be ventilated and the atmosphere monitored to measure toxic gas concentrations. Persons in the space must wear the necessary personal protective equipment. Confined Space Entry clearance may apply. This type of activity must only be undertaken in exceptional circumstances and requires the approval of the nominated project management representative.

16.22 Hydraulically Powered Tools and Equipment

Hydraulic powered tools must use only approved fluid that retains its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's stated safe operating pressures for hoses, valves, pipes, filters and fittings must not be exceeded.

Only manufacturer approved hoses, valves, pipes, filters and fittings must be used.

16.23 Explosive Powered Tools

All operators shall be trained by the contractor.

The contractor shall ascertain that the explosive charges to be used are of the correct strength for the purpose.

Projectiles from explosive powered tools shall NOT be driven into:

- Tile, terracotta, glazed brick, glass, marble, granite, thin slate or other brittle substances;
- High tensile steel, cast iron or steel hardened by heat treatment; or
- Concrete that contains aggregate that will not pass wholly through 25mm mesh screens.

Under no circumstances shall a tool be fired in such a manner as to cause the projectile to fly free.

Suitable safety glasses and hearing protection shall be worn by operators when firing an explosive powered tool.

At all times when a tool is being used, the operator shall display clearly legible signs at or near the place where the tool is in use. Sign should read: WARNING: EXPLOSIVE POWERED TOOL IN USE – KEEP CLEAR.

The operator shall warn all other employees in the vicinity of the area in which the tool is about to be used.

Tools shall never be stored in a loaded state. Cartridges and tools shall be stored separately in lockable containers.

A logbook must be kept of the number of cartridges used and returned.

16.24 Hand Tools

Employees required to use hand tools must receive training relevant to the tool and have their competency assessed in the operation, inspection and maintenance of the tool. Where necessary, additional applicable personal protective equipment must be worn when using hand tools.

Wrenches, including adjustable, pipe, end, and socket wrenches, must not be used when the jaws are sprung to a point where slippage occurs. Impact tools such as drift pins, wedges and chisels, must be kept free of mushroomed heads. The wooden handles of tools must be kept free of splinters or cracks.

Adjustable wrenches must not be used in lieu of ring or open-end type spanners, unless a risk assessment has been conducted and the use of the adjustable wrench is approved by the nominated project management representative. Wherever possible, ring spanners must be used in preference to open end spanners.

Correct hand tools for the job must be used, e.g. screwdrivers must not be used as chisels, and pliers must not be used as hammers.

All wedges and drifts that may spring, fly or fall to lower levels upon impact must be fitted with an attachment which attaches a safety "lanyard" to a solid structure to restrain the impact tool from becoming a projectile.

All hand tools used in elevated areas, that may be dropped or fall to lower levels must be fitted with safety lanyards and attached to solid structures or in the case of podges, scaffold keys etc., attached by wrist lanyard to the user.

Purpose built tools and equipment may not be used unless a risk assessment has been conducted and authorised by the nominated project management representative.

16.24.1 Stanley Knives / Utility Knives

A utility knife must be used as a last resort, when it is the safest tool to use. Always consider alternatives that pose less of a risk to the operator.

Whenever a utility knife is used, ensure that a complete risk assessment is done and that all possible hazards have been addressed.

Only utility knives with retractable blades are to be used. The blade is to be retracted at all times when the knife is not in use or is being stored.

Before using the utility knife, ensure that the tool is in a good condition and the blade is secure in the holder (seated correctly and that there is no play).

Ensure that the blade is always sharp and in good condition. This will prevent the use of excessive force.

Always wear cut resistant gloves and safety glasses when using a utility knife. There is always a risk of the blade breaking under tension and becoming a projectile.

Always ensure that you cut away from your body, and that no part of your body is in the firing line.

Always ensure cleanliness of all equipment in use during the cutting operations.

16.25 Inspection of Equipment and Tools

All tools must be inspected by the user before, during and after use. If any faults are identified, the tool must be taken out of service and not used until repaired. Faulty tools that are not able to be repaired must be tagged "out of service" and removed from site.

16.26 Manual Handling and Vibration

Any handling or lifting task that can only be done manually must be planned and rehearsed before the task is done.

If more than one person is involved in a task a communication procedure must be agreed in advance. Lowering the load must be done in a controlled manner. Dropping a load is dangerous and must be avoided.

As a guideline 25 kg is considered to be the limit of what a person can safely handle. Where there are loads exceeding 25 kg the risk of handling the load must be mitigated to assure minimal potential for any injury.

When mechanical lifting aids are provided, they should be used.

Extra care should be taken when lifting awkwardly shaped objects.

Position the feet correctly. The feet should be placed hip-width apart to provide a large base. One foot should be put forward and to the side of the object, which gives better balance.

Bend or 'unlock' the knees and crouch to the load. The weight will then be safely taken down the spine and the strong leg muscles will do the work.

Get a firm grip. The roots of the fingers and the palm of the hand should grip the load. This keeps the load under control and permits it to be distributed more evenly.

The following should be considered with conducting the Risk Assessment with regards Manual Handling and also take into consideration the task factors, physical demands and tools involved in the task:

- Load weight/frequency;
- Hand distance from lower back;
- Asymmetrical trunk/load;
- Postural constraints;
- Grip on the load;
- Floor surface;
- Environmental factors;

- Carry distance; and
- Obstacles enroute.

Team Manual Handling:

- Load weight;
- Hand distance from lower back;
- Vertical lift region;
- Trunk twisting/sideways bending;
- Postural constraints;
- Grip on the load;
- Floor surface;
- Environmental factors; and
- Communication, co-ordination and control.

As far as possible, exposure to vibration must be eliminated.

However, if this is not possible, short-term solutions to decrease exposure include:

- Reducing the vibration levels;
- Removing the person from the vibrating equipment / tools;
- Reducing the period of time that the person works with the vibrating equipment/ tools (at least 40 minutes break after 20 minutes working with a machine that vibrates excessively).

In order to reduce exposure to vibration:

- Consider buying equipment that operates effectively at lower speeds;
- Buy equipment with built-in damping materials;
- Buy lighter tools if they are available - they require less of a grip;
- Maintain the equipment;
- Make sure equipment is balanced and there are no worn parts;
- Use remote controls when they are available;
- Reduce your grip on the equipment when it is safe. The less time you actually have your hands on the equipment the better. Relax your hands during these brief breaks;
- Take scheduled breaks; and
- Do other tasks that allow you to move away from vibrating tools and equipment.

The workplace must be assessed by a competent person for compliance with good design, layout and practice, to avoid or minimise adverse health consequences due to manual handling and vibration issues.

Quantitative evaluations of vibration produced by specific equipment must include the following measurement parameters: direction of movement, frequency, intensity, and variation with time and duration, as per documented methods.

Employees and contractors must be informed of the results of assessments and instructed in appropriate manual handling techniques, where the risk assessment indicates a need.

Workplace vibration sources that could contribute to the exceedance of an Occupational Exposure Limit (hence potential for impact on worker Musculo-skeletal fitness) must be identified and adequately characterised.

Manual handling tasks assessed as having the potential to cause a Lost Time Injury (i.e. with potential for impact on worker Musculo-skeletal fitness) must be identified and adequately characterised.

Workplace manual / materials handling tasks risk rated as "significant" must be assessed and recorded to include biomechanical factors (e.g. posture, bending, twisting, repetitive motions, working overhead, and exerting force away from the body).

16.27 Personal Protective Equipment

All applicable legislation concerning Personal Protective Equipment (PPE) must be complied with at all times.

As a minimum, the following PPE must be worn by all persons (including visitors) at all times whilst on a project site:

- Safety footwear with steel toe protection;
- Safety glasses (individuals who wear prescription spectacles must be provided with either over-spec safety glasses or prescription safety glasses);
- Safety helmet (hard hat); and
- High visibility protective clothing with reflective taping (long trousers and long-sleeved shirts with collars and cuffs).
- Additional PPE requirements must be determined through hazard identification and risk assessment. This hazard-specific PPE (such as hand protection, hearing protection and respiratory protection) must be worn as required (e.g. when in a certain area, when performing a certain task, or when working with a certain substance);
- The correct PPE must always be worn:

- In accordance with site requirements (as indicated at the entrances to a project site and at the entrances to buildings and / or designated areas on the premises);
- In zoned areas (e.g. noise zones and respirator zones); or
- As required by a Safe Work Procedure, a risk assessment, or a Safety Data Sheet (SDS).

Each contractor must provide each of his employees with all required PPE (at no cost to the employee). The specific PPE that is provided to a particular employee must be based on the nature of that employee's work and the location in which the work is performed (i.e. must be based on the hazards to which the employee is exposed). PPE requirements for a particular job or for a particular area must be determined through a risk assessment for that job or area.

Any employee who does not have all of the PPE that is required for him to perform his duties safely will not be permitted to work.

Each employee must care for his PPE, maintain it in good condition, and inspect it on a daily basis.

If an item of PPE has worn out, has become damaged, or is found to be defective in any way, it must be replaced by the contractor.

PPE must be stored in accordance with the manufacturer's requirements and / or recommendations.

Each employee must receive training in the use, maintenance and limitations of the PPE that is provided to him, and must be made aware of why the PPE is necessary as well as the consequences of not wearing it as instructed (i.e. the potential for injury and / or disciplinary action). Training records must be retained.

Any person who refuses to wear PPE as required must be removed from the site.

Symbolic signs indicating mandatory PPE requirements must be prominently displayed at the entrances to a project site and at the entrances to buildings and / or designated areas on the premises where additional PPE is required. These signs must comply with the applicable national standard (if one exists).

Each contractor must appoint an employee to:

- Control the issuing and replacement of PPE;
- Keep an up-to-date register as proof that items of PPE have been issued to individuals (an employee must sign for the items that he receives);
- Ensure that there is an adequate supply of all required PPE (i.e. maintain PPE stock levels on site); and

- Carry out regular inspections to ensure that PPE is being used correctly, is being maintained in a good, serviceable and hygienic state, and is not being shared between employees.

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16.27.1 Head Protection

A safety helmet (or hard hat) worn correctly will help protect the head in the event of:

- An employee being struck on the head by a falling or flying object;
- An employee striking his head against a fixed or protruding object; or
- Accidental head contact being made with an electrical hazard.

A safety helmet must be worn at all times on a project site, with the following exceptions:

- Vehicle and equipment operators inside enclosed cabs;
- In offices and in office or administration buildings; and
- At designated lunch and break areas (provided that no work is in progress in the immediate break area).

A safety helmet must be worn in accordance with the manufacturer's requirements.

A safety helmet must be worn directly on the head. The wearing of a cap or other headgear beneath a safety helmet is prohibited unless the items have been specifically designed to be used in combination (i.e. the arrangement is approved by the safety helmet manufacturer).

The suspension system inside a safety helmet (that acts as a shock absorber) may not be removed.

The painting of safety helmets is prohibited.

Safety helmets may only be cleaned using a mild detergent and water. No solvents may be used.

16.27.2 Eye Protection

If an employee is carrying out, assisting with, or working adjacent to any activity where sparks or projectile particles are being generated, where chemical mists or fumes are being generated, where liquids may splash or spray, where harmful electromagnetic radiation (heat or light) is being generated, or where there is a risk of wind-blown particles entering the eyes, then suitable protective eyewear must be worn at all times (i.e. safety glasses, safety goggles, a face shield, a welding helmet, or a combination of these).

Such activities include:

- Working with rotating equipment (e.g. grinders, drills, mills, lathes, and saws);
- Welding and cutting;
- Chipping, chiselling or caulking;
- Using explosive powered tools;
- Abrasive blasting;
- Sanding; and
- Working with chemical substances (e.g. drilling fluids, acids, solvents, paints, pesticides, etc.).

For certain activities, special eye protection is required (e.g. a heat-resistant face shield is required when working near molten metal).

Double eye protection is required for activities such as:

- Grinding, cutting, chipping, chasing and reaming (employees must wear both a full face shield and safety glasses or goggles); and
- Arc welding (welders must wear both safety glasses and a welding helmet).

Screens must be erected to protect passers-by, where practical.

Safety glasses must be worn at all times on a project site, with the following exceptions:

- Vehicle and equipment operators inside enclosed cabs with the windows fully closed;
- In offices and in office or administration buildings;
- At designated lunch and break areas (provided that no work is in progress in the immediate break area); and
- When another form of eye protection is required (e.g. safety goggles).

All safety glasses used on site must have suitable permanent side protection.

In strong sunlight, dark safety glasses should be worn to reduce eyestrain and fatigue. However, caution must be exercised when employees are required to frequently move between outdoor and indoor environments. Dark safety glasses may not be worn indoors or in poor daylight conditions. Prescription spectacles with tinted lenses are prohibited inside buildings or other structures with limited illumination unless the lenses are light-sensing and adjust to changing illumination levels.

Employees who wear prescription spectacles (i.e. require corrective lenses) must make use of either:

- Prescription safety glasses (with permanent fixed side shields) that conform to the requirements of a recognised national or international standard (e.g. CSA, ANSI, or equivalent); or
- Over-spec safety glasses or goggles.

The use of contact lenses in certain areas may not be suitable because of increased risk to the eye due to dust or heat.

16.27.3 Hearing Protection

Local regulations concerning occupational exposure to noise and the use of hearing protection must be complied with as a minimum.

“Low noise” tools and machinery must be used wherever possible to reduce noise levels.

Where noise cannot be reduced to an acceptable level through engineering and work practice controls, measures must be put in place to minimise the exposure of employees to the noise (i.e. administrative controls and personal hearing protection).

Areas where it is likely that the 95% upper confidence limit of an eight hour Leq mean exceeds 85dB(A), or areas where impulse noise exceeds 140dB(C), must be designated as noise zones. These noise zones must be clearly demarcated and mapped, signs must be posted, and all employees must be made aware of the requirements for working in such an area.

Suitable hearing protection must be worn in all designated noise zones and when carrying out (or working in the vicinity of) any activity where the noise level exceeds 85dB(A).

Where hearing protection is required, a hearing conservation programme (applicable to all personnel and visitors) must be implemented. The programme must include training in the correct use and proper storage of hearing protection devices as well as replacement requirements. Training must be provided when hearing protection is first issued to an employee and refresher training must be carried out at least annually thereafter. Training records must be retained.

At least two types of personal hearing protection must be made available to employees. The hearing protection devices provided must have adequate noise reduction ratings (i.e. must be able to attenuate the noise level to below 85dB(A)).

Personal hearing protection must be issued on an individual basis and must not be shared.

In addition to personally issued hearing protection, suitable disposable hearing protection must be made available at the entrances to all noise zones.

All Hearing Protection Devices (except for disposable hearing protection) must be properly inspected and cleaned on a regular basis.

16.27.4 Respiratory Protection

Designated areas (respirator zones) must be established where:

- It is likely that the 95% upper confidence limit of a Similar Exposure Group's mean exposure concentration exceeds the relevant Occupational Exposure Limit (OEL) for agents resulting in chronic effects, such as total inhalable dust, respirable dust, respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials; or
- The concentration of an agent (particulate, vapour or gas) with an acute effect exceeds 50% of the relevant OEL.

Note: For a particular hazardous agent, the OEL to be adopted must be either the client's OEL or the OEL specified in local legislation, whichever is the most stringent.

These areas must be clearly demarcated and mapped, signs must be posted, and all employees must be made aware of the requirements for working in such an area.

Suitable Respiratory Protection Devices (RPDs) must be worn in all designated respirator zones and when carrying out (or working in the vicinity of) any activity where the risk assessment has identified the need for respiratory protection.

RPD's must be selected based on:

- The type(s) of airborne contaminants that are present (gases, vapours, and particulates and aerosols including dusts, fumes, sprays, mists, and smoke);
- The potential particulate size distribution;
- Substance toxicity; and
- The likely concentrations.

Compatibility with the work tasks and other PPE, comfort (as it affects wear-time), and the ability to communicate adequately, must also be considered.

The risk assessment and method statement for the work to be performed, the information contained in the relevant Material Safety Data Sheets (MSDSs), and the results of any air monitoring associated with the substances to be worked with or activities to be carried out, must be used to ensure that the most suitable RPD is selected.

Only RPDs certified to a recognised standard and approved by the nominated project management representative may be used.

Where respiratory protection is required, a respiratory protection programme (applicable to all personnel and visitors) must be implemented.

The respiratory protection programme must include:

- Periodic inspection of RPDs, including before each use;
- Periodic evaluation (by competent persons) of cleaning, sanitising, maintenance and storage practices;
- Performance of positive pressure and negative pressure fit checks by RPD wearers before each use to ensure that the respirator is functioning properly; and
- Training at first issue of a RPD and regular refresher training thereafter in accordance with regulatory requirements or at least once every two years (the training must cover fit testing, use, cleaning, maintenance, filter cartridge replacement, and storage). Training records must be retained.

RPDs must be used, maintained, and stored in compliance with the manufacturer's requirements as well as the respiratory protection programme.

Suitable facilities must be provided for the cleaning and sanitary storage of RPD's.

As a minimum, qualitative and documented fit testing must be carried out (although quantitative fit testing is preferred) to ensure that the use of negative pressure RPDs (including disposable RPDs) is effective. Fit testing must be performed by a competent person when an RPD is first issued and must be repeated periodically in accordance with legal requirements or every two years as a minimum. A policy must be in place requiring a clean shaven face when using a negative or neutral pressure RPD for routine tasks (otherwise a positive pressure RPD must be used). A medical evaluation including a pulmonary function test may be required to determine whether or not an individual is medically fit to wear a respirator.

For air-supplied RPDs, breathing air must be effectively filtered and / or isolated from plant and instrument air, and isolated from sources of potential contaminants. The supplied air must be tested to determine if the air quality complies with the requirements of applicable standards for breathing air.

For nuisance dust, dust masks with a protection level of at least FFP2 must be worn.

16.27.5 Hand and Arm Protection

Gloves must be worn when handling or working with equipment, materials or substances with the potential to cause injury or illness.

Suitable gloves must be selected based on the task to be performed and the specific hazard against which the employee requires protection, such as:

- Sharp edges;
- Sharp points and splinters;
- Abrasive surfaces;
- Hazardous chemical substances (toxic, corrosive, sensitising, etc.);
- Extreme temperatures; and
- Viruses, bacteria and parasites.

16.27.6 Foot Protection

Safety boots must be worn at all times whilst on a project site, with the exception of offices and office or administration buildings in which closed athletic, business or similar shoes may be worn.

Sandals, slaps, slippers, open-toed and high-heeled shoes are not permitted on any project premises.

Safety boots must provide the following protection:

- Steel toe cap to protect against crushing (impact and compression forces);
- Leather uppers that provide resistance against water penetration and water absorption;
- Slip resistant soles;

And where a risk assessment identifies the need:

- Puncture resistant soles (i.e. steel midsoles) for protection against sharp objects;
- Chemical resistant soles for protection against spilt chemical substances (such as solvents, hydrocarbons, acids, and alkalis);
- Heat resistant soles for protection against hot surfaces or molten metal; or
- Electrical shock resistant soles for protection (insulation) against live electrical conductors.
- Gumboots with steel toe caps must be worn when working in water or very wet conditions.

16.27.7 Clothing

All employees working on a project site must wear high visibility protective clothing with reflective taping. Trousers must be long and shirts must be long-sleeved. Shirts must be buttoned at the neck and wrists.

Protective clothing must preferably be made of natural fibres.

Short pants, short-sleeved shirts, sleeveless shirts, and vests are prohibited as outer garments (with the exception of a high visibility vest worn over a long-sleeved shirt).

Loose clothing may not be worn where it may become caught in moving machinery or equipment.

For hot work (e.g. welding, cutting, etc.), work in the vicinity of molten metal, and any work carried out in the vicinity of an open flame, the protective clothing worn (shirt and trousers) must be made of a suitable fire retardant fabric. Underwear and socks must be made of natural fibres (preferably wool) or fire retardant fabric.

No employee may tuck his trousers into his boots when working in the vicinity of molten metal.

16.27.8 Body Protection

Suitable body protection must be provided as required to protect employees against specific hazards. A range of work activities require body protection in one form or another, including but not limited to:

- Working in extremes of temperature, such as firefighting, attending to a heating furnace, working with molten metal, working in refrigerated environments, etc.;
- Hot work (e.g. welding, burning, cutting and grinding);
- Working with hazardous chemical substances (e.g. acids, solvents, pesticides, etc.); and
- Clean up and disposal of hazardous materials and wastes (e.g. asbestos, hydrocarbons, etc.).

A wide variety of protective garments are available, such as firefighting suits, furnace suits, freezer jackets, leather aprons, leather spats, laboratory coats, chemical resistant aprons, chemical resistant (or hazmat) suits, and disposable coveralls. Suitable items must be selected to provide protection against the specific hazard(s) to which an employee is exposed. Hazards must be carefully identified and characterised to ensure that the correct protection is used.

Body protection must be sized properly to prevent tearing, the parting of seams, tripping, or restriction of movement.

16.27.9 Electrical Protective Equipment

To reduce the risk of electric shock, electrical insulating equipment appropriate for the voltage that may be encountered must be worn when working on energised electrical installations and when working within two metres of exposed energised conductors.

All rubber electrical insulating equipment (including gloves, sleeves, matting, covers, blankets, and line hoses) must be inspected for damage prior to and after each use, and immediately following any incident that can reasonably be suspected of having caused damage.

Rubber insulating equipment with any of the following defects and / or damage may not be used:

- A cut, rip, tear, hole, or puncture;
- Ozone cutting or ozone checking (i.e. the cutting action of ozone on rubber under mechanical stress causing a series of interlacing cracks);
- An embedded foreign object;
- Chemical deterioration (texture changes) such as swelling, softening, hardening, or becoming sticky or inelastic; or
- Any other defect that damages the insulating properties.

Rubber insulating gloves must be electrically tested before first issue and every 12 months thereafter as a minimum. Insulating gloves must also be given an air test along with the daily inspection. Essentially, this involves filling a glove with air and checking for any holes or leakage.

Insulating equipment that fails an inspection or electrical test may be repaired only as follows:

- Rubber insulating line hose may be used in shorter lengths with the defective portion(s) cut off;
- A rubber insulating blanket may be repaired using a compatible patch that results in the patched area having electrical and physical properties equal to those of the blanket;
- A rubber insulating blanket may be salvaged by cutting the defective area off the undamaged portion of the blanket;

- Rubber insulating gloves and sleeves with minor physical defects, such as small cuts, tears, or punctures, may be repaired by applying compatible patches. The patched areas must have electrical and physical properties equal to those of the surrounding material.

Repairs to gloves are permitted only in the area between the wrist and the reinforced edge of the opening.

Repaired insulating equipment must be retested before it is put back into use.

Insulating equipment must be cleaned as required to remove foreign substances (using a mild detergent).

Insulating equipment must be stored in such a location and in such a manner so as to protect it from light, temperature extremes, excessive humidity, ozone, and other damaging substances and conditions.

Leather protective gloves must be worn over rubber insulating gloves to provide mechanical protection against cuts, abrasions, and punctures.

Suitable arc flash PPE (e.g. voltage rated gloves, fire retardant clothing, arc rated face shield, arc flash hood, arc flash suit, etc.) must be worn whenever an employee is potentially exposed to an arc flash hazard. The appropriate level of PPE must be worn depending on the task and the potential energy exposure. These PPE requirements must be clearly specified as part of a project-specific arc flash protection programme (refer to the Electrical Safety Standard).

16.27.10 Jewellery

Necklaces, dangling earrings, and bracelets may not be worn on a project site.

No ring or watch may be worn where there is a risk that it may become caught in machinery or equipment.

No jewellery or other conductive apparel (such as a key chain or watch) may be worn when carrying out energised electrical work.

16.27.11 Hair

Scalp hair that is longer than the top of the shoulders must be tied up and restrained within the person's safety helmet or within the collar of his or her overalls, shirt or jacket.

For negative or neutral pressure Respiratory Protection Devices, facial hair must not cause the seal between the respirator and facial skin to be broken (or prevent a seal from being formed in the first place).

16.27.12 Task-Specific PPE

In addition to the standard PPE required for a project site (including a safety helmet, safety glasses, safety boots, and high visibility protective clothing), the following task-specific PPE must be used as a minimum by any person carrying out or assisting with such a task:

- Arc Welding – safety glasses and welding helmet (i.e. double eye protection), respiratory protection against the specific airborne contaminants being generated (fumes, gases, dusts, etc.), leather welding gloves, leather apron, leather spats, leather yoke (for work above shoulder height), and knee pads for welders in kneeling positions;
- Gas Welding, Cutting or Brazing – gas cutting or welding goggles with shade 4 filter lenses and full face shield (i.e. double eye protection), respiratory protection against the specific airborne contaminants being generated (fumes, gases, dusts, etc.), leather gloves (long cuff for welding and cutting, short cuff may be used for brazing), leather apron, leather spats, and leather yoke (for work above shoulder height);
- Grinding – safety glasses or goggles and full face shield (i.e. double eye protection), hearing protection, respiratory protection where dust or fumes may be generated, leather gloves, leather apron, and leather spats;
- Abrasive Blasting – respiratory protection (air-supplied hood), hearing protection, leather gloves, and leather apron;
- Spray Painting – respiratory protection (air-supplied hood for confined spaces), safety goggles (if the respirator design does not provide this protection), hearing protection (where air compressors are used), chemical resistant gloves, and chemical resistant disposable coveralls.

16.28 Sun Protection

The contractor must ensure that all personnel are protected in sunlight through the use of long sleeve shirts, long trousers, health and safety to safety helmets and UV factored sunscreen. Shade structures must also be made available to all employees.

The contractor must conduct training and awareness sessions with his employees, advising on the risks associated with working in the heat (including dehydration) and the precautions to be taken (e.g. ensuring adequate fluid intake).

16.29 Fuel/ Flammable Liquid Storage and Refuelling

No fuel (diesel, petrol, paraffin, etc.) or any other flammable liquid (paints, solvents, etc.) may be stored on site unless approved in writing by the nominated project management representative.

If the on-site storage of a fuel or a flammable liquid is approved, the contractor must ensure the following:

- The quantity of fuel / flammable liquid to be stored on site must be kept to the minimum that is required;
- The storage area must be located in a well-ventilated area at least 10 metres away from any building, drain, boundary or any combustible material;
- If more than 200 litres of fuel / flammable liquid is to be stored, the tank must be installed / the containers must be positioned within a bund (see Definitions);
- If the fuel / flammable liquid are to be stored in bulk tanks / vessels, then the minimum capacity of the bund must be 110% of the volume of the largest tank / vessel. If many small containers (e.g. 210 litre drums) are to be stored, the bund must be able to contain 25% of the total volume of the stored products;
- The bund must be impermeable. It must have a solid concrete floor and the walls must be constructed out of brick and must be plastered on the inside;
- The bund must be fitted with a lockable drain valve (for draining away rainwater), which must remain locked in the closed position. The valve may only be opened under supervision and in accordance with a written procedure;
- The fuel / flammable liquid storage area may not be used for the storage of any other materials / equipment, and must be kept completely free of all combustible materials (including rubbish, brush and long grass) at all times;
- Access to the storage area must be controlled (wire mesh fencing and gate);
- Appropriate warning signage (i.e. "Flammable Liquid", "No Smoking" and "No Naked Flames") must be prominently displayed at the storage area. The contents and volume of each tank must be indicated;
- In order to contain spillages, the offloading / refuelling bay at the fuel/ flammable liquid storage area must have a solid concrete base surrounded by bund walls, ramps or humps and / or spill trenches (covered with steel grating) that lead into a sump;
- Fuel dispensing pumps must be protected against impact damage;
- All fuel / flammable liquid storage tanks and dispensing equipment must be electrically bonded and properly earthed;
- All electrical installations and fittings must be of an approved intrinsically safe type;
- Two 9kg dry chemical powder fire extinguishers must be mounted in an easily accessible position near the entrance gate to the fuel / flammable liquid storage area. Depending on the size of the storage area, additional fire extinguishers may be required to ensure that an extinguisher is no further than 15 metres away from any point on the perimeter of the storage area;

- A fire extinguisher must be at hand wherever refuelling is carried out;
- Smoking or open flames within 10 metres of a fuel / flammable liquid storage / refuelling area is strictly prohibited;
- No petrol or diesel powered vehicle or equipment may be refuelled while the engine / motor is running;
- Cellular phones must be switched off in fuel / flammable liquid storage / refuelling areas;
- Spill clean-up kits (containing a suitable absorbent fibre product) must be provided;
- Any spillages must be cleaned up immediately and all contaminated cleaning materials must be disposed of in accordance with the applicable legislation;
- If a flammable liquid is spilt or is leaking from a container / vessel, the area must be cordoned off and appropriate warning signage must be displayed to keep unauthorised personnel away from the affected area. Every effort must be made to contain the spillage. All hot work in the vicinity must be stopped immediately. If the spilt product is volatile and the possibility exists that a vapour cloud may form, or if the leak or spillage cannot be contained or stopped, then appropriate emergency response procedures must be activated (refer to Section 14) including the evacuation of all persons in the vicinity. Suitable firefighting equipment must be positioned ready for use should the spilt product ignite;
- The manual decanting of fuel or a flammable liquid from a large container should only be done using a stirrup pump (or similar) or a purpose-made frame which allows the container / drum to tilt for decanting and then return to the upright position;
- Drip trays must be used wherever required;
- All tanks, drums, cans, etc. containing flammable liquids must be tightly closed and properly sealed except for when a container is being filled or when a product is being decanted;
- The transport or storage of corrosive or flammable liquids in open containers is strictly prohibited
- Daily-use quantities of fuel (up to a maximum of 20 litres) must be handled in an approved safety can with a flash arresting screen, spring closing lid and spout cover that will safely relieve internal pressure if the can is exposed to fire;
- Where safety cans may be impracticable, only approved metal containers with screw caps may be used. Each container must be clearly labelled to indicate its contents;
- Only small quantities of flammable liquids (paints, solvents, etc.) may be stored within a building. Each product must be kept either in its original container or in an approved container which must be properly sealed. Each container must be clearly labelled to

indicate its contents. When not in use, all such containers must be stored in a well-ventilated steel cabinet which must be kept locked to prevent unauthorised access;

- Not even small quantities of flammable liquids may be stored or dispensed in buildings or places of public assembly, in general warehouses, or in buildings containing sources of ignition such as space heaters, cooking devices, open electric motors, motor vehicles, or where welding, cutting, or grinding activities are being carried out;
- Safe Work Procedures must be compiled for the transportation (including delivery), offloading, storage, handling and use of any fuel/ flammable liquid on site;
- All personnel that will be required to work with or may come into contact with a flammable liquid must be made aware of the hazards associated with the product and must be thoroughly trained in the safe transportation, use, handling and storage thereof.

16.30 Fire Protection and Prevention (SANS 10400, Part T)

The contractor must compile a Fire Protection and Prevention Plan for the work that will be carried out on site.

The contractor must assess / survey his area of responsibility and identify locations where the risk of fire is high. Cognisance must be taken of the fact that certain locations may need to be designated as high risk due to the presence of large quantities of flammable or combustible materials / substances. For all high risk areas, the contractor must ensure that additional precautions are taken to prevent fires and strict control is exercised over any hot work (i.e. welding, cutting, grinding, etc.) that is carried out.

The contractor must supply and maintain all required firefighting equipment. The type, capacity, positioning, and number of firefighting appliances must be to the satisfaction of the nominated project management representative and must meet the requirements of the applicable legislation. Fire mains, hydrants and hose reels will rarely be available on site, so use must primarily be made of portable fire extinguishers.

Firefighting equipment, fixed and portable, must be strategically located with a view to being able to rapidly deploy the equipment in order to bring potentially dangerous and destructive fires under control while still in their infancy.

All fire extinguishers (and any other firefighting equipment) placed on site must be:

- Conspicuously numbered;
- Recorded in a register;

- Visually inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register and the competent person must sign off on the entries made); and
- Inspected and serviced by an accredited service provider every six months (the nominated project management representative may require that this frequency be increased depending on the environmental conditions (e.g. high dust levels, water, heat, etc.) to which the fire extinguishers are exposed).

Any fire extinguisher that has a broken seal, has depressurised, or shows any sign of damage must be sent to an accredited service provider for repair and/ or recharging. Details must be recorded in the register.

Firefighting equipment may not be used for any purpose other than fighting fires. Disciplinary action must be taken against any person who misuses or wilfully damages any firefighting equipment.

Access to firefighting equipment, fixed or portable, must be kept unobstructed at all times. Approved signage must be in place to clearly indicate the location of each permanently mounted fire extinguisher, fire hose reel, etc.

The contractor must ensure that all persons working in / entering his area of responsibility are made aware of where all firefighting appliances and alarm points are located.

The contractor must ensure that his employees (and those of any appointed sub-contractors) are trained in firefighting procedures and the use of firefighting equipment.

The contractor must compile an emergency response procedure detailing the actions that must be taken in the event of a fire or a fire / evacuation alarm (see Section 14).

All personnel working within the contractor's area of responsibility must be trained, and all visitors must be instructed, on this procedure. Copies of the procedure must be prominently displayed in the workplace in all languages commonly used on the site.

A person discovering a fire must extinguish the fire if he can do so safely, and then immediately report the incident to his supervisor. If the person cannot extinguish the fire, he must raise the nearest alarm and then report the fire as quickly as possible to his supervisor, the person responsible for the area, and / or Security.

On hearing a fire / evacuation alarm, all persons must make any operational plant or equipment safe, and then proceed to the nearest emergency assembly point and await instructions.

All incidents of fire (including the use or misuse of any firefighting equipment) must be reported to the nominated project management representative immediately. Used fire extinguishers must be replaced by the contractor without delay.

No hot work (i.e. welding, cutting, grinding, etc.) or any other activity that could give rise to a fire may be performed outside of a designated workshop without a Permit to Work having been issued.

Wherever hot work is being carried out, a fire extinguisher must be at hand. Where the risk assessment determines that it is necessary, a fire watch must be stationed.

Supervisors must carry out workplace inspections regularly to ensure adherence to fire prevention measures and procedures.

At the end of every working period (i.e. before each tea / lunch break and at the end of every shift / day), the workplace must be thoroughly inspected to ensure that no material is left smouldering and no condition / situation exists that could give rise to a fire.

The contractor must ensure that all supervisors and all employees carrying out or assisting with any hot work or any other activity that could give rise to a fire have been trained in firefighting procedures and the use of firefighting equipment. The training must be conducted by an accredited training provider.

When using electrical equipment, all cables must be in good condition and the nearest convenient socket must be used.

No power socket may be loaded beyond its rated capacity through the use of adaptors, etc. Makeshift electrical connections are not permitted under any circumstances.

Water-based firefighting equipment must not be used on electrical equipment or burning liquids.

Refer to Section 13.16 – Electrical Safety.

Each vehicle used on site for work purposes and each item of mobile equipment with a diesel or petrol engine must be fitted with a permanently mounted fire extinguisher.

Smoking is only permitted in designated smoking areas. Cigarette ends / butts must be properly stubbed out in the ashtrays provided and never thrown into waste bins.

The contractor must ensure that good housekeeping practices are enforced, as this is crucial to the prevention of fires.

All combustible waste materials must be removed from the workplace on a daily basis (at the end of each shift) and placed in waste receptacles located at least 5 metres away from any structure.

The accumulation of waste materials in out-of-the-way places is prohibited.

Offices, desks, cabinets, etc. must always be kept tidy and uncluttered. Waste paper bins must be emptied regularly.

The storage of combustible materials under stairways or in attics is prohibited.

The storage of any materials against the exterior of a building or any other structure is prohibited.

All walkways, passages and stairways must be kept clear (i.e. must be unobstructed) at all times, as they may need to be used as a means of escape.

The areas around and the routes to all exits, fire escape doors, fire hydrants, fire hose reels and fire extinguishers must be kept clear (i.e. must be unobstructed) at all times.

"No Smoking" signs must be conspicuously displayed in and around all storage areas / rooms.

Waste may not be burned under any circumstances.

No flammable liquid (such as petrol, acetone, alcohol, benzene, etc.) may be used for starting fires or as a solvent for cleaning clothes, tools, equipment, etc. Only solvents approved by the nominated project management representative may be used for cleaning purposes.

Whenever any work is carried out involving the use of a flammable substance / material, the area must be cordoned off and appropriate warning signage (i.e. "No Unauthorised Entry", "No Smoking" and "No Naked Flames") must be displayed.

Refer to Section 14.32 – Fuel / Flammable Liquid Storage and Refuelling.

16.31 Smoking

The contractor must not permit smoking on site except within designated smoking areas selected in accordance with the applicable legislation. Such an area must be clearly demarcated and the required signage must be displayed.

Any person found smoking or discarding a cigarette butt outside of a designated smoking area may be removed (temporarily or permanently) from site.

In all designated smoking areas, adequate non-combustible commercial ashtrays and / or cigarette butt receptacles (butt cans) must be provided.

Ashtrays and other receptacles provided for the disposal of smoking materials must not be emptied into rubbish bins or any other container holding combustible materials.

"No Smoking" signs must be strictly observed.

16.32 Housekeeping

The contractor must maintain all work areas in a tidy state, free of debris and rubbish. Unless directed otherwise, the contractor must dispose of all debris, rubbish, spoil and hazardous waste off site in a designated and authorised area or facility. The contractor must familiarise health and safety with the waste management plan for the site including collection and disposal arrangements, and must align his waste management activities accordingly.

In cases where an inadequate standard of housekeeping has developed and compromised safety and cleanliness, a nominated project management representative may instruct the contractor to cease work until the area has been tidied up and made safe.

Neither additional costs nor contract deadline extensions will be allowed as a result of such a stoppage. Failure to comply will result in a clean-up being arranged through another service provider at the cost of the non-complying contractor.

The contractor must carry out housekeeping inspections on a weekly basis to ensure maintenance of satisfactory standards. The contractor must document the results of each inspection. These records must be maintained and must be made available to the nominated project management representative on request.

The contractor must implement a housekeeping plan for the duration of the contract ensuring that the site housekeeping is maintained. Furthermore, at the end of every shift, the contractor must ensure that all work areas are cleaned, all tools and equipment are properly stored, and construction rubble is removed.

Where the contractor fails to maintain housekeeping standards, the nominated project management representative may instruct the contractor to appoint a dedicated housekeeping team for the duration of the project at the contractor's expense.

Littering is prohibited.

16.33 Waste Management

Waste may not be disposed of unless the disposal of that waste is authorised by law. The contractor must therefore ensure that all waste that is generated is handled, stored, transported and disposed of in accordance with the requirements of the applicable legislation / local authority.

No waste may be removed from the project site to a waste storage or disposal facility unless that facility has been approved for use by the nominated project management representative.

An adequate number of waste bins and skips must be provided by the contractor and suitable arrangements must be made to ensure that these bins and skips are emptied regularly.

Hazardous wastes must be kept separate from general wastes.

Waste disposal service providers must be approved by the nominated project management representative before any waste is removed from site. These service providers must be audited on a two-yearly basis (or more frequently if deemed necessary based on risk) in order to ensure compliance with legislation and to help ensure that no liabilities accrue to the project.

16.34 Stacking and Storage

All irregular shaped items will be stacked at floor / ground level in designated stacking areas on a level, firm base capable of withstanding the weight of the commodities being stacked and stacked in such a manner that the items do not topple over or change position due to subsidence or weight transfer when being moved.

Where these commodities are stacked on shelves or racks, the shelves or racks must be designed to carry the weight of the commodity being stacked.

All racks or shelves where heavy material or commodities are stacked will have a weight carrying limitation clearly marked on the structure and have a safety factor of at least +10% of maximum total carrying capacity.

All materials, commodities or articles, which could be damaged due to inclement weather, must be stored under cover.

Waste material that is combustible must not be allowed to accumulate in sufficient quantities to create a hazard.

No commodities or equipment may be stacked or stored within 500mm of rolling stock tracks or where mobile equipment travels.

The storage of material, small equipment, tools, files and general items in cupboards and on shelves must be neat and controlled at all times. Incompatible substances must not be stored in or on the same cupboard or shelf.

No equipment, tools, files or documents may be stored or stacked on top of cupboards which are higher than 1.5 metres in height.

16.35 Demarcation

No demarcation of floors is required inside offices, training centres and the like.

Where it is impractical to paint floors, yellow lines will be deemed adequate e.g. where heavy traffic necessitates the continual painting of floors.

Temporary demarcation in the form of hazard tape (red and white) may be used to demarcate areas where there is, for relatively simple reasons, restricted access.

Where hazards exist and entry must be specifically excluded for safety or health reasons, hazard tape in any form must not be used in isolation. A robust and substantial barrier of timber, rope or other material must be used in conjunction with barrier tape, to prevent entry to unauthorised persons.

Outside storage areas where it is impractical to use floor demarcation, demarcation may take the form of creosote poles and wire rope or similar. Spans between uprights should be painted yellow.

16.36 Facilities

Sanitary conveniences must be provided and maintained at a rate of at least one shower facility for every 30 workers, at least one toilet facility for every 10 workers, separate male and female changing facilities and sheltered eating areas. (Check SANS 10400 Part F).

Where chemical toilets are provided, one toilet for every twenty five employees must be allocated.

All toilets must be cleaned daily, disinfected and provided with toilet paper.

All employees making use of these facilities have the responsibility to help keep the facilities neat, clean and hygienic.

Washing facilities, including soap and towels, must be made available for use by the contractor's employees.

Drainage from all washing / toilet facilities must be properly designed and constructed to prevent employee exposure to waste water (and the associated biological hazards). Waste water may not accumulate or stand in pools at any location on the project site.

Change rooms must be provided and must be kept clean and free from odours at all times.

No chemicals, except those normally used for domestic cleaning of these facilities, may be stored in the facilities.

No equipment or items (other than those normally associated with hygiene facilities) may be stored in the facilities.

All entrances must be constructed in a way to afford privacy to users.

Drinking water must be provided.

A sheltered (covered) area must be set aside on site to be used as a dining facility (eating area). Adequate seating must be provided for the maximum number of employees. The facility must be kept clean and tidy.

A suitably sized, impervious receptacle (bin) must be provided for the disposal of waste food and other refuse generated at the dining facility. This bin must be emptied and cleaned regularly (i.e. promptly after meal times).

Food may only be consumed in authorised sheltered areas.

Adequate refrigerated storage must be provided to the contractor's employees for the storage of food and drinks. Fridges must not be overstocked and must maintain sufficiently low temperatures.

16.37 Occupational Hygiene

The contractor must ensure that the exposure or potential exposure of his employees to any of the following stressors is assessed and measured

- Thermal stress (heat and cold);
- Noise;
- Particulates (dust);
- Silica (free crystalline silica);
- Asbestos;
- Gases or vapours;
- Lead;
- Chemicals;
- Ionising radiation;
- Non-ionising radiation;
- Vibration (hand / arm vibration and whole body vibration);

- Ergonomics; and
- Illumination.

If it is determined that exposure levels for a particular stressor are unacceptable, then a monitoring and control plan must be implemented to manage any risk of overexposure.

Note: Where chemical substances are to be used as part of the construction process, the contractor must ensure that the chemical composition of each substance is known.

Carcinogenic (cancer-causing) ingredients must be specifically identified with due understanding that no chemical known to cause cancer will be permitted for use on site (an alternative will need to be sourced).

16.38 Lighting

For all work areas and access ways, if the natural lighting available is inadequate it must be supplemented by artificial lighting to meet the minimum levels required.

A lighting survey to determine luminance must be conducted for all work areas, at least once every two years and prior to work commencing for the first time in any area.

Emergency lighting must be provided in all indoor workplaces that do have adequate natural lighting or in which persons work at night. The emergency sources of lighting that are provided must be such that, when activated, an illuminance of not less than 0.3 lux is obtained at floor level, to enable employees to evacuate safely.

Where it is necessary to stop machinery or shut down plant or processes before evacuating the workplace, or where dangerous materials are present or dangerous processes are carried out, the illuminance must be not less than 20 lux.

Windows and translucent sheeting must be kept adequately clean and clear of obstructions as far as reasonably practicable. Light fittings, i.e. lenses and reflectors must be kept clean. If a light intensity meter is used, a valid calibration certificate must be available.

Neon lights must not be installed in areas where moving parts of machinery or equipment cannot be fully guarded, i.e. lathes, bench grinders, etc. in order to eliminate the stroboscopic effect.

No person may use a portable electrical light where the operating voltage exceeds 50 volts, unless:

- It is fitted with a non-hydroscopic, non-conducting handle;
- All metal parts which may become live are protected against accidental contact;
- The lamp is protected by means of a guard firmly attached to the handle; and

- The cable can withstand rough use.

No person may use a portable electric light in damp or wet conditions or in closely confined spaces, inside metal vessels or when in contact with large masses of metal, unless:

- The lamp is connected to a source incorporating an earth leakage; and
- The operating voltage of the lamp does not exceed 50 volts.

16.38.1 Hearing Conservation

A hearing conservation program must be implemented and protection against the effects of noise exposure must be provided when the noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 decibels measured on the A-weighted scale of a standard sound level meter at slow response.

For the hearing conservation program to be effective it must include as a minimum:

- Monitoring of the workplace to determine the representative exposure of employees to excessive noise levels;
- An audiometric testing program for employees, which must include:
 - ♦ A baseline audiogram for all employees exposed to noise levels equal to or in excess of the standard;
 - ♦ Annual audiograms for each overexposed employee;
 - ♦ Analysis of audiogram results with retesting and/or referral to an otolaryngologist or qualified physician when a significant threshold shift (STS) occurs; and
 - ♦ Written employee notification of the STS.
- A training program for all employees exposed to noise;
- Provision of personal protective equipment to all affected employees when administrative or engineering controls fail to reduce sound levels to within the levels of the standards.

Monitoring of employee exposures to noise shall be conducted by an Approved inspection Authority.

The monitoring requirement may be met by either area monitoring or personal monitoring that is representative of employee exposures. Personal monitoring is preferred, and may be required based on the type(s) of noise sources.

For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with local legislation.

A person-task specification shall be available for every job category and shall be submitted with an employee for audiometric testing.

Audiometric testing and an annual audiogram shall be provided as part of the regular medical examinations.

Audiometric test results obtained from the pre-employment medical examination for a new employee shall be used as the baseline audiogram.

Testing to establish a baseline audiogram shall be preceded by at least 14 hours without exposure to workplace noise.

Hearing protectors shall not be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.

Employees shall be notified of the need to avoid high levels of non-occupational noise exposure during this 14-hour period.

Record-keeping for the audiogram shall include:

- Name and job classification of the employee;
- Date of the audiogram;
- The examiner's name;
- Date of the last acoustic or exhaustive calibration of the audiometer;
- Employee's most recent noise exposure assessment.

Audiometric test results shall be maintained in the employee's medical file.

To control noise exposure, its three basic elements shall be examined, i.e. source of the sound, travel path, and effect on receiver or listener. Solution of a given noise problem might require alteration or modification of any or all of these three basic elements.

2) Controlling noise at the noise source can be achieved by the following:

- Select quiet equipment initially. In selecting quiet equipment the following features shall be considered:
 - Low-noise certification;
 - Advertisement of "quiet" operation, evidence of noise control design;
 - Evidence of "lower" and "slower" operating characteristics;
 - Side-by-side noise testing of equipment; and
 - "On-site" or "in operation" inspection of mechanical equipment before purchase.
- Reduce operating noise by considering the following control measures:

- Reduce impact or impulse noise by reducing weight, size, or height of fall of impacting mass;
- Reduce speed in machines and flow velocities and pressure in fluid systems;
- Balance rotating parts – to control machinery noise and vibration of fans, fly wheels, pulleys, cams, etc.
- Reduce frictional resistance between rotating, sliding or moving parts in mechanical systems: frequent lubrication, proper alignment of moving parts; static and dynamic balancing of rotating parts; correction of eccentricity or "out-of-roundness" of wheels, gears, rollers, pulley, etc.;
- Reduce resistance in air or fluid systems: use of low flow velocities, smooth boundary surfaces of duct or pipe systems, and long-radius turns and flared sections in pipes, etc., to reduce turbulence noise;
- Isolate vibration elements in machinery; install motors, pumps, etc. on most massive part of machine; use belt or roller drives in place of gear trains; use flexible hoses and wiring instead of rigid piping and stiff wiring, etc.
- Apply vibration damping materials such as liquid mastic; pads of rubber, felt, foam or fibrous blankets; or sheet metal Visco-elastic laminates or composites to vibrating machine surfaces; and;
- Reduce noise leakage from the interior of machines such as compressors by sealing or covering all openings or applying acoustical materials to machine interiors.

3) Controlling noise in the transmission path can be achieved by the following:

- Separate the noise source and receiver as much as possible;
- Use sound-absorbing materials on ceiling, floor or wall surfaces as close to the machine as possible;
- Use sound barriers and deflectors in the noise path;
- Use acoustical lining on inside surfaces of such passageways as ducts, pipe chases, or electrical channels;
- Use mufflers, silencers or snubbers on all gasoline or diesel engines, regardless of size; and particularly on equipment when large quantities of high-pressure, high-velocity gases, liquids, steam or air are discharged into the open air; and
- Use vibration isolators and flexible couplers where the noise transmission path is structure borne in character.

4) Protection for the receiver – when engineering controls fail to reduce the levels to within the levels specified in local legislation, the following measures shall be implemented:

- Personal protective equipment shall be provided and replaced as necessary at no cost to employees;
- Supervisors shall ensure that hearing protective devices are worn by all employees who are exposed to a time-weighted average of 85 decibels or greater and who have experienced a significant threshold shift;
- Employees shall be given the opportunity to select their hearing protectors from a variety of suitable protectors; and

Noise zones shall be indicated by means of signs at every entrance to such zones.

When noise levels exceed 100 dB(A), a combination of earplug and earmuff may be required to achieve protection of the worker.

It is important to note that using double protection will add only 5 to 10 dB of extra attenuation above that of a single Hearing Protection Device.

Where an earmuff and earplugs are used together, OSHA recommends using this simple calculation: Take the higher rating of the two devices, and add five.

Hearing Protection Devices should be worn for the full noise exposure period.

Where an audiometry programme is required, it must meet the following standards:

- All testing must be by pure tone audiometry in an audiometry booth or quiet room, with measured noise levels less than 40 dB(A);
- The initial audiogram must be taken prior (minimum of 24 hours) to exposure to significant noise. Further audiograms must be taken periodically; annually where exposures are over 85 dB(A) Leq or where continued deterioration to hearing is occurring;
- Testing must be performed by trained and competent personnel;
- Audiometers must be calibrated according to the manufacturer's guidelines. As a minimum these will be a weekly biological calibration using an employee unexposed to noise, or a bio-acoustic simulator, and an annual quantitative check. All results must be documented; and
- Audiograms must be read by trained persons who will identify any increasing hearing loss and then determine if this is noise induced. Any employee with a significant downward shift in one or both ears (measured as an average non age-adjusted loss from baseline of 10 dB at 2, 3 or 4 kHz) must be retested following removal from noise for a minimum of 24 hours, usually after a days-off period. If the downward shift persists the employee must be reviewed by a physician and improved hearing protection considered.

16.39 Particulate and Gas / Vapour Exposures

Designated areas must be created where:

- It is likely that the 95 per cent upper confidence limit of a Specific Exposure Group's (SEG) mean exposure concentration for agents resulting in chronic effects (such as total inhalable dust, respirable dust, respirable crystalline silica, PAH, fluorides, lead, mercury, asbestos or non-asbestos fibrous materials) exceeds the relevant OEL; and
- Agents with an acute effect, such as particulate hazards, or gases (e.g. CO, SO₂, NH₃, HF, etc.), or vapours exceed 50 per cent of the relevant OEL.

Designated areas must:

- Be identified and mapped, signposted or otherwise clearly communicated to employees working in the area. Signposting, where necessary, must use appropriate wording or symbols on signs to identify the hazard;
- Have a documented respiratory protection programme based on suitable risk assessment and standards, which is applied to employees, contractors and visitors;
- Have regular monitoring of SEGs working in the area; and
- Have a formal review of the practicality of engineering controls at least every two years, or less where it is a critical control for a significant risk.

Particulate and gas / vapour monitoring must be appropriate to the exposure conditions and toxicants, and based on the use of equipment approved by local regulatory authorities, as per documented methods.

Where risk assessment indicates the possible presence of levels of gas or vapour sufficient to cause health effects in less than one shift (e.g. confined space entry), continuous monitoring is required as long as the potential for harm exists.

Employees and contractors must be covered by a medical surveillance programme when:

- Their Specific Exposure Group TWA mean exposure to respirable crystalline silica, total inhalable dust, respirable dust, lead or asbestos is greater than 50 per cent of the relevant OEL;
- The medical adviser considers that it is advisable; or
- There is a legal requirement for medical monitoring.

Where risk assessment indicates a risk of a respiratory condition, assessment programmes must include chest x-rays and / or lung function tests. The test or tests chosen must enable the earliest detection of adverse effects from the exposure of concern. Where indicated, they must meet the following standards:

- High quality chest x-rays will be taken every five years, unless local legislation requires these to be more frequent;

- All chest x-rays for pneumoconiosis surveillance will be read to International Labour Organisation (ILO) standards by an ILO B reader, wherever possible, and if not, by a competent radiologist using verifiable quality criteria;
- Any progression of more than one step on the ILO extended scheme to a reading above 1/0 will be reviewed by a physician;
- Any reading suggesting active lung disease will be reviewed by a physician; and
- All spirometry will be performed by trained staff following the American Thoracic Society guidelines or equivalent and be offered at a frequency determined by the likely rate of detectable change in lung function.

Controls must be of an adequate standard such that surfaces are adequately cleaned to avoid:

- Dust generation due to material dislodgment (e.g. windblown), where practicable; or
- Fume generation from accumulated dust during welding / heating or cutting operations.

Where risk assessment indicates the need to reduce exposures to toxic substances for employees or their families, good personal hygiene must be enforced. The programme must include:

- No smoking, eating or drinking in designated hazard areas;
- Washing of hands and face prior to drinking, eating or smoking;
- Showering at work post shift or after exposure to 'dirty' conditions; and
- Laundering of contaminated clothing by the contractor.

Abrasive blast cleaning must be conducted so as to protect worker health and minimise dust emissions. Substitutes must be used whenever practicable for abrasives containing crystalline silica. However, if such abrasives are used, workers must be aware of the hazards and exposure monitoring conducted. The hazardous properties of alternative materials must be considered before use.

Where required, training in the recognition of signs and symptoms of hazardous particulate and gas / vapour exposure, emergency procedures and preventative measures must be provided.

16.39.1 Respiratory Protection Devices

The selection of Respiratory Protection Devices (RPD's) must be based on:

- The potential particulate size distribution, gas / vapour types, substance toxicity and likely concentrations;

- Compatibility with the work tasks and other PPE; and
- Comfort (as it affects wear-time) and allowance for adequate communication.

Only RPD's approved by the nominated project management representative may be used. Suitable facilities must be available for cleaning and sanitary storage of RPD's.

Half-mask and full-face air-purifying respirators must NOT be used where:

- The atmosphere is oxygen deficient (< 19.5 per cent);
- The atmosphere is immediately dangerous to life or health (e.g. in areas where CO concentrations are > 1500 ppm, HF > 30 ppm or NH₄ > 300 ppm);
- Gases and vapours are more than ten times their OEL or greater than 1000 ppm for half-mask respirators, or more than 100 times their OEL for full-face respirators; or
- Particulates are more than five times their OEL for half-mask respirators, or more than 50 times their OEL for full-face respirators.

For atmospheres that are oxygen deficient, or contain unknown hazards, or have concentrations of gases and vapours that are unknown, or could potentially exceed levels that are immediately dangerous to life or health, an air-supplied type respirator must be worn.

For effective use of negative pressure RPD's (including disposable RPD's), fit testing must be qualitative and documented as a minimum, although quantitative fit testing is preferred. Fit testing must be performed by a competent person when RPD's are first issued and must be repeated periodically according to legal requirements or two-yearly as a minimum frequency. There must be a policy requiring a clean shaven face when using a negative or neutral pressure RPD for routine tasks, or the use of a positive pressure RPD will be required. A pulmonary function test and medical evaluation may be required to determine whether or not an individual is medically fit to wear a respirator.

For air-supplied RPD's, breathing air must be effectively filtered and / or isolated from plant and instrument air, and isolated from sources of potential contaminants. The quality of the breathing air must be checked for conformance with applicable standards.

The respiratory protection programme must include:

- Periodic inspection of RPD's, including before each use;
- Periodic evaluation of cleaning, sanitising, maintenance and storage practices by competent persons;
- Performance of positive and negative fit checks before each use by RPD wearers to ensure that the respirator is functioning properly; and
- Training at first issue of a RPD and regular refresher training thereafter in accordance with regulatory requirements or at least once every two years.

16.39.2 Asbestos and Non-asbestos Fibrous Silicates

This section applies to asbestos and bio-persistent non-asbestos fibrous silicates that may display asbestos-like toxicity, related to fibre diameter and length. Local regulations must be followed as a minimum. The following requirements must be met:

- A management program must be in place and actively pursued;
- No new products containing these materials may be purchased;
- Installed materials of this type must be identified and assessed annually for current safety. Where 'safe in place', it should not be removed, unless there is an opportunity for removal during renovation or construction of buildings or equipment;
- Work areas must be barricaded off and signposted to restrict entry; and
- Contaminated material must be promptly placed in appropriate marked plastic disposal bags or covered containers for disposal to an approved landfill.

All workers exposed to these materials must be on a register. "Exposed" means working on or near such material that has been disturbed, abraded or cut. The register must contain details of their annual medical examination and the results of occupational hygiene monitoring.

Asbestos contractors must be competent, registered and have adequate equipment, procedures and monitoring.

Where required, the asbestos / bio-persistent non-asbestos fibrous silicates management programme must cover work practices, training, monitoring, medical surveillance, and waste handling and disposal.

Maintenance operations must be made aware of potential cristobalite exposure hazards when disturbing non-asbestos fibrous silicates that have undergone high temperature conditions.

The potential for occurrence of naturally occurring asbestiform materials in exploration or mining production activities must be assessed, the risk of exposure determined and appropriate control measures implemented where required.

16.40 Hazardous Chemical Substances

No chemical substance may be brought onto site unless it has been approved for use by the nominated project management representative and it appears on the Approved Chemical Substances Register which will be made available to all contractors.

The register will contain the following information:

- Trade name / product name of substance;

- Manufacturer / supplier of substance;
- Maximum inventory;
- Storage requirements and precautions;
- Inventory of special emergency items held for handling spillages, fires, etc. (e.g. reagents to neutralise spillages, firefighting foam, etc.); and
- Approved disposal methods.

If the contractor wishes to make use of a chemical substance that does not appear on the register, then the contractor must provide the following information to the nominated project management representative for review PRIOR to bringing the substance onto site:

- A detailed 16-point Safety Data Sheet (SDS) issued by the manufacturer/ supplier of the substance;
- The reason for wanting to bring the substance onto site (i.e. the intended use of the substance);
- The proposed method of transportation;
- The proposed arrangements for the safe storage of the substance;
- The quantity to be stored on site;
- The proposed methods for handling / using the substance (including PPE);
- The proposed method of disposal of the waste;
- Proof that the contractor is able to readily provide the necessary first aid measures as specified in the SDS; and
- A risk assessment covering the transportation, use, handling, storage and disposal of the substance with specific reference to the substance's compatibility with other chemicals.

This information must be provided at least five (5) working days prior to the date on which the contractor intends to bring the substance onto site for use.

Any chemical substance brought onto site without adherence to the requirements stipulated above shall be removed from site immediately.

If the nominated project management representative approves the substance for use, the contractor must ensure that all necessary precautions are taken concerning the transportation, use, handling, storage and disposal of the substance, and that all required PPE and first aid materials / equipment (as stipulated in the SDS) are readily available on site.

The contractor must ensure that a Safety Data Sheet (SDS) is obtained for each chemical substance brought onto site. A file, or files, containing all of the SDS's must be maintained and must be readily available to all personnel on site (particularly first aiders) as well as other potentially affected parties (e.g. emergency services personnel, persons from the local community, etc.). The SDS's must be in the language(s) commonly used on site.

The contractor must appoint a trained and competent Hazardous Chemical Substances Coordinator who understands and is able to evaluate the risks associated with a wide variety of substances. This person shall be responsible for:

- Assessing the hazardous properties and risks associated with all chemical substances brought onto site by the contractor and appointed sub-contractors (using the SDS's);
- Determining precautions and safe practices for transportation, use, handling, storage and disposal (including PPE requirements) (using the SDS's);
- Determining first aid and emergency response requirements/ procedures (using the SDS's);
- Maintaining the SDS file;
- Managing and monitoring the consumption of inventory; and
- Providing an "as needed" service to site personnel and suppliers.

The risks associated with the transportation, use, handling, storage and disposal of all hazardous chemical substances brought onto site must be assessed and managed by the contractor through a process that incorporates risk reduction using the hierarchy of controls as described in Section 7.

Whenever a task-based risk assessment is carried out, consideration must be given to the use of chemical substances (e.g. greases, solvents, etc.).

The contractor must provide Safe Work Procedures for the transportation, use, handling, storage and disposal of all hazardous chemical substances to be used on site.

The contractor must provide his employees with all of the Personal Protective Equipment that is necessary to prevent exposure / injury while handling / using the hazardous chemical substances that they will be required to work with. Appropriate PPE must be selected with consideration given to the potential hazards, permeability, penetration, resistance to damage and compatibility with the work tasks.

The contractor's employees must be trained in the safe transportation, use, handling, storage and disposal of the hazardous chemical substances that they will be required to work with or may come into contact with. The training must specifically address PPE requirements (including the correct selection, fitment and use thereof).

All personnel must be trained to understand the potential health effects associated with exposure to hazardous chemical substances and therefore the importance of Safe Work Procedures and PPE. All personnel must be trained on emergency response procedures and first aid measures.

Behaviour-based observations and coaching must include the use / handling of hazardous chemical substances.

An appropriate occupational exposure monitoring and medical surveillance programme must be in place for all personnel potentially exposed to hazardous chemical substances which have the potential to cause immediate or long-term harm.

Emergency showers and eyewash stations must be provided where required by law, or where a risk assessment indicates a need. The emergency showers and eyewash stations must be appropriately located, signposted, and regularly tested and maintained. Employees must receive training on the location and use of the showers / eyewash stations.

An emergency response plan for incidents involving hazardous chemical substances must be in place. Regular and appropriately staged emergency drills (possibly involving external spill response and ambulance support services) must be held and lessons learnt must be incorporated into the emergency response plan.

The contractor must provide appropriate storage facilities for all hazardous chemical substances to be used on site. The storage facilities must be secure and protected from damage. They must also be designed for easy access for firefighting purposes. Where applicable, the storage facility must protect chemical containers from physical damage due to temperature extremes, moisture, corrosive mists or vapours, and vehicles.

The inventory of hazardous chemical substances stored on site must be kept to a minimum. The quantity of each chemical stored must be justifiable.

Storage and segregation requirements for all hazardous chemical substances to be used on site must be based on:

- The quantities of the substances stored;
- The physical state of the substances (solid, liquid or gas);
- The degree of incompatibility; and
- The known behaviour of the substances.

Access to areas where hazardous chemical substances are stored and handled must be limited and controlled.

Every chemical substance container must be adequately and clearly labelled to identify its contents, to indicate precautionary requirements for the substance, and to indicate the date of expiry (if applicable). Pipes used to transfer / convey / distribute chemical substances must be clearly identified (e.g. colour coding). Directional flow must be indicated where practical.

Before any item, equipment or empty container containing a chemical residue is disposed of as general waste, it must be properly decontaminated (where applicable). Before being disposed of, empty chemical containers must also be rendered unusable for carrying water (by puncturing, cutting or crushing them).

Hazardous chemical substance waste (i.e. redundant / expired hazardous chemical substances, containers containing residues, contaminated items / materials, etc.) must be disposed of in accordance with the applicable legislation.

Maintenance, inspection and testing schedules and procedures must be in place for critical equipment associated with hazardous chemical substances.

A system must be in place to ensure that the risks are assessed before any changes are made to equipment and / or processes for the transportation, storage, handling, use or disposal of a hazardous chemical substance.

A programme must be in place to continually investigate possibilities / opportunities for replacing hazardous substances with safer alternatives.

16.41 Thermal Stress

Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.

Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.

For defined extreme thermal conditions and job activities, medical examinations must include information about the operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.

Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.

Workplace thermal stress levels (temperature, air movement, humidity, etc.), activities (work level, etc.) and conditions (clothing, health, etc.) that have the potential to exacerbate thermal stress effects must be adequately characterised and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organisation, process or equipment which may impact thermal stress levels.

Detailed heat stress assessment of identified tasks or jobs must be tiered to:

- Commence with the use of a simple heat stress index as a screening tool; then, if necessary;
- Use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; and
- Undertake physiological monitoring when exposure times are calculated to be less than 30 minutes, or where high level PPE that limits heat loss must be worn.

Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.

When a risk of thermal stress is identified, the following exposure controls must be implemented:

- An acclimatisation period for new workers and those returning from extended leave or sickness;
- Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;
- Protective observation (buddy system or supervision); and
- A requirement for self-paced working.

The following exposure controls must be considered by a competent person:

- Work / rest regimes and job rotation based on measurements conducted;
- Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;
- Selection of appropriate clothing or other PPE for extreme temperature conditions;
- The use of engineering controls; and
- Undertake hot / cold tasks during a cooler / warmer time of the day.

Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

16.42 Fitness for Work

The contractor must develop and implement a programme to manage employee fitness for work. All employees working on site for whom the contractor is responsible (i.e. direct employees of the contractor as well as the employees of any appointed sub-contractors) must be subject to this programme.

All safety critical jobs (i.e. roles where fatigue or other causes of reduced fitness for work could lead to serious injury, illness or death to employees, significant equipment / plant damage, or significant environmental impact) must be identified and the risks associated with reduced fitness for work in these roles must be assessed.

A programme to manage these risks must be implemented, and it must include:

- Mechanisms for managing fatigue, stress and lack of fitness;
- An alcohol and other (including prescription, pharmaceutical or illicit) drugs policy that includes testing;
- An Employee Assistance Programme providing confidential access to resources and counsellors; and
- Training and awareness programmes.

Each employee has an obligation to present health and safety fit for work at the start of the day / shift, and to remain fit for work throughout the work period. Reporting for work under the influence of alcohol or any other intoxicating substance will not be tolerated. Any transgression concerning the alcohol and other drugs policy applicable to the project may result in the offending employee's access to the project premises being temporarily or permanently withdrawn.

Alcohol and drug testing on the project premises will be carried out randomly (as employees report for duty and during the course of the day / shift), following significant incidents (all persons involved), and whenever there is reasonable suspicion. Alcohol and drug testing may also be carried out as part of a Pre-Employment Medical Examination.

Sleep deprivation during shift work or from excessive working hours is a known cause of fatigue. Fatigued employees are at increased risk of accidents. Shift system design must consider:

- The effect on worker fatigue;
- The effects of activities carried out during scheduled and overtime hours;
- The impact on sleep cycles of activities such as commuting to and from site; and
- The monitoring and control of working hours.

The contractor is responsible for the administration of the working hours of his employees as well as the employees of any appointed sub-contractors. The maximum working hours per day and the minimum rest times between shifts must be specified in the contractor's Health and Safety Management Plan and must comply with all applicable legislation.

All employees engaged in safety critical jobs must undergo fitness assessments (medical examinations) which must be carried out prior to the commencement of employment on the project, prior to a change in role, periodically based on an employee's individual risk profile, and on termination of employment on the project:

- Pre-Employment Medical Examination – to assess the physical suitability of the person for the role and environment in which he will work (carried out prior to the commencement of employment on the project and prior to induction);
- Periodic (Surveillance) Medical Examination - to assess the ongoing physical condition of an employee to determine if his role is impacting on his health and whether the employee's fitness level is still adequate for the role he holds (these medical examinations are "risk driven" – the specific protocol followed and the frequency of the examinations will depend on the applicable legal requirements and the employee's individual risk profile as determined by his personal fitness, the nature of his role / duties, and the environment in which he works / occupational health hazards to which he is exposed).
- The periodic medical assessment programme must include:
 - ♦ The identification of modifiable risk factors that may impact fitness for work;
 - ♦ Education and support to maintain health or address identified risk factors; and
 - ♦ Education and support to help employees regain their fitness for work.
- Role Change Medical Examination – to assess an employee's physical suitability for a different role and work environment (carried out prior to a change in role / duties);
- Exit (Post-Employment) Medical Examination – to determine the total physical impact of the work the employee performed (carried out on termination of employment on the project if the employee worked on the project site for more than six months).

Note: The results of an Exit Medical Examination from previous employment will not be accepted as a Pre-Employment Medical Examination.

Note: The medical examinations described above may only be carried out by an occupational medical practitioner (i.e. a medical doctor who holds a qualification in occupational medicine).

A detailed job (role) description and an exposure profile (noise, dust, heat, fumes, vapours, etc.) must be provided for each employee or group of employees. The medical examinations

that an employee undergoes must be based on (i.e. the employee's fitness must be assessed against) the information contained in these documents as well as the baseline risk assessment for the work. This information must be made available to the occupational medical practitioner performing the medical examination.

For each role, the medical criteria for fitness must be documented and these must be based on an evaluation of the physical and medical requirements for the role.

Depending on the circumstances, certain vaccinations may need to be provided to employees.

The medical examinations carried out for all drivers and operators must include testing / assessment for medical conditions that could affect the safe operation of vehicles or equipment.

Specific testing / questioning must be carried out to determine if an individual:

- Suffers from epilepsy or any other medical condition deemed to be a risk by the occupational medical practitioner;
- Makes use of chronic medication that could affect performance;
- Is colour-blind; or
- Has poor day or night vision.

The medical examinations carried out for employees that are required to work at height must include testing / questioning to determine if an individual suffers from epilepsy, hypertension (high blood pressure) or any other medical condition deemed to be a risk (with regard to working at height) by the occupational medical practitioner.

Electricians must be tested for colour-blindness.

With regard to the placement of new employees:

- Prospective employees must be referred to a suitable occupational medical practitioner (doctor) for a "Pre-Employment Medical Examination";
- If an individual is found to be medically "unfit for placement", the doctor will indicate which work activities cannot be performed by the person;
- The individual may still be employed on the project if his medical restrictions can be accommodated and provided that no legislation is transgressed.

A process must be established to manage medical restrictions that may be placed on an employee. For every employee with a medical restriction, regular follow up visits with the occupational medical practitioner must be arranged to ensure that each case is proactively managed.

An employee in a safety critical job must report (to his supervisor) any condition that might impair his ability to safely perform the duties associated with his role. A mechanism must be in place for such reports to be referred to an occupational medical practitioner to determine if the employee is fit to continue with his work.

Proof of all medical examinations (i.e. certificates of fitness signed by an occupational medical practitioner) must be kept on site and these records must be readily available for inspection by the nominated project management representative.

An employee's certificates of fitness must be included in his Personal Profile (dossier). If an Employee Personal Profile (dossier) hasn't already been compiled for a particular employee, then this must be done without delay following the employee's Pre-Employment Medical Examination.

No employee in a safety critical role may commence work on site without proof that he has undergone a Pre-Employment Medical Examination.

Occupational medical examinations and data interpretation may only be carried out by medical practitioners that are appropriately qualified and certified to do so.

Occupational medical data contained in reports to management must be grouped and summarised to ensure that the confidentiality rights of each individual employee are maintained.

All occupational medical data and records must be retained for at least 40 years.

16.43 Legionnaires Disease

All equipment with the potential for generating Legionella (such as cooling towers and associated equipment, air-handling systems, hot water services and showers) must be identified and the risks of contamination and aerosol generation assessed.

Where there is an assessed risk that Legionella could grow in the system and cause harm, a programme must be in place such that:

- All such equipment is identified on a register. The register must contain details of the regular maintenance, cleaning and checking programmes;
- Control measures are in place to minimise aerosol emissions;
- There must be a documented water treatment programme, including procedures for inspection, assessment and maintenance of the controls; and
- New or retrofitted equipment is designed and constructed to minimise the risk of Legionella growth.

Where available, the Legionella plate count test should be used if more effective methods are not available.

Good maintenance procedures must be followed to minimise the risk of significant contamination of equipment with other bacteria and microbial organisms.

Adequate procedures must be available for disinfecting systems if significant concentrations of Legionella bacteria are present. Once disinfected, systems must be retested to confirm effectiveness of treatment.

16.44 HIV / AIDS

The contractor must assess the risks posed by HIV. Appropriate mitigation strategies must be implemented as required.

Discrimination towards employees on the basis of actual or perceived HIV status is forbidden.

All information on the HIV status and condition of employees and community members, including that relating to counselling, care and treatment and receipt of benefits, must be maintained in medical confidence.

HIV / AIDS screening may not be a requirement for recruitment or a condition of employment.

17. Working near or over Water Environments

The principal contractor must ensure that where construction work is done over or in close proximity to water, Health and Safety documents for such work should include, but not be limited to:

- Methodology for carrying out such work preventing persons from falling into water; and
- Emergency preparedness e.g. contingency plans, rescue plans of persons in danger of drowning, evacuation plans.
- A contractor must ensure that where a person is exposed to the risk of drowning by falling into the water, the person is provided with and wears a lifejacket.
- A task specific risk assessment for the relevant work to be carried out near water should be conducted before any such work commences.
- The Risk assessment should be reviewed periodically. All potential hazards involved in the work to be carried out near water e.g. drowning, plant/equipment falling into water should be identified and mitigated.

18. Occupational Hygiene

AIA- Approved Inspection Authority

- Chemical agents =Gases, vapours, solids, fibres, liquids, dusts, mists, fumes, etc.

- Physical agents =Noise, Vibration, Heat, Cold, Electromagnetic fields, lighting etc.
- Biological agents =Bacteria, fungi, etc.
- Ergonomic factors =Lifting, stretching, and repetitive motion.
- Psychosocial factors =Stress, workload and work organisation

The contractor must conduct an Occupational Health Risk Assessment in respect of their trade.

The contractor must appoint an Approved Inspection Authority (AIA) for Occupational Hygiene to conduct the identified Occupational hygiene Surveys.

18.1 Lighting

- Should be measured once-off within 6 months of new installations prior to work commencing for the first time in any area
- The installations should be placed on a maintenance/ repair/ replacement schedule by management. Proof of this should be available
- Lighting and ventilation shall comply with the National Building Regulations (SANS 10400-O: Lighting and Ventilation) before occupancy is established
- Measurements do not need to be conducted by an Approved Inspection Authority for Occupational Hygiene

18.2 Particulate and Gas/ Vapour Exposures

The concentration of an HCS in the air is, or maybe, such that the exposure of employees working in that workplace exceeds the recommended limit without the wearing of respiratory protective equipment, is zoned as a respirator zone

18.3 Thermal Stress

Hot areas or activities where employees have experienced or could experience excessive fatigue, muscle cramp, dehydration, dizziness and other symptoms of heat stress must be identified and described.

Where a risk of thermal stress is determined, a competent person must conduct monitoring surveys on site, in consultation with workers.

For defined extreme thermal conditions and job activities, medical examinations must include information about the operator's physiological and biomedical aspects, and an assessment of fitness for the working conditions.

Cold areas or activities where employees have experienced or could experience pain or loss of feeling in extremities, frostbite, severe shivering, excessive fatigue and other symptoms of cold stress must be identified and described.

Workplace thermal stress levels (temperature, air movement, humidity, etc.), activities (work level, etc.) and conditions (clothing, health, etc.) that have the potential to exacerbate thermal stress effects must be adequately characterized and described. Workplace exposure assessment must be repeated according to regulatory requirements or whenever there is a change in production, work organization, process or equipment which may impact thermal stress levels.

Detailed heat stress assessment of identified tasks or jobs must be tiered to:

- Commence with the use of a simple heat stress index as a screening tool; then, if necessary;
- Use rational heat stress indices in an iterative manner to determine the 'best' control methods for alleviating potential heat stress; and
- Undertake physiological monitoring when exposure times are calculated to be less than 30 minutes, or where high level PPE that limits heat loss must be worn.

Detailed cold stress assessment of identified tasks or jobs must be conducted according to current appropriate guidelines that incorporate a cold stress index, to determine the 'best' control methods for alleviating potential cold stress.

When a risk of thermal stress is identified, the following exposure controls must be implemented:

- An acclimatization period for new workers and those returning from extended leave or sickness;
- Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;
- Protective observation (buddy system or supervision); and
- A requirement for self-paced working.

The following exposure controls must be considered by a competent person:

- Work / rest regimes and job rotation based on measurements conducted;
- Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;
- Selection of appropriate clothing or other PPE for extreme temperature conditions;
- The use of engineering controls; and
- Undertake hot / cold tasks during a cooler / warmer time of the day.

Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

18.4 Measuring and Monitoring

The workplace exposure (or potential exposure) of persons to occupational health stressors must be measured and monitored to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.

All such measuring and monitoring must be carried out by an Approved Inspection Authority (i.e. a specialist service provider that is appropriately registered with a governing authority).

A plan for measuring and monitoring occupational exposure must be developed and it must include:

- Detail of what must be measured and monitored, based on a risk assessment and / or identified legal or other requirements;
- The frequency of measurement and monitoring;
- A description of the necessary equipment;
- Data quality requirements and controls (including details on the sample size for statistical validation and any rejection criteria);
- The sampling and analysis method(s) including any laboratory certification requirements; and
- The competency requirements for persons carrying out workplace monitoring.

Each instrument and item of equipment used for occupational exposure measurement and / or monitoring must be:

- Properly maintained to ensure compliance with legislative requirements;
- Controlled and safeguarded from unintentional adjustments;
- Suitably stored and protected from damage; and
- Calibrated or verified against a traceable standard at specific intervals (calibration records must be retained).

Each analytical laboratory service that is used must have implemented a credible quality assurance or quality control programme.

All monitoring results obtained must be analyzed on a regular basis to:

- Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);

- Identify inconsistent or unusual results;
- Evaluate the effectiveness of existing control measures;
- Measure performance against stated objectives; and Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented.

19. Temporary works

A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.

A contractor must ensure that all temporary works structures are adequately erected, supported, braced; and

A contractor must ensure that, all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand;

All temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted;

detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee;

All persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;

all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used;

All temporary works structures are inspected by a competent person

all temporary works structures are inspected by a competent person immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the results have been recorded in a register and made available on site;

No person may cast concrete, until authorization in writing has been given by the competent person; if, after erection, any temporary works structure is found to be damaged or weakened to such a degree that its integrity is affected, it is safely removed or reinforced immediately;

- Adequate precautionary measures are taken in order to—
- Secure any deck panels against displacement; and
- Prevent any person from slipping on temporary works due to the application of release agents;
- As far as is reasonably practicable, the health of any person is not affected through the use of solvents or oils or any other similar substances;
- Upon casting concrete, the temporary works structure is left in place until the concrete has acquired sufficient strength to safely support its own weight and any imposed load, and is not removed until authorization in writing has been given by the competent person contemplated in paragraph (a);
- The foundation conditions are suitable to withstand the loads caused by the temporary works structure and any imposed load in accordance with the temporary works design.
- Provision is made for safe access by means of secured ladders or staircases for
- A temporary works drawing or any other relevant document includes construction sequences and methods statements;
- The temporary works designer has been issued with the latest revision of any relevant structural design drawing;
- A temporary works design and drawing is used only for its intended purpose and for a specific portion of a construction site; and
- The temporary works drawings are approved by the temporary works designer before the erection of any temporary works.

No contractor may use a temporary works design and drawing for any work other than its intended purpose.

20. Structure

A contractor must ensure that, all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;

No structure or part of a structure is loaded in a manner which would render it unsafe; and all drawings pertaining to the design of the relevant structure are kept on site and are available on request to an inspector, other contractors, the client and the client's agent or employee.

An owner of a structure must ensure that; Inspections of that structure are carried out periodically by competent persons in order to render the structure safe for continued use;

That the inspections contemplated in paragraph (a) are carried out at least once every six months for the first two years and thereafter yearly;

The structure is maintained in such a manner that it remains safe for continued use;

The records of inspections and maintenance are kept and made available on request to an inspector.

21. Emergency Preparedness and Response

The contractor must develop, implement, test and maintain an Emergency Response Plan (incorporating emergency evacuation procedures) that focuses specifically on the contractor's team and work activities. The plan must be risk-based and must detail the procedures that must be followed when responding to all potential emergency scenarios such as a medical emergency (including first aid response), a fire, an explosion, a hazardous substance spill, flooding, rescue from height, rescue from a confined space, etc.

The contractor's Emergency Response Plan must be aligned with the Emergency Response Plan developed for the project.

Potential off-site emergency scenarios must be included (e.g. emergency scenarios related to the transport of personnel, the transport of hazardous materials, and personnel performing work in remote locations).

Consideration must be given to neighbours, and to the availability and capability of local emergency services. Details of any arrangements with external emergency response service providers must be included.

The Emergency Response Plan must satisfy and comply with all applicable legal requirements.

The plan must be adequately resourced to ensure effective implementation. These resources must include appropriate personnel, external emergency response service providers, emergency response equipment, and warning devices. All equipment and warning devices must be identified, maintained and tested to ensure availability at all times.

Accountability for the Emergency Response Plan must be clearly defined. An Emergency Response Team (ERT) responsible for the implementation, management and execution of the Emergency Response Plan must be established. The roles and responsibilities of each team member must be clearly defined in the plan. Each team member must receive appropriate training to ensure that each role is performed competently.

The process for managing incident communication, notification, and reporting must be incorporated into the Emergency Response Plan. The responsible person(s) must be clearly identified, and the protocols for communicating with internal and external stakeholders must be defined.

Emergency evacuation procedures must be developed and included in the Emergency Response Plan.

A copy of the plan must be provided to the nominated project management representative for approval prior to site establishment.

The Emergency Response Plan must be formally reviewed (and amended if necessary) on at least an annual basis, and following any emergency situation, to ensure that it remains appropriate and effective.

At each project work site:

- A suitable evacuation alarm (siren) must be provided. If work is to be carried out in proximity to an existing operational plant, the alarm provided by the contractor must be distinctly different (in terms of the sound that it generates) to any alarm installed in the operational plant. All persons working in an area where an evacuation alarm is sounded must respond to it immediately.
- Suitable fire-fighting equipment must be provided and maintained, and personnel must be trained in fire-fighting procedures and the use of fire-fighting equipment.
- Suitable first aid equipment and supplies must be provided and maintained, and an adequate number of appropriately trained First Aiders must be in place (refer to Section 14.2).
- Emergency assembly points positioned in safe locations away from buildings, plant and equipment must be designated (and conspicuously signposted). In the event of an evacuation, all persons (i.e. personnel and visitors) must assemble and be accounted for at these emergency assembly points.
- All personnel must receive awareness training on the applicable emergency response procedures, and all visitors entering the site must be properly instructed in these procedures.
- The emergency response procedures must be displayed on each notice board.
- A diagram (site plan) indicating evacuation routes, emergency assembly point locations, and the positioning of emergency equipment (fire extinguishers, first aid boxes, etc.) must be prominently displayed in all buildings and plants, in all offices, on all notice boards, and in other locations on the site as may be required.

- An up-to-date list of emergency telephone numbers must be compiled and maintained. A copy of this list must be posted at each site entrance, in each office, near each telephone, and on every notice board.
- Emergency response drills must be conducted to test the effectiveness of the emergency procedures and equipment, as well as the knowledge and proficiency of the response personnel. Where appropriate, drills must include liaison with and the involvement of external emergency response service providers. A variety of emergency scenarios must be tested including, but not limited to, medical emergencies, fires, rescues, and hazardous substance spills. A drill must be carried out one month after site establishment and six-monthly thereafter.

Each drill must be monitored and the outcomes (highlights and shortcomings) must be documented. Corrective actions must be identified and implemented to address the shortcomings, and the Emergency Response Plan and associated procedures must be amended as required.

21.1 Fire Fighting

The contractor must ensure that Fire Fighting requirements are met

21.2 First Aid

The contractor must ensure that First Aiders are trained and appointed as described in (Section 10.5)

21.2.1 First Aid Kits

A suitable first aid kit (i.e. appropriate to the level of training) must be readily available to each First Aider. All kits must be provided and maintained by the contractor.

Taking into account the type of injuries that are likely to occur in the workplace, each first aid kit must contain suitable equipment and supplies. First aid equipment and supplies required by applicable legislation must be provided as a minimum.

The contents of each first aid kit must be kept clean and dry. Each kit must be contained in either a portable weatherproof case / bag or a steel box mounted to a fixed structure. Access to first aid equipment / supplies must be limited to train First Aiders only. Access to portable kit bags must be controlled and steel first aid boxes mounted in the workplace must be kept locked.

Approved signage must be in place to indicate the locations of the first aid boxes / bags.

A record of each treatment administered must be kept in a suitable register.

The first aid kits must, as a minimum, contain the following equipment and supplies:

Table 19.2.1-1 Minimum Requirements to be included when equipping first aid boxes

Item 1:	Wound cleaner/ antiseptic – 100ml;
Item 2:	Swabs for cleaning wounds;
Item 3:	Cotton wool for padding – 100g;
Item 4:	Sterile gauze – minimum quantity 10;
Item 5:	1 x Pair of forceps – for splinters;
Item 6:	1 x Pair of scissors – minimum size 100mm
Item 7:	1 x Set of safety pins;
Item 8:	4 x Triangular bandages;
Item 9:	4 x Roller bandages – 75mm x 5m;
Item 10:	4 x Roller bandages – 100mm x 5m;
Item 11:	1 x Roll of elastic adhesive – 25mm x 3m;
Item 12:	1 x Non-allergenic adhesive strip – 25mm x 3m;
Item 13:	1 x Packet of adhesive dressing strips – minimum quantity 10 assorted sizes;
Item 14:	4 x First aid dressings – 75mm x 100mm;
Item 15:	4 x First aid dressings – 150mm x 200mm;
Item 16:	2 x Straight splints;
Item 17:	2 x Pairs large and 2 x pairs medium disposable latex gloves;
Item 18:	2 x CPR mouth pieces or similar devices.

Additional items / supplies may need to be provided depending on the nature of the workplace (specific hazards) and the level of training of the first aider in position of the kit.

22. Management Review

A review of the contractor's Health and Safety Management System must be completed annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements.

The review must evaluate if there is any need for change and must identify actions to improve the system.

The review must be led by senior management and the following must be considered:

- The suitability of the policy adopted for the project;
- The impact of changing legislation;

- The management of risk;
- Health and safety objectives and performance indicators;
- Changing expectations and requirements of relevant stakeholders;
- Changes to the contractor's scope, schedule, designs, etc.;
- Changes to the contractor's organisational structure;
- Communication and feedback (particularly from employees, Project representatives, and client representatives);
- The effectiveness of the management of change process;
- Workplace exposure monitoring and medical surveillance;
- The status of corrective actions;
- Performance statistics, including an annual summary of safety statistics, and occupational hygiene monitoring and medical surveillance results;
- Non-conformances (findings) from completed audits;
- Follow up on actions from previous management reviews; and
- Recommendations and opportunities for improving the effectiveness of the management system.

A record of each completed management review must be retained and it must include all decisions and identified actions concerning alterations, modifications or improvements to the management system that demonstrate a commitment to continual improvement.

For occupational hygiene: **Approved Inspection Authority (AIA) for Occupational Hygiene**

23. Management of Change

To ensure that proposed changes do not give rise to unacceptable health or safety risk, the contractor must develop and implement a process for identifying and managing change in the workplace (e.g. changes to scope, schedule, procedures, work methods, site conditions, designs, plans, plant and equipment, materials, processes, etc.) that may impact on health or safety performance.

The management of change process must take into consideration that changes may be planned or unplanned, sudden or gradual, temporary or permanent.

The process must aim to ensure that:

- Changes are identified and assessed before they are implemented;
- Careful consideration is given to managing the risks associated with any change;

- Due diligence can be shown to have taken place;
- The number of unsatisfactory or unnecessary changes is minimised;
- The right people are involved in the change process; and
- All statutory requirements are met.

All risks associated with a proposed change must be evaluated and ranked. The risks that are ranked as moderate or higher must be managed to prevent serious injury or illness.

It must not simply be assumed that a change will not result in significant risks. All proposed changes must be formally evaluated. The evaluation or review must include:

- An appropriate level of technical expertise;
- The involvement of the workforce potentially affected by the proposed change; and
- Approval of the change by a person with at least the same level of authority as those who control the existing process or item being changed.

24. Sub-contractor Alignment / Stakeholder management

Processes must be in place to ensure that the health and safety risks associated with the procurement of materials, equipment, services and labour are identified, evaluated and effectively managed.

A process for evaluating a sub-contractor's (or supplier's) ability to provide materials, equipment, services and labour that meet defined specifications must be in place. A prospective sub-contractor's health and safety management expertise, experience and capability (including previous health and safety performance) must be formally assessed prior to any contract or purchase order being awarded.

Each appointed sub-contractor must develop and implement a detailed Health and Safety Management Plan based on the requirements of the contractor's Health and Safety Management Plan and the Health and Safety Specification for the project. This plan must be reviewed and approved by the contractor prior to the commencement of any work.

The properties of all materials provided to the project must be adequately understood, documented and integrated into operating procedures where exposure to these materials presents a significant health or safety risk.

Procedures, commensurate with the evaluated risk, must be in place for the receiving, storing, dispatching and transporting of all equipment and materials.

Before work commences on any contract, all sub-contractor personnel must receive comprehensive orientation and induction training (refer to Section 12).

All work carried out by a sub-contractor must be managed (activity supervised) throughout the contract period and performance must be reviewed (audited) on a regular basis (refer to Section 22).

25. Measuring and Monitoring

The workplace exposure (or potential exposure) of persons to hazardous substances or agents must be measured and monitored to determine the effectiveness of control measures as well as compliance with legal and other requirements, particularly Occupational Exposure Limits.

All such measuring and monitoring must be carried out by an Approved Inspection Authority (i.e. a specialist service provider that is appropriately registered with a governing authority).

A plan for measuring and monitoring occupational exposure must be developed and it must include:

- Detail of what must be measured and monitored, based on a risk assessment and / or identified legal or other requirements;
- The frequency of measurement and monitoring;
- A description of the necessary equipment;
- Data quality requirements and controls (including details on the sample size for statistical validation and any rejection criteria);
- The sampling and analysis method(s) including any laboratory certification requirements; and
- The competency requirements for persons carrying out workplace monitoring.

Each instrument and item of equipment used for occupational exposure measurement and / or monitoring must be:

- Properly maintained to ensure compliance with legislative requirements;
- Controlled and safeguarded from unintentional adjustments;
- Suitably stored and protected from damage; and
- Calibrated or verified against a traceable standard at specific intervals (calibration records must be retained).

Each analytical laboratory service that is used must have implemented a credible quality assurance or quality control programme.

All monitoring results obtained must be analysed on a regular basis to:

- Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);
- Identify inconsistent or unusual results;

- Evaluate the effectiveness of existing control measures;
- Measure performance against stated objectives; and
- Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented.

26. Incident Reporting and Investigation -

The contractor must establish a procedure for the management of all health and safety incidents. This procedure must define the responsibilities, methodologies and processes that must be followed for:

- Reporting an incident;
- Investigating an incident;
- Analysing an incident to determine the root cause;
- Identifying and implementing corrective actions to prevent a recurrence; and
- Communicating information concerning an incident to relevant persons and / or groups.

Please Note: Arrangements must be in place to ensure that proper medical care is provided to any principal contractor and contractor employee that suffers an occupational injury or illness (refer to Section 16). These arrangements must be described in the contractor's Health and Safety Management Plan.

An incident may have multiple impacts. For each impact, the Actual Consequence and the Maximum Reasonable Outcome must be evaluated. Each impact must be evaluated independently, with the most significant classification forming the primary rating of the incident.

A Near Hit is an incident. All Near Hits must be reported.

The Maximum Reasonable Outcome (MRO) is based on a risk evaluation of the maximum reasonable consequence of an impact and the likelihood of the event occurring again given a reasonable failure of existing controls. Using the matrix referred to above, each impact must be evaluated and classified as:

- Low;
- Moderate;
- High; or
- Extreme.

An incident must be reported on the same work day or shift on which it occurs and preliminary details must be recorded.

Depending on the Actual Consequence and Maximum Reasonable Potential Outcome of the impact(s), the relevant internal and external parties must be notified in accordance with specified protocols and timeframes, and legislative requirements.

In the event of a significant incident (i.e. an incident with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Potential Outcome of High or Extreme, work must cease and must only resume once the necessary actions (including the re-evaluation of any relevant risk assessments) have been taken to eliminate or reduce the risk of recurrence. Work must only be permitted to recommence once formal authorisation has been granted by the Project Construction Manager. In the case of incidents with an Actual Consequence of Major or Catastrophic, work must not be permitted to recommence until authorisation has been granted by the relevant government authorities (i.e. the South African Police, the Department of Labour or the Department of Mineral Resources).

The Contract Manager must ensure that an investigation is completed for each incident that occurs, and that appropriately senior personnel participate in, and authorise the outcomes of, each investigation. Incident investigations must be facilitated by competent and experienced persons who have been trained in the appropriate methodology.

All significant incidents (i.e. incidents with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Outcome of High or Extreme must be investigated using the approved Transnet investigation methodology. Such an investigation must be facilitated by a trained project representative within 7 calendar days.

For all other incidents (i.e. incidents with an Actual Consequence of Insignificant or Minor, or a Maximum Reasonable Outcome of Low or Moderate other methodologies approved by the Project Health and Safety Manager must be used.

Each incident (including Near Hits) must be investigated to a level of detail that is appropriate for the Maximum Reasonable Potential Outcome of the incident.

Each incident must be analysed to determine the root cause, and corrective actions must be identified and prioritised for implementation to eliminate or reduce the risk(s) in order to prevent recurrence of the incident.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing incidents) must be monitored and reported on. The implementation of corrective actions must be verified during monthly audits by the Project Health and Safety Advisors but also no later than 30 calendar days after the conclusion of the incident investigation.

The contractor must document the results of each investigation and a report must be submitted to the nominated project management representative within five working days of the incident occurring.

As a minimum, each incident report must include:

- The date, time and location of the incident;
- A detailed description of the incident, including photographs;
- The names of any injured persons;
- Injury details (if applicable);
- A summary of the first aid and / or medical treatment provided (if applicable);
- The current status of any injured persons;
- The root causes of the incident; and
- Detailed corrective actions, including responsible persons and target dates for implementation.

Each significant incident must be summarised for its lessons learnt following the investigation. This information must be reviewed by the contractor's Project Manager to assure completeness, accuracy and relevance before it is shared with (communicated to) all project personnel.

27. Non-conformance and Action Management

The contractor must establish a process for identifying and recording corrective actions arising from:

- Incident investigations;
- Hazard identification and risk assessment;
- Measurement and monitoring;
- Improvement plans and suggestions;
- Managing change;
- Audits and inspections; and
- Safety observations and coaching (safety interactions).

The contractor must establish a procedure for managing actions that addresses:

- Identification, categorisation and prioritisation of actions;
- Formal evaluation and approval of actions (management of change process);
- Assignment of responsibilities, resources and schedules for implementation;
- Implementation of actions;
- Tracking and reporting on implementation status; and

- Monitoring and verifying the effectiveness of the actions.

28. Performance Assessment and Auditing

The contractor must establish and maintain programmes for measuring and monitoring Health and Safety performance on a regular basis. Metrics must include leading and lagging indicators, and be based on qualitative and quantitative data.

28.1 Reporting on Performance

Reports summarising the contractor's health and safety performance on the project must be compiled on a weekly and/or monthly basis.

The contractor must be prepared to discuss the content of these reports at scheduled health and safety meetings.

The reports must contain the following information: cross check with weekly reports

- Number of contractor and sub-contractor employees on site;
- Total hours worked on site by contractor and sub-contractor employees (by company);
- Number of incidents by category (i.e. Near Hit, FAI, MTI and LTI);
- Lost Time Injury Frequency Rate (LTIFR) (project to date and 12-month rolling);
- Details of all new incidents for the reporting period and the corrective actions taken or to be taken;
- Feedback (progress updates) on all open incidents and outstanding corrective actions;
- Status and feedback on any employee that may have been injured and has not yet returned to work;
- Details of all health and safety training carried out during the reporting period;
- Number of SOC's (Safety Observations and Coaching) carried out during the reporting period;
- SOC trends identified and proposed action for the coming week or month to maintain positive trends and / or address negative trends;
- Details of all audits, inspections and site visits carried out during the reporting period, and the corrective actions taken (or to be taken) to address all non-conformances;
- Feedback (progress updates) on all open non-conformances and outstanding corrective actions;
- Number of Toolbox Talks conducted during the reporting period (monthly);
- Number of Planned Task Observations (PTO's) carried out during the reporting period (monthly);

- Details of all active risk assessments and Safe Work Procedures highlighting those that are due for review in the coming month (monthly);
- A look ahead (to the coming week, month or quarter) to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Challenges faced with regard to health and safety; and
- Any other health and safety related information specific to the project that may be required.

Leading indicators (e.g. audit findings, observations, etc.) must be analysed, and any negative trends identified with regard to unsafe behaviour or conditions must be appropriately addressed to prevent incidents.

Lagging indicators (e.g. injuries, illnesses, near hits, etc.) must be investigated in detail to determine the root causes. Corrective actions must be identified, implemented and integrated into Safe Work Procedures to prevent recurrences.

28.2 Audits and Inspections

On a monthly basis, the health and safety management system and workplace activities of the contractor will be audited by a Clients Project Health & Safety Representative to assess compliance with the project health and safety requirements. Any deviation from these requirements (i.e. non-conformance) that places the health or safety of any person in immediate danger will result in the specific activity being stopped until the non-conformance is corrected.

For each non-conformance determined during any audit, the contractor must identify and implement appropriate corrective actions.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing non-conformances) must be monitored and reported on. The implementation of corrective actions will be verified during the monthly audits.

Should it be determined that the contractor's level of compliance is unsatisfactory, all work being performed by the contractor on the project site may be stopped (at the contractor's expense) until an investigation into the reasons for the poor performance has been carried out, a corrective action plan has been developed, and corrective actions have been implemented.

In addition to the audit carried out by the Clients Project Health & Safety Representative, the contractor must carry out an internal audit on a monthly basis to assess compliance with the project health and safety requirements (including the requirements of this specification and the contractor's Health and Safety Management Plan). Furthermore, the contractor must ensure that each appointed sub-contractor is audited and measured to the same standard. Copies of these audit reports must be submitted to the Clients Project Health & Safety Representative on a monthly basis.

The contractor must carry out internal health and safety inspections as follows:

- General site health and safety inspections on a daily basis; and
- Inspections of plant, tools and equipment prior to establishment or use on site, and at least monthly thereafter.

All audits and inspections must be carried out by competent persons who have been appointed in writing.

A schedule of planned audits and inspections must be compiled and maintained ensuring that:

- All work areas and all activities are covered at regular intervals;
- All applicable legal requirements are complied with; and
- Areas or activities with significant associated hazards or risks receive greater attention.

Minimum score to be attained on HS compliance audit will be communicated.

29. Reference Documents

Table 29-1: Reference Documents

Document Title
Occupational Health and Safety Act, 85 of 1993 and Regulations
Compensation for Occupational Injuries and Diseases Act, 1993

PROJECT BASELINE RISK ASSESSMENT

For: TRANSNET NATIONAL PORTS AUTHORITY

Project Name : Supply and Installation of Smart Water and
Electricity Meters with a Software Solution
(Utility Management) Across the Eight Ports

Project Number :

Author : Jabulani Maluleke
Owner : Transnet National Ports Authority
Client : Chief Engineer, TNPA
Project Sponsor : General Manager, Infrastructure
Project Manager : Sphelele Ngcobo

Revision Number : 000

Approved by :

Release Date : 19/09/2012

Print Date :

Template Date : 01/01/2012

Document No : 1

DOCUMENTATION DISTRIBUTION, REVISION AND APPROVAL HISTORY

REVISION NUMBER	DATE	DISTRIBUTION/ REVISION	PREPARED BY	APPROVED BY	ACCEPTED BY
000	12/03/'26	Internal Review	Terrence Vilakazi	Jabulani Maluleke	Sphelele Ngcobo

SIGNATORIES

Compiled by:	<u>Terrence Vilakazi</u> Health and Safety Practitioner	 Signed	<u>26/03/2026</u> Date
Approved by:	<u>Jabulani Maluleke</u> Health and Safety Agent	 Signed	<u>26/03/2026</u> Date
Accepted by:	<u>Sphelele Ngcobo</u> Project Manager	 Signed	<u>26/ 03/ 2026</u> Date

Supply and Installation of Smart Water and Electricity Meters with a
Software Solution (Utility Management) Across the Eight Ports System

Project Baseline Risk Assessment

Risk Assessment Title	Baseline Risk Assessment

Risk Assessment Team				
	Name	Designation	Contact Number	E-mail
Facilitator				
Team Member				
Team Member	Sphelele Ngcobo	Engineer	071 5195 559	Sphelele.Ngcobo@transnet.net

PREFACE

Purpose of this Document

This baseline risk assessment identifies and categorise the low to high hazards associated with performing tasks during construction. This document focusses on the high-level Health and Safety risks anticipated during construction taking into consideration all construction methods.

SCOPE OF WORK

The Project scope is "Supply and Installation of Smart Water and Electricity Meters with a Software Solution Across the Eight Ports". The works to be carried out includes but is not limited to the items as summarised below which covers supply, installation, configuration, integration, design of communication networks [Local Area Network (LAN) & Private Wireless Network e.g. Radio Frequency (RF)], testing and commissioning of a utilities management solution across all ports:

- Supply, install, configure, test and commission smart energy meters for measurement of different electrical parameters listed elsewhere in the document including Active Energy (kWh/MWh), Reactive Energy (kVARh/MVARh), Apparent Energy (kVAh/MVAh) etc.
- Supply, install, configure, test and commission smart water meters for measurement of water consumption (KL), alarm notification for high flow set points and trigger night flow analysis.
- Supply, install, configure, test and commission all necessary AMR/AMI communication modules, transceivers, repeaters, gateways etc. All equipment to be supplied shall be of the latest AMR/AMI technologies.
- Design, develop, install, integrate (with existing systems in each port or lack thereof), test and commission a new utilities management software solution across all ports.
- Perform all the works, procurement, installation, testing and supervision to ensure compliance with the Employer's Works Information and all applicable standards.
- Design, supply and installation of networks (i.e. LAN and Wireless) including trenching, manholes, sleeves etc..
- Updating of as-builts, operating and maintenance manuals,
- Maintenance Contract:

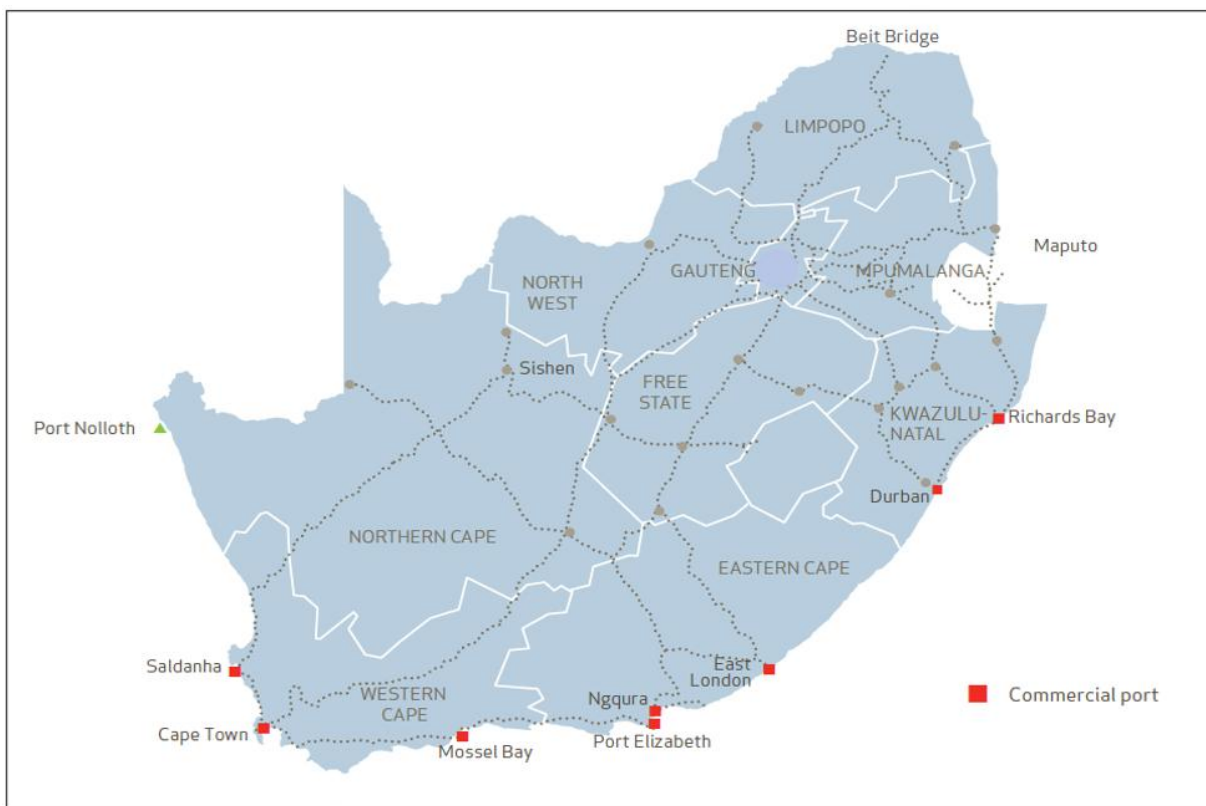
During the Defects Liability Period the Contractor shall undertake all system repairs, service and maintenance requirements including provision of manpower and consumables.

- Provision of the critical spares where required.

- Provision of training on the AMR and Utilities Management Software Solution.

GEOGRAPHIC LOCATION

All the Ports operated by Transnet National Ports Authority provides port infrastructure, Real Estate, Marine, Dredging and Lighthouse services. All the Ports are 24 hours operational. Works to be carried out will be undertaken in operational areas.



Supply and Installation of Smart Water and Electricity Meters with a Software Solution (Utility Management) Across the Eight Ports System

Project Baseline Risk Assessment

Activity, Step or Action step	Hazards	Associated risk event	Risk controls	Risk Rating
Access to Port	Principle Contractor not duly inducted prior to entry into the various Ports/ Non verification of fitness to work.	- Employees entering site not being inducted. - Absence of relevant hazards prevalent in different Ports not communicated to Principal Contractors employees, delivery drivers and visitors may result in incidents/accidents. - Injuries to persons and property damage. - Non verification of medical certificates may result in Contractors personnel being exposed to conditions which may be hazardous to their health.	- Site induction can only be done with an employee if the required up to date medical is presented at the induction, and safety file has been approved. - Medical fitness certificates must be validated by the Principal Contractor to ensure adherence to the minimum requirements and validity of the document. - Each person's ID or valid work permit must be inspected before induction can be allowed on site for the individual. - Induction arrangements to be done through TNPA PM	HIGH
Access to Port	Unauthorised access to port.	Non-compliance with port rules and national key point Act. Port entry denied.	All Contractor's employees including visitors, suppliers and deliveries must undergo port induction before entering the Port. TNPA Project managers to arrange for access permits.	MEDIUM
Access to site	Entering site and driving under the influence of alcohol and drugs.	Injury to persons and property damage.	- All employees entering the site shall undergo an alcohol Breathalyzer or drug test if requested to do so. - The Contractor's drivers shall abide by all general road traffic rules found in the National Road Traffic Act (Act 93 of 1996) and Regulations thereto or otherwise.	MEDIUM

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	Speeding (reckless and negligent driving)	Injuries to persons and property damage	All drivers shall abide by speed limit	MEDIUM
	Parking in areas not designated for parking	Obstruction of the roads and possible injuries and damage to property	Contractor must ensure that an approved Traffic Management Plan is implemented.	MEDIUM
	- Incompetent drivers - Vehicles not in good and serviceable condition - Uneven road conditions - Speed - Fatigue - Poor visibility due to dust/sunlight	- Injuries resulting in permanent disabilities - Fatalities	- The contractor's drivers shall abide by - All general road traffic rules found in the - National Road Traffic Act (Act 93 of 1996). - Adherence to TNPA Vehicle and - Transportation Management procedure and the Road Traffic Act. - Ensure drivers are competent, including random verification. - Strict speed control with use of 24-hour active satellite tracking. - Inspections by competent inspector. - Ensure selection of correct vehicle type for conditions, including tyre selection - Fatigue management plan to be developed and approved.	MEDIUM
	Congestion caused by Contractor's trucks and construction	Vehicle incidents which may lead to injuries, fatalities and/or property damage.	Contractor to develop a Traffic Management Plan. It must be communicated and implemented accordingly.	HIGH

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Site establishment	- Poor ground stability. - Substandard rigging and lifting practices. - Possible mechanical failure of lifting equipment. - Miscommunication between rigger and driver.	- Crane tipping over causing property damage and possible injuries. - Falling of container(s) which may lead to injuries and property damage.	- Contractor to conduct ground survey before offloading process. - Operator competency, load test certifies and pre-operative checks. - Competent rigger to be appointed. - Adherence to Traffic Management Plan. - Clients site induction.	MEDIUM
	- Incompetent drivers offloading containers/offices. - Mobile cranes not in safe and serviceable.	Falling of container(s) which may lead to injuries and property damage.	- Rigger to use approved rigging signals and rigging safe work procedure. - Contractor to conduct rigging study. - Valid crane, hook, load, and calibration test to be completed.	
	No ablution facilities.	Infectious diseases due to poor hygiene practices.	Contractor to adhere to Facilities and Construction Regulations under Occupational Health and Safety Act No.85 of 1993 and TNPA Health and Safety Project Specification.	
	Using water from un-identified sources/connections	Ill-health resulting from drinking water from unsafe sources.	Drinking water must only be sourced from connections identified safe for human consumption.	
	No canteen / dining / sheltered eating areas available for employees on site.	Ill-health resulting from eating at hazardous/untidy areas.	Eating areas to be established at a safe and secure location on site as per Facilities Regulations.	

Supply and Installation of Smart Water and Electricity Meters with a Software Solution (Utility Management) Across the Eight Ports System

Project Baseline Risk Assessment

Clearing and grubbing	• Use of unsafe Heavy Mobile Equipment (HME). • Damage of site fence due to site clearing operations. • Employees being struck by moving plant working in the area. • Construction vehicle and mobile plants reverse hooters not working. • Presence of venomous insects and snakes.	• Biological conditions • Extreme weather conditions (Cold and Heat) • Incompetent person operating Heavy Mobile Equipment (HME) • HME not in safe and serviceable condition • Injury • Person bitten by a venomous spider or snake whilst carrying out site clearing. Possible fatality	• All services on site must be pointed out by the client to the principal contractor. • Safe distance from site fence and services must be established by contractor and must be maintained and marked. • Dust control measures must be implemented by the principal contractor as determined by the environmental requirements. • All construction vehicles on site must be inspected when delivered to site to ensure adherence to the legal requirements before any usage of the plant. • Mobile plants to be in good working condition and maintained as per maintenance plan. • Safety boots to be worn, gloves, eye protection Snake removal service arrangements to be in place and snake and insect awareness to be carried out. Snake identification chart and snake bite emergency response procedure to be displayed on notice boards. Emergency Response Plan to be implemented (including procedures for responding to a medical emergency). An adequate number of trained First Aiders to be in place.	MEDIUM

Supply and Installation of Smart Water and Electricity Meters with a Software Solution (Utility Management) Across the Eight Ports System

Project Baseline Risk Assessment

Interface with adjacent construction activities of other contractors	- No communication with other contractors on premises in close vicinity of work area. - Prevalence of dust in Port of Richards Bay	- Injuries resulting in permanent disabilities - Fatalities - Inhalation exposure to solid dust results in Respiratory infection (potentially permanent health impact). Lung Irritation / damage to eyes/ red eyes.	- Contractor must communicate daily regarding items that may affect 3rd party or site access. - Principle contractor to monitor activities to limit potential dust exposure in line with wind speed and direction. Provision of dust masks to personnel to prevent inhalation. Occupational health assessments	MEDIUM
Working at MHI Site				
Operating portable electrical equipment and cell phones on an MHI / hazardous zone	Potential ignition sources	- Fatalities - Serious injuries - Property damage	Only intrinsically safe appliances approved by TNPA may be switched on or used in the berths. Owners of such devices will carry with them the approval certificate for use at all times.	EXTREME
Working on an MHI site	Vapour Emission	- Poor air quality - Air pollution	- Air quality monitoring by contractor - Compliance project health and safety specification requirements.	
Manual handling of materials	- Awkward postures whilst working - Repetitive movements - Prolonged standing - Constant kneeling - Sharp edges - Heavy lifting of materials e.g., wall cabinets and ceramic tiles.	- Musculoskeletal disorders e.g., back injuries - Blood pooling which may lead to fainting - Cuts/Abrasions and pinch points	- Safe lifting procedures - Contractor to ensure long sleeved clothing and appropriate gloves are worn by all employees handling roof trusses and sheets. - Appropriate PPE including gloves. - Contractor to ensure sufficient labour available for manual lifting.	HIGH

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Project Baseline Risk Assessment

Electrical Work				
Removal of existing metering system and installation of Smart Energy Meter	Exposure to live electricity	Electrocution	- Electrical source to be isolated when conducting removal and installation work. - Competent and registered electrician to conduct the electrical installation work who is registered with DoEL and proof thereof to be submitted to TNPA. - Occupational medicals to be available. - SWP, Task Observation, DSTI and training. - Site access to be obtained for entry into TNPA substations.	
Installation of Electrical Cables	Exposure to live electricity	Electrocution	- Electrical source to be isolated when conducting installation work. - Competent and registered electrician to conduct the electrical installation work who is registered with DoEL and proof thereof to be submitted to TNPA. - Occupational medicals to be available. - SWP, Task Observation, DSTI and training.	HIGH
Connecting of electricity meters to existing systems	Exposure to live electricity	Electrocution	Electrical source to be isolated when conducting installation work.	HIGH
	Incompetent person conducting electrical connection.	Project interruption	- Competent and registered electrician to conduct the electrical installation work who is registered with DoEL and proof thereof to be submitted to TNPA. - SWP, Task Observation, DSTI and training.	

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Commissioning of Electrical System	Using electrical equipment in wet areas or outside in wet conditions.	Electrocution	- Electrical equipment may not be used in wet areas or wet conditions. - Task specific training. - Testing and commissioning to be carried out by competent authorised personnel with appropriate safety precautions in place.	HIGH
Asbestos Work				
Cutting of asbestos containing material (pipes)	Asbestos	Exposure to asbestos fibres leading to an Occupational illness and disease (asbestosis, mesothelioma etc).	- Full compliance to Asbestos Regulations, 2001 and Health and Safety Specification. - Application of applying good occupational hygiene principles. - Appropriate training of any person who may be exposed. - Ensure appropriate PPE is always worn by workers. FFP2 respirators mandatory.	EXTREME
Placing material in waste disposal skips	Improper handling leading to damaged asbestos bags			
Transporting asbestos skip to an approved asbestos disposal site	Accident-causing release of asbestos fibres due to breakage	Employees and public exposed to asbestos causing occupational illness and disease	- Driver to be trained in hazardous spill procedures. - The asbestos skip must be clearly identified as an asbestos waste disposal container with appropriate asbestos signage displayed. - Asbestos disposal certificate to be issued.	
	Damaged asbestos bags can cause people from community to be exposed to asbestos and cause health hazard			

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Excavations and trenching	• Unprotected excavations, unsafe access and egress into and from excavations • Underground services being struck/damaged • Use of defective tools and equipment (spades and forks) • Awkward movement / posture (Ergonomics)	Injuries and fatalities	• Method statement for drainage of excavations, adequate drainage procedure, daily inspections, and inspections after inclement weather, monitor weather forecasts, ensure correct batter angles, shoring to prevent collapse. • Ensure competent, trained personnel are used. • Contractor to ensure employees are trained on safe use of hand tools. • Pre-inspections of tools by Contractor. • Contractor to ensure appropriate PPE is always worn. • Drawings of existing services to be available and communicated. • Adequate supervision to stop all excavation work at the first visible sign of foreign material (e.g., electric cable sheath, PVC piping material). • Appropriate approval/permits. Permit to work • Correct tools for the job to be provided and used. • Task-Based Risk Assessments to be conducted and Safe Work Procedures to be in place.	HIGH

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	Dust generated from blasting, construction activities and heavy machinery	Regular to dust may result in irritation to eyes and respiratory illnesses such as lung cancer, silicosis, occupational asthma and Chronic Obstructive Pulmonary Disease (COPD).	- Occupational health assessment - Hygiene monitoring - Medical surveillance - Effective ventilation - Dust suppression - Wherever possible, avoid dust-generating activities during windy periods. - Respiratory protective equipment (RPE)	HIGH
Asbestos Work				
Cutting and removal of material containing asbestos	Employees not wearing the correct personal protective equipment	Exposure to asbestos fibres leading to an Occupational illness and disease (asbestosis, cancer of the lungs and mesothelioma)	- Contractor to develop an Asbestos Management Plan - All employees to wear the mandatory asbestos PPE in Asbestos work area - Adherence to Asbestos Abatement Regulations, 2020	HIGH
	Not placing asbestos material in designated area / skip	No control over asbestos material leading to incorrect disposal and legal liability claims	- Asbestos containing material to be placed in a designated area. - Inventory list to be compiled and updated regularly - Proper and constant supervision - Training to staff	HIGH

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Working Outdoors	• Extreme heat during winter nights and summer days. • Adverse weather conditions such as wind, rain or too cold	• Overexposure to heat may lead to heat-related conditions such as heat cramps, heat exhaustion and heatstroke which may be caused by dehydration and desalination. • Hypothermia, cold stroke, heat colds and flu)	• Occupational hygiene monitoring and medical surveillance. • Scheduling of regular break times • Regular hydration of employees • Specialized PPE (e.g., lined gloves, balaclavas, winter jackets. • Use of sun brims to limit sun exposure.	HIGH
	Excessive UV radiation.	Premature skin ageing, precancerous and cancerous skin conditions, keratitis, weakening of immune system.		
Working in close proximity to the water	Water	Falling into water Drowning	• Always work with a partner or preferably a team when working around or near water • Supervision • Working Near Water Procedure • Appropriate personal protective equipment (PPE) • Rescue plan to be in place.	HIGH
Working in confined spaces / tunnel in Port of Richards Bay	Limited supply of oxygen	Breathing difficulties. Asphyxiation	• A rigorous Permit to Work system to be implemented for confined space entry. Task-Based Risk Assessment to be conducted and Safe Work Procedures to be in place. Safe means of access into and egress from the confined space to be provided. • All hazardous systems or energy sources linked to the confined space to be isolated and locked out prior to entry. Pre-entry atmospheric testing to be	HIGH

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			carried out by a competent and appointed person who must certify in writing that the atmosphere in the confined space is safe for entry. • A safe atmosphere to be maintained within the confined space for the duration of the work by providing adequate forced-air ventilation. Confined space atmosphere to be monitored continuously while work is carried out in the space. • Suitable monitoring devices that emit both audible and visual alarms to be used. An effective communication system (e.g. two-way radios) to be in place and to be tested to ensure clear communication between personnel inside the confined space and designated persons positioned outside the space. • A standby person to be stationed immediately outside the entrance to the confined space whenever any person is inside the space. • Suitable emergency response (including evacuation and rescue) procedures to be in place. Emergency response personnel with suitable rescue, resuscitation, first aid, fire-fighting, communication, and personal protective equipment to be present (i.e. be on standby outside the entrance) during any confined space	

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			entry where the risk assessment has determined that this is necessary. Each person required to enter a confined space (including emergency response personnel), or to act as a standby person, to receive suitable training and to be assessed and found competent in the particular role that he is required to fulfil.	
Isolation of water valves to install smart water meters on to system.	- Pressurised pipes. - Limited supply of water to Port tenants and Transnet employees	- Injury, Damage to property - Reputational damage, unhygienic conditions due to non-provision of water for facilities.	- Mechanical isolation and lockout procedures to be in place. - Task-Based Risk Assessments to be conducted and Safe Work Procedures to be in place. Suitable PPE to be provided and worn. Pressure testing to be conducted on water pipes. - Communication via internal media communication channels to all affected stakeholders regarding dates and times when water interruption will occur.	High
Working on/near railway lines	Existing railway lines/ Existing level crossings not protected	- Accident between a train and construction vehicles, construction workers and/or pedestrians - Injuries and fatalities. - Damage to infrastructure and assets. - Damage to construction plan & machinery. - Discontinuation of operations; delay in project schedule.	- Ensure protection on level crossing as per Train Working Rules (TWR) requirements. - Protection of employees against moving trains. Fatal Risk Control (FRC) standards to exist for project. FRC to include no rail crossings. Construction footprint should consider this risk. Emergency response plan to include this type of accident. HSMP to address this.	HIGH

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	Insufficient construction space	- Limited construction space. - Working next to a railway line. - Current structures closer to construction site. - Slips, trips and falls while walking on uneven surfaces e.g. Rail ballast	- Insufficient space between construction site and Man/machine interface must be managed properly and ensure compliance to project specification. - DSTI, SWP to be in place. Ensure appropriate safety footwear is utilised to limit falling.	HIGH
	Working between moving trains/on full occupation	Injuries because of accidental hit by moving trains.	- The use of flagman at all times when working on or close to railway line. - Compliance to TWR - Induction by rail operator - Ensure proper communication is undertaken with network operator daily when work is carried out in the vicinity of the rail infrastructure. Contractor to attend rail specific induction carried out by network operator arranged by TNPA Project Manager.	
Site Demobilization				
Disconnection of services	Incompetent person disconnecting temporary electrical distribution boards.	Electrocution.	Competent / registered electrician to conduct the disconnection of temporary electrical installations	HIGH
Loading of material, equipment and offices	Employees standing underneath lifting operations.	Load falling on employees causing injuries.	- Employees to stand clear of lifting operations and no employees allowed underneath suspended loads. - Operators to be competent.	HIGH

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Loading of Machinery on Trucks	Improper loading of plant and machinery.	Plant / machinery falling off trucks causing property damage.	- Lifting equipment to be load tested. - Load test certificates to be available. - Lifting equipment to be placed on register and inspected on a monthly basis. - Employees to stand clear of lifting operations and no employees allowed underneath suspended loads. - Operators to be competent.	HIGH
		Load falling on employees.		



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Annexure 1 – Risk Matrix and Descriptions

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Critical
Almost Certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Medium	High	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Low	Medium

Assessed Risk Level	Description of Risk Level	Action Required
Low	If an incident were to occur, there would be little likelihood that an injury would result	Undertake the activity with the existing controls in place
Medium	If an incident were to occur, there would be some chance that an injury requiring First Aid would result	Additional controls may be needed
High	If an incident were to occur, it will be likely that an injury requiring medical treatment would result	Controls will need to be in place before the activity is undertaken
Extreme	If an incident were to occur it, it would be likely that a permanent or death would result	Consider alternatives to doing the activity. Significant control measures will need to be implemented to ensure safety

Likelihood	Description of Likelihood		Consequence	Description of Consequence
1. Rare	Will only occur in exceptional circumstances		1. Insignificant	No treatment required
2. Unlikely	Not likely to occur within the foreseeable future, or within the project lifecycle		2. Minor	Minor injury requiring First Aid treatment (e.g. minor cuts, bruises, bumps)
3. Possible	May occur within the foreseeable future, or within the project lifecycle		3. Moderate	Injury requiring medical treatment or lost time
4. Likely	Likely to occur within the foreseeable future, or within the project lifecycle		4. Major	Serious injury (injuries) requiring specialist medical treatment or hospitalisation
5. Almost Certain	Almost certain to occur within the foreseeable future or within the project lifecycle		5. Critical	Loss of life, permanent disability or multiple serious injuries

Transnet Integrated Management System (TIMS) POLICY COMMITMENT STATEMENT

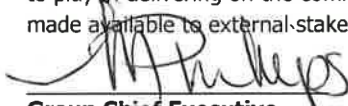
Transnet is a State-Owned Company that operates as an integrated freight transport company. It is structured around six core Operating Divisions, namely Transnet Freight Rail (TFR), Transnet Engineering (TE), Transnet National Ports Authority (TNPA), Transnet Port Terminals (TPT), Transnet Pipelines (TPL) and Transnet Property (TP) as well as the Transnet Academy, a specialised unit, a skills development provider in the transportation, freight, maritime, logistics and associated industries.

Transnet has developed and implemented a Transnet Integrated Management System (TIMS) programme, which sets out Systems, Policies, Procedures and Processes, providing a foundation and framework for conducting its core business. We are committed to **transporting freight, passengers and providing excellent customer service** to our customers along the key transport corridors. Our aim is to **competitively grow our business, enhance customer satisfaction** and ensure **sustainable business development** for the benefit of the South African economy.

TIMS is established, implemented, and maintained in accordance with recognised best practices that will enable us to:

- Incorporate and comply with applicable **legislation, regulations, codes, standards, protocols, best practices and customer requirements** to which we subscribe, in order to achieve our business objectives.
 - Set and achieve **objectives and targets** that address significant enterprise-wide **strategic, tactical, and operational risks, opportunities and mitigate the consequences** thereof.
 - Proactively implement **strategies** to prevent **environmental degradation, protect ecosystems and drive climate change mitigation and adaptation**.
 - Continually promote the prudent and **sustainable** use of **energy and natural resources**.
 - Provide **quality products and services** to meet our customers' requirements.
 - Create a **safe and secure environment** for our employees and stakeholders.
 - Carry out our business in a manner which **protects our assets and information** and **prevents injuries and ill health** to our employees and stakeholders.
 - Promote **safe operational principles** during operations to minimise occurrences.
 - Strategically **source our contractors** through fair, equitable and transparent processes.
 - Provide **socio-economic development** as a good corporate citizen.
 - Uphold **food safety practices** in our food preparation and handling environments.
 - Ensure **proficiency and preparedness** to deal with and **effectively recover** from any **emergency situations**.
 - **Develop, train and manage our employees** through inspirational leadership, providing the necessary **organisational information, knowledge and resources** to achieve the intention of this policy statement.
 - Build relationships based on care, openness, mutual trust and involvement while protecting **personal and confidential information** of internal and external stakeholders. **Communicate, engage, support** and promote TIMS risk awareness culture.
 - Allocate **responsibilities and accountabilities** to meet the requirements of the TIMS Policy Statement.
- Drive an **integrated assurance management programme** to ensure **continual improvement** of TIMS.

The TIMS Policy Commitment Statement shall be **reviewed every three (3) years** or **as circumstances dictate** to ensure that it remains **current and relevant**. Our progress on the achievement of the policy statement commitments shall be reported to the respective Governance Structures. Transnet Leadership, employees and stakeholders have a role to play in delivering on the commitment set out in this policy statement. The TIMS Policy Commitment Statement can be made available to external stakeholders on request.


Group Chief Executive

Date: 10/05/24

Next Review Date: 31 May 2027

CONTRACTOR ENVIRONMENTAL AND SUSTAINABILITY SPECIFICATION GUIDELINES

Document number	TRN-IMS-GRP-GDL-014.4
Version number	3.0
Classification	Unclassified
Effective date	01 October 2023
Review date	30 September 2028

SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
3.0	- Addition of reference documents (section 3) - Inclusion of additional definitions - Removal of DEA and replacing it with DFFE - Removal of Transnet EO and replacing with Transnet Environmental Resource (PER) - Inclusion of additional abbreviations - Inclusion of minimum environmental requirements for construction (section 5) - Inclusion of details of site inspections/audits (table 1) - Inclusion of Records Management	6-7 7-10 11 12 12-23 23 45	June 2023

Note: Only latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	Senior Specialist: Environmental Risk and Compliance		01/10/2023
Accepts document for adequacy and practicability. Comments:			
Approval Committee:	GM: Corporate Sustainability		01/10/2023
Approves document for use. Comments:			

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1. PURPOSE

This document describes the minimum requirements for environmental management to which Contractors must comply. This document must be read in conjunction with the Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP).

In this document, unless the context clearly indicates otherwise:

- Words importing any one gender shall include the other gender;
- The singular shall include the plural and vice versa; and
- Any reference in this document to legislation or subordinate legislation is to such legislation or subordinate legislation at the date of promulgation thereof and as amended and/or re-enacted from time to time.

2. APPLICABILITY

This standard applies to Contractors that work on site under the authority of Transnet SOC Ltd.

3. REFERENCE DOCUMENTS

Name	Applicable Section
Constitution of South Africa, Act 108 of 1996	Section 24
National Environmental Management Act, 107 of 1998	Section 2 National Environmental Management Principles
National Water Act, 36 of 1998	Section 164, Permissible Water Use
National Environmental Management: Waste Act, 58 of 2008	Part 1 15 (1) (i) and (2) Part 6 26 (10) (a) and (b) Schedule 3, Defined Wastes Category A: Hazardous Wastes Part 8: Contaminated Land
Environment Conservation Act, 73 of 1989	Section 20
Occupational Health and Safety Act, 85 of 1993	Asbestos Regulations, 2001

Name	Applicable Section
	Government Notice R155 in Government Gazette 23108 of February 2002 General Safety Regulations-Reg. 2 (2) PPE
GNR 326, 7 April 2017 as amended, EIA Regulations	Chapter 15, Appendix 4
Transnet Environmental Risk Management strategy and Framework	2015:42
Environmental Management Systems ISO 14001: 2015	Clause 5, 6, 7, 8, 9 and 10

4. DEFINITIONS AND ABBREVIATIONS

4.1 Definitions

Compliance	Meeting of all the organization's regulatory requirements
Conformance	The action or fact of conforming to this standard and other internal Transnet policies, procedures, guidelines and best practice.
Construction Environmental Management Standard Operating Procedure	Is a document which is used to define how environmental management will be practiced on any construction site under the management of Transnet to ensure that the environment is considered, negative impacts avoided or minimized, and positive impacts are enhanced.
Contractor	The Principal Contractor as engaged by Transnet for infrastructure construction operations, including all sub-contractors appointed by the main contractor of his own volition for the execution of parts of the construction operations; and any other contractor from time to time engaged by Transnet directly in connection with any part of the construction operations which is not a nominated sub-contractor to the Principal Contractor.

Contractor Environmental and Sustainability Specification Guidelines	A set of minimum environmental standards for all Transnet SOC Ltd-managed construction sites.
Environmental Aspect	Element of an organization's activities or products or services that interacts or can interact with the environment.
Environmental Impact	Change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
Environmental Risk	The product of the likelihood and severity of an unforeseen occurrence/incident/aspect and the impact it would have, if realised, on the environment.
Fauna	A group of animals specific to a certain region or time period.
Flora	A group of plants specific to a certain region or time period.
General waste	Waste that does not pose an immediate hazard or threat to health or to the environment; and includes:- (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste;
Indigenous vegetation	Plants that naturally occur in an area.
Liquid waste	Waste that appear in liquid form such as used oil, grease and/or contaminated water or waste water.

Method statement	A document that describes how the Contractor will apply environmental management measures associated with a particular activity during construction.
Monitoring	Determining the status of a system, a process or an activity
Natural Vegetation	All existing species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.
Responsible Authority	A Responsible Authority, according to the National Water Act 36 of 1998, relates to specific power or authority in respect of water uses that is assigned by the Minister to a Catchment Management Agency or to a Regional Office.
Rehabilitation	Refers to measures that must be put in place to restore the site to its pre-construction or enhanced state, subsequent to construction taking place.
Scope of Work	The construction work for which the Contractor has been appointed in terms of the Contract with Transnet.
Sensitive area	Any area that is denoted as sensitive by this Specification due to its particular attributes, which could include the presence of rare or endangered vegetation, the presence of heritage resources (e.g. archaeological artefact or graves), the presence of a unique natural feature, the presence of a watercourse or water body, the presence of sensitive social receptors etc. As a minimum, habitats that fall under this definition include: mountain catchments, Ramsar wetland sites, coastal shores, estuaries and endangered ecosystems.
Solid waste	All solid waste, including construction debris, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Spoil	Excavated material which is unsuitable for re-use as material in the Works or any other use; or is material which is surplus to the requirements of the Works.
Sub -Contractor	is a person or organisation who has a contract with the contractor to: Construct or install part of the contractor's work. Provide a service necessary to provide the works; or Supply plant and materials which the person or organisation has wholly or partly designed specifically for the works.
Temporary Storage	A once-off storage of waste for a period not exceeding 90 days.
Topsoil	Means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility appearance, structure, agricultural potential, fertility and composition of the soil.
Waste	Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes. Waste or a portion of waste ceases to be a waste only once the waste is, or has been re-used, recycled or recovered.
Wastewater	means water containing waste, or water that has been in contact with waste material
Watercourse	Refers to - a river or spring; a natural channel in which water flows regularly or intermittently;

a wetland, lake or dam into which, or from which, water flows;
and

any collection of water gazetted by the National Water Act, 36 of 1998 as a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Wetland

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

4.2 Abbreviations

Acronym	Meaning In Full
CEM SOP	Construction Environmental Management Standard Operating Procedure
CM	Construction Manager
CV	Curriculum Vitae
DEFF	Department of Environment, Forestry and Fisheries
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
CESSG	Contractor Environmental and Sustainability Specification Guidelines
EO	Environmental Officer

Acronym	Meaning In Full
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EGF	Environmental Governance Framework
NEMA	National Environmental Management Act 107 of 1998
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NWA	National Water Act 36 of 1998
PER	Project Environmental Resource
PES	Project Environmental Specification
PM	Project Manager
SAHRA	South African Heritage Resource Agency
SDS	Safety Data Sheet
SHEQ	Safety, Health, Environment and Quality
TRANSNET	Transnet SOC Ltd

5. MINIMUM ENVIRONMENTAL REQUIREMENTS FOR CONSTRUCTION

5.1 Tender Documents

Any construction-related tender issued to the market must include:

- Transnet Integrated Management System Policy Statement;
- The Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP);
- The Contractor Environmental & Sustainability Specification Guideline; and
- The Project Environmental Specification (PES).

Any construction-related tender must be recommended for issue by the Transnet Project Environmental Resource/s before it is released to the market.

5.2 Project Environmental Specification (PES)

Must incorporate all relevant recommendations of the Environmental Impact Assessment (EIA) and other environmental studies for the project and the relevant conditions of the EA and/or other applicable environmental permit(s) and licence(s), and the Transnet Operating Division's Environmental Management requirements (where applicable) into an environmental performance specification for implementation during the construction phase of the project.

The PES need not be a separate document; however it can be in a format of an appendix/addendum making reference to environmental authorisation(s), permit(s) or licence(s) applicable to the project. In cases where the project does not trigger any of the NEMA listed activities or any permit(s)/licence(s); the PES may be compiled to prescribe additional environmental management measures over and above the measures stipulated in the MERC.

5.3 Contractor's Environmental Policy

The Contractor's Environmental Policy must be signed and dated by Top Management.

The content of the Contractor's Environmental Policy must:

- be appropriate to the purpose and context of the Contractor's organization, including the nature, scale and environmental impacts of its activities, products and services;
- provide a framework for setting environmental objectives;
- include a commitment to the protection of the environment, including prevention of pollution and other specific commitment(s) relevant to the context of the Contractor's organization;
- include a commitment to fulfil compliance obligations; and
- include a commitment to continual improvement of the Contractor's environmental management system to enhance environmental performance

5.4 Contractor's Environmental Management Plan (EMP)

The Contractor's EMP must include:

- the name of the person who compiled the EMP;
- the expertise of the person who compiled the EMP, including a CV;
- a description of the Contractor's scope of work;
- a detailed description of the environmental aspects related to the Contractor's scope of work;
- a map at an appropriate scale which depicts all construction activities including associated structures, and infrastructure and environmental sensitivities affected by the construction footprint , as well as no go-areas and associated buffers;
 - The map must include the following:
 - an accurate indication of the project site position as well as the positions of the alternative sites, if any;
 - road names or numbers of all the major roads as well as the roads that provide access to the site(s)
 - a north arrow;
 - a legend;
 - the prevailing wind direction;
 - site sensitivities, including but not limited to vegetation, wetlands, watercourses, heritage sites, critical biodiversity area/s, World Heritage Site, etc. and it must be overlaid by the study area; and

- GPS co-ordinates (Indicate the position of the proposed activity with the latitude and longitude at the centre point for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should be to at least three decimal places. The projection that must be used in all cases is the WGS-84 spheroid in a national or local projection).
- a description of the impacts and risks that need to be avoided, managed and mitigated during the execution of the Contractor's scope of work including (as relevant);
 - planning and design;
 - pre-construction activities;
 - construction activities;
 - rehabilitation; and
 - operation of Transnet assets.
- a description and identification of impact management outcomes required for the identified aspects;
- a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated above will be achieved, and must, where applicable, include actions to:
 - avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - comply with any prescribed environmental management standards or practices; and
 - comply with any applicable local, provincial and national legislation.
- the method of monitoring the implementation of the impact management actions contemplated above;
- the frequency of monitoring the implementation of the impact management actions contemplated above;
- an indication of the persons who will be responsible for the implementation of the impact management actions;
- the timeframe within which the impact management actions contemplated above must be implemented;
- the mechanism for monitoring compliance with the impact management actions contemplated above;

- a program for reporting on compliance, taking into account the requirements of this document;
- an environmental awareness plan describing the manner in which:
 - the Contractor intends to inform his employees of any environmental risk which may result from his scope of work; and
 - risks must be dealt with in order to avoid pollution or the degradation of the environment.
- any specific information that may be required by Transnet.

5.5 Contractor's Environmental Officer (EO)

The Contractor's EO should have relevant environmental qualifications and experience required for the project. The level of qualifications and experience must be in line with the complexity of the Contractor's scope of work coupled with the sensitivity of the site. The level of competency will be determined by Transnet during tender.

5.6 Management of Sub-Contractors

The Contractor must ensure that all his sub-contractors comply with this document in so far as it relates to their specific scope of work or services.

5.7 Pre-Site Access Environmental Governance

The Contractor must appoint the EO recommended in his tender proposal. Should the EO no longer be available, the Contractor must submit a CV of an alternative EO with similar or better qualifications and experience for approval by the Transnet PM and PER. The same principle will apply if the Contractor's EO is replaced for whatever reason at any stage. No construction may take place without a duly appointed Contractor's EO.

The Contractor must provide his EO with all environmental documents provided by Transnet during tender and submitted as a part of the Contractor's proposal.

The Contractor must obtain the contact details of the responsible Transnet PER and Transnet PER and provide these details to his EO.

The Contractor's EO must develop an appropriate environmental file for approval by the Transnet PER, including but not necessarily limited to (the environmental file must always be available and up to date on the construction site):

- Documents from the tender as described above.
- His CV.
- An organogram indicating reporting lines of all Contractor's staff (with names included).
- Contact Information for: the overall responsible person acting on behalf of the Contractor to execute the construction works; Contractor's Construction Manager (CM); Contractor's EO; and all relevant emergency personnel.
- A list of the Contractor's plant and equipment indicating a description of the plant/equipment, its fuel capacity, any hazardous components (oils, greases etc.), individual service/maintenance cycles and noise levels.
- A list of hazardous substances to be used during construction indicating: official substance name from Material Safety Data Sheets (MSDS)/ Safety Data Sheet (SDS); quantity on site; storage method; transport method to site; and period to be used on site. All substances listed must have MSDS/ SDS on site in the environmental file.

The MSDS/ SDS should contain the following minimum requirements:

- Section 1: Product and company name
- Section 2: Hazard identification
- Section 3: Composition/information on ingredients
- Section 4: First aid measures
- Section 5: Fire fighting measures
- Section 6: Accidental release measure
- Section 7: Handling storage
- Section 8: Exposure controls/personal protection
- Section 9: Physical and chemical properties
- Section 10: Stability and reactivity
- Section 11: Toxicological Information
- Section 12: Ecological Information
- Section 13: Disposal Consideration

- Section 14: Transportation
- Section 15: Regulatory Information
- Section 16: Other Information
- Photographic pre-construction report that details the site before any activities commence.
- Site Layout Plan indicating but not necessarily limited to,: access roads, site offices, material laydown areas, stockpile areas and parking areas, waste and effluent storage and handling facilities, entire construction footprint, no-go-areas, sewage and sanitary facilities. The plan must be appropriately drawn on a computer and must be clearly visible and properly scaled.
- A site establishment method statement (minimum requirements for method statements are described below in this document).
- Environmental Induction Material to be used to educate site staff and visitors (minimum requirements for environmental induction are described below in this document).
- An activity-based environmental risk assessment.

The Contractor's EO must submit the environmental file for acceptance to the Transnet PER.

The Contractor must obtain a Site Access Certificate from the Transnet PM before accessing the site.

5.8 Safety Data Sheets

Each hazardous substance used on site must have a valid SDS. The SDS must comply with the requirements of the Occupational Health and Safety Act, 85 of 1993.

5.9 Environmental Induction

The Contractor will ensure that all management, foremen and the general workforce, as well as all sub-contractors, suppliers and visitors to site have attended the Transnet Environmental Induction Programme prior to commencing any work on site. Where new personnel commence work on site during the construction period, the Contractor will ensure that these personnel also undergo the Transnet Environmental Induction Programme and are made aware of the environmental specifications on site.

The Contractor must ensure that all of his personnel understand the requirements of the CEM SOP; MERC; EA, EMPr, relevant permits and licences and PES as relevant to their scope of work.

5.10 Environmental Method Statements

- Environmental Method Statements as identified by the Transnet PER based on the Contractor's activity-based environmental risk assessment will be written submissions by the Contractor to the Transnet CM and PER describing:
- The proposed activity, setting out the plant, equipment, materials, labour and method the Contractor proposes using to carry out an activity;
- The environmental management of site conditions – waste management, housekeeping, site establishment etc;
- Transportation of the equipment to and from site;
- How the equipment/ material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Description of potential positive and negative environmental impacts and how they will be managed;
- Conformance/ non-conformance with this document and any other statutory and best practice standards;
- Monitoring and reporting requirements;
- Records Management; and
- Any other information deemed necessary by the Transnet CM and Transnet PER as well as ECO where applicable.

The Environmental Method Statements will enable the potential positive and negative environmental impacts associated with the proposed construction activity to be identified and mitigation measures put in place. All method statements must be signed by the Contractor, Transnet CM and PER, with the addition of the ECO on authorized projects, thereby indicating that the works will be carried out according to the methodology described therein.

Activities may only commence once the Environmental Method Statements have been approved by the Transnet CM, Transnet PER and ECO (where relevant). In some instances, local authorities may also need to approve the method statements. This will be highlighted in the Project Environmental Specification, where applicable.

All changes to the original Environmental Method Statements must be approved by the Transnet PER and Transnet CM prior to implementation.

To enable timely approvals, the environmental method statements will be submitted to the Transnet CM and Transnet PER for review two (2) weeks prior to the intended date of commencement of the activity, or as directed by the Transnet Project Manager/CM.

Emergency construction activity Environmental Method Statements may also be required. The activities requiring Environmental Method Statements cannot commence if they have not been approved by the CM and PER or ECO.

NOTE: No advice, approval of method statements or any other form of communication from Transnet will be construed as an acceptance by Transnet of any obligation that indemnifies the Contractor from achieving any required level of performance. Further, there is no acceptance of liability by Transnet which may result from the Contractor failing to comply with the specifications, i.e. the Contractor remains responsible for achieving the required performance levels.

5.11 Environmental Occurrences (Incidents)

The Transnet PER shall provide the Contractor with the procedure to follow in managing environmental occurrences during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

In the event of an environmental occurrence, the Contractor must, as soon as is reasonably practicable:

- classify an environmental occurrence in line with the Transnet Environmental Management Occurrence process flow;

- take all reasonable measures to contain and minimise the effects of the occurrence, including its effects on the environment and any risks posed by the occurrence to the health, safety and property of persons;
- undertake cleanup procedures;
- remedy the effects of the occurrence; and
- assess the immediate and long-term effects of the occurrence on the environment and public health

5.12 Environmental Non-Conformances (Defects)

Environmental Non-Conformances shall be handled as per the terms and conditions of the Contract.

The Transnet PER shall provide the Contractor with the procedure to follow in managing environmental non-conformances during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

The Transnet Project Manager shall ensure that all Non-conformances are appropriately closed out within the timeframe specified in the Non-Conformance Report.

Any environmental non-conformance will be dealt with similarly to a Defect as defined in the Contract. A defect is due to non-compliance with the Works Information and it is the responsibility of the Contractor to correct the defect in order to ensure that the work takes place in accordance with the Works Information. Similarly, non-conformance/non-compliance with any other permit or licence will be regarded as a non-conformance with the Works Information. The Contractor is responsible for rectifying any defect (non-conformance) as defined above promptly.

The Contractor's EO shall be responsible to search for and identify non-conformances with the environmental specifications at inspection intervals agreed to with the Transnet PER. The Transnet PER shall also undertake such inspections on a monthly basis. If such monthly inspections indicate that any part of the Contractor's work is non-conformant with the environmental requirements, the Transnet PER shall advise the Transnet PM to issue a Defects Notification to the Contractor accordingly. The Contractor shall correct the non-

conformance (defect) within the timeframes specified in the report and notification and submit proof of such correction to the Transnet PER.

The Transnet PER shall not recommend that a Site Closure Certificate be issued to the Contractor if any non-conformances have not been properly closed out. In such an event, the Transnet Project Manager may also make use of any reasonable contractual means to rectify the non-conformance(s) as allowed by the Contract (retention moneys etc.).

5.13 Community Grievances (Public Complaints)

The Transnet PER shall provide the Contractor with the procedure to follow in managing community grievances during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

5.14 Environmental Inspections and Audits

Environmental inspections and audits may be conducted using five basic techniques:

- Interviews with Contractor's staff including Sub-contractors and suppliers;
- Document review;
- Observations;
- Monitoring; and
- Measurement and verification.

Table 1 sets out the areas and aspects of the construction site that will be inspected or audited, the frequency of such inspections/audits, the inspector/auditor and the inspected party/auditee. It should be noted that the list is not exhaustive and that each site will have specific issues that will need to be inspected/audited.

Table 1: Details on Environmental Inspections/Audits (where Transnet is the Inspected Party/Auditee, respective Contractors must give full cooperation).

Place	Inspector/Auditor	Inspected Party/ Auditee	Inspection/audit frequency
Construction Site	Contractor's Environmental Officer	Contractor	Daily/Weekly Inspection
Project (including all construction sites).	Transnet Project Environmental Resource/Project Environmental Manager	Contractor	Monthly Inspection
Project (including all construction sites)	Transnet Environmental Specialist: Assurance	Transnet Project Environmental Resource	As stipulated on the annual audit plan
Project (as defined in Environmental Authorisation)	Environmental Control Officer	Transnet (represented by Transnet Environmental Resource)	As stipulated in the Environmental Authorisation
Project (as defined in Water Use Authorisation)	Independent Auditor	Transnet (represented by Transnet Environmental Resource)	As stipulated in the Water Use Authorisation

The Contractor's EO will be required to conduct inspections of all work areas for which the Contractor is responsible, at intervals agreed to with the Transnet PER. Monitoring shall

be conducted as per the Contractor's approved EMP and all required records shall be maintained by the Contractor.

The Transnet PER will be required to conduct inspections of all work areas for which the Contractor is responsible on a monthly basis or at intervals agreed to with the Transnet Project Environmental Manager. Monitoring shall be conducted as per the Project Environmental Specification. The Inspection Checklist to be used shall be approved by the Transnet PER prior to each inspection.

5.15 Contractor's Environmental Performance

The Transnet PER will explain how the Contractor's performance will be scored during pre-site access governance to the Contractor's EO. The standard/minimum requirement for all environmental inspections will be 90%.

5.16 Site Planning and Establishment

The Contractor shall establish his construction camps, offices, workshops, eating areas and any other facilities on the site in a manner that does not adversely affect the environment. These facilities must not be sited in close proximity to sensitive areas; the buffer to be determined by the ecological requirements of the fauna/flora found on-site.

The site offices should not be sited in close proximity to steep areas. It is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles be located as far away as possible from any watercourse.

5.16.1 Site Layout Plan

The Site Layout Plan must as a minimum include but not limited to:

- Detailed layout of the construction works areas including access roads, site offices, material laydown areas, temporary stockpile areas and parking areas;
- Detailed locality and layout of all waste storage and handling facilities for litter, kitchen refuse and workshop-derived effluent;
- Proposed areas for the stockpiling of topsoil and excavated spoil material;
- Demarcation of the construction footprint including areas not to be disturbed by the development;

- Location of sewage and sanitary facilities at the site offices and staff accommodation at all localities where there will be a concentration of labour.

Any changes to the location of the facilities and site activities as per the approved site layout plan shall be re-submitted to the Transnet CM and Transnet PER for approval prior to implementation.

The Contractor may be required to submit a separate layout plan dealing only with his site camp. If so this will be specified in the PES.

5.16.2 Identification and Establishment of Suitable Access Routes/Roads

Existing access routes to the construction/works areas must be used as far as possible. The building of access roads must be restricted to prevent unnecessary disturbance of the surrounding environment. Access tracks must be maintained in a good condition at all times during construction to minimize erosion and dust generation.

5.16.3 Demarcation of Site Limits

Prior to the commencement of construction, the site must be clearly demarcated by means of visible barriers. Vegetation within the demarcated zone may be cleared only upon obtaining approval from the Transnet PER. No activities are allowed outside of the approved footprint on the Site Layout Plan.

5.16.4 Eating Areas

The Contractor is responsible for providing adequate eating facilities within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags/bins must be provided at all established eating areas and when full it should be disposed of appropriately.

5.16.5 Liquid Waste Management

Liquid waste water from site shall be stored on-site in a properly designed and constructed system, situated so as not to adversely affect water courses. Only domestic type wastewater, i.e. toilet, shower, basin, kitchen water shall be allowed to enter the designated system.

5.17 Sewage and Sanitation

The Contractor is responsible for providing adequate sanitary facilities including toilets, toilet paper, wash basins etc. to all workers on site and for enforcing the proper use of these facilities.

Toilet facilities shall be serviced regularly and the waste material generated from these facilities shall be disposed of at a registered waste water treatment works/macerator and relevant permits for transportation of waste and proof of servicing and disposal shall be maintained.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on site, and away from sensitive areas. Use of open areas (i.e. the veld) is not allowed. For projects of high mobility a mobile toilet facility shall be made available by the Contractor.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. Toilets must not be placed in areas susceptible to flooding and high winds. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such facilities in a clean, orderly and hygienic condition to the satisfaction of the Transnet CM.

5.18 Waste Management

Waste shall be grouped into “**general**” or “**hazardous**”, depending on its characteristics. The classification shall determine handling methods and the ultimate disposal of material.

General waste which is likely to be generated on site during construction include but not limited to the following:

- Trash (waste paper, plastics, cardboard, etc.) and food waste from offices, warehouses and construction personnel;
- Uncontaminated construction debris such as used wood and scrap metal; and
- Uncontaminated soil and non-hazardous rubble from excavation or demolition.

The Contractor shall classify all waste expected to be generated during the construction period. Examples of typical construction waste which could be expected on the site and how they should be classified are indicated in the following table:

TABLE 2: EXAMPLE OF CONSTRUCTION WASTE CLASSIFICATION

Waste	Classification	
	Hazardous	General
Aerosol containers	X	
Batteries, light bulbs, circuit boards, etc.	X	X
Clean soil		X
Construction debris contaminated by oil or organic compounds	X	
Domestic waste		X
Empty drums (depends on prior use)	X	X
Empty paint and coating containers		X
Explosive waste	X	
PCB waste	X	
Rubble (not contaminated by oil or organic compounds)		X
Waste Cable		X
Waste plastic		X
Waste paint and/or solvent	X	
Waste oil	X	
Waste concrete		X
Waste cement powder	x	
Waste empty cement bags (must be thoroughly decanted)		x
Waste containing fibrous asbestos	X	
Waste timber		X
Sewerage sludge	X	
Scrap metal		X

Waste	Classification	
	Hazardous	General
Chemically-derived sanitary waste	X	

Waste will be managed in accordance with the Waste Management Hierarchy depicted in Figure 1 below:

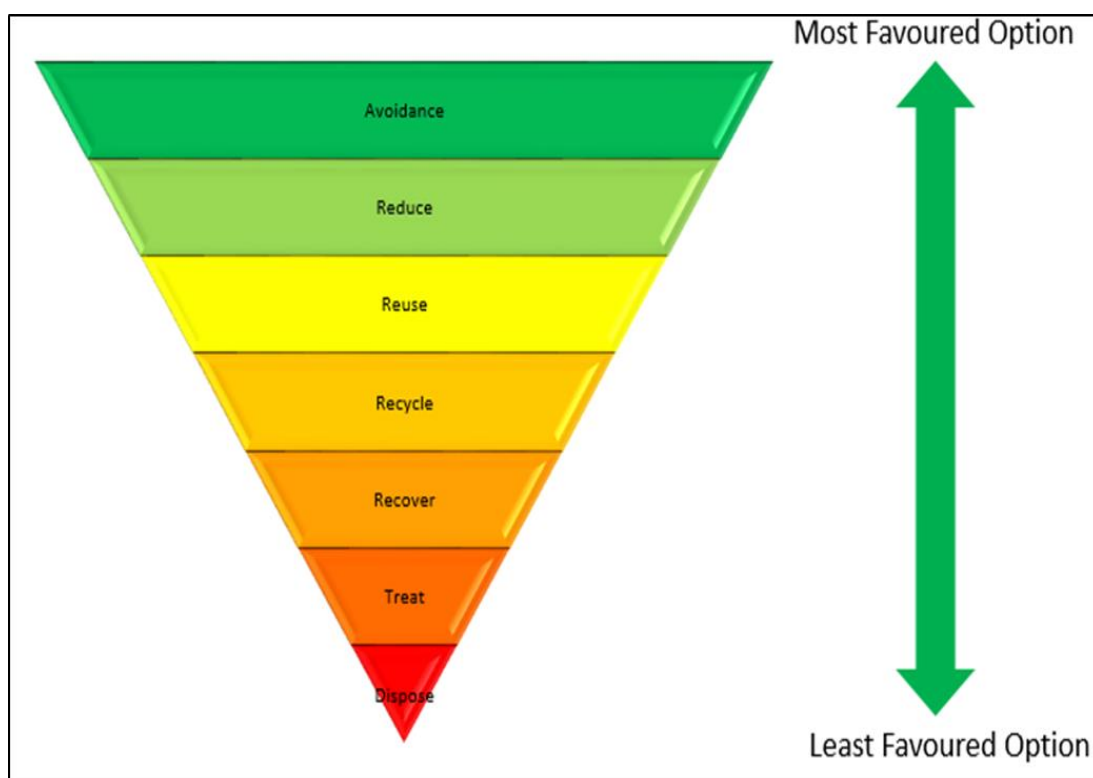


FIGURE 1: THE WASTE MANAGEMENT HIERARCHY

(Transnet Environmental Risk Management strategy and Framework, 2015:42)

- 1. Avoidance/Prevention:** using goods in a manner that minimises their waste components
- 2. Reduction/Minimisation:** reduction of the quantity and toxicity of waste generated during construction
- 3. Re-use:** removing an article from a waste stream for use in a similar or different purpose without changing its form or properties

4. Recycling:	separating articles from a waste stream and processing them as products or raw materials
5. Recovery:	reclaiming particular components or materials, or using the waste as a fuel
6. Treatment:	processing of waste by changing its form or properties in order to reduce toxicity and quantity
7. Disposal:	burial, deposit, discharge, abandoning or release of waste

The Contractor is responsible for the removal of all waste generated from site. The Contractor shall ensure that all waste is removed to appropriate licensed waste management facilities. (For the identification of an appropriate facility, the following source may be utilized: <http://sawic.environment.gov.za/>).

The Contractor shall manage **GENERAL WASTE** that is anticipated to be generated by operations as follows:

- Notify waste hauler when container is full so that it can be removed and replaced with an empty container/skip;
- No littering is allowed on site. In the event where staff mobility is high, refuse bags will be made available by the Contractor;
- Provide documented evidence of proper disposal of waste (Waste Disposal Certificate)

The Contractor shall recycle **GENERAL WASTE** (as far as practically possible) that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for the following (whichever relevant) and locate them at secure designated locations on site:
 - Office Waste;
 - Aluminium;
 - Steel;
 - Glass;
 - Ferrous Metals;

- Non Ferrous Metals; and
- Waste Timber
- Establish recycled material collection schedule;
- Arrange for full bins to be hauled away;
- Spent batteries, circuit boards, and bulbs, while non-hazardous, require separate storage, special collection and handling; and
- No burning, burying or dumping of waste of any kind will be permitted.

The Contractor shall manage **HAZARDOUS WASTE** anticipated to be generated by his operations as follows:

- Obtain and provide an acceptable container with correct and visible classification label;
- Place hazardous waste material in allocated container;
- Inspect the container on a regular basis as per the Contractor's EMP;
- Track the accumulation time for the waste, haul the full container to the registered hazardous disposal site;
- Notify the waste hauler when container is full so that it can be removed and replaced with an empty container/skip; and
- Provide documented evidence of proper waste disposal of the waste (Waste Disposal Certificate).

The Contractor shall maintain the following waste records for submission to the Transnet PER on request:

- Date of waste management activity;
- Activity Type (reuse, recycle, recover, treat, dispose);
- Description (e.g. contaminated soil, medical waste, tyres, plastic, domestic waste etc.)
- Classification (General/Hazardous);
- Estimated Quantity in kilograms
- Disposal Site Name and Reference Number (where relevant);
- Method of Transport; and
- Signed Collection or Disposal Records

5.19 Workshops, equipment maintenance and storage

All vehicles and equipment must be kept in good working order to maximise efficiency and minimise pollution. Maintenance, including washing and refueling of plant on site must be done at designated locations approved on the Site Layout Plan. The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities.

All machinery servicing areas must be bunded. Stationary plant that leak harmful substances shall not be permitted on site. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided and the wastewater should be disposed of appropriately in accordance with its waste classification.

5.20 Vehicle and Equipment Refueling

5.20.1 Stationary/Designated Refuelling

No vehicles or machines shall be serviced or refueled on site except at designated servicing or refueling locations included on the approved Site Layout Plan.

The Contractor shall provide details of his refueling activities in his EMP or Refueling Method Statement. Facility design shall comply with the regulations of the National Water Act, (Act 36 of 1998), the Hazardous Substances Act, (Act 15 of 1973), the Environmental Conservation Act, (Act 73 of 1989), National Environmental Management Act, (Act 107 of 1998), and the Occupational Health and Safety Act, (Act 85 of 1993), mainly the Construction - and Hazardous Chemical Substances Regulations.

5.20.2 Mobile Refuelling

In certain circumstances, the refueling of vehicles or equipment in a designated area is not a viable/practicable option and refueling has to be done from a tank, truck, bowser or container moved around on site. In such circumstances, the Contractor may request approval from the Transnet CM to conduct mobile refueling subject to the following control measures:

- Secondary containment equipment shall be in place. This equipment shall be sized to contain the most likely volume of fuel that could be spilt during transfer.

- Absorbent pads or drip trays are to be placed around the fuel inlet prior to dispensing.
- Mobile refueling units are to be operated by a designated competent person.
- The transfer of fuel must be stopped prior to overflowing. Fuel tanks or refueling equipment on vehicles may only be filled to 90% carrying capacity.
- Mobile fuelling equipment must be stored in areas where they are not susceptible to collisions.
- Mobile refueling operations shall not take place within 30 meters of any watercourses or 7.5 meter from other structures, property lines, public ways or combustible storage.

All mobile refueling tanks are to be properly labelled and fire extinguishers with valid service dates shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.

5.21 Spill Response

The Contractor shall have adequate spill response materials/equipment on site which must be aligned with the volumes of hazardous substances used on site and the risk of pollution to sensitive environmental features.

The Contractor shall have an approved Spill Response Plan, either in his EMP or in the form of a method statement approved by the Transnet CM and Transnet PER.

The Contractor shall instruct construction personnel on the following spill prevention and containment responsibilities:

- All plants to be inspected daily to ensure that they are in good condition;
- Immediately repair all leaks of hydrocarbons or chemicals;
- Take all reasonable measures to prevent spills or leaks;
- Do not allow sumps receiving oil or oily water to overflow;
- Prevent storm water runoff from contamination by leaking or spilled drums of oil or chemicals; and
- Do not discharge oil or contaminants into storm water or sewer systems.

If a spill occurs on land, the Contractor must:

- Immediately stop or reduce the spill;

- Contain the spill;
- Recover the spilled product;
- Remediate the site;
- Implement actions necessary to prevent the spill from contaminating groundwater or off-site surface water; and
- Manage the contaminated material in accordance with Waste Management requirements in this document.

Any spill to water has the potential to disperse quickly, therefore, the spill must be contained immediately using appropriate containment equipment.

If a spill to water occurs, the Contractor must:

- Take immediate action to stop or reduce the spill and contain it;
- Notify the appropriate on-site authorities;
- Implement actions necessary to prevent the spread of the contamination by deploying appropriate absorbent material;
- Recover the spilled product; and
- Manage the contaminated material in accordance with Waste Management requirements in this document. Water samples to be taken downstream from where the spill took place to trace the extent of pollution.

All spills must be recorded as occurrences and managed in accordance with the requirements for Occurrences in this document.

5.22 Spray Painting and Sandblasting

Spray painting and sandblasting must be kept to a minimum. All painting must, as far as practicable, be done before equipment and material is brought on site. Touch-up painting is to be done by hand painting or as per the approved EMP or Method Statement.

The relevant Contractor will inform his EO when and where spray painting or sandblasting will be carried out prior to commencement of work. The Contractor's EO will monitor these activities to ensure that adequate measures are taken to prevent contamination.

Sand may only be acquired from approved commercial sources and in instances where sand is collected from the natural surrounds, such collection must be approved by the Transnet PER.

If the area is in confined or high (elevated) areas, a protection plan must be issued for approval by the Transnet PER.

5.23 Dust Management

The usage of water for dust management will be minimized as far as practically possible. Discretion must be applied in this regard especially relating to drought conditions. Only water from approved sources may be used. Dust control measures must be approved by the Transnet PER prior to commencement of the Works.

The following minimum dust management practices must be implemented on site:

- Vehicles must be operated within speed limits, where no speed limit has been specified, the limit shall be 40km/h;
- Haulage distances must be minimized as far as reasonable practicable;
- Where water suppression is insufficient or impractical, environmentally friendly soil stabilizers must be used;
- Stockpiles and open areas that may cause dust must be stabilized and vegetated where required;
- Dust suppression measures must be implemented on inactive construction areas. (An inactive construction site is one on which construction will not occur for a month or more);
- Disturbance of natural vegetation must be minimized to reduce potential erosion, runoff, and air-borne dust;
- Material in transit must be loaded and contained within the load bin of the vehicle in such a way as to prevent any spillage or creation of dust clouds. If necessary, the load bin of the vehicle shall be covered with a tarpaulin;

5.24 Storm Water and Dewatering Management

Apart from runoff from overburden emplacements and stock piles, storm water can also be contaminated from batch plants, workshops, vehicle wash-down pads, etc., and contaminants during construction may include hydrocarbons from fuels and lubricants, sewerage from employee ablutions and excess fertilizer from rehabilitated areas, etc.

Discharges to controlled waters such as the sea, rivers, and groundwater or to sewerage systems are controlled under South African Water Legislation. The following specific measures are required:

- Temporary drainage must be established and maintained on site during the construction period until permanent drainage is in place. Secondary drainage that prevents erosion must be provided, where necessary.
- Contractors must employ good housekeeping in their areas to prevent contamination of drainage water.
- Stagnant water shall be cleared at a frequency approved by the Transnet PER.
- Any surface water flows off-site must be approved by the Transnet PER. Where necessary, silt traps shall be constructed to ensure retention of silt on site and cut-off ditches shall be constructed to ensure no runoff from the site except at points where silt traps are provided. The Contractor shall be responsible for checking and maintaining all silt traps for the duration of the project.
- The removal from groundwater is defined as a water-use under the National Water Act 36 of 1998. Therefore, it must be ensured that the project has been authorised by the Responsible Authority to remove and discharge groundwater prior to dewatering taking place. If applicable, the Contractor shall be responsible for collection, management, and containment within the site boundaries of all dewatering from all general site preparation activities.
- On-site drainage shall be accomplished in accordance with a plan approved by a suitably qualified civil engineer.

5.25 Erosion Control

Erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include, but not limited to the following:

- Activities must be scheduled to minimise the extent of disturbance of an area at any one time;
- Re-vegetation must be implemented as early as feasible;
- Construction traffic must be properly managed and controlled;
- Areas must be graded to the extent feasible at drainage ditches;
- Loose soil will be compacted as soon as possible after excavation, grading, or filling;
- Silt fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary berms or swales, small sedimentation basins must be used;
- The transport of sediment must be minimised;
- An erosion and sedimentation control plan must be developed, approved by the Transnet PER and communicated to staff; and
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls.

5.26 Noise Management

- The following specific measures are required:
- Keep all equipment in good working order;
- Operate equipment within its specification and capacity and don't overload machines;
- Apply regular maintenance, particularly with regards to lubrication;
- Operate equipment with appropriate noise abatement accessories, such as sound hoods;
- Relevant stakeholders shall be notified of any excessive noise-generating activities that could affect them;
- Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS 10103:2004 or the latest at the time, so that it will not produce excessive or undesirable noise when released;

- All the Contractor's equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice, SANS 10103:2004 or the latest at the time, for construction plant noise generation
- Contractor's vehicles shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road.
- If on-site noise control is not effective, protect the victims of noise by ensuring that all noise-related occupational health provisions are met. (Occupational Health and Safety Act, (Act 85 of 1993).

5.27 Protection of Heritage Resources

5.27.1 Archaeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the Transnet CM and Transnet PER of such a discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority is to be contacted and will appoint an Archaeologist to investigate the find. Work may only resume once clearance is given in writing by the Archaeologist.

5.27.2 Graves

If a grave is uncovered on site, or discovered before the commencement of work, all work in the immediate vicinity of the grave shall be stopped and the Transnet CM and PER informed of the discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with the SAHRA, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred.

5.28 Fire Prevention

Fires shall only be allowed in facilities or equipment specially constructed for this purpose.

A firebreak shall be cleared and maintained around the perimeter of the camp and office sites where and when necessary. In cases where construction is taking place in a Critical Biodiversity Area as listed under NEM:BA; it must be ensured that the requirement of a firebreak is screened against the NEMA Listing Notice 3 to confirm legislative requirements.

All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented.

5.29 Water Protection and Management

No water shall be abstracted from any water course (stream, river, or dam) without the expressed permission of the Transnet CM and Transnet PER. Such permission shall only be granted once it can be shown that the water is safe for use, that there is sufficient water in the resource to meet the demand, and once permission has been obtained from the Department of Water and Sanitation in accordance with the requirements of the National Water Act (Act 36 of 1998).

Water for human consumption shall be available at the site offices and at other convenient locations on site. The generally acceptable standard is that a supply of drinking water shall be available within 200m of any point on the construction site.

Method Statement(s) must be prepared by the Contractor for the various water uses. The Contractor shall keep a record of the quantities of water used on-site during construction (including use by sub-contractors), irrespective of the purpose of use.

5.30 Protection of Fauna and the collection of firewood

On no account shall any hunting or fishing activity of any kind be allowed. This includes the setting of traps, or the killing of any animal caught in construction works.

On no account shall any animal, reptile or bird of any sort be killed. This specifically includes snakes or other creatures considered potentially dangerous discovered on site. If such an animal is discovered on site, an appropriately skilled person should be summoned to remove the creature from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

The Contractor shall provide adequate facilities for all his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The Contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

5.31 Environmental Awareness Training

An Environmental Awareness Program is considered a necessary part of the Construction Environmental Management Plan for the Project. Training of the appropriate construction personnel will help ensure that all environmental regulations and requirements are followed which must be defined in the relevant Method Statement to be prepared by the Contractor.

Objectives of environmental awareness training are:

- Environmental Management – protecting the environment from the effects of construction by making personnel aware of sensitive environmental resources.
- Regulatory compliance – complying with requirements contained in project – specific permit conditions, also complying with requirements in regional and local regulations.
- Problem recognition and communication – training personnel to recognise potential environmental problems, i.e. spills, and communicate the problem to the Contractor's EO for a solution.
- Liability control - non-compliance with regulatory requirements can lead to personal and corporate liability.

All individuals on the Project construction site will need to have a minimum awareness of environmental requirements and responsibilities. However, not all need to have the same degree of awareness. The required degree of knowledge is greatest for personnel in the Safety, Health, and Environmental Sections and the least for the manual personnel.

The Contractor shall present environmental awareness programmes on a weekly/bi-monthly basis (depending on project requirements) and keep record of all the environmental related training of the personnel.

5.32 Handling and Batching of Concrete and Cement

Concrete batching shall only be conducted in demarcated areas which have been approved by the Transnet CM and Transnet PER.

Such areas shall be fitted with a containment facility for the collection of cement-laden water. This facility shall be bunded and have an impermeable surface protection so as to prevent soil and groundwater contamination. Drainage of the collection facility will be separated from any infrastructure that contains clean surface runoff.

The batching facility will not be placed in areas prone to floods or the generation of stagnant water. Access to the facility will be controlled so as to minimise potential environmental impacts. Hand mixing of cement and concrete shall be done on mortarboards and/or within the bunded area with impermeable surface or concrete slab. Bulk and bagged cement and concrete additives will be stored in an appropriate facility at least 10m away from any watercourses, gullies and drains.

Waste water collected in the containment facility shall be left to evaporate. The Contractor shall monitor water levels to prevent overflows from the facility. It is acknowledged that all waste water will evaporate; it must be ensured that the remaining water can be pumped into sealed drums for temporary storage and must be disposed of as liquid hazardous waste at an authorised hazardous waste management facility.

All concrete washing equipment, such as shovels, mixer drums, concrete chutes, etc. shall be done within the approved washout facility. Water used for washing shall be restricted as far as practically possible.

Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated and approved by the Transnet CM and PER for this purpose.

The Contractor shall periodically clean out hardened concrete from the wash-out facility or concrete mixer, which can either be reused or disposed of as per accepted waste management procedures.

Empty cement and bags, if temporarily stored on site, must be collected and stored in weatherproof containers. Used cement bags may not be used for any other purpose and

must be disposed of on a regular basis in accordance with the Contractor's solid waste management system.

Sand and aggregates containing cement will be kept damp to prevent the generation of dust.

Concrete and cement or any solid waste materials containing concrete and cement will be disposed of at a relevant registered disposal facility and SDCs kept on the file. Where disposal facilities for general waste are utilised, written consent from the relevant municipality must be obtained by the Contractor and filed in the Green file.

5.33 Stockpiling, Soil Management and Protection of Flora

The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated. Sensitive areas shall be cordoned off and avoided in this regard.

Stockpiling may only take place in designated areas indicated on the approved site layout plan. Any area to be used for stockpiling or material laydown shall be stripped of all topsoil.

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works. Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible when and where necessary. The detail of vegetation clearing shall be subject to the Transnet CM's approval and shall occur in consultation with the Transnet PER.

Stockpiles must be positioned in areas sheltered from the wind and rain to prevent erosion and dispersion of loose materials. Stockpiled soil shall be protected by adequate erosion-control measures. Soil stockpiles shall be located away from drainage lines, watercourses and areas of temporary inundation. Stockpiles containing topsoil shall not exceed 2m in height unless otherwise permitted by Transnet.

Topsoil shall be stockpiled separately from other materials and prevented from movement. Excavated subsoil, where not contaminated, must be used for backfilling, if possible, and topsoil for landscaping and rehabilitation of disturbed areas. Where topsoil

has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil shall be provided by the Contractor.

No vegetation located outside the construction site shall be destroyed or damaged. As far as is reasonably practicable, existing roads must be used for access to the site. Before site clearance takes place, vegetation surveys must be conducted and protected species identified.

No protected plant species shall be removed without written consent from the relevant authorities. The development of new embankments or fill areas must be undertaken in consultation with the Transnet PER.

No dumping of solid waste or refuse shall be allowed within or adjacent to areas of natural vegetation.

The Contractor shall identify and eradicate all declared alien and invasive plant species occurring on site.

5.34 Traffic Management

Vehicles usage is permitted only on access roads. Vehicles should only be parked within designated parking areas as demarcated on the site layout plan.

Turning of vehicles should only take place within a clearly demarcated "turn area" located within the approved construction footprint.

The Contractor must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any one time and that side-tracks are not created on the site.

5.35 Transportation of Materials

The Contractor is responsible for ensuring that all suppliers and delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of the SOP CM and this Specification. Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover, where ADTs are not utilised, to prevent spillage from the vehicles. The Contractor will be held responsible for any clean-up resulting from the failure to properly secure transported materials.

5.36 Borrow Pits and Quarries

The Contractor shall ensure that suppliers of rock and sand raw materials are in possession of the required permit/license and keep record of the quantity of material supplied.

The Contractor will not make direct use of any borrow pits and quarries unless the borrow pit has a valid permit, he has obtained written approval from the Transnet CM and Method Statement has been submitted and approved. The Method Statement will provide the detailed description of the location of the borrow pits and/or quarries and the procedures that will be followed to adhere to any pertinent national or local legislation (e.g. mineral extraction, rehabilitation, safety and noise levels).

5.37 Social and Labour Issues

The criteria for and selection of labourers, sub-contractors and suppliers for the project shall demonstrate preference for the local community and shall be aligned with the criteria set by Transnet SOC Ltd in appointing the Contractor. The Contractor shall keep records of the identity of all staff.

Under no circumstances shall the Contractors engage in formal discussions with landowners without prior consent by the Transnet CM.

No activity on private property shall be allowed without written consent by the relevant landowner and Transnet CM/Transnet PER.

Any damage to private property caused by the Contractor during the construction period, shall be repaired to the satisfaction of the Transnet CM, the Transnet PER and the landowner.

The Contractor shall keep record of any complaint raised during the construction period relating to the Contractor's activities.

No job-seekers shall be allowed on site and signs reflecting such shall be displayed on the notice boards.

5.38 Energy Management

The Contractor shall measure and keep updated records of the following:

- Electricity consumption (to be measured in Kilowatt Hours)
- Fuel consumption (to be measured in liters)

5.39 Handling, Storage and Management of Hazardous Substances

All hazardous materials/substances shall be stored in a secured, designated area that is fenced, bunded and has restricted entry.

All storage shall take place using suitable containers to the approval of the Transnet CM and PER.

All hazardous liquids shall be located in a secure, demarcated area and an adequate bund wall (110% of the total volume stored) shall be provided. The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled/leaked liquids into the soil.

No spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area.

Hazard signs indicating the nature and volume of the stored materials shall be displayed on the storage facility or containment structure.

Weigh bills of hazardous substances shall be sourced from suppliers and kept on site for inspection by the Transnet PER.

The Contractor must provide a method statement detailing the hazardous substances that are to be used during construction, as well as the storage, handling and disposal procedures for each substance. Emergency procedures in the event of misuse or spillage that might negatively affect the environment must be specified.

Information on each hazardous substance will be available to all persons on site in the form of MSDS/SDS. Training and education about the proper use, handling, and disposal of the material will be provided to all workers handling the material.

The Contractor's EO must be informed of all activities that involve the use of hazardous substances to facilitate prompt response in the event of a spill or release.

5.40 Housekeeping

The Contractor must ensure proper housekeeping of the site for the duration of the project. If practical the contractor shall amongst construction personnel, assign one to be responsible for good housekeeping

Materials shall be stored in a neat and tidy manner in designated areas as per the approved site layout plan.

5.41 Rehabilitation

Contractors shall rehabilitate the entire site upon completion of work. Where applicable, rehabilitation must be in line with the measures outlined in the Project Environmental Specification. A rehabilitation plan will be submitted to the Transnet CM and PER for approval at least six weeks before project completion. The following, but not limited are critical issues to be included in the rehabilitation plan:

- Details of soil preparation procedures including proposed fertilisers or other chemicals being considered for use;
- A list of the plant species that will be used in the rehabilitation process. Note that these should all be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified Botanist/Horticulturist should be sought in developing this list;
- Procedures for watering the planted areas (frequency of watering, methodology proposed etc.);
- An indication of the monitoring procedures that will be put in place to ensure the successful establishment of the plants (duration and frequency of monitoring, proposed criteria for declaring rehabilitation as being successful); and
- Procedures for the prevention of the establishment and spread of alien invasive species.

5.42 Documentation and Records Management

The Contractor's EO will complete and maintain copies of all documents and records and ensure that these documents and records are kept up to date.

The Contractor's EO will submit these documents to the Transnet PER on a frequency as agreed to with the Transnet PER, except where documents have remained unchanged in which case written notification to this effect must be provided to the Transnet PER. The Contractor's EO must ensure that electronic copies of these documents are saved on the Transnet system.

Once the construction activities have been completed and the Transnet PER has conducted a site closure inspection and notified the Contractor that site closure will be granted, all documents described above must be handed over to Transnet after which a Site Closure Certificate will be issued by the Transnet Project Manager.

NOTE: All documents/records are to be retained, within the Transnet Document Control System, for a period of 10 years. In the event of environmental documentation/record being lost before receiving a Site Closure Certificate, the Contractor will be penalised according to the specifications laid down in the Contract.

6. RECORDS

Refer to CEM SOP.

7. ANNEXURES

None.

STANDARD OPERATING PROCEDURE

CONSTRUCTION ENVIRONMENTAL MANAGEMENT

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[illegible]

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	Senior Specialist: Environmental Compliance and Permitting		01/10/2023
Accepts document for adequacy and practicability. Comments:			
Sponsor:	General Manager: Corporate Sustainability		01/10/2023
Approves document for use. Comments:			

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1. PURPOSE

- 1.1** The purpose of this Standard Operating Procedure (SOP) is to define how environmental management will be practiced on any construction project under the management of Transnet to ensure that the environment is considered, negative impacts avoided or minimized, and positive impacts are optimized and/or enhanced throughout the lifecycle of the asset.
- 1.2** It further defines environmental management responsibilities for key stakeholders involved in the construction management process.
- 1.3** It must be read in conjunction with the Contractor Environmental and Sustainability Specification Guidelines (CESSG) and the Project Environmental Specification (PES) relevant to the project.
- 1.4** In this document, unless the context clearly indicates otherwise:
- Words importing any one gender shall include the other gender.
 - The singular shall include the plural and vice versa; and
 - Any reference in this document to legislation or subordinate legislation is to such legislation or subordinate legislation at the date of promulgation thereof and as amended and/or re-enacted from time to time.

2. APPLICABILITY

- 2.1** The SOP applies to any construction project under the management of Transnet SOC Ltd or its Construction Agent.

3. REFERENCE DOCUMENTS

Name	Applicable Section
Constitution of South Africa, Act 108 of 1996	Section 24 (a) right to an environment that is not harmful to health or wellbeing Section 24(b) (i) right to have environment protected for current and future generations through legislation and measures that prevents pollution and ecological degradation.
Capital Governance and Assurance Policy	Entire document
Capital Governance and Assurance Framework	Entire document
Capital governance and Assurance Manual	Entire document.
PLP Manual – Execution	Entire document
National Environmental Management Act, 107 of 1998	Section 2 National Environmental Management Principles (4) (viii), (e), (h), (j) and (p).
National Water Act, 36 of 1998	Section 164, Permissible Water Use Section 19
National Environmental Management: Waste Act, 58 of 2008	Part 1 15 (1) (i) and (2) Part 6 26 (10) (a) and (b) Scheduled 3, Defined Wastes Category B: Hazardous Wastes Part 8: Contaminated Land
Environment Conservation Act, 73 of 1989	Section 20
Occupational Health and Safety Act, 85 of 1993	Asbestos Regulations, 2001 Government Notice R155 in Government Gazette 23108 of February 2002

Name	Applicable Section
	General Safety Regulations-Reg. 2 (2) PPE
GNR 326, 7 April 2017 as amended, EIA Regulations	Chapter 15
Integrated Management System – Policy Statement Procedure (TRN-IMS-GRP-PROC-002)	Whole document
Integrated Management System – Competency, Awareness and Training Procedure	Whole document
Integrated Management System¹ – Document, Data and Record Management Procedure (TRN-IMS-GRP-PROC-010)	Whole document
Integrated Management System – Occurrence and Non-Conformance Management Procedure (TRN-IMS-GRP-PROC-013)	Whole document
Transnet Environmental Risk Management Strategy and Framework	2015:42
Environmental Management Systems ISO 14001: 2015	Clause 5, 6, 7, 8, 9 and 10

¹ Management of certain documents, data and records will be in accordance with NEC3 – Engineering and Construction Contract prescripts

4. DEFINITIONS AND ABBREVIATIONS

4.1 DEFINITIONS

Compliance	The action or fact of complying with legislation or regulations.
Conformance	The action or fact of conforming to this standard and other internal Transnet policies, procedures, guidelines and best practice.
Contractor	The Principal Contractor as engaged by Transnet for infrastructure construction operations, including all sub-contractors appointed by the main contractor of his own volition for the execution of parts of the construction operations; and any other contractor from time to time engaged by Transnet directly in connection with any part of the construction operations which is not a nominated sub-contractor to the Principal Contractor.
Contractor Environmental and Sustainability Specification Guidelines (CESSG)	A set of minimum environmental standards for all Transnet SOC Ltd-managed construction sites.
Corrective Action	It is generally a reactive process used to address problems after they have occurred. Corrective action may be triggered by a variety of events, e.g. Non-conformance to documented procedures and work instructions, non-conformances raised through internal audits, unacceptable monitoring and measurement results, internal & external SHEQ complaints, etc.
Emergency	Sudden unforeseen event needing immediate or prompt action.

Environment	Surroundings in which the Contractor operates, including air, water, land, natural resources, flora, fauna, humans and their interrelations.
Environmental Aspect	Element of an organization's activities or products or services that interacts or can interact with the environment
Environmental Authorisation (EA)	Environmental Authorisation is the authorisation granted by a competent authority of a listed activity or specified activity in terms of National Environmental Management Act 107 of 1998 (as amended).
Environmental Impact	Change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects
Environmental Management Plan (EMP)	A plan generated by the Contractor describing the relevant roles and responsibilities and how potential environmental risks will be assessed and managed including the monitoring and recording thereof.
Environmental Management Programme (EMPr)	A programme that has been approved by the Competent Authority in terms of NEMA, 107 of 1998 stipulating information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified
Environmental Risk	The product of the likelihood and severity of an unforeseen occurrence/incident/aspect and the impact it would have, if realised, on the environment

Incident/Occurrence	An undesired event occurring at work that results in physical harm to a person or death, or damage to the environment, plant and/or equipment, and/or loss of production.
Non-conformance	An action or situation that does not conform to Transnet's SHEQ standards, procedures or legislative requirement(s) and that can be, or lead to, an unacceptable SHEQ incident.
Non-compliance	Contravention to environmental legislative requirements.
Project Environmental Specification (PES)	Describes standards specific to a particular project. Variations and additions to the MESC are set out in this PES. These would include the EA issued to the project or elements generally drawn from the EA or permits for that project or from specific requirements set by the Transnet Operating Divisions. The PES may also require a more stringent standard to that described in the MESC if required by the EA or a particular industry code to which Transnet subscribes including any environmental constraints at a construction site.
Sub -Contractor	A person or organisation who has a contract with the contractor to - Construct or install part of the contractors work. - Provide a service necessary to provide the works; or - Supply plant and materials which the person or organisation has wholly or partly designed specifically for the works.

4.2 ABBREVIATIONS

Acronym	Meaning in Full
CESSG	Contractor Environmental and Sustainability Specification Guidelines
CM	Construction Manager
CV	Curriculum Vitae
CEM	Construction Environmental Management
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECO	Environmental Control Officer
EO	Environmental Officer
EMI	Environmental Management Inspectorate
NCR	Non-conformance Report
NEMA	National Environmental Management Act 107 of 1998 (as amended)
PER	Project Environmental Resource
PES	Project Environmental Specification
PLP	Project Life-cycle Process
PM	Project Manager

Acronym	Meaning in Full
SAHRA	South African Heritage Resources Agency
SOP	Standard Operating Procedure
SHEQ	Safety, Health, Environment and Quality
Transnet	Transnet SOC Ltd

5. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

5.1 Transnet Procurement Department

5.1.1 Ensures that this SOP (and relevant associated environmental specifications) is included in any construction-related request whether open market, quotation or confinement process.

5.1.2 The Procurement Department shall further ensure that the relevant environmental personnel are consulted during tender review, tender evaluation and contract award.

5. Transnet Project Manager (PM)

5.2.1 Takes overall accountability for the project including ensuring that this SOP is implemented by all relevant stakeholders.

5.2.2 The specific tasks during construction will include:

- Appointment of the Transnet Environmental Resource/s;
- Certifying site access to the Contractor;
- Giving instructions to the Contractor on recommendation from the Transnet Environmental Resource/s (e.g. defects, non-conformances etc.); and
- Certifying site closure to the Contractor.

5.3 Transnet Project Environmental Resource

5.3.1 The Transnet Project Environmental Resource (PER) will be responsible for ensuring that this SOP and associated specifications or requirements are complied with. The Transnet PER will report functionally to the relevant PM.

5.3.2 The specific tasks will include:

- Preparation of the PES;
- Tender evaluation, development of environmental criteria and adjudication thereof;
- Liaison with the relevant environmental Competent Authorities;

- Review and approve site layout plan including any subsequent revisions thereof;
- Environmental Induction of Contractor's staff;
- Generate an inspection checklist prior to construction commencement;
- Review and Sign off Method Statements prepared by Contractor;
- Prepare environmental monitoring protocols/checklists to be used during construction;
- Prepare monthly conformance audit reports, including sign-off on Monthly Inspection Reports;
- Conduct monthly observation & inspections of all work places based on the approved inspection checklist;
- Audit conformance to Method Statements;
- Monitor the Contractor's compliance with this SOP and any other environmental requirements relevant to the site;
- Develop an Audit Finding and Close out Register that documents all audit findings, close out actions and the time frame allowed for in order to close the finding/s;
- Ensure that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules;
- Measurement of completed work (e.g. areas top soiled, re-vegetated, stabilised etc.);
- Attendance at scheduled SHE meetings, as and when required, and project coordination meetings;
- Ensure that site documentation (permits, licenses, EA, EMP, SOP-CEM, method statements, audit reports, waste disposal slips etc.) related to environmental management is maintained on the relevant Document Control System;
- Inspect and report on environmental incidents and check corrective action;
- Keep a photographic record of all environmental incidents;

- Environmental incident management as required by Transnet policies and procedures;
- Implementation of environmental-related actions arising out of the minutes from scheduled meetings;
- Management of complaints register;
- Conduct any environmental incident investigations;
- Coordinate and/or facilitate any environmental monitoring programmes e.g. EMI Inspections, ECO Audits, Transnet Environmental Assurance Audits etc.
- Collate information received, including monitoring results into a monthly report that is supported with photographic records to the Transnet CM and Transnet PM showing progress against targets; and
- Report environmental performance of the project on a monthly basis through relevant governance channels.

5.3.3 The tasks stipulated above may be conducted by one or more Project Environmental Resource, depending on the scale, complexity and sensitivity of the environment. Discretion to be taken by the Environment Lead within the area of control of the project site.

5.4 Transnet Construction Manager (CM)

5.4.1 The Transnet Construction Manager (CM) has overall responsibility for environmental management on site and reports to the Transnet PM. The Transnet CM is supported by the Transnet PER.

5.4.2 The specific tasks during the construction stage will include:

- Reviewing the monthly reports compiled by the Transnet PER;
- Approving method statements prepared by the Contractor;
- Communicating directly with the Contractor on environmental issues observed on-site; and
- Escalating any relevant environmental matters to the Transnet PM.

5.6 Environmental Control Officer

5.6.1 The Environmental Control Officer is an independent person legally appointed to monitor compliance of construction related activities with the conditions of the Environmental Authorisation. The ECO fulfils an autonomous role and submits reports to the Competent Authority at timeframes specified in the Environmental Authorisation.

5.6.2 The Environmental Control Officer will conduct the following tasks:

- Monitors compliance to the conditions of the EA, Environmental Management Programme (EMPr) and can include permits and licences applicable to a project;
- Attends project meetings as and when required;
- Conducts audits at a frequency stipulated on the EA/EMPr; and
- Compiles audit reports and submits them to relevant authorities.

5.7 Contractor's Environmental Officer

5.7.1 The Contractor's Environmental Officer (EO) must ensure implementation of the requirements of this SOP on site.

5.7.2 The Contractor's EO will liaise with the Transnet PER on site. It will be the responsibility of the Contractor's EO to ensure that all work is conducted according to the approved Method Statements and that the Contractor team's roles and responsibilities as set out in this document are fulfilled.

5.7.3 The Contractor EO's tasks will include:

- Developing an appropriate environmental file for approval by the Transnet PER prior to site access, including but not necessarily limited to (the environmental file must always be available and up to date on the construction site):
 - All environmental documents provided by Transnet in the tender e.g. policies, SOPs, standards, environmental approvals;

- Contractors commitments to comply with this SOP and associated documents as signed during tender;
- The Contractor's EMP;
- His/her CV;
- An organogram indicating reporting lines of all Contractor's staff (with names included);
- Contact Information for: the overall responsible person acting on behalf of the Contractor to execute the construction works; Contractor's CM; Contractor's EO; all relevant emergency personnel;
- A list of the Contractor's plant and equipment indicating a description of the plant/equipment, its fuel capacity, any hazardous components (oils, greases etc.), individual service/maintenance cycles and noise levels;
- A list of hazardous substances to be used during construction indicating: official substance name from Material Safety Data Sheet (MSDS); quantity on site; storage method; transport method to site; period to be used on site (all substances listed must have an MSDS on site in the environmental file);
- Site Layout Plan indicating but not necessarily limited to, access roads, site offices, material laydown areas, stockpile areas and parking areas, waste and effluent storage and handling facilities, entire construction footprint, no-go-areas, sewage and sanitary facilities. The plan must be appropriately drawn on a computer and must be clearly visible and properly scaled;
- A site establishment method statement (for more details on what method statements should entail the Contractor must refer to the Minimum Requirements for Construction Environmental Management)
- Conducting an activity-based environmental risk assessment based on the Contractor's scope of work;
- Agreeing on an appropriate inspection schedule with the Transnet PER (either daily or weekly);

- Ensuring that all required Contractor staff attends the environmental induction to be given by the Transnet PER (any Contractor's staff, sub-contractors or visitors to site must subsequently be inducted by the Contractor's EO);
- Inspection of the work area(s) as per schedule or authorised through written instruction by Transnet PER;
- Preparing activity-based Method Statements that indicate how environmental risks will be managed on site OR ensuring that the necessary environmental information is included in the Contractor's method statements (all method statements must be maintained in the Contractor's Environmental File);
- Identify local, provincial and national environmental legislation that applies to the Contractor's activities;
- Conduct ongoing Environmental Awareness Training of the Contractor's site personnel;
- Reporting, investigating and recording of any environmental incidents caused by the Contractor or due to the Contractor's activities, including their sub-contractors and visitors;
- Close out of environmental incidents;
- Attendance at all SHE meetings and induction programmes, and toolbox talks where required
- Monitor Waste Management;
- Monitor Water Management;
- Monitor Energy Management;
- Ensure that environmental signage and barriers are correctly placed;
- Taking required corrective action within specified time frame and close out of non-conformances; and
- Maintain site documentation related to environmental management on site.

5.7.4 The Contractor's EO will be expected to submit reports to the Transnet PER on a daily/weekly basis.

5.8 The Contractor

- 5.8.1 The Contractor shall comply with the requirements of this SOP and abide by the Transnet PM's instructions regarding the implementation of this SOP.
- 5.8.2 The Contractor must confirm that he will conform to the requirements of this SOP and any other documents provided to him by Transnet during tender.
- 5.8.3 The Contractor must recommend a suitably qualified, competent person to fulfill the role of the Contractor's EO at tender and if accepted by Transnet this person must be appointed when the Contract is awarded for the duration of construction. Should this person be replaced for whatever reason, the Contractor shall ensure that a person of similar qualification and competency is appointed in his/her place before the previous incumbent vacates his/her position.
- 5.8.4 The Contractor must obtain any relevant environmental approvals required by his activities that have not been obtained by Transnet e.g. permits for the destruction of protected plant species; grave relocation permits etc.
- 5.8.5 The Contractor shall have overall accountability for environmental compliance on site and will be held liable for any non-compliance with environmental statutes or non-conformances with this SOP due to his negligence.

5.9 Reporting Lines

- 5.9.1 The organisational structure identifies and defines the responsibilities and authority of the various entities involved in the project. All instructions and official communications regarding environmental matters will follow the organisational structure shown in Figure 1.
- 5.9.2 All instructions that relate to the SOP will still be given to the Contractor via the Transnet PM. In an emergency situation, however, the Transnet PER may give an instruction directly to the Contractor. Environmental Management of the site will be an item on the agenda of the monthly site meetings, and the Transnet PER will attend these meetings on request by the contractor. If at any time the Transnet

PM is uncertain in any way with respect to an environmentally related issue or specification in the SOP, he will consult with the Transnet PER .

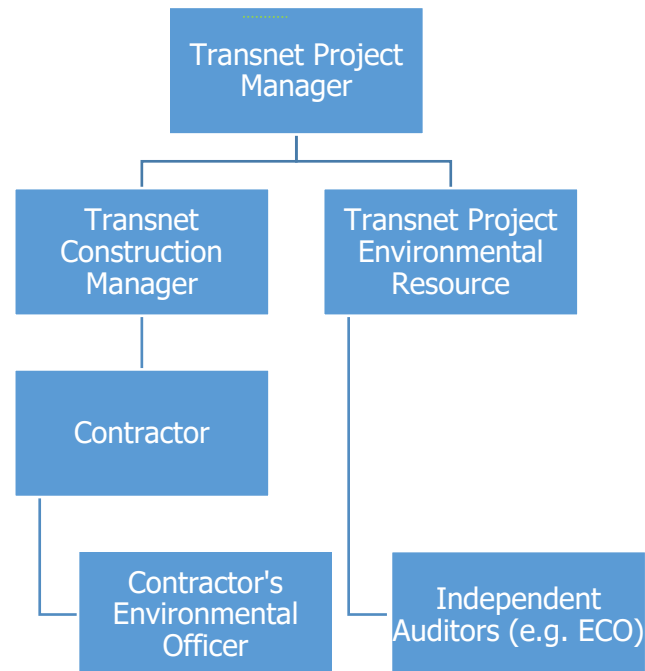


Figure 1: Typical Transnet Organogram for Construction Environmental Management²

6. STANDARD OPERATING PROCEDURE

6.1 Tender Stage (prior to Contract Award)

- The Transnet PM appoints or assign a Project Environmental Resource/s³.
- The Transnet PER requests the draft tender from the Transnet Procurement Department
- Transnet Procurement routes the draft tender to the Transnet PER

² Structure dependent on OD own structure and organizational operating model

³ Project complexity will determine the final environmental management structure on the project.

- The Transnet PER ensures the tender includes all relevant environmental documents and signs the routing slip.
- The Transnet Procurement Department issues the tender to prospective Contractor(s).
- The Contractor submits his bid which MUST include: a commitment to conform to this SOP signed by the duly delegated person; recommendation of a suitably qualified, competent person to fulfill the role of the Contractor's EO; Environmental Policy; and EMP
- After submission the Transnet Procurement Department will invite the Transnet PER to evaluate tender submissions (environmental section);
- The Transnet PER evaluates the prospective Contractor's environmental submission.
- The Contract is awarded to the successful bidder.

6.2 Construction Stage (prior to Site Access)

- The Contractor appoints the Contractor's Environmental Officer (EO) accepted by Transnet SOC Ltd.
- The Contractor provides his EO with all documents submitted during tender, including but not necessarily limited to:
 - All environmental documents provided by Transnet in the tender e.g. policies, SOPs, standards, environmental approvals etc;
 - commitment to conform to this SOP; and
 - The EMP.
- The Contractor's EO conducts an activity-based environmental risk assessment;
- The Contractor's EO develops an appropriate environmental file for approval by the Transnet PER, including but not necessarily limited to all the documents specified in Section 5.7 above (the environmental file must always be available and up to date on the construction site);
- The Contractor's EO submits the environmental file for acceptance to the Transnet PER;

- Once accepted, the Transnet PER recommends that site access be granted to the Transnet PM; and
- The Transnet PM issues the Contractor with a Site Access Certificate

6.3 Construction Stage (post Site Access)

- The Transnet PER inducts all Contractor's staff on the environmental requirements of the site;
- The Transnet PER has an inception meeting with the Contractor's EO on site where the following is agreed:
 - The contents of the contractor's environmental file (in addition to what was approved prior to granting site access). This will include but not necessarily be limited to: a list of interested and affected parties that may be impacted by construction e.g. surrounding landowners, nearby communities etc.; energy consumption information; water use information; environmental induction and awareness information; activity-based environmental method statements; complaints records; record of external communications; environmental incident reports; minutes of contractors environmental meetings.
 - The composition of the Project Environmental Specification (PES) and how it will be implemented. This will include but may not necessarily be limited to: Environmental Approvals (e.g. Environmental Authorisations, Water Use Licenses, Waste Management Licences, Atmospheric Emissions Licences etc.); Environmental Management Programmes/Plans approved by external parties/authorities; and any third party auditors/monitoring specialists (e.g. Environmental Control Officers; Independent Auditors; Transnet Environmental Assurance Specialists; Water Quality Monitoring experts etc.) that have a bearing on the contractor's scope of work.
 - The frequency of inspections to be conducted by the Contractor's EO (e.g. daily, weekly etc.)
 - The frequency of inspections to be conducted by the Transnet PER (e.g. daily, weekly and/or monthly). Notwithstanding that the frequency of

Transnet PER inspections will be agreed, the Contractor may never refuse the Transnet PER

- The format used and elements to be checked during Contractor's inspections
 - Reporting frequency and requirements
 - The process to be followed in handling Environmental Occurrences and – Non-conformances
- **Note:** All the aforementioned agreements will be formalized in the form of minutes which the Transnet - and Contractor's EO must sign and must subsequently be approved by the Transnet Project Environmental Resource.
 - The Transnet PER reviews the Contractor's activity-based environmental risk assessment and instructs the Contractor's EO to submit activity-based method statements for construction activities that may pose an environmental risk (for more details on what method statements should entail the Contractor must refer to the Minimum Environmental Requirements for Construction). Only once a method statement has been approved by the Transnet PER and Transnet CM and ECO (where relevant) may the Contractor execute the relevant activity.
 - The Contractor's EO submits the method statements to the Transnet PER for approval (these must also be approved by the Transnet CM);
 - The Transnet PER compiles a site audit checklist (covering all environmental compliance and conformance requirements) for approval by the Transnet Project Environmental Manager
 - Whilst the Contractor executes the work in terms of the requirements of the Contract, the Contractor's EO and Transnet PER execute their monitoring functions as per this SOP and other monitoring stakeholders/auditors as per the PES.
 - The Transnet PER shall submit monthly reports to the Transnet CM and PM indicating the following:
 - Date of the inspection(s);
 - Details and expertise of the Transnet PER;

- Scope and purpose for which the report was prepared;
- Description of the methodology used during the inspection and report compilation;
- Compliance and/or conformance status of all relevant/individual elements as per the inspection checklist culminating in an overall compliance/conformance percentage for the project;
- Assumptions;
- Description of consultation processes undertaken during the inspection(s) with a summary and associated records of such consultations;
- Environmental incidents and non-conformances;
- Photos of pertinent construction and environmental matters that occurred on site;
- Water abstracted/withdrawn during the month (in kiloliters) as well as an indication of the source;
- Water recycled and/or reused during the month (in kiloliters);
- Waste water discharged (in kiloliters);
- Waste (both general and hazardous) disposed (in tonnages) with an indication of waste type;
- Waste recycled (in tonnages);
- Alien invasive species eradicated (in hectares);
- Number of listed species safely relocated;
- Environmental Fines, Non-Compliances or Directives issues by authorities;
- Any NEMA Section 30 or NWA Section 19 incidents;
- Environmental Grievances;
- Rehabilitated Land (in hectares);
- Number of graves and/or heritage artifacts moved;
- Energy consumption for the project [Electricity(kWh); Gas (GJ); Oil(l); Diesel(l); Petrol(l); LPG(GJ)];
- Status of previous findings and/or observations; and
- Recommendations for improvement.

6.4 Post Construction

- The Contractor's EO submits a rehabilitation and site closure method statement for approval by the Transnet PER and Transnet CM.
- Once approved, the Contractor implements the rehabilitation method statement accordingly.
- The Contractor's EO submits a site close-out report for acceptance by the Transnet PER and CM.
- Post rehabilitation, the Transnet PER conducts a site closure inspection to ensure all requirements of the rehabilitation method statement have been met.
- Once rehabilitation has been accepted by the Transnet PER, the Contractor's EO sends the Transnet PER a copy of the entire environmental file (original to be handed over to Transnet as per document handover requirements of the Contract).
- On receipt of the environmental file, the Transnet PER recommends that a site closure certificate can be issued to the Transnet PM.
- The Transnet PM issues the Contractor with a Site Closure Certificate.

7. RECORDS

7.1 The responsibility for maintaining all records required by this SOP shall rest with the Contractor's EO; Transnet PER as specified below:

Record	Maintained By
1. Transnet PER Appointment Letter	Transnet PER
2. Signed Tender Routing Slip	Transnet PER
3. Contractor's Confirmation to conform to this CEM SOP	Transnet PER; Contractor's EO
4. Recommendation of Contractor's EO	Transnet PER

Record	Maintained By
5. Contractor's Environmental Policy	Transnet PER; Contractor's EO
6. Contractor's Environmental Management Plan	Transnet PER; Contractor's EO
7. Tender Evaluation Records from Transnet PER	Transnet PER
8. Contract	Transnet PER
9. Contractor EO's Appointment Letter and CV	Transnet PER
10. Activity-Based Environmental Risk Assessment	Transnet PER; Contractor's EO
11. Contractor's Organogram	Transnet PER; Contractor's EO
12. Contractor's Contact Information	Transnet PER; Contractor's EO
13. List of Contractor's Plant and Equipment	Contractor's EO
14. List of Hazardous Substances used by Contractor	Contractor's EO
15. Material Safety Data Sheets	Contractor's EO
16. Site Layout Plan	Transnet PER; Contractor's EO
17. Site Establishment Method Statement	Transnet PER; Contractor's EO
18. Minutes of Transnet PER – Contractor's EO Inception Meeting	Transnet PER; Contractor's EO
19. Environmental Induction Attendance Register (including material used during induction)	Transnet PER; Contractor's EO
20. Activity-based Method Statements	Transnet PER; Contractor's EO

Record	Maintained By
21. Contractor's Inspection Reports	Transnet PER; Contractor's EO
22. Transnet PER Inspection Reports	Transnet PER
23. List of Local, Provincial and National Environmental legislation applicable to the site	Contractor's EO
24. Environmental Awareness Attendance Registers (including material used)	Contractor's EO
25. Environmental Incident Reports	Transnet PER; Contractor's EO
26. Minutes of SHE Meetings	Transnet PER; Contractor's EO
27. Waste Records	Transnet PER; Contractor's EO
28. Water Records	Transnet PER; Contractor's EO
29. Energy Records	Transnet PER; Contractor's EO
30. Non-Conformance Records	Transnet PER; Contractor's EO
31. Approval of Contractor's Environmental File	Transnet PER
32. Site Access Certificate	Transnet PER
33. Approved Transnet PER Checklist	Transnet PER
34. Transnet Monthly PER Reports	Transnet PER
35. Rehabilitation Method Statement	Transnet PER; Contractor's EO
36. Contractor's Site Close-Out Report	Transnet PER; Contractor's EO
37. Transnet PER Site Closure Report	Transnet PER
38. Contractor's Environmental File Handover Transmittal	Transnet PER; Contractor's EO
39. Site Closure Certificate	Transnet PER

8. ANNEXURES

8.1 List of Construction Environmental Management Templates, Forms and Guidelines

8.2 009-TCC-CLO-SUS-TMP-11386.22 - Construction Environmental Management File Index

8.3 009-TCC-CLO-SUS-TMP-11386.23 - *Construction Environmental Management Process Flow*

Annexure 8.1 List of Construction Environmental Management Templates, Forms and Guidelines

No	Item Description	Document No
1.	Construction Environmental Management File Index	009-TCC-CLO-SUS-TMP-11386.1
2.	Project Environmental Specification (PES)	009-TCC-CLO-SUS-TMP-11386.2
3.	Declaration of Understanding (Signed)	009-TCC-CLO-SUS-TMP-11386.3
4.	Contractor's Information	009-TCC-CLO-SUS-TMP-11386.4
5.	Appointment of Contractors EO and Declaration of Understanding (Including CV and Job Profile)	009-TCC-CLO-SUS-TMP-11386.5
6.	Schedule of Contractor's Construction Plant and Equipment	009-TCC-CLO-SUS-TMP-11386.6
7.	Hazardous Substances Register	009-TCC-CLO-SUS-TMP-11386.7
8.	Emergency Contacts Register	009-TCC-CLO-SUS-TMP-11386.8
9.	Energy Consumption Register	009-TCC-CLO-SUS-TMP-11386.9
10.	Water Usage Register	009-TCC-CLO-SUS-TMP-11386.10
11.	Project Start-Up Checklist	009-TCC-CLO-SUS-TMP-11386.11
12.	Site Access Certificate	009-TCC-CLO-SUS-TMP-11386.12
13.	Method Statement Register	009-TCC-CLO-SUS-TMP-11386.13
14.	Method Statements	009-TCC-CLO-SUS-TMP-11386.14
15.	Waste Disposal Register	009-TCC-CLO-SUS-TMP-11386.15
16.	Daily Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.16
17.	Weekly Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.17
18.	Monthly Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.18

No	Item Description	Document No
19.	Public Complaints Register	009-TCC-CLO-SUS-TMP-11386.19
20.	Application for Exemption	009-TCC-CLO-SUS-TMP-11386.20
21.	Site Closure Certificate	009-TCC-CLO-SUS-TMP-11386.21
22.	Contractor's Environmental Management File Handover	009-TCC-CLO-SUS-TMP-11386.22
23.	Basic Environmental Rules for Visitors	009-TCC-CLO-SUS-GDL-11386.23
24.	Basic Environmental Rules for Contractors	009-TCC-CLO-SUS-GDL-11386.24
25.	Basic Site Procedure	009-TCC-CLO-SUS-GDL-11386.25
26.	Contractor Environmental and Sustainability Specification Guidelines (CESSG)	TRN-IMS-GRP-GDL-014.04

Annexure 8.2 Construction Environmental Management File Index

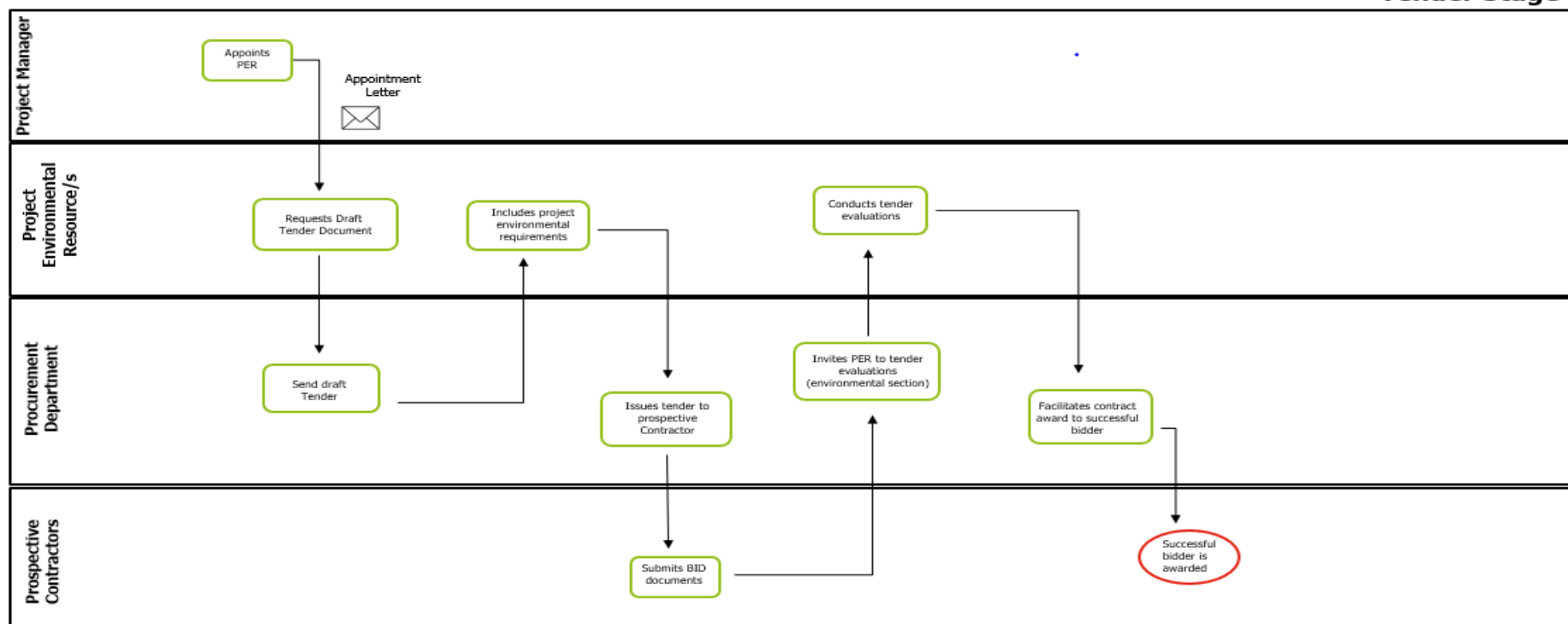
No	Item Description	Document No
1	Transnet Integrated management System (TIMS) Policy Statement	-
2.1	Standard Operating Procedure (SOP) - Construction Environmental Management (CEM)	009-TCC-CLO-SUS-11386
2.2	Environmental and Sustainability Specification Guidelines	TRN-IMS-GRP-GDL-014.04
3	Project Environmental Specification (PES)	009-TCC-CLO-SUS-TMP-11386.2
4	Declaration of Understanding (Signed)	009-TCC-CLO-SUS-TMP-11386.3
5.1	Contractor's Information	009-TCC-CLO-SUS-TMP-11386.4
5.2	Contractor's Environmental Policy	-
5.3	Contractor's Organogram	-
5.4	Contractor's Environmental Management Plan	-
5.5	Appointment of Contractors EO and Declaration of Understanding (Including CV and Job Profile)	009-TCC-CLO-SUS-TMP-11386.5
6	Schedule of Contractor's Construction Plant and Equipment	009-TCC-CLO-SUS-TMP-11386.6
7	Hazardous Substances Register	009-TCC-CLO-SUS-TMP-11386.7
8	Emergency Contacts Register	009-TCC-CLO-SUS-TMP-11386.8
9	Energy Consumption Register	009-TCC-CLO-SUS-TMP-11386.9
10	Water Usage Register	009-TCC-CLO-SUS-TMP-11386.10
11	Training Attendance Register	TIMS Procedure
12	Project Start-Up Checklist	009-TCC-CLO-SUS-TMP-11386.11
13	Site Access Certificate	009-TCC-CLO-SUS-TMP-11386.12
14	Method Statement Register	009-TCC-CLO-SUS-TMP-11386.13

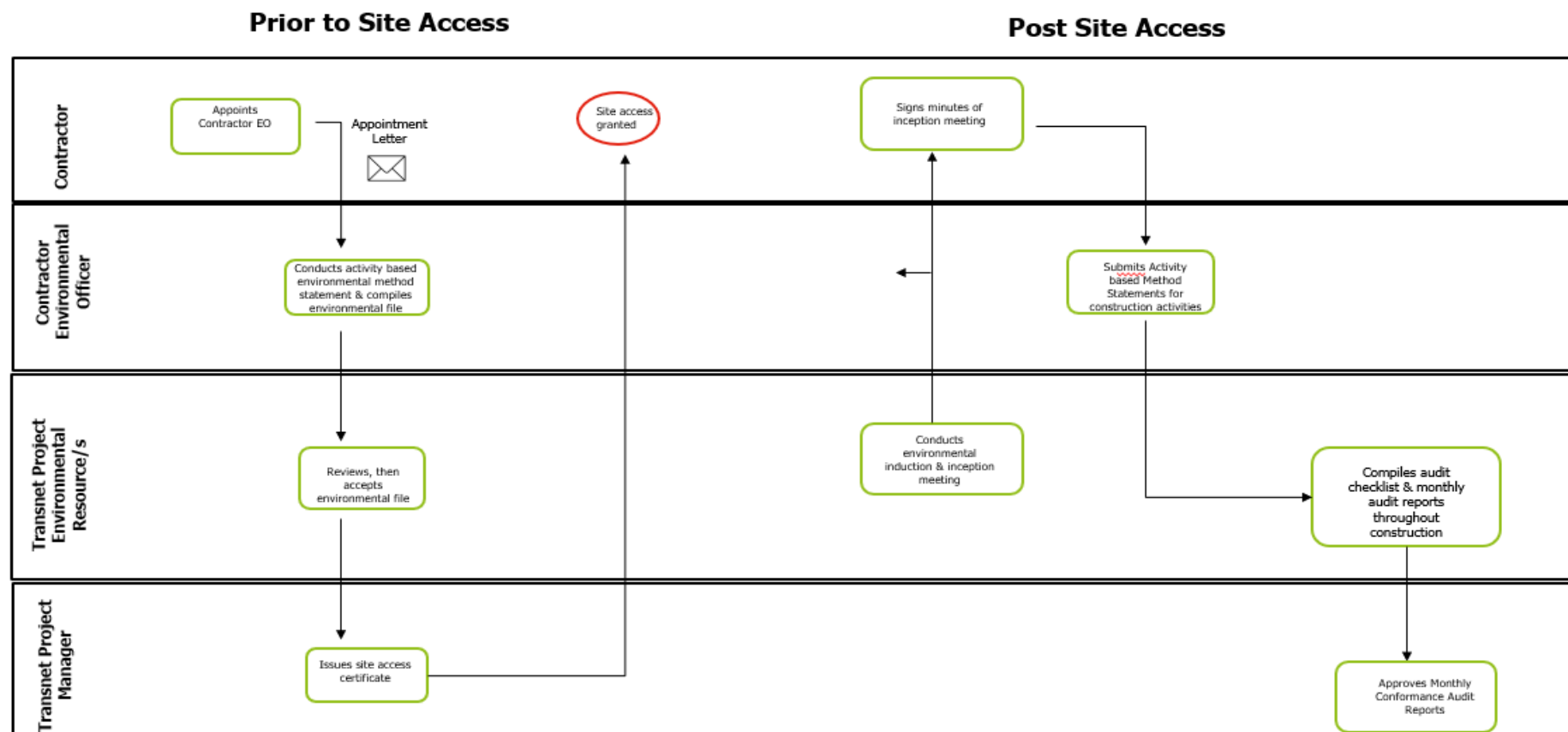
No	Item Description	Document No
15	Method Statements	009-TCC-CLO-SUS-TMP-11386.14
16	Waste Disposal Register	009-TCC-CLO-SUS-TMP-11386.15
17.1	Daily Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.16
17.2	Weekly Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.17
17.3	Monthly Inspection Checklist	009-TCC-CLO-SUS-TMP-11386.18
17.4	Environmental Inspection Findings Close-out Register	TIMS Procedure
18	Public Complaints Register	009-TCC-CLO-SUS-TMP-11386.19
19	Occurrence Register	TIMS Procedure
20	Transnet Occurrence Notification Report	TIMS Procedure
21.1	Environmental Occurrence Technical Form	TIMS Procedure
21.2	On-site Investigation Form – Incident Commander Report	TIMS Procedure
21.3	Investigation Form Report for Level 3 & 4 Occurrences	TIMS Procedure
21.4	Incident Commander Appointment Letter	TIMS Procedure
22	Non-Conformance Register	TIMS Procedure
23	Non-Conformance Report Form	TIMS Procedure
24	Non-Compliance Stop Certificate	TIMS Procedure
25	Application for Exemption	009-TCC-CLO-SUS-TMP-11386.20
26.1	Site Closure Inspection Form	TIMS Procedure
26.2	Site Closure Certificate	009-TCC-CLO-SUS-TMP-11386.21
26	Contractor's Environmental Management File Handover	009-TCC-CLO-SUS-TMP-11386.22

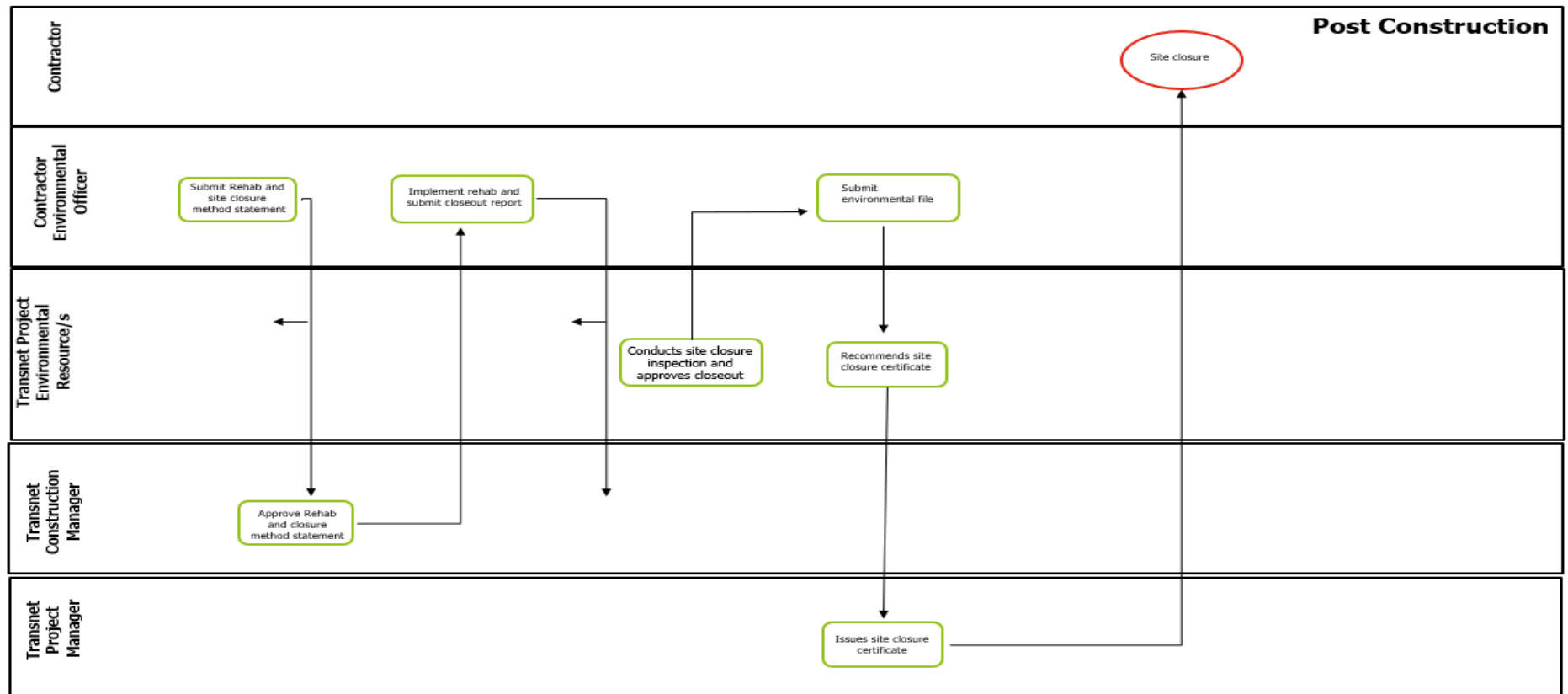
No	Item Description	Document No
27.1	Basic Environmental Rules for Visitors	009-TCC-CLO-SUS-GDL-11386.23
27.2	Basic Environmental Rules for Contractors	009-TCC-CLO-SUS-GDL-11386.24
27.3	Basic Site Procedure	009-TCC-CLO-SUS-GDL-11386.25

Annexure 8.3 Construction Environmental Management Process Flow

Tender Stage









TRANSNET

GENERAL QUALITY REQUIREMENTS FOR CONTRACTORS AND SUPPLIERS

Document Number	TNPA-QUAL-REQ-014.1
Version Number	02
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SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
1	Replacing Transnet Group Capital with Transnet		11/08/2020
2	Updated with ISO 9001:2015 referencing and adding clause numbering against requirements,		01/09/2023
2	Document number changed from TNPA-QUAL-REQ-014.1 to TNPA-QAL-REQ-014.1		01/09/2023

Note: Only the latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner	Quality Manager		01/09/2023
Accepts document for adequacy and practicability. Comments:			

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1. Purpose

This Specification outlines the minimum requirements to ensure that products and services supplied to TRANSNET are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in the Contract, all associated specifications, drawings, codes and standards.

2. Definitions / Abbreviations

Term, Abbreviation	Meaning
<i>Contract</i> :	Formal document evidencing agreement between <i>Employer</i> and <i>Contractor</i> for supply of on site or off-site services (generic term used for Purchase Orders, Contracts and Service Orders in this Standard).
<i>Contractor</i> :	The party to a <i>contract</i> that provides services to the <i>Employer</i> (Generic term used for Vendors, Suppliers, Contractors, Consultants, etc.).
<i>Contractor</i> Documentation Schedule (CDS)	A schedule specifying the <i>Employer's</i> requirements for the document types to be submitted by the <i>Contractor</i> at various stages of the <i>Contract</i> and the timing of the submissions.
<i>Data</i> :	All drawings/documents/data/information/DPs and IOMs required to be supplied under the <i>Contract</i> .
<i>Data Pack (DP)</i> :	A compilation of manufacturing data, certification, inspection and testing records prepared by the <i>Contractor</i> to verify compliance with the Contractual requirements.
<i>Employer</i> :	The party to a <i>Contract</i> or Purchase Order to whom the goods are supplied or for whom the work or services are performed. In the context of this document, Transnet Capital Projects is the <i>Employer</i> .
<i>Field Inspection Checklist (FIC)</i> :	A document that details the checks, requirements and test parameters for each type of equipment to permit field installation and pre-commissioning of the equipment
<i>Inspection Release Report (IRR)</i> :	A document issued to the <i>Contractor</i> by TRANSNET advising release of materials for shipment. This does not relieve the <i>Contractor</i> of its obligations in accordance with the Terms and Conditions of the <i>Contract</i> .
<i>Inspection Waiver Report (IWR)</i> :	A document issued to the <i>Contractor</i> by TRANSNET advising that TRANSNET has waived final inspection for the materials listed in this document. The issue of this report does not preclude further inspections by TRANSNET. It is issued without prejudice and does not relieve the <i>Contractor</i> from the guarantees and obligations included in the <i>Contract</i> .
<i>Installation and Operating Manual (IOM)</i> :	A document prepared by the <i>Contractor</i> providing relevant information applicable to the installation and maintenance of the specific equipment, including data relating to consumables (e.g., Oils, etc.)
<i>ISO 9001:2015 terms</i>	"shall" indicates a requirement
<i>Non-Conformance (NC)</i>	Material, product or workmanship which is not in accordance with the requirements of the <i>Contract</i> .
<i>Non-Conformance Report (NCR)</i> :	A document initiated by either TRANSNET or the <i>Contractor</i> advising that certain materials/products/workmanship provided by the <i>Contractor</i> do not conform to the required standards and specifications.
<i>Project Quality Plan (PQP)</i> :	A document that outlines the <i>Contractor's</i> strategy, methodology, resources allocation, Quality Assurance and Quality Control coordination activities to ensure that Goods and Services supplied meet or exceed the requirements defined in the <i>Contract</i> drawings, codes and standards.



Term, Abbreviation	Meaning
Quality Assurance (QA):	A formal methodology designed to assess the quality of products or services provided.
Quality Control (QC):	A set of activities intended to ensure that quality requirements are being met.
Quality Control Plan (QCP):	A document outlining specific manufacturing/construction inspection and testing requirements, including responsibilities, test acceptance criteria, nomination of witness and hold points.
Technical Query Note (TQN):	A document used by the <i>Contractor</i> to formally clarify a Technical Query related to the scope of supply. This should not be used where a Non-Conformance Report has already been initiated.
TRANSNET:	Transnet SOE Limited
Works Information:	Refers to the <i>Works Information</i> as defined in the <i>Contract</i>

3. Applicable Documents

3.1 General

All work performed shall comply with the requirements of this Specification, the documentation referenced in the *Contract* and the latest revision/edition of the relevant Codes and Standards referenced herein.

3.2 Statutory Regulations

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

3.3 Codes; Standards and Procedures

Document No.	Title
ISO 9001: 2015	Quality management systems – Requirements
ISO 10005:2018	Quality Management systems- Guidelines for Quality plans
PROCEDURE 014	Contractor Management

4. Quality System

4.1 General

4.1.1 The Contractor will be responsible for all quality activities necessary to ensure the Work meets the requirements specified in the Contract and shall manage and coordinate all Quality aspects of the Work in accordance with the requirements of this Specification, together with the Contractor's PQP and QCPs once reviewed and accepted by TRANSNET.

4.2 Contractor Quality System Requirements

4.2.1 The *Contractor* shall have and maintain a documented Quality Management System. The *Contractor* may be required to demonstrate its use to TRANSNET. The *Contractor's* Quality Management System should be in accordance with the requirements of *International Standard ISO 9001:2015 Clause 4.4.1 Quality Management System and its process*.

4.3 Kick Off Meeting

4.3.1 After the *Contract* start date, and prior to manufacture or construction activities, TRANSNET will require a Kick-Off Meeting with the *Contractor* to discuss fully the importance of meeting TRANSNET's quality requirements. This meeting may be held as part of the *Contract* kick-off meeting for each package or may be a separate meeting, subject to the critical or complex nature of the work. This requirement for a pre-inspection meeting may be repeated when Sub-Contractors of key equipment are engaged.

Note: The above requirement must be applied in conjunction with ISO 9001:2015 Clause 8.4.3



4.4 Contractor / Supplier Documentation Submittal Requirements

4.4.1 The *Contractor* shall make a formal submission of his Quality Documentation on award of the *Contract* and at the times defined in the *Contractor's* Documentation Schedule, included in the *Works Information* for the *Contract*.

4.4.2 The Contractor's responsibilities are defined in terms of *DOC-STD-0001* which outlines the standard requirements for preparation, submission, receipt, review, and collection of Technical and (or) Deliverable Documentation, as detailed in the Contractor Documentation Schedule (CDS).

4.4.3 TRANSNET uses the *Contractor's* Documentation Schedule (CDS), included in the *Works Information* for the *Contract*, to indicate those documents required to be submitted for information/review and/or acceptance.

4.4.4 The *Contractor* shall develop and maintain a comprehensive register of documents (*Contractor's* Documentation Register – CDR) that will be generated throughout the project. The CDR includes all quality-related documents. The CDR is a 'live' document and is submitted to TRANSNET for review following each revision by the *Contractor*. The CDR indicates the dates of issue of the documents considering sufficient time to allow for the TRANSNET review/acceptance cycle prior to the document being required for use. A sample of a CDR (DOC-FAT-0002) is issued by TRANSNET at the start of every *contract*.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 8.4.3 Information for external providers

4.5 Project Quality Plan

4.5.1 Where specified, the *Contractor* submits a PQP to TRANSNET within the period stated in the CDS and in any event not later than 28 days after the *Contract* start date. The PQP details how the *Contractor's* Quality System will be applied to the Scope of Work specified in the *Contract*, and shall address the following:

- a) Satisfying the technical and quality requirements of the Contractor's Scope of Work, and relevant elements of the applicable ISO 9001:2015 standard and should be developed with the reference to ISO 10005:2013 Guidelines.
- b) Include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls, objectives, and records used to control and verify compliance with the specified Contractual requirements.
- c) Include a listing of all special processes (e.g., welding and non-destructive testing, cube testing etc.) envisaged for use, including confirmation of personnel certification as required.
- d) Include all proposed method statements (for site-based work activities).
- e) Include a description of the Contractor's project organisation, with key positions and responsibilities identified and individuals named. The organisation structure shall also indicate the resources committed to the management and coordination of QA / QC activities.
- f) Include a listing of all Quality Control Plans (QCPs), and associated Field Inspection Checklists (FICs), as applicable.
- g) Identify in the PQP any Sub-Contractor/Sub-Supplier work. Sub-Contractor/Sub-Supplier plans are approved by the Contractor, and a copy forwarded to TRANSNET for information.
- h) Include the proposed Authorised Inspection Authority (where applicable - for pressurised equipment and systems).
- i) Include proposed quality records.

4.5.2 The PQP shall be controlled and re-submitted for approval when required to incorporate any change necessary during the *Contract* duration to ensure that the document is maintained as an effective control, change management and records. The change management will be done to an agreed policy or procedure.

Note: Where the *Contractor* is required to provide a PQP, no work shall commence until the PQP is accepted by TRANSNET.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 8 Operations



4.6 Procedures

4.6.1 The *Contractor's* PQP and procedures shall address the system elements and activities appropriate to the Scope of Work, in compliance with the specified Quality Standard.

4.6.2 Where specified, the *Contractor* shall submit copies of Quality Procedures for review. In addition, the *Contractor* shall ensure that copies of all Procedures relevant to the Scope of Work are available for reference by TRANSNET at each work location.

4.6.3 These will include, as applicable, the following:

- a) Document Control, the *Contractor's* PQP shall provide a description of how documents provided by TRANSNET to the *Contractor* are to be managed. The description shall address as a minimum:
 - Management tools and databases
 - Receipt, registration and maintenance
 - Internal and external distribution to Employer, third parties and Sub-Contractors
 - Management of Codes, Standards and Specifications
 - Internal review and approval routines and authorities
 - How it is ensured that the correct revisions of documents are available at the point of use including retention periods for all documentation

Note: The above requirement must be applied in conjunction with ISO 9001:2015 Clause 7.5 Documented Information

- b) Design Control procedure, where the *Contractor* is responsible for any aspect of design related to the Scope of Work, the Quality Plan shall describe the *Contractor's* methods and procedures for the control of these design activities.

Note: The above requirement must be applied in conjunction with ISO 9001:2015 Clause 8.3 Design and development of products and services

- c) Procurement procedure, where the *Contractor* is responsible for any aspect of procurement related to the Scope of Work, the Quality Plan shall describe the *Contractor's* methods and procedures for the control of these activities.

5. Quality Audits

5.1 Contractor Audits

5.1.1 The *Contractor* shall Carry out audits in accordance with its Quality System at its own and Sub-Contractor's facilities to ensure project quality requirements are being achieved.

5.1.2 The *Contractor* shall include a QA Audit Schedule in the *Contractor* PQP submitted to TRANSNET prior to commencement of the Scope of Work. The Audit Schedule shall include all audits to be implemented by the *Contractor* and Sub-Contractor during the execution of the *Contract*.

5.1.3 The *Contractor* shall, where stipulated in the *Contract*, perform an audit within three months after the *Contract* start date and thereafter at a minimum frequency of three months. Audit reports are submitted to TRANSNET at the completion of each Audit. Where unsatisfactory performance is evident, TRANSNET will direct the *Contractor* to perform additional audits.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 9.2 Internal Audit

5.2 Transnet Audit

5.2.1 Upon the appointment of the Contractor, the project Quality Officer will schedule and conduct the QMS Audit at the contractor's head office to assess the *Contractor's* ISO 9001:2015 Quality Management System status.

5.2.2 TRANSNET reserves the right to perform quality audits or participate as an observer in *Contractor* audits to verify compliance with the Contractual requirements. The *Contractor* shall, within the time frame as agreed upon, correct any adverse audit finding advised by TRANSNET.

5.2.3 The *Employer* may, at own discretion, require a Quality Audit of sub-contractor(s) to ensure that the sub-Contractor(s) have the necessary management, facilities, skilled staff, and quality control facilities to carry out the Works to ensure compliance with the Works Information.

6. Quality Control Plans

Note the of requirements of 6.1 to 7.7 must be applied in conjunction with ISO 9001:2015 Clause 8.5 Production and Service; ISO 10005:2018

6.1 Quality Control Plans

6.1.1 The *Contractor* shall prepare and submit QCPs to TRANSNET for review in accordance with the requirements of the Contract and PQP.

6.1.2 QCPs must clearly identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, acceptance criteria, witness and hold points.

6.1.3 The *Contractor* shall NOT commence fabrication or manufacture prior to review and approval of the applicable QCP by TRANSNET.

6.1.4 QCPs shall include reference to all tests specified in the *Works Information*.

6.2 Intervention Points

6.2.1 The QCP identifies points in the fabrication, manufacturing and/or installation process that are selected for inspection. These points are denoted by the following inspection codes:

a) Hold Point (H)	Inspection points in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Hold points require written notification to TRANSNET.
b) Witness Point (W)	An inspection point in the manufacturing cycle that will be witnessed or verified. If TRANSNET confirms it is unable to attend after being provided with the written notification, then manufacture may proceed. Witness points require written notification to TRANSNET.
c) Review Point (R)	A point at which products and quality records are verified and endorsed. Review points are not points that require notification to TRANSNET.
d) Surveillance (S)	An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.

6.3 Field Inspection Checklists

6.3.1 For site installation and construction activities, the *Contractor* shall prepare Field Inspection Checklists (FICs) to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCPs.

6.3.2 FICs are used to record the results of inspection and testing (where applicable). On completion, FICs are submitted to TRANSNET to confirm satisfactory completion of the tests and inspections at nominated QCP witness and hold points.



7. Inspection and Testing

7.1 General

7.1.1 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.

7.1.2 TRANSNET may, at its discretion, perform surveillance inspections at the *Contractor's* premises, the premises of any Sub-Contractor or at the location of the Scope of Work.

7.1.3 Dependent on the nature of the Scope of Work and the frequency of inspections, TRANSNET may elect to have inspection personnel resident at the place of manufacture, fabrication, or assembly.

7.1.4 The Contractor shall ensure free entry and access is given to TRANSNET, certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and quality records at all parts of the *Contractor's* and Sub-Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

7.1.5 The *Contractor* shall provide TRANSNET with all necessary tools, calibrated measuring equipment, safety equipment and workspace to verify or witness tests in progress.

7.1.6 While TRANSNET is at the *Contractor's* premises, the *Contractor* shall provide, free of charge, reasonable facilities including office facilities and reasonable access to a telephone, facsimile machine and computer connection point.

7.1.7 The *Contractor* shall provide written notice within a time frame as agreed upon, to allow the attendance of TRANSNET and other representatives at nominated witness and hold points.

7.2 Schedule of Inspection

7.2.1 The *Contractor* shall submit a Schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The Schedule shall be regularly updated with progress and issued to TRANSNET to show the current inspection and test status.

7.3 Contractor's Inspection

7.3.1 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 the Employer and/or Third-Party Inspection Authority.

7.3.2 For sub-contracted material or services, the Contractor shall ensure that controls are effective, including, where necessary, monitoring of the Subcontractor's works and retention of the necessary records.

7.3.3 Signing-off of the Quality Control Plan progressively by all relevant parties is a mandatory requirement following the indicated inspection activity.

7.4 Readiness for Inspection

7.4.1 Material or services shall be deemed ready for inspection by the Employer and/or Project Manager only when:

- a) The Contractor has firstly carried out his own inspection at the stage identified on the relevant Quality Control Plan and is satisfied that material, workmanship and services meet the specified requirements. Documented evidence shall be maintained by the Contractor including signing-off the Quality Control Plan.
- b) The Contractor shall ensure that the latest revisions of approved drawings and/or procedures with evidence of acceptance by Transnet, his nominated representative or Third-Party Inspection Authority are available.

7.5 Inspection Notification

7.5.1 The *Contractor* shall notify TRANSNET in writing for inspections or tests within the country, arrangements are confirmed at least two working days before the event. For inspection and tests outside of the country, arrangements are confirmed at least seven working days before the event.

Inspection notifications include the following essential information:

- Contract Number
- Location of Inspection or Test
- Nature of Inspection or Test
- Date and Time of Inspection or Test
- Name and telephone number of the *Contractor's* Representative.

7.6 Cancellation of Inspection

7.6.1 Contractors are advised that it is a condition of Purchase / Contract that all costs of Employer's representative and/or Third-Party Inspection Authority will be passed on to the Contractor for cancellation of inspection visits.

7.6.2 A visit is considered cancelled if:

- a) The Contractor advises "readiness" for inspection and upon arrival of Employer's representative or Third-Party Inspection Authority, the material, or Services and/or the associated documentation is not ready; or
- b) If Employer's personnel identify that material or services are to specification such that the Contractor's Inspector should have identified the non-conformity prior advising readiness for Employer's or Third-Party Inspection Authority inspection.

7.7 Inspection Waiver

7.7.1 Any Employer's Witness, or review or Hold point may, at the sole discretion of Employer, be waived, which will be followed by an inspection waiver report.

8. Fabrication Process and Factory Acceptance Test

8.1 Fabrication Process

8.1.1 It is the *Contractor's* responsibility to ensure that all processes which require prequalified procedures and/or work methods are tested and qualified before work begins at the manufacture's premises. This typically covers such activities as welding, non-destructive testing, special fabrication techniques and painting. When such procedures are requested, no work shall commence at the manufacturer's premises until procedures are approved by TRANSNET.

8.1.2 It is the *Contractor's* responsibility to ensure all operators are qualified for the processes in accordance with the procedure and/or applicable standards. Records of qualification of operators shall be maintained by the *Contractor* and made available to TRANSNET when requested.

8.1.3 Records of qualification of procedures and processes shall be maintained by the *Contractor* in accordance with the applicable procedure or code.

8.1.4 The Employer's representatives are also required to do inspections during fabrication to ensure that the fabrication process is in accordance with the designs, specifications, and standards to ensure the work meets the requirements specified in the Contract.8.1.1 Welding Procedures

8.1.5 Where the *Contractor's* Scope of Work includes fabricated weldments, Welding Procedure Specifications (WPS) defining the method, preparation and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of the *Contractor's* Scope of Work. The procedure shall only be submitted to TRANSNET when requested in the *Contract*.



8.1.6 WPS includes all welding essential and non-essential variables for each process used, including appropriate test results. WPS comply fully with the standard or code pertaining to welding required in the execution of the *Contractor's* Scope of Work.

8.1.7 When requested in the *Contract*, a suitably marked "weld map" is completed by the *Contractor* for all items to be fabricated. A summary of WPS is prepared and, when used, is identified on the weld map.

8.1.8 Where TRANSNET approval is required, fabrication is not to commence until written approval of WPS and Welding Procedure Qualification Records (WPQR) is received by the *Contractor*. No welding fabrication will be accepted that is not covered by a TRANSNET approved WPS/WPQR.

8.1.9 Welding Procedure Qualification (WPQ) tests may be witnessed by TRANSNET and/or an independent inspection authority. Testing of the specimens prepared during the WPQ Tests is carried out by an approved testing laboratory, independent of both TRANSNET and the *Contractor*. In certain instances, a certificate to EN 10204 3.1 B may be required which will be clarified at Tender review and clarification stage.

8.1.10 Where actual weld deposit analysis and weld metal physical properties are required for procedure qualification, the information is taken from the procedure qualification tests. Data listed in the catalogues of the manufacturer of welding consumables is not acceptable.

8.1.11 Welders/welding operators are qualified in accordance with the relevant welding code prior to commencing production fabrication. Specific Welder Qualification (WQ) records will be reviewed by TRANSNET in the *Contractor's* works and should NOT be submitted for review.

8.1.12 A register of welders qualified to work shall be maintained by the *Contractor*.

8.2 Material Traceability

8.2.1 Where, and to the extent that material traceability is required, the *Contractor* shall provide its procedures for the maintenance of material identification throughout all phases of manufacture. Methods of identification, routines for re-stamping or stenciling as appropriate shall be defined and agreed with the *Employer*.

8.2.2 Adequate records shall be maintained throughout construction enabling traceability of key materials from final product back to original material certificates. The material traceability records shall form part of the DP.

8.2.3 The *Contractor* shall prepare a schedule of materials and equipment that are subject to traceability requirements.

8.3 Material Certification

8.3.1 Where specified in the Contract the following certificates shall be provided to TRANSNET and included in the DP.

- a) *Type A*: A *Contractor's* certificate of compliance with the *Contract*. This certifies that the goods or services are supplied in compliance with the *Contract* without mention of any test results (EN10204 certificate 2.1).
- b) *Type B*: A certificate issued by a laboratory or test facility independent of the *Contractor's* works. It shall quote test results carried out on the product supplied and state whether compliance with the relevant technical standard, code, etc., has been complied with. (EN10204 certificate 3.1B).
- c) *Type C*: The same as Type B, the tests are to be witnessed by a third party (EN10204 certificate 3.1C).

8.4 Factory Acceptance Test

8.4.1 The factory acceptance test (FAT) is a process that evaluates the equipment during and after the assembly process by verifying that it is built and operating in accordance with design specifications.

8.4.2 The Contractor shall conduct a Factory Acceptance Test for all Plant's to be installed as part of the Works to be executed in this Contract prior to delivery to site. The Factory Acceptance Test shall be conducted in the presence of the Employer's representatives (Quality, Engineering and/or the Third-Party Inspection Authority).



8.5 Inspection Release

8.5.1 At completion of the Scope of Work, either in total or in phases, TRANSNET may issue an Inspection Release Report (IRR) or an Inspection Waiver Report (IWR).

8.5.2 The issue of either an inspection release or waiver of inspection does not relieve the *Contractor* of its obligations under the *Contract*. The *Contractor* ensures that a copy of the release note and final expediting release note for transport, where appropriate, is attached to the delivery docket and accompanies the Work to the designated destination indicated in the *Contract*. Items delivered to TRANSNET without a copy of these documents may not be accepted.

8.5.3 A copy of the inspection release or waiver of inspection is included in the DP.

9. Non-Conforming Products

9.1 General

Note the requirements of 9.1 to 9.3 must be applied in conjunction with ISO 9001:2015 Clause 10.2 Nonconformity and Corrective action

9.1.1 The *Contractor* shall establish and maintain procedures to control material or products that do not meet the specified requirements.

9.1.2 All Contractor product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- a) If the *Contractor* discovers material or product which is not in accordance with the requirements of the *Contract*, i.e., a non-conformance, the *Contractor* shall immediately initiate the non-conformance procedure in terms of the *Contractor's* Quality Management System, advise TRANSNET promptly, and provide a copy of the non-conformance report (NCR) to TRANSNET
- b) If TRANSNET or its agent identifies a non-conformance, a TRANSNET NCR may be raised.

9.1.3 Originals of all closed out NCRs shall be included in the DP.

9.2 Defects

9.2.1 The project Quality officer will notify the NEC supervisor / Construction Manager of any defects observed and long them on the snag list.

9.3 Corrective and Preventative Action

9.3.1 If the Contractor proposes a disposition of any non-conforming materials or product which varies from the requirements of the Specification or *Contract*, such a proposal shall be submitted in writing to TRANSNET whose decision on the proposal shall be obtained in writing before the non-conforming material or product is covered up or incorporated into the Works, or is the subject of any other disposition.

9.3.2 The disposition of non-conformances which do not vary the requirements of the *Contract*, specification or drawings may be approved by the *Contractor* following discussion and agreement with TRANSNET.

10. Concession Requests and Technical Queries

10.1 Concession Requests

10.1.1 Where a *Contractor* requests a Concession to deviate from the requirements of the *Contract* or specified requirements, the *Contractor* raises the request for TRANSNET review and approval.

10.1.2 The Concession Requests shall clearly identify all elements of the proposed deviation together with any resulting technical, commercial and/or schedule impacts.

10.1.3 Completed original Concession Requests shall be included in the DP.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 8.7 Control of Non-Conforming outputs

10.2 Technical Queries

10.2.1 For clarification of technical issues (only), the *Contractor* may submit a Field Engineering Query (FEQ) to TRANSNET in accordance with the *Contract*.

10.2.2 The FEQ shall clearly identify all elements of the query, and all supporting documentation and/or drawings shall be attached where appropriate.

Completed original FEQ's shall be included in the DP.

11. Inspection, Measuring and Test Equipment

Note the requirements of 11.1 to 11.3 must be applied in conjunction with ISO 9001:2015 Clause 7.1.5.1 & 7.1.5.2 General and Measurement traceability

11.1 Calibration

11.1.1 The *Contractor*, including its Sub-Contractors/Sub-Suppliers, shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant *Contractor* procedures and/or the equipment manufacturer's specifications.

11.1.2 Where calibration is required by an external laboratory, the *Contractor* shall ensure that the facility selected for calibration possesses current certification. Calibration certificates shall contain a statement that the test equipment is accurate to within specified tolerances.

11.1.3 The Contractor should establish the frequency of calibration for each item of equipment (including jigs, fixtures or templates) and record the details in a 'Measuring and Test Equipment Register' (or similar).

11.2 Use of Inspection, Measuring and Test Equipment

11.2.1 The *Contractor* shall ensure that authorized equipment users:

- a) Use the equipment in accordance with manufacturer's instructions, and accepted industry practices
- b) Ensure the equipment is covered by a current calibration certificate
- c) Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
- d) Prior to commencement of each inspection or test activities:
 - Identify the measurements to be made
 - Determine the accuracy required
 - Select the appropriate inspection, measuring or test equipment for the scope of work.

11.3 Verification of Previous Test Results

11.3.1 Where the calibration status of the equipment is unknown, expired or has doubtful accuracy, the equipment shall immediately be quarantined, and tagged according to *Contractor's* Quality System procedures. The *Contractor* shall then arrange for either in-house or external calibration, and:

- a) review all previous test results associated with the suspect equipment;
- b) identify the inspections, measurements or tests required to re-validate the results;
- c) ensure that suitable re-testing is performed with calibrated equipment;
- d) record the results of the re-testing on the respective inspection and test documentation.

12. Quality Personnel Qualifications

12.1.1 The contractor shall nominate/appoint a Quality officer with minimum experience and qualifications specified in the Tender documents.

12.1.2 The Contractor shall submit the CV and relevant qualifications of its nominated/appointed quality representative for the Project Manager's review and approval.

12.1.3 Should the approved qualify officer be no longer available, the contractor will notify the Project Manager in writing and upon agreement the contractor will provide the CV and qualifications of the proposed resource that is equivalent to the previously approved.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 7.2 Competence

13. Quality Records

13.1.1 *Contractors* shall maintain Quality Records necessary to provide objective evidence that demonstrates and verifies achievement of the QA / QC requirements associated with the Scope of Work.

13.1.2 All Quality Records, including original source material test certificates and non-destructive test reports, shall be retained by the *Contractor* during the project, and be provided to TRANSNET at the times, and in the quantities specified in the *Contract*.

13.1.3 The *Contractor* shall collate all quality records in the Data Pack (DP) and submit the DP to TRANSNET in accordance with the *Contract* and all referenced standards and specifications. This DP shall be compiled progressively and shall be available for review at all phases of manufacture or construction activities.

13.1.4 The Scope of Work shall not be complete until the *Contractor's* DP, including the quality records from Sub-Contractors/Sub-Suppliers, has been reviewed and accepted by TRANSNET.

13.1.5 The *Contractor* compiles the DP progressively during the execution of the Scope of Work and makes the DP available for review by TRANSNET as required.

13.1.6 The *Contractor* shall retain a copy of all Quality documentation generated during the *contract*, including a copy of the complete DP, for his own records for a minimum period of five years after the completion of the work.

Note: The above requirements must be applied in conjunction with ISO 9001:2015 Clause 7.5.3 Control of Documented Information

CYBERSECURITY AND NETWORK SECURITY REQUIREMENTS

REVISIONS		
REV	DATE	APPROVED
00	21/04/2026	

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1. SCOPE

This specification covers Transnet National Port Authority requirements for the design, supply, installation, configuration, testing, commissioning and support for all systems delivered under this Contract in a manner that ensures the confidentiality, integrity, availability and resilience of Transnet National Ports Authority (TNPA) information, systems and infrastructure.

Cybersecurity shall be treated as a core technical requirement of the Works and shall apply to, but not be limited to, the following components:

- Smart electricity meters
- Smart water meters
- AMR / AMI communication devices and gateways
- Wired and wireless communication networks
- Servers, databases and application software
- Firewalls, DMZ infrastructure and management workstations

The Contractor shall ensure that cybersecurity controls are designed into the solution from the outset and are not implemented as an afterthought or optional enhancement.

All systems shall be implemented in a manner that:

- Prevents unauthorized access, use, disclosure, modification or destruction of data
- Protect operational continuity and service availability
- Limits the impact of cyber incidents through appropriate security controls and segregation
- Supports monitoring, logging and incident response requirements

Cybersecurity requirements defined in this document shall be mandatory, and failure to comply may result in rejection of deliverables or suspension of Works until compliance is achieved.

2. COMPLIANCE AND STANDARDS

The Contractor shall ensure that all systems, equipment, software, network infrastructure and services delivered under this Contract comply with Transnet-approved cybersecurity standards and applicable industry best practice for Operational Technology (OT) and information systems.

At a minimum, the Contractor shall comply with the following:

- Transnet ICT Operational Technology (OT) Systems Standard
- Transnet ICT Network Security Standard
- Transnet ICT Cryptography Standard
- Transnet Change and Release Management Procedures
- IEC 62443 series – Security for Industrial Automation and Control Systems
- Applicable SANS, IEC and ISO standards relevant to the Works

The Contractor shall ensure that:

All cybersecurity requirements are incorporated into the design, implementation and commissioning of the Works.

3. NETWORK SEGMENTATION AND ARCHITECTURE

The Contractor shall design and implement a secure, structured and segmented network architecture for the Works that protects operational systems, prevents unauthorised access and limits the impact of cyber security incidents.

The network architecture shall be appropriate for an Operational Technology (OT) environment and shall prioritise availability, safety and resilience while enforcing effective security controls.

The Contractor shall ensure that:

- Field devices, smart meters, AMR / AMI devices, gateways, servers, management workstations and applications are logically and/or physically segregated
- Operational networks are separated from management and corporate networks
- Data flows between network segments are controlled, restricted and

documented

- Network design prevents unnecessary lateral movement between systems

Network segmentation shall be implemented using appropriate mechanisms, including but not limited to:

- Virtual Local Area Networks (VLANs)
- Routing and access control mechanisms
- Security zones aligned to system function and risk

Flat or unrestricted network architectures are not permitted.

Direct connectivity between the Transnet corporate network and field devices, meters, gateways or control systems is prohibited.

All network architecture designs shall be:

- Fully documented, including logical and physical network diagrams
- Submitted to the Employer for review and acceptance
- Approved prior to procurement, installation or commissioning

Any deviation from the approved network architecture shall be subject to formal change control and written approval.

4. FIREWALLS AND SECURITY ENFORCEMENT

The Contractor shall supply, install, configure, test and commission enterprise-grade and/or industrial-grade firewalls to enforce network segmentation and security controls across the solution.

Firewalls shall be used as the primary security enforcement mechanism between network segments and shall not be replaced by routing, switching, or VLAN configuration alone.

The Contractor shall ensure that firewalls are deployed, at a minimum, at the following boundaries:

- Between the Transnet corporate network and the Contractor-provided network
- Between management, application, and operational network segments

The Contractor shall develop and document a firewall rule base aligned to the approved network architecture. Submit firewall configurations for review and approval prior to implementation

Ensure firewall rules are:

- Justified
- Documented

Ensure firewalls support:

- Logging of security-relevant events
- Time synchronisation
- Integration with Transnet's central monitoring and SIEM platforms

5. DEMILITARISED ZONE (DMZ) REQUIREMENTS

The Contractor shall design, supply, install, configure, test and commission a Demilitarized Zone (DMZ) to securely segregate operational systems from external, corporate and management networks. The DMZ shall serve as the only permitted interface between operational networks and any external or corporate connectivity and shall be enforced through firewall controls.

The Contractor shall ensure that the DMZ is implemented at each site where systems connect to:

- The Transnet corporate network
- External networks
- Centralized monitoring, reporting or management platforms

No direct connectivity exists between operational systems and corporate or external networks outside of the DMZ.

Only systems that require controlled interaction between operational and corporate environments may be located within the DMZ, including but not limited to:

- Management and monitoring workstations
- Reporting and dashboard systems
- Secure access gateways
- Integration or data exchange services approved by the Employer

The following systems are not permitted within the DMZ:

- Field devices
- Smart meters
- AMR / AMI gateways
- Control or automation devices

6. FIRMWARE, PATCH AND UPDATE MANAGEMENT

The Contractor shall implement a controlled, risk-based firmware, patch and update management process for all systems, devices and infrastructure. This requirement applies to, but is not limited to:

- Smart electricity meters
- Smart water meters
- AMR / AMI devices and gateways
- Network infrastructure (switches, firewalls, routers)
- Servers and applications supporting the Works

The Contractor shall ensure that:

- All firmware, software and security updates are managed, tested and deployed in a controlled manner
- Updates do not compromise system availability, operational continuity, or safety
- Automatic or uncontrolled updates on operational systems are not permitted

Firmware, patch and update activities shall be planned and executed in accordance with Transnet change management processes.

7. VULNERABILITY MANAGEMENT AND SCANNING

The Contractor shall implement a structured, risk-based vulnerability management process for all systems, devices and infrastructure delivered under this Contract.

This requirement applies to, but is not limited to:

- Smart electricity and water meters
- AMR / AMI devices and gateways
- Network infrastructure and security devices
- Servers, applications and supporting platforms

The Contractor shall ensure that vulnerabilities are identified using methods appropriate for an Operational Technology (OT) environment, including:

- Vendor security advisories and notifications
- Approved vulnerability scanning techniques
- Threat intelligence and risk-based assessments

The Contractor shall ensure that vulnerability scanning and reporting is:

- Onboarded to Transnet's approved vulnerability management toolset, or
- Integrated with Transnet's central vulnerability management capability for consolidated visibility, reporting and governance

The Contractor shall ensure that identified vulnerabilities are assessed based on:

- Severity
- Exploitability
- Potential operational impact

Remediation actions are prioritised using a risk-based approach, taking into account availability, safety and operational continuity. Where remediation is not immediately feasible, appropriate compensating controls are implemented.

8. NETWORK MONITORING, LOGGING AND SIEM INTEGRATION

The Contractor shall implement continuous network and security monitoring for all systems, devices and infrastructure delivered under this Contract to support operational visibility, threat detection, incident response and audit requirements.

This requirement applies to, but is not limited to:

- Network infrastructure (switches, firewalls, routers)
- Security devices and enforcement points
- Servers, applications and databases supporting the Works
- AMR / AMI devices and gateways, where technically feasible

The Contractor shall ensure that network traffic, device health and security-relevant events are monitored on an ongoing basis. Monitoring solutions are appropriate for an Operational Technology (OT) environment and do not negatively impact system performance or availability.

Monitoring is implemented in a manner that supports early detection of:

- Unauthorised access attempts
- Network anomalies
- Policy violations
- System faults impacting service delivery

The Contractor shall ensure that security and operational logs are generated by all relevant systems and devices. Logs are centrally collected and retained in accordance with Transnet requirements.

Logs are:

- Time-synchronised
- Protected against unauthorised modification
- Available for investigation and audit purposes

Network, security and system logs shall be:

- Integrated with the Transnet SIEM solution, or
- Forwarded to Transnet's central logging and security monitoring platform using approved protocols and formats

The Contractor shall support onboarding of all relevant log sources into the Transnet SIEM and SOC environment.

9. NETWORK MONITORING, LOGGING AND SIEM INTEGRATION

The Contractor shall submit all cybersecurity and network security designs to the Information Security Governance, Risk and Compliance Committee (ISGRC), or its nominated authority, for review and approval prior to implementation.

ISGRC approval shall be required for, but not limited to:

- Network architecture and segmentation design
- Firewall and DMZ implementation
- Firmware, patch and update management approach
- Vulnerability management and scanning approach
- Network monitoring, logging and SIEM integration
- Any proposed deviations or exceptions to Transnet standards

No implementation, configuration or commissioning activities may commence without documented ISGRC approval.

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 the 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

All the Ports are operated by Transnet National Ports Authority, which provides port infrastructure, Real Estate, Marine, Dredging and Lighthouse services. All the Ports are 24 hours operational. Hence the work to be carried out will be undertaken in operational areas.

Prospective *Contractors* shall attend the site briefing to acquaint themselves with the nature of the *works*, the condition under which the work is to be performed, and the means of access to site, any limitations or other authorities, and in general with all matters that may influence or affect the *Contractor*.

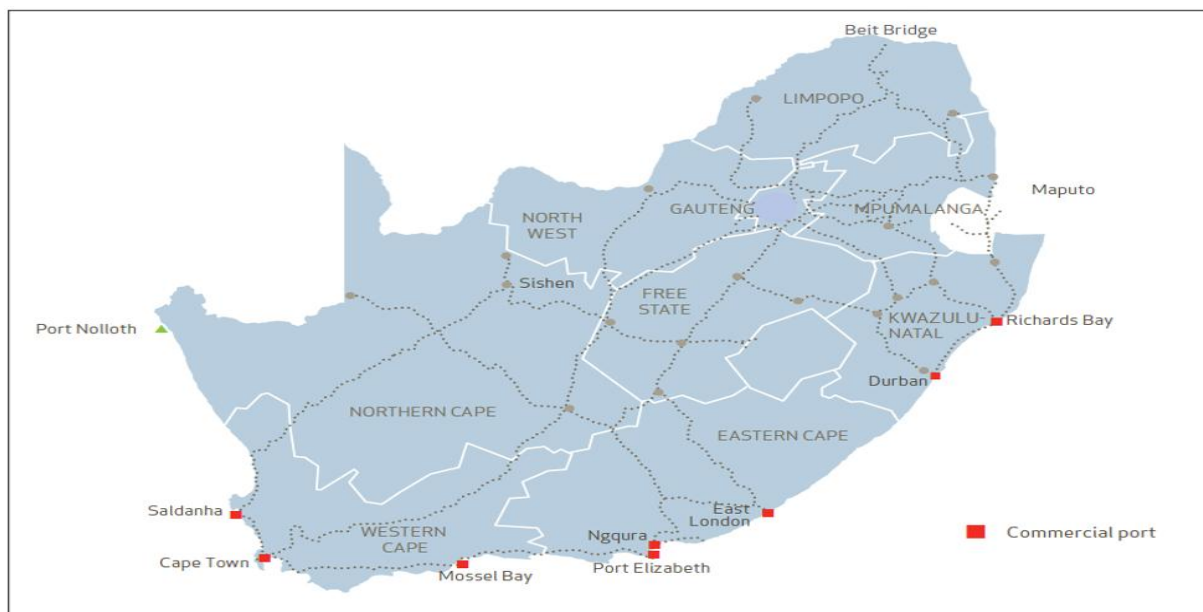


Figure 1: Locations of all Ports.

1.2. Existing buildings, structures, and plant & machinery on the Site

As built drawings (where available) for water reticulation will be provided to the *Contractor* for the specific sites where water meters are to be installed or configured.

1.2.1. Port of Richards Bay

General Description

The Port of Richards Bay is a coal, dry bulk, break bulk & liquid bulk handling port, situated Lat: 28° 48' S, Long: 32° 02' E approximately 160 km north-east of Durban and 465 km south of Maputo on the eastern seaboard of South Africa.



Figure 2: Aerial layout view of Port of Richards Bay

1.2.2. Water

No.	Location
1.	Harbour Main Meter
2.	Bayview Main Meter
3.	Die Duine Main Meter
4.	Government House
5.	Water Gantry
6.	Silver Ocean: Main
7.	Newark: Main
8.	Action Cricket
9.	Tidal Gates (Two Meters)
10.	Chemical Berth Main
11.	300 Series Meter
12.	Baermer
13.	Liquid Pitch
14.	Fedmis Main Meter
15.	Fedmis Fire
16.	Shincell Fire
17.	Shincell Ring Feed
18.	Fermentech
19.	Coaking Coal
20.	IVS: Administration: Small

No.	Location
21.	IVS: Administration: Large
22.	IVS: Gate
23.	IVS: Fire Main
24.	Richards Bay Bunker Terminal
25.	RBCT Main (Hydra substation)
26.	Carriage & Wagon – Departure Yard
27.	Shunters Cabin 124 & 138 – Silver Ocean Road
28.	Shunter's Cabin 139 – Bottom Discharger
29.	Shunter's Cabin 229 – Arrivals Yard
30.	Shunter's Cabin – CoalLink
31.	Shunter's Cabin – Duine Area
32.	Carriage And Wagon – Duine Area
33.	DBT Storage – Mechanical
34.	DBT Storage – Electrical
35.	DBT Storage – Administration
36.	Dry Bulk Terminal Main Meter
37.	DBT – Saxon Road
38.	Mhlathuze Building
39.	Office 2279
40.	Coal Link Locomotive Depot

1.2.3. Electricity

No.	Location
1.	Harbour West
2.	Workshop Substation
3.	Office Substation
4.	Departure Yard Sub
5.	Sort Yard Sub
6.	Liquid Pitch Sub
7.	Arrivals Yard Sub

No.	Location
25.	Osizweni
26.	Pioneer Centre
27.	Port Control
28.	Sorting Yard High Mast Lights
29.	Sorting Yard New Ark Road
30.	Sorting Yard Wayfarers Road
31.	Truck Staging Area

No .	Location
8.	Eastern Intake Sub
9.	Admin Quay
10.	Hydra Yard
11.	Berth 209
12.	South Dunes
13.	Arrivals Yard New Ark Lights
14.	Bayvue Yard High Mast Lights
15.	Berthing Master Northmoore Road
16.	Berth 208 Lights (Medium Masts)
17.	Berth 300 Lights
18.	Departure Yard High Mast Lights
19.	Departure Yard Silver Ocean Lights
20.	Eastern Sub Silver Ocean Lights
21.	Ferro High Mast Lights
22.	Heli Pad Complex
23.	CCTV Technical (Harbour Café)
24.	Maritime Complex

No .	Location
32.	Western Intake Urania & San Road Thom Kiosk
33.	Workshop New Ark & Ventura Roads
34.	WG (Vikela Security/Clinic and Fire dept.)
35.	Bureau Viritas
36.	KNK Curries 3 (new)
37.	Police Boat
38.	Bid Freight (Coal Quay)-Kiosk Berth. Master
39.	Spoornet Trunk Counter
40.	(M & L) TFR Automatic Signals
41.	CCTV TPT
42.	TFR Automated Signals
43.	KNK Curries (1)
44.	Bid freight (New container)
45.	BTT Mess and Ablution
46.	KNK Curries (2)

1.2.4. Port of Durban

General Description

The Port of Durban is one of the largest and busiest port in Africa situated Lat: 29° 53' S, Long: 31° 02' E approximately 1259 km north-west of Cape Agulhas and 1158 km south-west of Maputo on the east coast of South Africa. The port consists of five precincts namely Point, Maydon Wharf, Ship Repair, Durban Container Terminal (Pier 1 & 2) and Island View. The port handles break bulk, dry bulk, liquid bulk, automotive, container and passenger vessels.



Figure 3: Aerial layout view of Port of Durban

1.2.4.1. Water

Excluded.

1.2.4.2. Electricity

No.	Location
1.	Building & Marine Depot (Berth 100)
2.	Shameisher Langerberg (Building & Marine)
3.	Power Supplies and Services Depot
4.	Pollution Control Depot
5.	Lighthouse Department
6.	Workshop 24
7.	Graving Dock
8.	Crane Supply Mini Substation
9.	Building & Marine Depot (Methven Road)
10.	Point Clinic

No.	Location
11.	Bay Terrace Building
12.	Queens Warehouse Building
13.	TNPA Security Maydon Wharf
14.	Cato Creek Yard
15.	Manganese Yard
16.	Hokaido Yard
17.	Fynnland Yard
18.	Tank Washout Yard
19.	Kingsrest Yard

1.2.5. Port of East London

General Description

The Port of East London is located approximately 950 km east of Cape Town and 460 km south of Durban on the eastern seaboard of South Africa. (Lat: 33° 01', 26" S Long: 27° 54', 50" E). The port offers diversified cargo handling facilities for automotive, containers, liquid bulk, dry bulk free flowing grains and general breakbulk.



Figure 4: Aerial layout view of Port of East London

1.2.5.1. Water

No.	Location
1.	Orient Beach TNPA
2.	Buffalo Street
3.	Pontoon Road
4.	Old Guard Post near SA navy
5.	Port Captain
6.	Latimer's Landing
7.	West Bank near B/R/Y/C

No.	Location
21.	Foot Prints
22.	Dept Public Works, Saps
23.	Venue
24.	Car Terminal Complex
25.	Terminal Control Bldg.
26.	Straddle Workshop
27.	Mess/Ablution TPT 4 Quay

No.	Location
8.	Dale Street TNPA
9.	Strand Street Cabin
10.	Strand Street BCM
11.	Strand Street
12.	Grey Stones W/B
13.	EMD Horseshoe
14.	Old Navy Base
15.	Almega College TNPA
16.	Latimer's Complex (Bulk)
17.	El Yacht Club, Orient Pier
18.	Customs House
19.	Latimer's Landing
20.	Shipyard Area
21.	Power Boat Club, MC Arthur
22.	House No. 9
23.	House No. 8

No.	Location
28.	TPT Admin Building, 3 Quay
29.	G Shed
30.	Elevator EL&P
31.	Elevator Building
32.	TPT Office (Old CPO), 4 QUAY
33.	TPT & IT & Bills Office 4 Quay
34.	SHEQ OFFICE On Bank M/Gate
35.	Dry Dock Pump Room
36.	Repair Quay Area
37.	Shop 17 Workshop
38.	Shop 17 M & A
39.	Procurement/Security
40.	MHA Area

1.2.5.2.Electricity

No.	Location
1.	EL Yacht Club
2.	Port Admin Building
3.	Combi Substation
4.	Biblia Building
5.	State Warehouse Sub
6.	C-Berth Building

No.	Location
7.	Sewage Pit Shop 17
8.	Shipwrights W/shop
9.	STBD Kiosk No.1
10.	STBD Sub
11.	M.G Room STBD

1.2.6. Port of Port Elizabeth

General Description

The Port of Port Elizabeth is in Algoa Bay in the Eastern Cape, South Africa. (Lat: 34 ° 01' S (3357, 5 S), Long: 25 ° 42'E (2538, 5 E). The port offers diversified cargo handling facilities for dry bulk, liquid bulk, break bulk and containers, as well as providing facilities for tugs and fishing vessels.



Figure 5: Aerial layout view of Port of Port of Elizabeth

1.2.6.1. Water

No.	Location
1.	Procurement
2.	Security Cabin Green Street
3.	Clinic
4.	SHEQ Building (TPT)
5.	VW Office Opposite Shed 101

No.	Location
57.	Shunters t/s double storey
58.	Shell south africa (pty) ltd
59.	Total oil sa (pty) ltd
60.	Absm crane
61.	Eyethu fishing (pty) ltd

No.	Location	No.	Location
6.	Shunters Cabin (TFR)	62.	Eyethu fishing (pty) ltd
7.	Black impala	63.	Talhado fishing
8.	Rennies group	64.	Fingcorp 113cc
9.	Greystone cargo systems(pty)ltd	65.	Vacant building 1
10.	Bidfreight port operations(pty)ltd	66.	Vacant buiding 2
11.	Bidfreight port operations(pty)ltd	67.	Vacant building 3
12.	J.I. wessels	68.	Vacant building 4
13.	Commercial marine	69.	Cvc building (ablution block)
14.	Cdc commercial divers contractors 015mm	70.	Oreberth 9ablution block)
15.	Security foot bridge	71.	Civil depot
16.	Hr offices / building	72.	Business manager (mpt)
17.	103 tower	73.	Ulwandle (next to oyster)
18.	102 tower	74.	Live fish tanks (east coast)
19.	Security container entrance	75.	Department of public works
20.	103 quay side	76.	Alvodex cc
21.	102 quay side	77.	Pumpstation house (seawater)
22.	Shed 101	78.	Trade motto (1)
23.	Car terminal admin office	79.	Trade motto (2)
24.	Spoornet	80.	Rial buildings(1)
25.	Malgas (tfr)	81.	Rial buildings(2)
26.	National sea rescue institute	82.	Marine services
27.	Stormfire trading 11 cc	83.	Marine services
28.	Tabak	84.	Port admin building (port authority)
29.	Umsobomvu (no 2)	85.	Port control tower (port captain)
30.	Shell south africa marketing(pty)ltd	86.	Minor buildning (offices)
31.	Shell sa (pty) ltd	87.	Minor building ablutions
32.	Extreme projects	88.	Tpt offices
33.	Ds + cl sgacace fishing farming	89.	Shell south africa (pty) ltd
34.	Cvc africa	90.	Talhado fishing enterprise(pty)ltd
35.	Toilet tpm kepli petroleum	91.	P.e. deep sea angling club
36.	Blue water fishing	92.	Shell south africa (pty) ltd
37.	Van niekerk / zandalee	93.	Biblia harbour mission

No.	Location
38.	Kepu petroleum
39.	Algoa bay sailing marina
40.	Albatross off shore services (pty)ltd
41.	Albatross (by the toilets)
42.	Rail to rail - red grouwa (no.1)
43.	Rail to rail (no.2)
44.	Camanga
45.	Blue water fish traders
46.	Bereau veritus
47.	Tankerberth control room
48.	Tankerberth security cabin
49.	Rial buildings (3)
50.	Engen petroleum limited
51.	Shell south africa (pty) ltd
52.	Chevron south africa (pty) ltd
53.	Umsobomvu
54.	Finance building
55.	Bus depot (clinic)
56.	Shed 12 tpt ablution

No.	Location
94.	Talhado fishing
95.	Tnpa lighthouse services
96.	Plot no.1 (shop17) breakeven
97.	Zwembesi farm
98.	Bpo
99.	Cargo
100.	Ore berth control tower
101.	Eyethu fishing (pty) ltd
102.	Siyaloba fishing academy
103.	Fpt port leasing
104.	Technical manager (shop 17)
105.	Technical manager
106.	Tipplers
107.	Shell south africa (pty) ltd
108.	Talhado fishing enterprise (pty) ltd
109.	Oil sites main supply
110.	Baakens main supply
111.	Jetty main supply

1.2.6.2.Electricity

No.	Location
1.	Talhado
2.	Live fish tank
3.	Turntable
4.	Fire Department (Marine House)
5.	Ore Berth west Substation
6.	Oil Site Substation
7.	Green street
8.	Rail Substation
9.	Main Intake Substation (opposite fire dep)
10.	Kiosk at Jetty entrance

No.	Location
22.	Red Ground
23.	Extreme Project
24.	Light house Department
25.	Switch room Behind clinic
26.	Civil Depot
27.	Shed 10
28.	Shed 11
29.	Shed 12 pump house
30.	Old Navy (Entrance)
31.	Ore berth west substation

No.	Location
11.	Metering panels citrus substation (FTP)
12.	Admin Building Substation
13.	Charl Malarn Quay Mini Sub
14.	CAE garage
15.	Main Intake Substation
16.	Switch room behind Clinic
17.	Albatios No 1 Quay
18.	Malgas Kiosk
19.	Procurement building
20.	Admin Building Substation
21.	Green Street Substation

No.	Location
32.	Malgas kiosk
33.	Dom pedro (Tunnel)
34.	Ore berth west
35.	Orange kiosk
36.	Ship way café
37.	Siyaloba
38.	NSRI Building
39.	PE yacht (Marina)
40.	Bakkens kiosk
41.	Slip way

1.2.7. Port of Ngqura

General Description

The Port of Ngqura is a world-class Deepwater container transshipment hub that has been dubbed the heartbeat of the Eastern Cape economy. Situated in Algoa Bay, 20 km north-east of Port Elizabeth, it is the newest port in the South African port system midway between Durban and Cape Town. This industrial port, which became operational in 2009, is located in the Coega Special Economic Zone (SEZ). The port offers diversified cargo handling facilities for containers, dry bulk & liquid bulk.



Figure 6: Aerial layout view of Ngqura

1.2.7.1. Water

No.	Location
1.	NMBM
2.	Main Ent. Zone 1 (B1)
3.	Main Port Entrance (C1)
4.	Main Port Entrance (C2)
5.	Main Port Entrance (C3)
6.	Joorst Park Offices (D)
7.	NCT Trailer Park (G1)
8.	NCT Trailer Park (G2)
9.	NCT Entrance (F)
10.	NCT Exit (Sec) – (H)
11.	NCT Entrance (Sec) – (I)
12.	NCT Help Desk (J)
13.	NCT Admin Building (K)

No.	Location
14.	NCT Terminal Supply Nort Rail (L)
15.	NCT Hauler Zone (N)
16.	NCT Workshop (S)
17.	Sand Bypass Main Pump Station (E)
18.	BP1 (M)
19.	BP2 (T)
20.	BP3 (P)
21.	TNPA Admin Building (V)
22.	(U)
23.	(R)
24.	Port Control (O)
25.	ACB Admin (Q)

1.2.7.2. Electricity

No.	Location
1.	Substation M100 – HV Switch Room Area
2.	Administration Building – LV Panel
3.	E Mendi Building – LV Distribution Board
4.	Substation 001
5.	Substation 002
6.	Substation ACB - LV Room
7.	ACB Building – LV Switch Room
8.	Port Control Building – HV Switch Room
9.	AMS Substation – LV Switch Room
10.	Sand Bypass MPS, BPS 1, and BPS 3 – LV Switch Room
11.	Clear Water Intake
12.	Finger Jetty Mini-Substation
13.	B100 Mini-Substation
14.	Substation M100 – HV Switch Room
15.	Administration Building – LV Panel
16.	E Mendi Building – LV Distribution Board
17.	Substation 001
18.	Substation 002
19.	Substation ACB – LV Switch Room
20.	ACB Building – LV Switch Room

No.	Location
24.	Clear Water Intake
25.	Finger Jetty Mini-Substation
26.	B100 Mini-Substation
27.	Admin Craft Basin
28.	Booster Pump No.2
29.	Booster Pump No.3
30.	Port Admin LV Board
31.	Port Control LV Board
32.	Booster Pump No.1
33.	Clear water
34.	AMS - Transformer 1
35.	AMS - Transformer 2
36.	TPT Kiosks
37.	Cemza Kiosks 2
38.	B100 Kiosk G
39.	Vanguard Kiosk
40.	Vodacom Site
41.	MTN Site
42.	TFR site
43.	B100 - CDC-Black wayleave

No.	Location
21.	Port Control Building – HV Switch Room
22.	AMS Substation LV Switch Room
23.	Sand Bypass MPS, BPS 1, and BPS 3 – LV Switch Room

No.	Location
44.	Cemza 3 kiosks
45.	TPT Quay Side Building

1.2.8. Port of Mossel Bay

General Description

The Port of Mossel Bay, situated (34° 10' S 22° 09 E) approximately 400km East of Cape Town, is the only South African port that operates two offshore mooring points within port limits. The main commodities handled are petroleum products exported through the offshore moorings and fish products from the fishing industry of the region. It also serves as an offshore supply vessel base for one of its key clients, PetroSA.



Figure 7: Aerial layout view of Port of Mossel Bay

1.2.8.1. Water

No.	Location	No.	Location
1.	MZR 181 Flames Area	37.	Sea Gypsy
2.	Flames Restaurant	38.	Biblia
3.	Car Wash	39.	Gate 1 Guard House
4.	Station Complex (Check Meter)	40.	Border Management Agency
5.	Bedding Stores	41.	Luna Moon
6.	Station 1	42.	PetroSA Office
7.	Station 2 Laparon	43.	PetroSA Mess & Ablution
8.	Old Electrical Workshop	44.	Meg Plant (Tanks)
9.	Station Platform	45.	Long shed (PetroSA) Q4
10.	GZR 257 Bridge Bulk (Quay 4) Dependants	46.	Quay Side Point 1 (Charlie)
11.	Recreational Slipway Office	47.	Quay Side Point 2 (Bravo)
12.	Recreational Brick Building Ablutions TNPA	48.	Quay Side Point 3 (Alpha)
13.	Mobile Toilets TNPA	49.	UZR 752 Bulk Meter (Viking Area)
14.	WAG/Steakhouse	50.	Blue Shed
15.	KAAI 4	51.	Afro Fishing 2 (Old I & J Site) On quay side
16.	London Bus/Oyster Bar	52.	Viking Fishing
17.	Waterfront 1	53.	Gate No 3 TNPA
18.	Waterfront 2	54.	Kepu Site
19.	Romonza	55.	Common User Quay No 3 TNPA Supply Point
20.	Minoli	56.	NSRI
21.	Gate No 2	57.	Tuck Shop
22.	Good Shed	58.	Slipway
23.	F/H Supply Bulk meter (Station Platform)	59.	Administration Building (TNPA)
24.	Check Meter for VJ	60.	Vincent Jetty Quay Side Supply @ Romonza
25.	VJ Security Guardhouse	61.	Marine Park Home
26.	TNPA Marine Supply Point Artic Turn	62.	Pioneer 1
27.	TNPA Marine Supply Point Snipe	63.	Pioneer 2
28.	Smit Amanadla	64.	Lucky Star

No.	Location
29.	VJ Quay Side Supply Pnt #1
30.	VJ Quay Side Supply Pnt #2
31.	VJ Quay Side Supply Pnt #3
32.	VJ Quay Side Supply Pnt #4
33.	Sliding door
34.	Store Racks
35.	Wash Bay
36.	Tsisa yama

No.	Location
65.	Walk on Moorings (TNPA)
66.	Wash bay (TNPA)
67.	Bulk meter
68.	Blue Door
69.	Mozambiek
70.	Ladies Ablutions (TNPA)
71.	Men's Ablutions (TNPA)
72.	Aquamarine

1.2.8.2.Electricity

No.	Location
1.	Yatch Club (Municipality Feeder)
2.	Yatch Club
3.	Recreational Area
4.	Recreational Area
5.	Main Substation LV Switch Room
6.	Station Area – Kiosk F
7.	Station Area – Kiosk E
8.	Petro SA Kiosk
9.	Ikamva Mini Substation
10.	MSB Mini Substation - Tenant
11.	MSB Mini Substation - TNPA
12.	Seavuna Mini-Substation (LV)
13.	Seavuna Mini-Substation (Main Feeder)

No.	Location
14.	Seavuna Mini-Substation B (LV)
15.	Seavuna Mini-Substation B (Main Feeder)
16.	Seavuna Shore Supply – Box No.1
17.	Seavuna Shore Supply – Box No.2
18.	Vincent Jetty Mini-Substation
19.	Vincent Jetty Kiosk
20.	Vincent Jetty Shore Plugs
21.	Civil Workshop Switch Room
22.	Slipway Kiosk G
23.	Municipality Kiosk
24.	Security Gates

1.2.9. Port of Cape Town

General Description

The Port of Cape Town is the premier port for the Western Cape region (S 33.9095 and E 18.4356). The port is well-equipped to provide world-class service to a variety of sectors, including containers, liquid bulk, dry bulk, break-bulk, fresh produce and fishing (including international operations and exports), as well as the burgeoning offshore oil and gas industry.



Figure 8: Aerial layout view of Port of Cape Town

1.2.9.1. Water

No.	Location
1.	NPA House out building (Plan room & toilet)
2.	Security hut - A Berth
3.	Corner A & B Berth tunnel.

No.	Location
154.	FFS
155.	FFS
156.	Cape Town Bulk Storage (pty) Ltd FFS

No.	Location	No.	Location
4.	Ferro-marine - A Berth - Ablution	157.	Cape Town Bulk Storage (pty) Ltd
5.	Ferro-marine - A Berth - Admin office	158.	Elliott Basin security bldg
6.	NPA House	159.	Dorbyl Marine (pty) Ltd.
7.	A Berth area.	160.	Dorbyl Marine (pty) Ltd.
8.	Corporate Affairs - B Berth	161.	Dorbyl Marine (pty) Ltd (right next to workshop)
9.	IT - Opp Corp Affrs - vacant	162.	Dorbyl Marine (pty) Ltd (right next to workshop)
10.	Training Centre	163.	Dorbyl Marine (pty) Ltd (workshop) (inside building)
11.	Fresh Produce Term. (in manhole on B/C Berth)	164.	Globe Engineering (fire main)
12.	Fresh Produce Term. (in manhole on B/C Berth)	165.	Globe Engineering (domestic main)
13.	Fresh Produce Terminals Cape Town.	166.	Globe Engineering
14.	Fresh Produce Terminals Cape Town. (On balcony)	167.	Elliott Basin ring feed meter
15.	B-C Berth (Tunnel - sprinkler system) - FPT	168.	Indo Atlantic Fishing (SHIPPING)
16.	Fresh Produce Term. (Against wall-inside D Shed)	169.	Theodore Luis Camara
17.	Long Line Tuna Corporation (pty) Ltd	170.	Mechanical workshop
18.	Portside Stevedoring Services offices.	171.	Shop 24
19.	SA Police / Dept.of Public Works	172.	Shop 24 mess & ablution for general workers.
20.	South Arm Rd Security building	173.	Farocean marine (Damen Shipping)
21.	CCC Municipal water meter at Dock Road.	174.	Bassticks
22.	Transnet Projects RME (Bruce)	175.	Damen Shipping (Back yard).
23.	Svitzer Wijsmuller (inside Filing room)	176.	Panama Jacks (pty) Ltd
24.	Svitzer Wijsmuller	177.	Damen
25.	Bid freight.	178.	Royal Cape Yacht Club (meter that supplies yachts)
26.	SA Stevedores	179.	Royal Cape Yacht Club (meter that supplies yachts)
27.	SA Stevedores / Lighthouse Martinet Ind.Eng.CC	180.	Royal Cape Yacht Club (members public toilet)
28.	Magmaster (Lighthouse) (INCOMING)	181.	Security hut Quay 500
29.	Magmaster (Lighthouse) (REVERSE)	182.	Quay 500 Polution.

No.	Location
30.	Magmaster (Lighthouse) (NETT INCOMING)
31.	Lighthouse Services
32.	SA Stevedores (Melfra)
33.	Robben Marine / SA Stevedores
34.	Safbulk (pty) Ltd
35.	Atlotech (pty) Ltd - offices
36.	Atlotech (pty) Ltd - workshop
37.	Mission to seamen in SA
38.	Electrical workshop
39.	Elect. Depot Mess & Ablution.
40.	Berthing Office
41.	P&O Ports Nationwide Cargo Terminal SA (pty) Ltd.
42.	Cowrie place (MPT) - Bon 1
43.	Cowrie place (MPT) - Bon 1
44.	Ship Society of SA / Port Services (pty) Ltd - Bon 1
45.	Christelike Seemans Organisasie - D Mast Bon 1
46.	Marine Operations Manager - Dock Master Bon 1
47.	Dockland
48.	Control Point 26 (Spoornet)
49.	Security Hut (Heerengracht Entrance)
50.	Maritime Training (Ex Creche)
51.	Spoornet (Heerengracht Entrance)
52.	Die Evangelie aan die seelui.
53.	Training Centre for Seamen.
54.	Eastern deli
55.	SHEQ building
56.	Pirow St. Security building

No.	Location
183.	Ro-Ro Pier (Quay 500) Mountain side
184.	Ro-Ro Pier (Quay 500) Seaside
185.	WBHO Work site (Panama Jacks)
186.	Damen Shipping (Panama Jacks side)
187.	WBHO Container (Medite bldg.)
188.	Civil Store under BS bridge
189.	Crest Chemicals
190.	Crest Chemicals
191.	Lusitania Frozen Goods Container Road
192.	Lusitania Frozen Goods Container Road
193.	Lusitania Frozen Goods Container Road
194.	R.J.Sauthey (Scaffolding)
195.	Old Container link (Grindrod Logistics) (SACD)
196.	Caltex service station Marine Drive
197.	TCP (Ismail)
198.	Security gate NPA Paarden Eiland
199.	Joint Bunkering Services Container Road
200.	Shmidthausen
201.	Y & L Frozen Fish Enterprises Container Road
202.	Y & L Frozen Fish Enterprises Container Road
203.	M.M.Hilario
204.	BSD Weigh bridge
205.	BSD Weigh bridge
206.	Container Terminal drivers mess & ablution. (Reverse)
207.	Container Terminal drivers mess & ablution.
208.	Security bldg (Quay 700)
209.	WBHO Site office (Quay 700)

No.	Location	No.	Location
57.	E-Berth Shed(Cold Store)	210.	SAPO ski-cabin
58.	E-Berth Shed (Passenger Terminal)	211.	Vehicle Testing Centre (old) (Kershaw 073 257 1736)
59.	E-Berth Shed (Passenger Terminal)	212.	Vehicle Repair Centre (Freight Dynamics)
60.	E-Berth Shed (Passenger Terminal)	213.	Container Fruit Terminal (inside Fire Control room)
61.	E-Berth Shed (Passenger Terminal)	214.	Helicopter Africa (pty) Ltd
62.	F-Berth Security bldg.	215.	Makhulu
63.	Weighbridge (F Berth)	216.	Blastrite (pty) Ltd
64.	Duty Free Shop	217.	Road to Rail building
65.	Heribi House	218.	Spoornet (Bay Road)
66.	SA Stevedores (Port Services) - ex gardener bldg	219.	Tryang Trading Import & Export (Pty) Ltd
67.	Combi Terminal bldg.	220.	Optimal Maintenance services CC
68.	G-Berth Shed (New meter)	221.	Raw Engineering CC
69.	G-Berth Shed (Against inside wall)	222.	Helicopter Heli Pad Cold Storage
70.	G-Berth mess & ablution.	223.	Transea Shipping Services (Pty) Ltd
71.	G-Berth Quay office	224.	Etlin International (pty) Ltd (Cape Cold Storage)
72.	H-Berth Security kiosk	225.	Etlin International (pty) Ltd (Cape Cold Storage)
73.	H-Berth Shed	226.	PIP Site main meter (Entrance)
74.	H-Berth Shed	227.	PIP Site main meter (Entrance)
75.	H-Berth mess & ablution	228.	SACD PIP Site
76.	J-Berth mess & ablution	229.	SACD PIP Site
77.	J-Berth Shed	230.	Eskom PIP site
78.	J-Berth Shed	231.	East Coast Containers
79.	J-Berth store & Toilets	232.	CCC Municipal water meter at Marine Drive.
80.	Operations Rail to rail control block offices	233.	Magmaster (INCOMING)
81.	Forklift depot	234.	Magmaster (REVERSE)
82.	L-Berth Mess & Ablution bldg	235.	Magmaster (NETT INCOMING)
83.	L-Berth Security bldg.	236.	Two Oceans Boat Sales Marine Drive
84.	J-Berth Security kiosk	237.	Province Log Cabins Marine Drive
85.	Commercial Cold Store (Duncan Dock) (pty) Ltd	238.	RME is occupying a site next to House of Cabin.

No.	Location	No.	Location
86.	Commercial Cold Store (Duncan Dock) (pty) Ltd	239.	Shop 17
87.	SAS Unitie M-Berth	240.	Shop 17
88.	SAS Unitie M-Berth	241.	Shop 17
89.	Security hut (M-Berth)	242.	Shop 17
90.	Boss marine	243.	Civil Depot watermain
91.	Resource Ballast	244.	Civil Depot watermain
92.	RCYC Water supply to ships.	245.	Roro Control office & abl. BSD
93.	Security hut. - Repair Pier?	246.	Old SACD site (TCP - Bert)
94.	RCYC (inside repair area)	247.	New Container Entrance to Terminal
95.	RCYC (inside repair area)	248.	Old Mediterranean Shipping building
96.	RCYC (entrance - inside)	249.	Quay 501 Container control office & abl. BSD
97.	RCYC (entrance - outside)	250.	TBC – To be Confirmed
98.	RCYC (kitchen area)	251.	Quay 601 Container control office & abl. BSD
99.	Sailing School (RCYC)	252.	TBC – To be Confirmed
100.	International Yacht Brokers Cape (pty) Ltd	253.	Quay 602 Container control office & abl. BSD
101.	Spoornet (opposite RCYC)	254.	TBC – To be Confirmed
102.	Globe Engineering Works (pty) Ltd	255.	Quay 603 Container control office & abl. BSD
103.	Misplon bridge Security building	256.	Quay 604 Container control office & abl. BSD
104.	JJ van Greunen	257.	TBC – To be Confirmed
105.	De Beers	258.	Quay 602 Container control office & abl. BSD seaside
106.	Harbour Weld	259.	Container Terminal building
107.	Fusion Hydraulics CC	260.	Chevron (Tanker Basin Cross Berth)
108.	MRH	261.	Joint Bunkering Services (TBXB)
109.	NNA	262.	Quay 502 Container control office & abl. BSD
110.	SGB Scaffolding	263.	WBHO (Quay 613).
111.	Hazard Marine CC	264.	WBHO (PIP Site)
112.	Marine manager CC Propnet	265.	PIP Site (S a fence & Gate)
113.	Quantum leap	266.	WBHO (Area 340 B.S.D.).
114.	Cape Diving (Pty) Ltd	267.	PIP site (Christopher Clement)

No.	Location
115.	NPA Staff SDD ablution (Grant Walker-Dockmaster)
116.	Dock Master's office
117.	ALBATROSS (trevshan)
118.	Globe Engineering (office block & Ablution).
119.	Supply pipe for lessees in SSD area.
120.	Security hut SSD boom entrance
121.	The Pure Cane Molasses Co.
122.	The Pure Cane Molasses Co.
123.	Elekt. Werkwinkel
124.	Taipei Liaison office
125.	Taipei Liaison office
126.	Taipei Liaison office
127.	South East Marine services (pty) ltd
128.	Nautilus (pty) ltd
129.	Nautilus (pty) ltd
130.	Nautilus (pty) ltd
131.	Marine Slops (pty) ltd
132.	Albatross Offshore Services
133.	To be confirmed
134.	Elgin Brown Hamer (pty) ltd
135.	Security hut SSDb
135.	Watermain feeding Landing Wall.
137.	Crossberth Marine Investments (pty) ltd
138.	Crosberth Fire Main
139.	Globe Engineering Works (pty) ltd
140.	Feedline to Caltex area.
141.	Security hut Tanker basin
142.	Caltex Oil SA (pty) ltd
143.	BP, Caltex, SA Energy Co, Shell (JBS)
144.	Fire Dept. Tanker basin 2 - NPA

No.	Location
268.	PROTICON CONTAINERS
269.	Q 501 (SECURITY) ROBBEN EILAND
270.	PIP SITE NEW SECURITY BLDG
271.	DAMEN SPRAY ROOM
272.	Etlin International (pty) ltd (Cape Cold Storage) Heli pad
273.	CONTAINER X-RAY
274.	SJW CIVILS
275.	Servest Marine
276.	Shounters Kiosk Blue Store
277.	Washing Bay TPT
278.	De Beers @ L-Berth
279.	Construction @ Eastern Mole
280.	Construction @ Eastern Mole
281.	Construction @ Eastern Mole
282.	Construction @ Eastern Mole
283.	Next to old Fire
284.	FFS New Buildings
285.	FFS New Buildings
286.	FFS New Buildings
287.	Next to bridge @ Eastern Mole
288.	Security Building (Quay 500) new meter
289.	TBC – To be Confirmed
290.	Ams Construction (Ocean Road)

No.	Location
145.	Fire Dept. (Steel scrap yard - Reclaimed Area).
146.	Caltex Oil SA (pty) ltd
147.	Caltex Oil SA (pty) ltd
148.	Pump room on Eastern Mole No.2
149.	Mess & Ablution on Eastern Mole No.2.
150.	Toilet on Eastern Mole No.2.
151.	Telkom SA ltd
152.	Telkom SA ltd
153.	Standpipe TAP

No.	Location

1.2.9.2.Electricity

No.	Location
	Verified on-site

No.	Location

1.2.10. Port of Saldanha

General Description

The Port of Saldanha is a dry bulk ore & liquid bulk handling port situated on the west coast of South Africa (lat: 33° 0'58.86"S, long: 17°59'23.35"E). It is the deepest and largest natural port in Southern Africa.



Figure 7: Port of Saldanha Aerial View

1.2.10.1. Water

No.	Location
1.	Municipal Main Meter
2.	Fire / Clinic 2
3.	IDZ Area 1
4.	Kumba
5.	Security
6.	Customs
7.	THB Shipping
8.	Tippler 1&2
9.	Washbay

No.	Location
27.	Berthing Services
28.	Iron Ore Jetty
29.	SFF Terminal
30.	OSSB 1 - Old North Supply
31.	OSSB 2 - Southern Supply
32.	Sokhana
33.	FMA
34.	TNPA Bayvue Precinct
35.	Municipal Bayvue

No.	Location
10.	New Security Bld
11.	Haul Road Security
12.	Sunrise
13.	IDZ Area 2
14.	Tippler 3 Stockpile RO Supply
15.	Tippler 3 Main Line
16.	Stockpile 1
17.	Stockpile 2
18.	MPT Main
19.	MPT Admin
20.	MPT Quay
21.	Sampling Plant
22.	RO Plant 1
23.	RO Plant 2
24.	OPCSA
25.	IOT Shop
26.	Municipal Main Meter

No.	Location
36.	Municipal SCH
37.	SAMSA
38.	Port Control
39.	Club House
40.	Yacht Port
41.	Marine Services
42.	Lighthouse Services
43.	Caisson 6 - Vessel Meter
44.	Caisson 9 - Vesel Meter
45.	Caisson 11 - Vessel Meter
46.	SFF Fire Hydrant
47.	Main Entrance Garages
48.	OSSB - New Northern Supply
49.	Bayvue Rec Centre
50.	Infra Depot
51.	Bayvue Admin Building

1.2.10.2. Electricity

No.	Location
1.	Mini-Sub 3 -Fire & Clinic Building
2.	Hostels
3.	Bayvue Centre
4.	Recreation Centre
5.	Port Control
6.	OSSB Port Terminal
7.	Port Terminal Entrance

No.	Location
8.	FMA Site Substation
9.	Substation G –Shore Supply 5
10.	Substation G –Shore Supply 7
11.	Substation G –Shore Supply 8
12.	Substation G –Shore Supply 9
13.	Substation G –Shore Supply 10
14.	SAMSA Main DB – Office Building

1.3. Hidden services

The areas where works is to be carried out consists of underground services such as water pipes, electrical cables, sewer lines and product pipelines. The Contractor should ensure that it does not damage any nearby services such as electrical cables and pipelines. The Contractor exercises due care and attention in carrying out any excavation work to avoid damage or disruption to existing services.

1.4. Access limitations

It is important to note that some precincts are operational areas. Transnet operations take priority over any *Contractor's* work. The *Employer* will arrange for the required access permits and issue them to the Contractor when required. Should any of Contractor's personnel lose access permit these will be replaced at a cost set by the Employer, to be paid by the Contractor. The Employer has a strict Health and Safety policy in place. No persons may enter the site and undertake work on site until they have undergone the mandatory Employer's site induction.

TRANSNET APPROVED LIST OF GUARANTORS

NAME OF FINANCIAL INSTITUTION
Absa Bank
FirstRand Bank
Investec Bank Ltd
Nedbank Ltd
Standard Bank
Bank Of America, N.A
African Import-Export Bank
Bank Of China Limited
Barclays Bank Plc
BNP Paribas
China Construction Bank
China Development Bank
Citibank
Credit Suisse
Deutsche Bank
Goldman Sachs International
HSBC Holdings
JPMorgan Chase Bank
Morgan Stanley

NAME OF FINANCIAL INSTITUTION
Macquarie Bank Limited
Societe Generale Bank
Standard Chartered Bank
International Banks
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

TRANSNET NATIONAL PORTS AUTHORITY

TENDER NUMBER: TNPA/2025/02/0002/89478/RFP

DESCRIPTION OF THE WORKS: SUPPLY AND INSTALLATION OF SMART WATER AND ELECTRICITY METERS WITH A SOFTWARE SOLUTION (UTILITIES MANAGEMENT) ACROSS THE EIGHT PORTS.



NAME OF FINANCIAL INSTITUTION
Bryte Insurance Company Ltd
Credit Guarantee Insurance Corporation
Guardrisk Insurance
Hollard Insurance Company
Infinity Insurance
Lombard Insurance Group
Mutual & Federal
Renasa Insurance Company
Santam
Yard Insurance Limited