

TENDER NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

Transnet National Ports Authority

an Operating Division **TRANSNET SOC LTD**

[Registration Number 1990/000900/30]

TENDER

FOR THE: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF 24 MONTHS.

TENDER NUMBER	: TNPA/2024/11/0006/82453/RFP
ISSUE DATE	: 28 October 2025
COMPULSORY BRIEFING	: 11 November 2025
CLOSING DATE	: 01 December 2025
CLOSING TIME	: 16:00
TENDER VALIDITY PERIOD	: 12 weeks from closing date

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(002)

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1.0



T1.1 TENDER NOTICE AND INVITATION TO TENDER

SECTION 1: NOTICE TO TENDERERS

1. INVITATION TO TENDER

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

It is estimated that tenderers must have a CIDB grading of **9ME**; however, components requiring 7CE, 6EP, and 5GB classifications shall be executed by contractors who are registered in the appropriate grade and class of works in compliance with CIDB regulations.

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TENDER DOWNLOADING	This Tender may be downloaded directly from the National Treasury eTender Publication Portal at www.etenders.gov.za and the Transnet website at https://transnetetenders.azurewebsites.net (please use Google Chrome to access Transnet link) FREE OF CHARGE.
COMPULSORY TENDER CLARIFICATION MEETING	A Compulsory Tender Clarification Meeting will be conducted at TNPA Admin building, 55 Bland Street, Mossel Bay, on 11 November 2025, at 10:00am [10 O'clock] for a period of ± 3 (three) hours. [Tenderers to provide own transportation and accommodation]. The Compulsory Tender Clarification Meeting will start punctually, and information will not be repeated for the benefit of Tenderers arriving late. A Site visit/walk will take place, tenderers are to note: • Tenderers are required to wear safety shoes, goggles, long sleeve shirts, high visibility vests and hard hats. • Tenderers without the recommended PPE will not be allowed on the site walk. • Tenderers and their employees, visitors, clients and customers entering Transnet Offices, Depots, Workshops and Stores will have to undergo breathalyser testing. • All forms of firearms are prohibited on Transnet properties and premises. • The relevant persons attending the meeting must ensure that their identity documents, passports or drivers licences are on them for inspection at the access control gates. Certificate of Attendance in the form set out in the Returnable Schedule T2.2-01 hereto must be completed and submitted with your



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	Tender as proof of attendance is required for a compulsory site meeting and/or tender briefing. Tenderers are required to bring this Returnable Schedule T2.2-01 to the Compulsory Tender Clarification Meeting to be signed by the <i>Employer's</i> Representative. Tenderers failing to attend the compulsory tender briefing will be disqualified.
DEADLINE FOR CLARIFICATION	All questions or queries should be submitted onto the system (Transnet e-tender portal) or TNPATenderenquiries3@transnet.net by 25 November 2025 at 12:00. No questions or queries will be attended to after the specified date and time.
CLOSING DATE	16:00 on 01 December 2025 Tenderers must ensure that tenders are uploaded timeously onto the system. If a tender is late, it will not be accepted for consideration.

2. TENDER SUBMISSION

Transnet has implemented a new electronic tender submission system, the e-Tender Submission Portal, in line with the overall Transnet digitalization strategy where suppliers can view advertised tenders, register their information, log their intent to respond to 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 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 or numerical characters shall be used in filenames.**
- b) The tender offers to this tender will be opened as soon as possible after the closing date and time. Transnet shall not, at the opening of tenders, disclose to any other company any confidential details pertaining to the Tender Offers / information received, i.e. pricing, delivery. The names and locations of the Tenderers will be divulged to other Tenderers upon request.
- c) Submissions must not contain documents relating to any Tender other than that shown on the submission.

3. CONFIDENTIALITY

All information related to this 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 award the tender to the highest scoring Tenderer/s unless **objective criteria** exist that justify the award to another Tenderer. Transnet may apply Objective Criteria in this tender process as follows:

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- Tenderer(s) 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;
 - There is clear, uncontrived and/or overwhelming evidence and/or facts that the Tenderer has or continues to be in breach of any of the provisions contained in the Integrity Pact;
 - The Probity check undertaken by Transnet National Ports Authority establishes the existence of any unmitigated risks which would have a negative impact on the project;
 - Unless the appointment of the Tenderer would result in a negative impact on Transnet's Return on Investment;
 - It is necessary to rotate Suppliers to promote opportunities for other suppliers, in circumstances where the Tenderer has been awarded business previously and the award of the tender will result in inequitable allocation of business;
 - The tenderer or its members, directors, partners:
 - Is under restrictions as contemplated in the Integrity Pact;
 - Is a 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;
 - in relation to the proposed contract, a due diligence exercise to validate the Tenderer's proposal that demonstrate 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;
 - has no legal capacity to enter into the contract;
 - is insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, being wound up, has its affairs administered pursuant to a court order, has ceased or suspended their business activities, or is subject to legal proceedings in respect of any of the foregoing;
 - does not comply with the legal requirements, if any, stated in the tender data; and
 - is not able to perform the contract free of conflicts of interest.

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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

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

Tenderer are required to provide the following to Transnet in order to enable it to verify information on the CSD:

Supplier Number (MAAA.....)

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



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SECTION 1: SBD1 FORM

PART A

INVITATION TO TENDER

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

TENDER NUMBER:	TNPA/2024/11/0006/82453/RFP	ISSUE DATE:	28/10/25	CLOSING DATE:	01/12/25	CLOSING TIME:	16:00
DESCRIPTION	REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS						

TENDER RESPONSE DOCUMENTS SUBMISSION

RESPONDENTS ARE TO UPLOAD THEIR TENDER RESPONSE PROPOSALS ONTO THE TRANSNET SYSTEM AGAINST EACH TENDER SELECTED (please refer to Annexure B1 for a detailed process on how to upload submissions):

<https://transnetetenders.azurewebsites.net>

TENDERING PROCEDURE ENQUIRIES MAY BE DIRECTED TO		TECHNICAL ENQUIRIES MAY BE DIRECTED TO:	
CONTACT PERSON	Nondyebo Sibindlana-Tambula	CONTACT PERSON	Nondyebo Sibindlana-Tambula
E-MAIL ADDRESS	tnpatenderenquiries3@transnet.net	E-MAIL ADDRESS	tnpatenderenquiries3@transnet.net

SUPPLIER INFORMATION

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

B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX] ☐ Yes ☐ No	B-BBEE STATUS LEVEL SWORN AFFIDAVIT	[TICK APPLICABLE BOX] ☐ Yes ☐ No
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) 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]
QUESTIONNAIRE TO TENDERING FOREIGN SUPPLIERS			
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? ☐ YES ☐ NO			
DOES THE ENTITY HAVE A BRANCH IN THE RSA? ☐ YES ☐ NO			
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? ☐ YES ☐ NO			
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? ☐ YES ☐ NO			
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? ☐			
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 1.3 BELOW.			

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PART B

TERMS AND CONDITIONS FOR 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 TENDER.**
- 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 TENDERER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.**



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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.

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 is</i> 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: Name: Commodity Specialist Nondyebo Sibindlana-Tambula Address: Transnet National Port Authority N2, Neptune Road Off Klub Road Street Port Of Ngqura 6212 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 – Test for Responsiveness:

Step 1: Administrative and Substantive Responsiveness

- Validate whether the bid has been lodged on time;
- Verify whether all returnable documents and/or schedules [where applicable] were completed and returned by the closing date and time;
- Verify the validity of all returnable documents;

Check if the mandatory returnable documents are submitted:

- An authorized 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.
- CIDB grading 9ME
- Technical Pre-Qualification - Professional registrations of the Construction Project Manager (Pr. CPM) or PMP and Construction Manager (Pr. CM) registered with South African Council for the Project and Construction Management Profession (SACPCMP) or in the case of a PMP – registered with the Project Management Institute – USA (PMI-USA) and a Trade test for the Mechanical Technician/ artisan.
- A fully completed Bill of Quantities.
- A fully completed and signed Form of Offer and Acceptance.

Step 2 – Eligibility Criteria

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 C2.7

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 a **9ME** class of construction work, are eligible to have their tenders evaluated; however, components requiring 7CE, 6EP, and 5GB CIDB classifications shall be executed by a contractor registered in the appropriate CIDB grade and class in compliance with CIDB regulations.

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 **9ME** class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations

The tenderer shall provide a copy of its signed joint venture agreement.



3. Technical Pre-Qualification for the Professional registrations of key personnel responsible for the execution of this project.

Key Personnel	Registration	Yes / No
Project Manager registered with SACPCMP in the category (Pr.CPM,) or registered with PMI USA as a PMP	Pr CPM/ PMP	
Construction Manager registered with SACPCMP in the category (Pr.CM)	Pr CM	
Mechanical Technician/ artisan	Trade Tested	
HSE Officer registered with SACPCMP in the category (CHSO or CHSM)	SACPCMP Registered	

NOTE: Registrations in the "Candidate" category will not be considered.

4. A fully completed Bill of Quantities
5. A fully completed and signed Form of Offer and Acceptance

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

The test for responsiveness [Step One] must be passed for a Tenderer to progress to the next stage of evaluations.

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 score for functionality is **60 points**.

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.

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

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

C.2.12 No alternative tender offers will be considered.

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

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

Identification details:

The tender documents must be uploaded with:

- Name of Tenderer:
- Contact person and details:
- The Tender Number: TNPA/2024/11/0006/82453/RFP
- The Tender Description: Rehabilitation of the Ship Repair Facility in the Port of Mossel Bay for a period of 24 Months.

Documents must be marked for the attention of:

Employer's Agent:

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 **01 December 2025**

Location: The Transnet e-Tender Submission Portal:

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

NO LATE TENDERS WILL BE ACCEPTED

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

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

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

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

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

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

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

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

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

Functionality Criteria

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

	Technical Evaluation Criteria	Weighting
T2.2-06	Method Statement	10
T2.2-07	Programme	10
T2.2-08	Previous Experience	53
T2.2-09	Quality Management	7
T2.2-10	Health and Safety Requirements	10
T2.2-11	Environmental Management	10
	Total	100.00

Failure to submit any of the above requested documents or meet the above-mentioned requirements, the tenderer will fail technical and lead to disqualification.

<u>Evaluation Criteria</u>	Scoring principal	Score	Weight
T2.2-04 Method Statement	Method statement - The tenderers must sufficiently demonstrate the approach/methodology that will be employed to cover the scope of the project, Method Statement include all specifications as per the scope of work tying into categories listed below, looking at, at a minimum the works packages as listed in section 1.1 of C3 document 1. Refurbishment of the Ship Repair Facility 2. Refurbishment of the Workshop	10	10

	3. Electricals Evaluation Schedule: METHOD STATEMENT - Approach Paper (Elements 1-6 are compulsory elements and elements 7 and 8 are additional elements) 1. Scope of Works 1.1 Demolition and removal of existing deteriorated slipway components. 1.1.1 Removal of the cradle, 1.1.2 removal of the winch system, 1.1.3 removal of the rail 1.1.4 Demolition of existing beams, Electricals, 1.1.5 Demolition of existing lead in jetties 1.2. Excavation, and foundation works, installation of the new cradle, 1.3 Concrete and structural works (including fendering and mooring interfaces). 1.4 Installation of services: electrical, water, drainage. 1.5 Finishing, surfacing, and ancillary works (lighting, safety handrails, signage). 2. Construction Methodology / Sequence 2.1 Site Preparation: 2.1.1 Survey, staking, and demarcation of slipway alignment. 2.1.2 Temporary works, access roads, and storage areas setup.		



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	2.1.3 Environmental protection measures (silt barriers, containment). 2.2 Demolition & Excavation: 2.2.1 Removal of damaged structures using mechanical and manual means. 2.2.2 Excavation to design levels, stockpiling, and disposal of surplus material. 2.3 Foundation & Substructure Works: 2.3.1 Installation of piles, retaining walls, and reinforced concrete foundations. 2.3.2 Soil compaction and geotechnical verification. 2.4 Superstructure & Concrete Works: 2.4.1 Slipway ramps, aprons, and embankments construction. 2.4.2 Placement of reinforced concrete, curing, and formwork removal per specifications. 2.5 Mechanical & Electrical Installation: 2.5.1 Installation of fendering system, mooring bollards, lighting, drainage, and water services. 2.6 Finishing & Commissioning: 2.6.1 Surfacing, markings, handrails, and safety barriers. 2.6.2 Testing and commissioning of services and structural integrity. 3. Resources / Personnel		

	3.1 Project Management Team: Project Manager, Site Agent, QA/QC Officer, Saf Officer. 3.2 Labour: Skilled and semi-skilled workers. 3.3 Equipment: Excavators, piling rigs, concrete mixers/pumps, cranes, transport vehicles. 4. Quality Assurance / Control 4.1 Inspection and test plans for concrete, steel, and piling works. 4.2 Compliance with CIDB standards, TNPA specifications, and project drawings. 4.3 Documentation of all testing and approvals. 5. Health, Safety & Environment (HSE) 5.1 Site induction for all personnel. 5.2 PPE, fall protection, and safe lifting procedures. 5.3 Spill containment, erosion control, and environmental monitoring. 5.4 Emergency response plan in place. 6. Programme / Schedule 6.1 Works sequenced to minimize disruption to port operations. 6.2 Milestones aligned with TNPA and CIDB reporting requirements. 6.3 Monitoring through weekly progress meetings and monthly reporting. 7. Risk Management/ Contingency		



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	Measures 7.1 Identification of critical risks 7.2 Mitigation strategies 8. Stakeholder and Operational Coordination 8.1 Close coordination with TNPA operations to minimize disruption to port activities. 8.2 Regular engagement with marine services, ship repair operators, and safety officials. 8.3 Communication plan for notifying stakeholders of high-risk or disruptive activities.		
T2.2-05 Programme	Starting date and completion date are stated, and the programme duration does not exceed 24 months. (Show Column or Gantt Chart)	1	10
	All Activities to be properly linked and logically tied link using critical path method (CPM). (Show the Critical path, Predecessors and Successors Column or Gantt Chart)	2	
	The schedule should be detailed to at least level 4	2	
	The TNPA activities calendar on the schedule should represent the actual work week/month used. E.g., weekends, public holidays are marked as non-working days from start to finish date	1	



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	All activity durations to be realistic and activities that can be measured in days, Weeks and Months. (Show the duration Column)	2	
	Programme submission (Software) in PDF either Microsoft project or Primavera P6	2	
T2.2-06 (a) Company Previous Experience	<u>Mechanical Experience</u> Tenderers are required to demonstrate performance and experience in Mechanical Engineering projects, specifically for construction of winch drum systems consisting of gearbox, motors, drums and wire ropes and the construction of a cradle system that consist of a control system, steel structure and automated mechanism in the last twenty (20) years. NB: Any other work that does not include what is mentioned above will not be considered. Companies should demonstrate a minimum of four (4)- five (5) projects completed in the last twenty (20) years.	10	26
	<u>Civil Engineering Experience</u> Tenderers are required to demonstrate performance and experience in Civil Engineering projects, specifically in respect of Quay walls, Slipways, jetties, groynes and piers constructed in water in the last Twenty (20) years. Companies should demonstrate a minimum of four (4)- five (5) projects completed in the last twenty (20) years.	8	

	<u>Electrical Experience</u> Tenderers are required to demonstrate performance and experience in electrical works, construction of the following in the last Ten (10) years.; 1. MV (11kV) switchgear installation and associates 2. MV Cable installation and Terminations 3. Mini - Sub Installation and LV Generator 4. LV switchgear installation (floor standing and miniature boards) 5. MV and LV protection grading 6. Building and street lighting and small power installations NB: Any other work that does not include what is mentioned above will not be Considered. Companies should demonstrate a minimum of five (5)-six (6) projects completed in the last ten (10) years	4	
	<u>Building Work Experience</u> Tenderer's are required to demonstrate construction experience of large, multi-level, office buildings. Companies should demonstrate a minimum of five (5)-six (6) projects completed in the last ten (10) years.	4	
	<u>Construction Project Manager</u> <u>(Pr.CPM/ PMP)</u> The tenderer's project team must include a Construction Project manager, registered with SACPCMP in the category		27



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T2.2-06 (b) Previous Experience (Key Personnel)	Pr. CPM, or registered with PMI USA as a Project Management Professional (PMP) with construction experience. Evidence to be provided, including a comprehensive Curriculum Vitae, Authorised body registration (PMI-USA/SACPCMP), with references, with ten (10) or more years' experience and 5 years post registration.	5	
	<u>Construction Manager (Pr.CM)</u> The tenderer's project team must include a Construction Manager , registered with SACPCMP in the category Pr. CM, with construction and fabrications experience, concrete. Evidence to be provided, including a comprehensive Curriculum Vitae, proof of qualification, Authorised body registration (SACPCMP), with references, with ten (10) or more years' experience and 5 years post registration	7	
	<u>Mechanical Technician or artisan</u> The tenderer's project team must include a Trade tested Artisan . with experience in the fabrication, installation, and commissioning of winching systems and cradles. The previous projects shall involve gearboxes, drums, wire ropes, motors, cradles, control systems, stop/start mechanism and all associated accessories with a design load of not less than 200 tons. Evidence to be provided,	6	



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	including a comprehensive Curriculum Vitae, proof of qualification, Authorized Centre, Training with references with 10 or more years' experience and 10 years post certification.		
	<u>Civil Engineering Technician</u> The tenderer's project team must include a Civil Engineering technician (Minimum of NQF 5) with concrete, and steel structure construction experience. Evidence to be provided, including Curriculum Vitae, proof of qualification, with a minimum of 7 or more experience.	5	
	<u>Electrician/ artisan</u> The tenderer's project team must include as a minimum, personnel who are qualified as Electrical Artisan . The minimum qualifications for the required team members is as follows 1. Electrician (Trade Test) Evidence to be provided, including a comprehensive Curriculum Vitae, Certified proof of qualification and trade test, with references with eight (8) or more years' experience and 8 years after accreditation with the Trade test certificate.	4	
T2.2-07 Quality Management	Project Quality Plan (PQP) for the project detailing at least three of the following: 1. Scope of works 2. Control of documented information 3. Resources 4. Audits	2	7



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	5. Control of non-conforming outputs		
	Experience of Quality Officer - The Quality Officer MUST have a minimum of <u>three</u> years' quality experience in projects, inclusive of Quay walls, Slipways, jetties, heavy Civil structure construction projects submitted in a Curriculum Vitae. The CV must detail the duties carried out on the Quality Officer role.	1	
	Qualifications of Quality Officer – a minimum Programme in Quality OR Diploma in Quality OR Technical Diploma (ND, B-Tech, BSC Eng, B. Eng.) in built environment. In addition to the minimum qualification submitted, a tenderer must submit a 5-days ISO 9001:2015 Quality Management System (QMS) training certificates (QMS Implementation AND/OR QMS Auditing). Proof of these qualifications and certificates must be attached.	1	
	Quality Control Plans - A minimum of <u>three</u> (QCPs) shall be in line with the scope of works detailing the Engineering works (Civil, Structural, Painting and corrosion protection, Mechanical, Electrical). These QCP's shall identify all inspections as detailed in the scope of works together with other tests and verifications required to demonstrate that the works comply with the scope of works, specifications, and drawings.	1	
	Quality Control Plan (QCP) in line with the scope of works detailing at least 3 of the following:	2	



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	1. Sequence of activities 2. Procedure/code specifications 3. Intervention points 4. Field inspection checklist 5. Relevant signatories		
T2.2-08 Health and Safety Requirement	Company Health & Safety Policy signed and dated by the Director/ Chief Executive Officer (CEO). Indicating the following five elements 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. Include objectives and targets.	2	
	Project specific Health and Safety Plan in line with Project Health & Safety Specification. Health and Safety Management Plan must include the following requirements but not limited to: 1. Project Scope. 2. HIRA 3. Health and Safety Training 4. Health and Safety Inspection & Audits 5. Emergency Preparedness and response 6. Personal Protective Equipment (PPE) 7. Fall Protection and Rescue Plan 8. Incident Management and Reporting 9. Plant, Machinery and Equipment's	2	



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	10. Occupational Health and Hygiene		10
	Overview of the tenderer's Risk Assessment methodology, and submission of risk assessments indicating major activities of the works and how the risks will be addressed and mitigated and must be in line with the Scope of Work (SoW). 1. M1 – Mechanical Equipment, Cradles and associated structures and ancillary steelwork. 2. E1 – Electrical upgrades. 3. C1 - Civil works Upgrades. 4. S1 - Structural Upgrades. 5. B1 – Operations Building. 6. B1.1 – Operations Building Civils. 7. B1.2 - Operations Building Structural Works. 8. B1.3 - Operations Building Electrical Works. 9. B1.4 - Operations Building Mechanical Works.	5	
	Complete and return with tender documentation the Contractor Safety Questionnaire included as a returnable, attach all required supporting documents. • Letter of Good Standing. • Safety Induction/ orientation booklet . • Valid ISO 45001: 2018 Certification. • Previously H&S Recognition Certificate.	1	



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	Contractor Health & Safety Questionnaire (Returnable Document).		
T2.2-09 Environmental Management	The tenderer must provide a project specific Environmental Management Plan. This plan must be clear on the following: 1. 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). 2. The method and frequency of monitoring the implementation of the impact management actions. 3. A description of how the environmental incidents will be managed on site. 4. An indication of the roles and responsibilities in the implementation of the impact management actions. 5. Records to be kept. 6. How non-conformance/non-compliance will be dealt with	3	10
	The tenderer must provide an Environmental Policy signed by Top Management that displays the following key components, namely: 1. Commitment to comply with all applicable environmental laws, regulations and standards. 2. Commitment to pollution prevention	1	

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	3. Emphasize the organisation's commitment to continual improvement in environmental performance. 4. Address the sustainable use of resources/ resource conservation. 5. Is communicated to all employees working for or on behalf of the Contractor.		
	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)	4	
	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.	2	
<u>Sub total</u>			100

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

- T2.2-06 Method Statement
- T2.2-07 Programme
- T2.2-08 Previous Experience
- T2.2-09 Quality Management
- T2.2-10 Health and Safety Requirements
- T2.2-11 Environmental Management

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

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

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

C.3.11. **Stage Three – Preference Points System**

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:

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

Thresholds	Minimum Threshold
Technical / functionality	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 preferences 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 Tenderer who provides the relevant required evidence for claiming points.



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Selected Specific Goal	Number of points allocated (80/20)	Number of points allocated (90/10)
B-BBEE Status Level of Contributor (1 or 2)	5.00	3.00
The promotion of supplier development through sub-contracting a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs 51% black owned.	15.00	7.00
Non-Compliant and/or B-BBEE Level 3-8 contributors	0.00	0.00
Total number of preference points	20.00	10.00

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 sub-contracting a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs 51% black owned.	Sub-contracting agreements. Subcontractors CIPC B-BBEE Certificate / Sworn- Affidavit / B-BBEE Certificate as per DTIC guidelines

The maximum points for this Tender are allocated as follows:

<u>DESCRIPTION</u>	<u>POINTS</u>
PRICE	80/90
- B-BBEE Status Level of Contributor (1 or 2) - The promotion of supplier development through sub-contracting a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs 51% black owned.	20/10
Total points for Price and Specific Goals must 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 National Treasury 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 (Form T2.2-20)** 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 will award the tender to the highest scoring Tenderer/s unless **objective criteria** exist that justify the award to another Tenderer. Transnet may apply the objective criteria in this Tender process as follows:
 - Tenderer(s) 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;

-
- There is clear, uncontrived and/or overwhelming evidence and/or facts that the Tenderer has or continues to be in breach of any of the provisions contained in the Integrity Pact (T2.2-27);
 - The Probity check undertaken by Transnet National Ports Authority establishes the existence of any unmitigated risks which would have a negative impact on the project;
 - Unless the appointment of the Tenderer would result in a negative impact on Transnet's Return on Investment;
 - It is necessary to rotate Suppliers to promote opportunities for other suppliers, in circumstances where the Tenderer has been awarded business previously and the award of the tender will result in inequitable allocation of business;
 - The tenderer or its members, directors, partners:
 - Is under restrictions as contemplated in the Integrity Pact (From T2.2-27),
 - Is a 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;
 - in relation to the proposed contract, a due diligence exercise to validate the Tenderer's proposal that demonstrate 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;
 - has no legal capacity to enter into the contract;
 - is insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, being wound up, has its affairs administered pursuant to a court order, has ceased or suspended their business activities, or is subject to legal proceedings in respect of any of the foregoing;
 - does not comply with the legal requirements, if any, stated in the tender data; and
-

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- is not able to perform the contract free of conflicts of interest.

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



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T2.1 List of Returnable Documents

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

- T2.2-01 **Technical Eligibility Criteria Schedule** – Certificate of attendance at Compulsory Tender Clarification Meeting/ TNPA Attendance register to be used as proof.
- T2.2-02 **Technical Eligibility Criteria Schedule** – only 9ME contractors may tender. Where components of the works require 7CE, 6EP, or 5GB classifications, these may be executed either directly by the 9ME contractor (provided they are appropriately registered in the relevant secondary classes) or through a joint venture/approved subcontractor, in compliance with CIDB regulations.
- T2.2-03 **Technical Pre-Qualification:** Professional registrations of key personnel responsible for the execution of this project.
- T2.2-04 C1.1 Form of Offer & Acceptance
- T2.2-05 C2.2 Bill of Quantities

2.1.2 Stage Two: These schedules will be utilised for evaluation purposes:

- T2.2-06 **Evaluation Schedule:** Method Statement
- T2.2-07 **Evaluation Schedule:** Programme
- T2.2-08 **Evaluation Schedule:** Previous experience
- T2.2-09 **Evaluation Schedule:** Quality Management
- T2.2-10 **Evaluation Schedule:** Health and Safety Management
- T2.2-11 **Evaluation Schedule:** Environmental Management

2.1.3 Returnable Schedules:

General:

- T2.2-12 Authority to submit a tender.
- T2.2-13 Record of addenda to tender documents.
- T2.2-14 Letter of Good Standing
- T2.2-15 Risk Elements
- T2.2-16 Availability of equipment and other resources
- T2.2-17 Subcontracting Form



T2.2-18 Site Establishment requirements

T2.2-19 Job-Creation Schedule

2.1.4 Agreement and Commitment by Tenderer:

T2.2-20 CIDB SFU ANNEX G Compulsory Enterprise Questionnaire

T2.2-21 SBD 6.1 (Preference Point System)

T2.2-22 SBD 4 (Declaration of Interest)

T2.2-23 Non-Disclosure Agreement

T2.2-24 Tender Declaration Form

T2.2-25 Tender Breach of Law

T2.2-26 Certificate of Acquaintance with Tender Document

T2.2-27 Service Provider Integrity Pact

T2.2-28 Supplier Code of Conduct

T2.2-29 Domestic Prominent Influential Persons (DPIP) Or Foreign Prominent Public Officials (FPPO)

T2.2-30 Agreement in terms of Protection of Personal Information Act, 4 of 2013 ("POPIA")

2.1.4 Bonds/Guarantees/Financial/Insurance:

T2.2-31 Insurance provided by the Contractor.

T2.2-32 Form of Intent to provide a Performance Guarantee

T2.2-33 Foreign Exchange requirements

T2.2-34 Forecast Rate of Invoicing

T2.2-35 Three (3) years of audited financial statements.

2.2 C1.2 Contract Data

2.3 C1.3 Forms of Securities



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T2.2-01: Eligibility Criteria Schedule: Certificate of Attendance at Tender Clarification Meeting

This is to certify that:

(Company Name)

Represented
by: (Name and Surname)

Was represented at the compulsory tender clarification meeting

Held at:		
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

T2.2-02: Eligibility Criteria Schedule – CIDB Grading Designation

Only **9ME** contractors may tender. Where components of the works require 7CE, 6EP, or 5GB classifications, these may be executed either directly by the 9ME contractor (provided they are appropriately registered in the relevant secondary classes) or through a joint venture/approved subcontractor, in compliance with CIDB regulations.

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

1. 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 **9ME** class of construction work, are eligible to have their tenders evaluated. Where components of the works require 7CE, 6EP, or 5GB classifications, these may be executed either directly by the 9ME contractor (provided they are appropriately registered in the relevant secondary classes) or through a joint venture/approved subcontractor, in compliance with CIDB regulations.

2. 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 one level below the required grading designation in the 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 **9ME** class

of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations. Where components of the works require 7CE, 6EP, or 5GB classifications, these may be executed either directly by the 9ME contractor (provided they are appropriately registered in the relevant secondary classes) or through a joint venture/approved subcontractor, in compliance with CIDB regulations.

4. the Contractor shall provide the employer with a certified copy of its signed joint venture agreement;
5. and in the event that the joint venture is an 'Incorporated Joint Venture' the Memorandum of Incorporation to be provided within 4 (four) weeks of the Contract Date.

T2.2-03: Technical Pre-Qualification - Professional registrations of key personnel responsible for the execution of this project

Note to tenderers:

NB: Any tenderer that fails to submit any of the registered proposed key personnel as listed below will be regarded as unacceptable.

NOTE: Registrations in the "Candidate" category will not be considered.

Key Personnel	Registration	Yes / No
Project Manager registered with SACPCMP in the category (Pr.CPM,) or registered with PMI USA as a PMP	SACPCMP/ PMP Registered	
Construction Manager registered with SACPCMP in the category (Pr.CM)	SACPCMP Registered	
Mechanical Technician/ artisan	Trade Tested	
HSE Officer registered with SACPCMP in the category (CHSO/CHSM)	SACPCMP Registered	

T2.2-04: Eligibility Criteria Schedule – C1.1 Form of Offer & Acceptance

Note to tenderers:

Tenderers are to append to this schedule a completed and signed C1.1 Form of Offer & Acceptance

Failure to indicate and submit a completed and signed C1.1 Form of Offer & Acceptance will lead to an automatic disqualification.

T2.2-05: Eligibility Criteria Schedule – C2.2 Bill of Quantities

Note to tenderers:

Tenderers are to append to this schedule C2.2 Bill of Quantities

Failure to indicate and submit a C2.2 Bill of Quantities will lead to an automatic disqualification.

T2.2-06: Evaluation Schedule: Method Statement [10 Points]

Note to tenderers:

Note to tenderers:

Method statement - The tenderers must sufficiently demonstrate the approach/methodology that will be employed to cover the scope of the project,

Method Statement includes all specifications as per the scope of work tying into categories listed below, looking at a minimum the works packages as listed in section 1.1 of C3 document [10]

1. Refurbishment of the Ship Repair Facility
2. Refurbishment of the Workshop
3. Electricals

Evaluation Schedule: METHOD STATEMENT - Approach Paper

Evaluation Schedule: METHOD STATEMENT - Approach Paper

(Elements 1-6 are compulsory elements and elements 7 and 8 are additional elements)

1. Scope of Works
 - 1.1 Demolition and removal of existing deteriorated slipway components.
 - 1.1.1 Removal of the cradle,
 - 1.1.2 removal of the winch system,
 - 1.1.3 removal of the rail
 - 1.1.4 Demolition of existing beams, Electricals,
 - 1.1.5 Demolition of existing lead in jetties
 - 1.2. Excavation, and foundation works, installation of the new cradle,
 - 1.3 Concrete and structural works (including fendering and mooring interfaces).
 - 1.4 Installation of services: electrical, water, drainage.
 - 1.5 Finishing, surfacing, and ancillary works (lighting, safety handrails, signage).
2. Construction Methodology / Sequence
 - 2.1 Site Preparation:
 - 2.1.1 Survey, staking, and demarcation of slipway alignment.

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- 2.1.2 Temporary works, access roads, and storage areas setup.
 - 2.1.3 Environmental protection measures (silt barriers, containment).
 - 2.2 Demolition & Excavation:
 - 2.2.1 Removal of damaged structures using mechanical and manual means.
 - 2.2.2 Excavation to design levels, stockpiling, and disposal of surplus material.
 - 2.3 Foundation & Substructure Works:
 - 2.3.1 Installation of piles, retaining walls, and reinforced concrete foundations.
 - 2.3.2 Soil compaction and geotechnical verification.
 - 2.4 Superstructure & Concrete Works:
 - 2.4.1 Slipway ramps, aprons, and embankments construction.
 - 2.4.2 Placement of reinforced concrete, curing, and formwork removal per specifications.
 - 2.5 Mechanical & Electrical Installation:
 - 2.5.1 Installation of fendering system, mooring bollards, lighting, drainage, and water services.
 - 2.6 Finishing & Commissioning:
 - 2.6.1 Surfacing, markings, handrails, and safety barriers.
 - 2.6.2 Testing and commissioning of services and structural integrity.
 - 3. Resources / Personnel
 - 3.1 Project Management Team: Project Manager, Site Agent, QA/QC Officer, Safety Officer.
 - 3.2 Labour: Skilled and semi-skilled workers.
 - 3.3 Equipment: Excavators, piling rigs, concrete mixers/pumps, cranes, transport vehicles.
 - 4. Quality Assurance / Control
 - 4.1 Inspection and test plans for concrete, steel, and piling works.
 - 4.2 Compliance with CIDB standards, TNPA specifications, and project drawings.
 - 4.3 Documentation of all testing and approvals.
 - 5. Health, Safety & Environment (HSE)
 - 5.1 Site induction for all personnel.

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5.2 PPE, fall protection, and safe lifting procedures.

5.3 Spill containment, erosion control, and environmental monitoring.

5.4 Emergency response plan in place.

6. Programme / Schedule

6.1 Works sequenced to minimize disruption to port operations.

6.2 Milestones aligned with TNPA and CIDB reporting requirements.

6.3 Monitoring through weekly progress meetings and monthly reporting.

7. Risk Management / Contingency Measures

7.1 Identification of critical risks

7.2 Mitigation strategies

8. Stakeholder and Operational Coordination

8.1 Close coordination with TNPA operations to minimize disruption to port activities.

8.2 Regular engagement with marine services, ship repair operators, and safety officials.

8.3 Communication plan for notifying stakeholders of high-risk or disruptive activities.

<u>S1 WORK PACKAGE</u> ○ Remediation of existing structural infrastructure site wide ○ New construction of structural works throughout the slipway site excluding those associated with the new Operations building	<u>E1 WORK PACKAGE</u> ○ New site wide low voltage reticulation upgrades excluding equipment requirements within the new operations building ○ New site wide medium voltage reticulation upgrades excluding equipment requirements within the new operations building if applicable
<u>M1 WORK PACKAGE</u> ○ Main Cradle including sheaves, rolling element assemblies and wooden chock blocks ○ Docking Towers and all ancillary equipment mounted on the towers eg access bridges, adjustment	<u>C1 WORK PACKAGE</u> ○ All site wide civil works including stormwater infrastructure as indicated on the drawings <u>B1 WORK PACKAGE</u>

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mechanisms, hydraulic equipment. ○ Side Slip Cradle on Starboard side including rolling element assemblies and wooden chock blocks ○ Uphaul, Downhaul and Side slip cradle winches complete with steel wire ropes, drives, support structures, actuating mechanisms, control panels. ○ All rails, associated fixing elements and stainless steel sole plates with rubber pads under the rails that together form the complete rail assemblies above and below water level ○ Wire rope supports, complete ○ All mechanical components for the stormwater management and recycling system ○ Demolition of old lead-in jetties ○ Corrosion Protection ○ Commissioning, Testing and Handover	○ All works comprising the complete new operations building including architectural requirements, civil/ structural, electrical and mechanical works

In addition to general methodology for the project, the tenderer must demonstrate the following aspects but not limited to:

- Order and timing of the audits, inspection and design milestones that will take place in order to provide the *Works*.
- Indication of how the above will be achieved in terms of the associated policies and procedures, and relevant specification described in the tender.

The table below will be used as guidelines for scoring / evaluating the method statement submitted by the Tenderer:

Score	No response	Poor	Less Than Acceptable	Acceptable response to the particular aspect	Above acceptable real understanding	Excellent Response
	(0)	(20)	(40)	(60)	(80)	(100)
10	No Response or the method statement submitted is inadequate and makes mention of less than two (2) of the listed areas	The technical approach will not satisfy project objectives, Method Statement makes mention of two (2) - 3 (three) of the compulsory listed elements.	The technical approach is unlikely to satisfy project objectives. The Tenderer has misunderstood certain aspects of the scope of work and does not deal with the critical aspects of the project. Generic and / or non-project specific information provided. Method Statement makes mention of between four (4) - five (5) of the compulsory listed elements.	Project specific method statement provided with some technical input. method statement found show potentially effective methods for completing the works and shows understanding on how to complete the works. The method statement details ways to improve the project outcomes and the quality of the Method Statement makes mention of six (6) of the compulsory listed elements,.	Besides meeting the "60" rating, the important issues are approached in an innovative and efficient way, indicating that the Tenderer has outstanding knowledge. Over and above of the 6 compulsory listed elements addressed, the bidder make mention of one additional element. (Stakeholder and Operational Coordination)	Besides meeting the "80" rating, the important issues are approached in an innovative and efficient way, indicating that the Tenderer has outstanding knowledge. Over and above of the 6 compulsory listed elements addressed, the bidder make mention of two additional elements (Stakeholder and Operational Coordination)

T2.2-07: Evaluation Schedule: Programme [10 Points]

Note to tenderers:

The Tenderer provides a hard copy of the proposed Programme and/or makes reference to his proposed Programme and electronic Programme developed using a scheduling software tool.

The tenderer shall provide the proposed Programme detailed to minimum of level 4 showing as a minimum the following:

Ability to provide the services:

Ability to provide the services in terms of the Employer's requirements within the required timeframe indicating, in a logical sequence, the order and timing of the services that will take place in order to Provide the Works clearly indicating the capacity & capability to achieve the dates stated in the Contract Data Including Environmental, Detailed design and Construction

Provision of Dates:

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

- Float,
- Time Risk Allowances,
- Health and safety requirements,
- Procedures set out in this contract,
- Work by the Employer and Others,
- Access to a part of the site if later than its access date,
- Acceptances,
- Plant & Materials and other things to be provided by the employer,
- Information by Others,
- starting date, access dates, Key Dates and Completion Date
- planned Completion for each Key Date for each option and the complete works

Resourcing & Equipment:

- The Tenderer indicates for each operation, a statement of how the Tenderer plans to do the work identifying the principal Equipment and other resources which he plans to use.
- The Contractor's Programme shows the following levels:
 - Level 1 Master Schedule – defines the major operations and interfaces between engineering design, procurement, fabrication and assembly of Plant and Materials, transportation, construction, testing and pre-commissioning, commissioning and Completion.
 - Level 2 Project Schedule – summary schedules 'rolled up' from Level 3 Project Schedule described below

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

- Level 3 Project Schedule – detailed schedules generated to demonstrate all operations identified on the Programme from the starting date to Completion. The Project Manager notifies any subsequent layouts and corresponding filters on revised Programme.
- Level 4 Project Schedule – detailed discipline specialty level developed and maintained by the Contractor relating to all operations identified on the Programme representing the daily activities by each discipline.

The scoring of the Programme will be as follows:

The Tenderer must demonstrate the facility meets the minimum requirement.	No.	Total 10	The tenderer shall demonstrate the following:					
			No response	Very Poor	Poor	Acceptable Response	Good Response	Excellent Response
			(0%)	(20%)	(40%)	(60%)	(80%)	(100%)
Starting date and completion date are stated, and the Programme does not exceed 24 months. (Show Column or Gantt Chart)	1	1	No Response or Starting date or completion date not shown = 0%	The duration of the project (start date vs completion date) is 25 months or more (Show Column or Gantt Chart) = 20%	The duration of the project (Start date vs completion date) is 24 months or more, but less than 25 months (Show Column or Gantt Chart) = 40%	The duration of the project (Start date vs completion date) is 23 months or more, but less than 24 months (Show Column or Gantt Chart) = 60%	The duration of the project (Start date vs completion date) is 22 months or more, but less than 23 months (Show Column or Gantt Chart) = 80%	The duration of the project (Start date vs completion date) is less than 22 months (Show Column or Gantt Chart) = 100%
All Activities to be properly linked and logically tied link using critical path method (CPM). (Show the Critical path,	2	2	No response or Program does not link activities using CPM = 0%	Activities partially linked using CPM and has open ends, and has links on summary activities (Show the Critical path, Predecessors and Successors Column or Gantt	Activities partially linked using CPM and has open ends, and has no links on summary activities (Show the Critical path, Predecessors and Successors Column or Gantt	Activities properly linked using CPM and has no open ends, and has no links on summary activities (Show the Critical path, Predecessors and Successors Column or Gantt	Activities properly linked using CPM and have no open ends, has no links on summary activities, has open ends on Milestones (Show the Critical path, Predecessors and	Activities properly linked using CPM and no open ends, no links on summary activities, and no open ends on milestones (Show the

Predecessors and Successors Column or Gantt Chart)				Chart) = 20%	Chart) = 40%	Chart) = 60%	Successors Column or Gantt Chart) = 80%	Critical path, Predecessors and Successors Column) = 100%
The schedule should be detailed to at least Level 4	3	2	No response or partially complete or schedule submission is not level 4 or 3 or 2 (i.e., Level 1) = 0%	The schedule is partially complete and detailed (level 2) = 20%	The schedule is detailed to level 3 = 40%	The schedule is complete and detailed to Level 4 = 60%	The schedule is complete and detailed to Level 4 and the Basis of schedule is submitted = 80%	The schedule is complete and detailed to Level 4 and the Basis of schedule is submitted and Key Milestones are shown = 100%
The TNPA activities calendar on the schedule should represent the actual work week/month used. E.g., weekends, public holidays are marked as non-working	4	1	No response = 0%	The TNPA activities calendar on the schedule should represent the actual Weekends or Public holidays are marked as working days from start to finish date = 20%	The TNPA activities calendar on the schedule should represent the actual Weekends are marked as working days from start to finish date = 40%	The TNPA activities calendar on the schedule should represent the actual Weekends, public holidays are marked as non-working days from start to finish date = 60%	The TNPA activities calendar on the schedule should represent the actual Weekends, public holidays, and builders break are marked as non-working days from start to finish date = 80%	The TNPA activities calendar on the schedule should represent the actual Weekends, public holidays, and builders' breaks are marked as non-working days and the calendar column shown from start to finish date =



DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

days from start to finish date								100%
All activity durations to be realistic and activities that can be measured in days, Weeks and Months. (Show the duration Column)	5	2	No response = 0%	All Activities durations to be realistic are broken down into Months (Show the duration Column) = 20%	All Activities durations to be realistic are broken down into Months and Weeks (Show the duration Column) = 40%	All activities durations to be realistic are broken down into Months, Weeks, and days (Show the duration Column) = 60%	All activities durations to be realistic are broken down into Weeks and days (Show the duration Column) and = 80%	All activities durations to be realistic are broken down into days (Show the duration Column) = 100%
Programme submission (Software) in PDF either Microsoft project or Primavera P6	6	2	No response = 0%	Programme submitted not in Microsoft Project, Primavera P6 or Excel = 20%	Programme submitted in Excel = 40%	Programme submitted in either Microsoft project or Primavera P6 = 60%	Programme submitted in either Microsoft project or Primavera P6 including resource loading (Show the resource Column or Gantt Chart) = 80%	Programme submitted in either Microsoft project or Primavera P6 including resource loading and float (Show the resource and float/total slack Column or Gantt Chart) = 100%

T2.2-08(a): Evaluation Schedule: Previous Experience [26]

Note to tenderers:

Tenderers are required to demonstrate performance in comparable projects and nature by supplying the following:

- A list of comparable projects in the last 20 years.
- Construction of works as detailed in the Works Information with reference to:
 - Civil /Building/Electrical/Mechanical works
 - Retaining structures related to the works information
- Sufficient references to substantiate experience indicated (Client letter head and contact details, project description, duration and contract value) letters should be signed and include Duration (Start and end date)

Reference letters/Completion Certificate with traceable contact details, period of outlined projects successfully executed, projects deliverables.

A Reference letters must:

- Be on the client letter head with contact details
- Have a project description and Completion date
- Be signed by client

A Completion Letter must:

- Be on the client letter head with contact details
- Have a project description and duration (start and end date)
- Be signed by client

Should Reference letters/Completion Certificates not have the above requirements it will not be considered.

The information below is required:

- Tenderers should very briefly describe his or her experience in this regard, emphasizing the nature of the works, and complexity and attach this to this schedule.
- Proof of completion in the form of a completion certificates or reference letters from the previous employer (client) on the letterhead of that employer/ client (dated and stamped) and signed by the Project Manager/ Client confirming that the Works has been completed shall be provided in order for a project to be scored.

The following information is needed:

- Reference letters must:(employer letterhead, signed and dated) or any official documentation from a previous employer indicating the project description and completion date.
- A completion certificate or proof of project completion from previous clients/employers.
- Tenderers are required to demonstrate performance and experience in Mechanical Engineering projects, inclusive of construction of a winch drum system consisting of gearbox, motors, drums and wire ropes, and the construction of a vessel cradle system that consists of a steel structure, control system, and automated mechanism in the last twenty (20) years. Companies should demonstrate a minimum of four (4)- five (5) projects completed in the last twenty (20) years. [10 points]
- Tenderers are required to demonstrate performance and experience in the Civil Engineering projects, inclusive of construction of Quay walls, Slipways, Jetties and Caisson in the last Twenty (20) years. Companies should demonstrate a minimum of four (4)- five(5) projects completed in the last twenty (20) years [8 points]
- Tenderers are required to demonstrate performance and experience in the Electrical engineering projects, inclusive of MV (11kV) switchgear installation and associates , MV Cable installation and Terminations, Mini - Sub Installation , LV switchgear installation (floor standing and miniature boards), MV and LV protection grading and Building lighting and small power installations in the last Ten (10) yearsTenderers are required to demonstrate performance in comparable projects of similar size and nature, condition and circumstances to the scope of works in the last Ten (10)years. Tenderers are required to demonstrate electrical works construction experience of the following;
 1. MV (11kV) switchgear installation and associates
 2. MV Cable installation and Terminations
 3. Mini - Sub Installation and LV Generator
 4. LV switchgear installation (floor standing and miniature boards)
 5. MV and LV protection grading
 6. Building, street lighting, and small power installations

Companies should demonstrate a minimum of four five(5)- six(6) projects completed in the last ten (10) years [4 points]
- Tenderer's are required to demonstrate construction experience of large, multi-level, high end office buildings
Companies should demonstrate a minimum of five(5)- six(6) projects completed in the last ten (10) years. [4 points]

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Score	No response	Poor	Less Than Acceptable	Acceptable response to the particular aspect	Above acceptable real understanding	Excellent Response
	(0)	(20)	(40)	(60)	(80)	(100)
10 Mechanical Experience	No response - Insufficient information or projects presented are not of a similar nature.	One (1) project was successfully completed in the last twenty (20) years, and evidence of company experience in the form of reference letters/completion certificates with project particulars such as project description, in the client letter head, completion dates, signed reference letters.	Two (2) - Three (3) projects have been successfully completed in the last twenty (20) years, and evidence of company experience in the form of reference letters/completion certificates with project particulars such as project description, in the client letter head, and completion dates,	Four (4) - Five (5) projects have been successfully completed in the last twenty (20) years, and evidence of company experience in the form of reference letters/completion certificates with project particulars such as project description, in the client letter head, and completion dates,	Six (6) - Seven (7) projects have been successfully completed in the last twenty (20) years, and evidence of company experience in the form of reference letters/completion certificates with project particulars such as project description, in the client letter head, and completion dates,	Eight (8) or more projects have been successfully completed in the last twenty (20) years, and evidence of company experience in the form of reference letters/completion certificates with project particulars such as project description, in the client letter head, and completion dates,
8 Civil Engineering Experience		One (1) project , was successfully completed in the last twenty (20) years, and evidence of company experience and project particulars such as, start and completion dates, completion certificates,	Two (2) - Three (3) projects have been successfully completed in the last twenty (20) years, and evidence of company experience and project details such as project value, start and finish dates, completion	Four (4) - Five (5) projects have been successfully completed in the last twenty (20) years, and evidence of company experience and project details such as, start and finish dates, completion certificates,	Six (6) - Seven (7) projects have been successfully completed in the last twenty (20) years, and evidence of company experience and project details such as, start and finish dates, completion certificates,	Eight (8) or more projects have been successfully completed in the last twenty (20) years, and evidence of company experience and project details such as, start and finish dates, completion certificates,

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		references, has been submitted.	certificates, references has been submitted.	references, has been submitted.	references, and so on has been submitted.	references, and so on has been submitted.
4 Electrical Experience		One (1) - Two (2) projects, was successfully completed in the last ten (10) years, and evidence of company experience and project particulars such as, start and completion dates, completion certificates, references,	Three (3) - Four (4) projects have been successfully completed in the last ten (10) years, and evidence of company experience and project details such as, start and finish dates, completion certificates, references, and so on has been submitted.	Five (5) - Six (6) projects have been successfully completed in the last ten (10) years, and evidence of company experience and project details such as, start and finish dates, completion certificates, references, and so on has been submitted.	Seven (7) - Nine (9) projects have been successfully completed in the last ten (10) years, and evidence of company experience and project details such as, start and finish dates, completion certificates, references, and so on has been submitted.	Ten (10) or more projects have been successfully completed in the last ten (10) years, and evidence of company experience and project details such as project, start and finish dates, completion certificates, references, and so on has been submitted.
4 Building Work Experience		One (1) - Two (2) projects submitted of previous projects successfully implemented in the listed project scope inclusion, including evidence of company experience and project particulars, completion certificates, references, and so on has been submitted.	Three (3) - Four (4) projects have been successfully completed in the last ten (10) years, and evidence of company experience and project details such as, start and finish dates, completion certificates, references, and so on has been submitted.	Five (5) - Six (6) projects submitted of previous projects successfully implemented in the listed project scope inclusion, including evidence of company experience and project particulars, completion certificates, references, and so on has been submitted.	Seven (7) - Nine (9) projects have been successfully completed in the last ten (10) years, and evidence of company experience and project details such as, start and finish dates, completion certificates, references, and so on has been submitted.	Ten (10) or more projects have been successfully completed in the last ten (10) years, and evidence of company experience and project details such as, start and finish dates, completion certificates, references, and so on has been submitted.

T2.2-08(b): Evaluation Schedule: Key Personnel Experience and qualifications [27]

Note to tenderers:

Tenderers are required to demonstrate the experience and qualifications of the key personnel who will be responsible for the management of the physical construction, maintenance, repairs, replacement and/or refurbishment of the slipway works, which includes the outlined disciplines for this project will be evaluated in relation to the scope of work from three different points of view:

1) General experience (total duration of work activity). The experience must be set out in the C.V., stipulating/ stating name of the project, key responsibilities, commencement and end date.

2) The education, training and skills which are pertinent to the scope of work, proof of education and training (certificates) must be attached to the C.V.

3) Organogram with all key resources to be enclosed,

- The tenderer's project team must include a Construction Project manager, registered with SACPCMP as a Pr. CPM or registered with PMI-USA as a PMP, with construction experience. Evidence to be provided, including Curriculum Vitae, Authorised body registration (PMP/ SACPCMP), with references with ten (10) or more years' experience of which a minimum of 5 years post registration experience is required.
- The tenderer's project team must include a Construction Manager, registered with SACPCMP as a Pr CM , with construction and fabrications experience, re-inforced concrete, with references with ten (10) or more years' experience of which a minimum of 5 years post registration experience is required. Evidence to be provided, including Curriculum Vitae, Authorised body registration (SACPCMP), with references with ten(10) or more years experience of which a minimum of 5 years post registration experience is required.

Mechanical Technician or Artisan

- The tenderer's project team must include Certified Technician/Artisan, trade test certificate, with experience in the fabrication, installation, and commissioning of winching systems and cradles. The previous projects shall involve gearboxes, drums, wire ropes, motors, cradles, control systems, stop/start mechanism and all associated accessories with a design load of not less than 200 tons. Evidence to be provided, including Curriculum Vitae, Authorized Training Centre, with references with 10 or more years' experience and 10 years post certification.

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Civil Engineering Technician

- The tenderer's project team must include a Civil Engineering technician with concrete, and steel structure construction experience
- Evidence to be provided, including Curriculum Vitae, proof of qualification, with a minimum of 7 or more years' of experience.

Electrician/artisan

- The tenderer's project team must include as a minimum, personnel who are qualified as Electrical technicians and electricians. The minimum qualifications for the required team members is as follows:
 - Electrician (Trade Test)

Evidence to be provided, including Curriculum Vitae, Certified proof of qualification and trade test with references, with 8 or more years' experience and 8 years after accreditation with the registration bodies.

List of Key Persons assigned to the above disciplines

No.	Key Persons	Name and surname	CV attached (Yes/No)
1	Project Manager registered with SACPCMP in the category (Pr.CPM,) or registered with PMI-USA as a PMP		
2	Construction Manager registered with SACPCMP in the category (Pr.CM)		
3	Mechanical Technician/ artisan, trade tested.		
4	Civil Engineer Technician		
5	Electrician/ Artisan, trade tested.		
6	HSE Officer registered with SACPCMP in the category (CHSO/CHSM)		

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Score 0	Score 0	Score 20	Score 40	Score 60	Score 80	Score 100
Construction Project Manager (Pr.CPM/ PMP) [5]	No Information provided or inadequate information provided	Construction Project Manager with less than six (6) years' experience in project management	Construction Project Manager with six (6) years or more, but less than ten (10) years' experience in project management	Construction Project Manager with ten (10) years or more, but less than fourteen (14) years of relevant experience, in project management	Construction Project Manager with fourteen (14) years or more, but less than seventeen (17) years relevant experience, in project management	Construction Project Manager with seventeen (17) years or more of relevant experience, in project management
Construction Manager (Pr.CM) [7]	No Information provided or inadequate information provided	"Site Construction Manager with less than six (6) years' Experience in managing projects involving ship repair, fabrication, or heavy industrial facilities. Projects that were outlined in technical requirements."	"Site Construction Manager with six (6) or more, but less than Ten (10) years experience, in Construction Management Experience in managing projects involving ship repair, fabrication, or heavy industrial facilities. Projects outlined in technical requirements. "	"Site Construction Manager with ten (10) years or more but less than Fourteen (14) years of relevant experience, in Construction Management of Experience in managing projects involving ship repair, fabrication, or heavy industrial facilities.	"Site Construction Manager with fourteen (14) years or more but less than seventeen (17) relevant experience, in Construction Management of Experience in managing projects involving ship repair, fabrication, or heavy industrial facilities. Projects outlined in technical requirements."	"Site Construction Manager with seventeen (17) years or more of relevant experience in Construction Management Experience in managing projects involving ship repair, fabrication, or heavy industrial facilities, heavy structures concrete works. Projects outlined technical requirements."

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				Projects outlined technical requirements."		
Mechanical Technician/Artisan [6]	No Information provided or inadequate information provided	"Technician/Artisan must have a trade test certificate with less than six (6) years' experience, in mechanical systems related to ship repair, Mechanical engineering gearbox, motors, drums, wire ropes, cradle system, control systems or heavy industrial facilities. Projects involving steel fabrication, installation, and maintenance of complex mechanical systems."	"Technician/Artisan must have a trade test certificate with six (6) years' or more but less than ten (10) years' experience. Experience in mechanical systems ship repair, Mechanical engineering, gearbox, motors, drums, wire ropes, cradle system, control systems or heavy industrial facilities. Projects involving steel fabrication, installation, and maintenance of complex mechanical systems steel."	"Technician/Artisan must have a trade test certificate with ten (10) years or more, but less than fourteen (14) years of relevant experience, in bilge, Experience in mechanical systems related ship repair, Mechanical engineering, gearbox, motors, drums, wire ropes, cradle system, control systems or heavy industrial facilities. Projects involving steel fabrication, installation, and maintenance of complex mechanical systems."	"Technician/Artisan must have a trade test certificate with fourteen (14) years or more, but less than seventeen (17) relevant experience in bilge, Experience in mechanical systems related ship repair, Mechanical engineering, gearbox, motors, drums, wire ropes, cradle system, control systems or heavy industrial facilities. Projects involving steel fabrication, installation, and maintenance of complex mechanical systems."	"Technician/Artisan must have a trade test certificate with seventeen (17) or more years of relevant experience in bilge, Experience in mechanical systems related ship repair, marine engineering, gearbox, motors, drums, wire ropes, cradle system, control systems or heavy industrial facilities. Projects involving steel fabrication, installation, and maintenance of complex mechanical systems."

Civil Engineer Technician [5]	No Information provided or inadequate information provided	"Civil Engineering Technician with less than Three (3) or more, but less than (4) years' experience. Civil Engineering technician with concrete, and steel structure construction experience	"Civil Engineering Technician with four (4) years or more but less than seven (7) years' experience. Civil Engineering technician with concrete, and steel structure construction experience Projects involving Civil Engineering structures such as Slipways, quaywalls, jetties, and foundations for heavy equipment"	"Civil Engineering Technician with seven (7) years or more but less than years (10) years relevant experience, Civil Engineering technician with concrete, and steel structure construction experience Projects involving Civil Engineering structures such as Slipways, quaywalls, jetties, and foundations for heavy equipment"	"Civil Engineering Technician with ten (10) years or more but less than twelve (12) years relevant experience, Civil Engineering technician with concrete, and steel structure construction experience Projects involving Civil structures such as Slipways, quaywalls, jetties, and foundations for heavy equipment"	"Civil Engineering Technician with twelve (12) years or more of relevant experience, Civil Engineering technician with concrete, and steel structure construction experience Projects involving Civil structures such as Slipways, quaywalls, jetties, and foundations for heavy equipment"
Electrician or artisan [4]	No Information provided or inadequate information provided	"Project team resource as listed and as indicated in scope of works, and submission includes supporting documents as listed:	"Project team resource as listed and as indicated in scope of works, and submission includes supporting documents as listed: -Listed resources has four (4) or more but less than Eight	"Project team resource as listed and as indicated in scope of works, and submission includes supporting documents as listed: -Listed resources has eight (8) or	"Project team resource as listed and as indicated in scope of works, and submission includes supporting documents as listed: -Listed resources has	"Project team resource as listed and as indicated in scope of works, and submission includes supporting documents as listed:

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		-Listed resources has less than Four (4) years experience in construction project -CV, certification, registration body documents submitted. -Proof of qualification -Track record on similar works, with contactable references"	(8) years experience in construction project -CV, certification, registration body documents submitted -Proof of qualification -Track record on outlined works, with contactable references"	more but less than ten (10) years experience in construction project -CV, certification, registration body documents submitted -Proof of qualification -Track record on outlined works, with contactable references "	ten (10) or more but less than twelve (12) years experience in construction project -CV, certification, registration body documents submitted -Proof of qualification -Track record on outlined works, with contactable references "	-Listed resources has twelve (12) or more years experience in construction project -CV, certification, registration body documents submitted -Proof of qualification -Track record on outlined works, with contactable references "

T2.2-09: Evaluation Schedule – Quality Management [7 Points]

Due consideration must be given to the deliverables required to execute and complete the rehabilitation of the Ship Repair Facility project as per the General Quality Requirements for Contractors and Suppliers - TNPA-QUAL-REQ-14.1 (**Annexure E** of the Scope of Work), ISO 9001:2015 QMS requirements and should include:

1. **Project Quality Plan** (PQP) detailing at least **three** requirements of how the Contractor's Quality System will be applied to successfully execute the Scope of Work and be aligned to **Section 4.5, 4.6 & 5** of the General Quality Requirements for Contractors and Suppliers - **TNPA-QUAL-REQ-14.1 (Annexure E** of the Scope of Work)
2. **Experience of Quality Officer** - The Quality Officer MUST have a minimum of **three** years' quality experience in Engineering projects, inclusive of Quay walls, Slipways, jetties, heavy Civil structure construction projects submitted in a Curriculum Vitae. The CV must detail the duties carried out on the Quality Officer role.
3. **Qualifications of Quality Officer**– a minimum Programme in Quality **OR** Diploma in Quality **OR** Technical Diploma (ND, B-Tech, BSC Eng, B. Eng,) in built environment. In addition to the minimum qualification submitted, a tenderer must submit a 5-days ISO 9001:2015 Quality Management System (QMS) training certificates (QMS Implementation **AND/OR** QMS Auditing). Proof of these qualifications and certificates must be attached.

Quality Control Plans- A minimum of **three** (QCPs) shall be in line with the scope of works detailing the Engineering works (**Civil, Structural, Painting and corrosion protection, Mechanical, Electrical**). These QCP's shall identify all inspections as detailed in the scope of works together with other tests and verifications required to demonstrate that the works comply with the scope of works, specifications, and drawings.

Index of documentation attached to this schedule:

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The scoring of the Quality Management will be as follows:

	PQP	Quality Officer		Quality Control Plan	
	Project Quality Plan (PQP) for the project detailing at least three of the following: - Scope of works - Control of documented information - Resources - Audits Control of non-conforming outputs	Experience a minimum of <i>three</i> years' quality experience in projects, inclusive of Quay walls, Slipways, jetties, heavy Civil structure construction.	Qualifications - Programme in Quality or Diploma in Quality or Technical Diploma - ISO 9001:2015 QMS Implementation - ISO 9001:2015 QMS Auditing	Quality Control Plan (QCP) in line with the scope of works detailing at least 3 of the following: - Sequence of activities - Procedure/code specifications - Intervention points - Field inspection checklist - Relevant signatories	Minimum Quality Control Plans in line with the scope of works must be of the following disciplines: - Civil works - Mechanical works - Structural works - Electrical works - Painting and corrosion protection works.
Total (7) points	2	1	1	1	2
Score 0	No PQP submitted or irrelevant information submitted	No submission of CV/ Submitted CV with no quality experience / irrelevant experience submitted	No submission / Submitted qualifications NOT relating to Quality/Technical	No submission or No QCP requirements met.	No submission OR Submitted QCPs (Civil, Structural, Painting and corrosion protection, Mechanical, Electrical) is not relevant to the current scope of works. i.e. for a different type of a project.

	PQP	Quality Officer		Quality Control Plan	
Score 20	Project Quality Plan contains 1 of the 5 PQP requirements.	Less than 1 year Quality experience in projects, inclusive of Quay walls, Slipways, jetties, heavy Civil structure construction projects	Submitted ISO certificates NOT relating to ISO 9001:2015 QMS Implementation and Auditing	Quality Control Plan contains 1 of the 5 QCP requirements.	1 of 5 required QCPs in line with the scope of work was submitted.
Score 40	Project Quality Plan contains 2 of the 5 PQP requirements.	1 to 2 years Quality experience in projects, inclusive of Quay walls, Slipways, jetties, heavy Civil structure construction projects	Submitted ISO 9001:2015 QMS Implementation AND /OR ISO 9001:2015 QMS Auditing Certificate is for less than 5 days training period.	Quality Control Plan contains 2 of the 5 QCP requirements.	2 of 5 required QCPs in line with the scope of work was submitted.
Score 60	Project Quality Plan contains 3 of the 5 PQP requirements.	3 years Quality experience in projects, inclusive of Quay walls, Slipways, jetties, heavy Civil structure construction projects	Programme in Quality OR Diploma in Quality OR Technical Diploma was submitted.	Quality Control Plan contains 3 of the 5 QCP requirements.	3 of 5 required QCPs in line with the scope of work was submitted.
Score 80	Project Quality Plan contains 4 of the 5 PQP requirements.	4-10 years Quality experience in projects, inclusive of Quay walls, Slipways, jetties, heavy Civil	Programme in Quality OR Diploma in Quality OR Technical Diploma with ISO 9001:2015 QMS certificate (Implementation of QMS) were submitted.	Quality Control Plan contains 4 of the 5 QCP requirements.	4 of 5 required QCPs in line with the scope of work was submitted.

	PQP	Quality Officer		Quality Control Plan	
		structure construction construction projects			
Score 100	Project Quality Plan contains all 5 of the PQP requirements.	More than 10 years Quality experience in projects, inclusive of Quay walls, Slipways, jetties, heavy Civil structure construction projects	Programme in Quality OR Diploma in Quality OR Technical Diploma with both ISO 9001:2015 QMS and Auditing certificates were submitted.	Quality Control Plan contains all 5 of the QCP requirements.	5 of 5 required QCPs in line with the scope of work was submitted.

T2.2-10: Evaluation Schedule: Health and Safety Management

[10 Points]

The tenderer must submit the following documents as a minimum with the tender submission:

1. Company Health & Safety Policy signed and dated by the Director/ Chief Executive Officer (CEO). Indicating the following five elements -
 - i. Commitment to Safety, prevention of pollution,
 - ii. Continual improvement,
 - iii. Compliance to legal requirements, appropriate to the nature of contractor's activities,
 - iv. Hold management accountable for development of the safety systems
 - v. Include objectives and targets.
2. Project specific Health and Safety Plan in line with Project Health & Safety Specification. Health and Safety Management Plan must include the following requirements but not limited to:
 - i. Project Scope
 - ii. HIRA
 - iii. Health and Safety Training
 - iv. Health and Safety Inspection & Audits
 - v. Emergency Preparedness and response
 - vi. Personal Protective Equipment (PPE)
 - vii. Fall Protection and Rescue Plan
 - viii. Incident Management and Reporting
 - ix. Plant, Machinery and Equipment's
 - x. Occupational Health and Hygiene
3. Overview of the tenderer's Risk Assessment methodology, and submission of risk assessments indicating major activities of the works and how the risks will be addressed and mitigated and must be in line with the Scope of Work (SoW).

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-
- i. M1 – Mechanical Equipment, Cradles and associated structures and ancillary steelwork.
 - ii. E1 – Electrical upgrades.
 - iii. C1 - Civil works Upgrades.
 - iv. S1 - Structural Upgrades.
 - v. B1 – Operations Building.
 - vi. B1.1 – Operations Building Civils.
 - vii. B1.2 - Operations Building Structural Works.
 - viii. B1.3 - Operations Building Electrical Works.
 - ix. B1.4 - Operations Building Mechanical Works
4. Complete and return with tender documentation the Contractor Safety Questionnaire included as a returnable, attach all required supporting documents.
- Valid Letter of Good Standing.
 - Safety Induction/ orientation booklet .
 - Valid ISO 45001: 2018 Certification.
 - Previously H&S Recognition Certificate.
 - Contractor Health and Safety Questionnaire (Returnable Document).

Attached submissions to this schedule:

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The scoring of the Tender's Health and Safety criteria is as follows:

Score	No response		Poor	Less Than Acceptable	Acceptable response to the particular aspect	Above acceptable real understanding	Excellent Response
	(0)		(20)	(40)	(60)	(80)	(100)
2	Health and Safety Policy	No response - The Tenderer has submitted no information or Health & Safety Policy not signed and dated.	The Tenderer has submitted signed and dated H&S Policy and addressed one (1) element for the Company Health and Safety Policy.	The Tenderer has submitted signed and dated H&S Policy and addressed two (2) elements for the Company Health and Safety Policy.	The Tenderer has submitted signed and dated H&S Policy and addressed three (3) elements for the Company Health and Safety Policy.	The Tenderer has submitted signed and dated H&S Policy and addressed four (4) elements for the Company Health and Safety Policy.	The Tenderer has submitted signed and dated H&S Policy and addressed five (5) elements for the Company Health and Safety Policy.
2	Project Specific Health and Safety plan	No response – Generic document submitted or irrelevant to the project.	The tenderer has submitted project specific Health & Safety Plan including two (2)- three (3) stated employer's requirements	The tenderer has submitted project specific Health & Safety Plan including four (4)- five (5) stated employer's requirements	The tenderer has submitted project specific Health & Safety Plan including six (6)– seven (7) stated employer's requirements	The tenderer has submitted project specific Health & Safety Plan, including eight (8) – nine (9) stated employer's requirements	The tenderer has submitted project specific Health & Safety Plan including all (ten) 10 stated employer's requirements.
5	Risk assessment	No response - Risk assessment	Risk assessment methodology is provided with the risk assessment. 1-	Risk assessment methodology is provided with the risk assessment. 3-4 major activities are	Risk assessment methodology is provided with the risk assessment. 5 major	Risk assessment methodology is provided with the risk assessment. 6-7 major	Risk assessment methodology is provided with the risk assessment. 8-9 major

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	methodology	t is provided but not aligned to project scope.	2 major activities are provided in task-based risk assessment and are aligned to the project.	provided in task-based risk assessment and are aligned to the project.	activities are provided in task-based risk assessment and are aligned to the project.	activities are provided in task-based risk assessment and are aligned to the project.	activities are provided in task-based risk assessment and are aligned to the project.
1	Contractor Safety Questionnaire (Questionnaire found in the Health and Safety specification)	No response - Health and Safety questionnaire is not fully completed and no supporting documents attached.	The tenderer has submitted one (1) document either Contractor Safety Questionnaire or supporting documents.	The tenderer has submitted two (2) document either Contractor Safety Questionnaire or supporting documents.	The tenderer has submitted three (3) document either Contractor Safety Questionnaire or supporting documents.	The tenderer has submitted four (4) document either Contractor Safety Questionnaire or supporting documents.	The tenderer has submitted five (5) documents.

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Contractor Safety Questionnaire

1. Safe Work Performance				
1A	Injury Experience / Historical Performance – Alberta			0.5
	Use the previous three years injury and illness records to complete the following:			
	Year			
	Number of medical treatment cases			
	Number of restricted workday cases			
	Number of lost time injury cases			
	Number of fatal injuries			
	Total recordable frequency			
	Lost time injury frequency			
	Number of worker manhours			
	Action taken to prevent re-occurrence			
	1	Medical Treatment Case	Any occupational injury or illness requiring treatment provided by a physician or treatment provided under the direction of a physician	
	2	Restricted Workday Case	Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties	
	3	Lost Time injury Cases	Any occupational injury that prevents the worker from performing any work for at least one day	
	4	Total Recordable Frequency	Total number of Medical Treatment, Restricted Work and Lost Time Injury cases multiplied by 200,000 then divided by total manhours	
5	Lost Time Injury Frequency	Total number of Lost Time Injury cases multiplied by 200,000 then divide by total manhours		
1B	Workers' Compensation Experience			
	Use the previous three years injury and illness records to complete the following (if applicable):			
	Industry Code:		Industry Classification:	
	Year			
	Industry Rate			
	Contractor Rate			

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	% Discount or Surcharge						
	Is your Workers' Compensation account in good standing? (Please provide letter of confirmation) 0.5				Yes		No
2. Citations							
2A	Has your company been cited, charged or prosecuted under Health, Safety and/or Environmental Legislation in the last 5 years? If yes, provide details:				Yes		No
2B	Has your company been cited, charged or prosecuted under the above Legislation in another Country, Region or State? If yes, provide details:				Yes		No
3. Citations							
	Does your company have a Certificate of Recognition?				Yes		No
	If yes, what is the	Certificate No:		Issue Date:			
4. Safety Program							
4A	Submit your company written health and safety plan? Submit for provide a copy for review						2
4B	Submit your company pocket safety booklet for field distribution?						0.5
4C	Health and safety plan should contain the following elements						
		Yes	No		Yes	No	
	Health and Safety Policy			Equipment Maintenance			
	Incident Management and reporting			Emergency Preparedness/Response			
	Recordkeeping & Statistics			Hazard Assessment and Risk Management and training			
	Reference to Legislation			Safe Work Practices			
	General Rules & Regulations			Safe Work Procedures and Safe operating procedures			
	Roles and responsibilities			Workplace Inspections			
	Responsibilities			Investigation Process			
	PPE Standards			Training Policy & Program			
	Environmental Standards			Communication Processes			
	Work Program or look ahead plan			Competency and Training			
5. Training Program							
5A	Attach orientation program for new hire employees? include a course outline. Does it include any of the following:						1
		Yes	No		Yes	No	
	General Rules & Regulations			Confined Space Entry			
	Emergency Reporting			Trenching & Excavation			
	Injury Reporting			Signs & Barricades			

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	Legislation			Dangerous Holes & Openings		
	Right to Refuse Work			Rigging & Cranes		
	Personal Protective Equipment			Mobile Vehicles		
	Emergency Procedures			Preventative Maintenance		
	Project Safety Committee			Hand & Power Tools		
	Housekeeping			Fire Prevention & Protection		
	Ladders & Scaffolds			Electrical Safety		
	Fall Arrest Standards			Compressed Gas Cylinders		
	Aerial Work Platforms			Weather Extremes		
5B	Submit a program for training newly hired or promoted supervisors? Tenderer must submit an outline for evaluation which include instruction on the following:					1
		Yes	No		Yes	No
	Employer Responsibilities			Safety Communication		
	Employee Responsibilities			First Aid/Medical Procedures		
	Due Diligence			New Worker Training		
	Safety Leadership			Environmental Requirements		
	Work Refusals			Hazard Assessment		
	Inspection Processes			Pre-Job Safety Instruction		
	Emergency Procedures			Drug & Alcohol Policy		
	Incident Investigation			Progressive Disciplinary Policy		
	Safe Work Procedures			Safe Work Practices		
	Safety Meetings			Notification Requirements		
6. Safety Activities						
6A	Do you conduct safety inspections?	Yes	No	Weekly	Monthly	Quarterly
	Describe your safety inspection process (include participation, documentation requirements, follow-up, report distribution)					
	Who follows up on inspection action items?					
6B	Do you hold site safety meetings for field employees? If Yes, how often?	Yes	No	Daily	Weekly	Biweekly
6C	Do you hold site meetings where safety is addressed with management and field supervisors?	Yes	No	Weekly	Biweekly	Monthly
6D	Is pre-job safety instruction provided before to each new task?	Yes	No			
	Is the process documented?	Yes	No			
	Who leads the discussion?					
6E	Do you have a hazard assessment process?	Yes	No			
	Are hazard assessments documented?	Yes	No			
	If yes, how are hazard assessments communicated and implemented on each project?					
	Who is responsible for leading the hazard assessment process?					

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6F	Submit your company policies and procedures for environmental protection, spill clean-up, reporting, waste disposal, and recycling as part of the Health & Safety Program?					
6G	How does your company measure its H&S success? Attach separate sheet to explain					
7. Safety Stewardship						
7A	Are incident reports and report summaries sent to the following and how often?	Yes	No	Monthly	Quarterly	Annually
	Project/Site Manager					
	Vice President/Managing Director					
	Safety Director/Manager					
	President/Chief Executive Officer					
7B	How are incident records and summaries kept? How often are they reported internally?	Yes	No	Monthly	Quarterly	Annually
	Incidents totalled for the entire company					
	Incidents totaled by project					
	Subtotalled by superintendent					
	Subtotalled by foreman					
7C	How are the costs of individual incidents kept? How often are they reported internally?	Yes	No	Monthly	Quarterly	Annually
	Costs totalled for the entire company					
	Costs totaled by project					
	Subtotalled by superintendent					
	Subtotalled by foreman/general foreman					
7D	Does your company track non-injury incidents?	Yes	No	Monthly	Quarterly	Annually
	Near Miss					
	Property Damage					
	Fire					
	Security					
	Environmental					
8. Personnel						
List key health and safety officers planned for this project. Attach resume (CV and qualification).						0.5
Name		Position / Title		Designation		
				Category	SACPCMP Number	
9. References						
List the last three company's your form has worked for that could verify the quality and management commitment to your occupational Health & Safety program						
Name and Company		Address		Telephone Number		

T2.2-11: Evaluation Schedule: Environmental Management [10 Points]

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

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

1. The tenderer must provide a project specific **Environmental Management Plan** based on the scope of work. This plan must be clear on the following and the score (minimum 4) will be awarded as illustrated in the table below:
 - 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.
2. The tenderer must provide an **Environmental Policy** signed by Top Management that displays the following key components (minimum 3), 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.
3. Provide a **company organogram** reflecting appointed **environmental officer** and

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associated **Curriculum Vitae (CV)** showing environmental officer competencies, experience and environmental qualification (certified copy of relevant degree or equivalent) relevant to environmental management functions. A minimum qualification is B-Tech/ Bachelor's degree, at least greater than 4 years of experience and environmental officer reflected on the organogram. a certified proof of Qualification must be submitted, CV and Organogram).

4. The tenderer must provide a **list of projects** (minimum of 3 relevant 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			

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

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

Site specific Environmental management system

	Environmental Management Plan	Environmental Policy	Environmental Officer Qualification (and reflected on the Organogram)	Environmental Officer Experience	List of relevant projects where construction environmental management duties have been executed
Points	3	1	2	2	2
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 EO not reflected on organogram or submitted Qualifications not in Natural Science or Environmental Studies to determine a score.	An Environmental Officer has not submitted relevant experience, no relevant experience or <1 year of relevant on-the-job experience.	The Tenderer has submitted no information to determine a score or irrelevant list of projects
Score 20	EMP only responds to 1-2 of the items listed under paragraph 1 in T2.2-09.	Policy addresses 1 of the required elements listed under paragraph 2 in T2.2-09.	An Environmental officer is in possession of a relevant Certificate in Natural Science or Environmental Studies	Environmental officer has ≥ 1 year but ≤ 3 years of relevant on-the-job experience.	Tenderer has only executed environmental management duties in 1 relevant project.

	Environmental Management Plan	Environmental Policy	Environmental Officer Qualification (and reflected on the Organogram)	Environmental Officer Experience	List of relevant projects where construction environmental management duties have been executed
			and reflected on organogram		
Score 40	EMP only responds to 3 of the items listed under paragraph 1 in T2.2-09.	Policy addresses 2 of the required elements listed under paragraph 2 in T2.2-09.	An Environmental officer is in possession of a Diploma in Natural Science or Environmental Studies and reflected on organogram	Environmental officer has >3 years but ≤4 years of relevant on-the-job experience.	Tenderer has only executed environmental management duties in 2 relevant projects.
Score 60	EMP only responds to 4 of the items listed under paragraph 1 in T2.2-09.	Policy addresses 3 of the required elements listed under paragraph 2 in T2.2-09.	An Environmental officer is in possession of a Bachelor's degree/ B-Tech in Natural Science or Environmental Studies and reflected on organogram.	An Environmental officer has >4 years but ≤8 years of relevant on-the-job experience.	Tenderer has only executed environmental management duties on 3 relevant projects.

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	Environmental Management Plan	Environmental Policy	Environmental Officer Qualification (and reflected on the Organogram)	Environmental Officer Experience	List of relevant projects where construction environmental management duties have been executed
Score 80	EMP only responds to 5 of the items listed under paragraph 1 in T2.2-09.	Policy addresses 4 of the required elements listed under paragraph 2 in T2.2-09.	An Environmental officer is in possession of a Bachelor's degree with Honours in Natural Science or Environmental Studies and reflected on organogram	An environmental officer has >8 but ≤10 years relevant on-the-job experience.	Tenderer has only executed environmental management duties on 4 relevant projects.
Score 100	EMP responds to all the items listed under paragraph 1 in T2.2-09.	Policy addresses all of the required elements listed under paragraph 2 in T2.2-09.	An Environmental officer is in possession of a master's degree in Natural Science or Environmental Studies and reflected on organogram.	An Environmental officer has > 10 years of relevant on-the-job experience.	Tenderer has only executed environmental management duties on 5 relevant projects.

T2.2-12: 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

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B. Certificate for Partnership

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

hereby authorise Mr/Ms

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

Name	Address	Signature	Date

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

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C. Certificate for Joint Venture

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise Mr/Ms _____, an authorised signatory of the company _____, acting in the capacity of lead partner, to sign all documents in connection with the tender offer for Contract _____ and any contract resulting from it on our behalf.

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

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

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

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D. Certificate for Sole Proprietor

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

Signed

Date

Name

Position

Sole Proprietor

T2.2-13: Record of Addenda to Tender Documents

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

	Date	Title or Details
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

T2.2-14 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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T2.2-15: Risk Elements

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

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

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

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

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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]

T2.2-17: 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 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

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% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdevel oped areas/ Townships	Military Veterans	
	☐	☐	☐	☐	☐	☐	☐	

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

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Tenderers to indicate their Site establishment area requirements:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend 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.

T2.2-19 : 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			

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(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				

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T2.2-20 : 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: _____

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

- i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;
- ii) confirms that 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

T2.2-21 SBD 6.1 (Preference Point System)

SBD 6.1

PREFERENCE POINTS CLAIM FORM

This preference form must form part of all Tenders 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 Tenders:

- 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 Tenders is estimated to **exceed** R50 000 000 (all applicable taxes included) and therefore the 90/10 preference point system shall be applicable. Despite the stipulated preference point system, Transnet shall use the lowest acceptable Tender to determine the applicable preference point system in a situation where all received acceptable Tenders are received outside the stated preference point system.

1.3 Preference points for this Tender shall be awarded for:

- (a) Price;
- (b) B-BBEE Status Level of Contributor; and
- (c) Any other specific goal determined in the Transnet preferential procurement policy

1.4 The maximum points for this Tender are allocated as follows:

<u>DESCRIPTION</u>	<u>POINTS</u>
PRICE	80/90
B-BBEE Status Level of Contributor (1 or 2)	5/3
The promotion of supplier development through sub-contracting a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs 51% black owned.	15/7
Total points for Price and Specific Goals must not exceed	100

- 1.5 Failure on the part of a Tenderer to submit proof of evidence required for any of the specific goals together with the Tender 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 Tenderer, either before a Tender 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) **"Tender"** 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 tendering 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 Tenderer to provide goods or services in accordance with specification as set out in the Tender 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 Tender 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

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

Where

P_s = Points scored for comparative price of Tender under consideration

P_t = Comparative price of Tender under consideration

$P_{\min}$ = Comparative price of lowest acceptable Tender

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 Tenderer for providing evidence in accordance with the table below:

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 sub-contracting a minimum of 30% of the value of a contract to South African Companies which are: I. EMEs and/or QSEs 51% black owned.	Sub-contracting agreements 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 & Sworn Affidavit
Large	Certificate issued by SANAS accredited verification agency
QSE	Certificate issued by SANAS accredited verification agency Sworn Affidavit signed by the authorised QSE representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership (only black-owned QSEs - 51% to 100% Black owned) [Sworn affidavits must substantially comply with the format that can be obtained on the DTI's website at www.dti.gov.za/economic_empowerment/bee_codes.jsp .]
EME¹	Sworn Affidavit signed by the authorised EME representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership Certificate issued by CIPC (formerly CIPRO) confirming annual turnover and black ownership Certificate issued by SANAS accredited verification agency only if the EME is being measured on the QSE scorecard

- 4.3 A trust, consortium or joint venture (including unincorporated consortia and joint ventures) must submit a consolidated B-BBEE Status Level verification certificate for every separate Tender.
- 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 Tender documents that such a Tenderer intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the

¹ 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.

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- points that such a Tenderer 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 Tenderers 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 Tenderer’s responsibility to ensure that his/her Tender complies fully with all B-BBEE requirements at the time of the submission of the Tender.

5. TENDER DECLARATION

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

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

- 6.1 B-BBEE Status Level of Contribution: . = ...(maximum of 10 points)
- (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*)

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,.

[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 Tenderer submitted false information regarding its B-BBEE status level of contributor, which will affect or has affected the evaluation of a Tender, or where a Tenderer has failed to declare any subcontracting arrangements or any of the

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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 tendering 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 Tenderer subcontracted a portion of the Tender to another person without disclosing it, Transnet reserves the right to penalise the Tenderer up to 10 percent of the value of the contract;
- (e) recommend that the Tenderer 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 TENDERER(S)

DATE:

ADDRESS

.....

T2.2-22 SBD 4 (Declaration of Interest)

TENDERER'S DISCLOSURE

SBD4

1. Purpose of the Form

Any person (natural or juristic) may make an offer or offers in terms of this invitation to Tender. 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 Tenderer 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 Tender process.

2. Tenderer's declaration

- 2.1 Is the Tenderer, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest² in the enterprise, employed by the state?

YES/NO

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

Full Name	Identity Number	Name of State institution

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

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2.2 Do you, or any person connected with the Tenderer, 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 Tenderer 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 tendering for this contract?

YES/NO

2.3.1 If so, furnish particulars:

.....

3 DECLARATION

I, the undersigned, (name)..... in submitting the accompanying Tender, 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 Tender will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 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 consortium³ will not be construed as collusive tendering.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices,

³ Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the Tender, tendering with the intention not to win the Tender and conditions or delivery particulars of the products or services to which this Tender invitation relates.

- 3.4 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.
- 3.5 There have been no consultations, communications, agreements or arrangements made by the Tenderer with any official of the procuring institution in relation to this procurement process prior to and during the tendering process except to provide clarification on the Tender submitted where so required by the institution; and the Tenderer was not involved in the drafting of the specifications or terms of reference for this Tender.
- 3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to Tenders and contracts, Tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

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

I ACCEPT THAT THE STATE MAY REJECT THE TENDER 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 Tenderer

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

Part T2: Returnable Schedules
T2.2-23: Non-Disclosure Agreement

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 **Tender** or **Tender 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 Tender 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.

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- 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	_____		

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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:

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

[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 RESPONDENTS

- Transnet established the SCM Complaints and Allegations Office to investigate any material complaint in respect of any tenders regardless of the value. Should a Respondent 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 Respondent 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.

TENDER NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

-
- 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 Respondents 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 Bidders.

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DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

T2.2-25 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

T2.2-26 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 contained in any printed form stated to form part of the documents thereof, but not limited to those listed in this clause.
2. I/we furthermore agree that Transnet SOC Ltd shall recognise no claim from me/us for relief based on an allegation that I/we overlooked any tender/contract condition or failed to take it into account for the purpose of calculating my/our offered prices or otherwise.
3. I/we understand that the accompanying Tender will be disqualified if this Certificate is found not to be true and complete in every respect.
4. For the purposes of this Certificate and the accompanying Tender, I/we understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:
 - a) has been requested to submit a Tender in response to this Tender invitation;
 - b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
 - c) provides the same Services as the Tenderer and/or is in the same line of business as the Tenderer
5. The Tenderer has arrived at the accompanying Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive Tendering.
6. In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

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- a) prices;
 - b) geographical area where Services will be rendered [market allocation]
 - c) methods, factors or formulas used to calculate prices;
 - d) the intention or decision to submit or not to submit, a Tender;
 - e) the submission of a tender which does not meet the specifications and conditions of the tender; or
 - f) Tendering with the intention not winning the tender.
7. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Services to which this tender relates.
8. The terms of the accompanying tender have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening or of the awarding of the contract.
9. I/We am/are aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to tenders and contracts, tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and/or may be reported to the National Prosecuting Authority [NPA] for criminal investigation. In addition, Tenderers that submit suspicious tenders may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

Signed on this _____ day of _____ 20____

SIGNATURE OF TENDERER

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T2.2-27 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.

OBJECTIVES

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.

COMMITMENTS OF TRANSNET

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

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.

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.

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.

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.

OBLIGATIONS OF THE TENDERER / SERVICE PROVIDER

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.

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

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

inducement to any employee of Transnet, connected directly or indirectly with the tendering process, or to any person, organisation or third party related to the contract in exchange for any advantage in the tendering, evaluation, contracting and implementation of the contract.

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.

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.

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.

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.

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.

Transnet may require the Tenderer/Service Provider/Contractor to furnish Transnet with a copy of its code of conduct. Such code of conduct must address the compliance programme for the implementation of the code of conduct and reject the use of bribes and other dishonest and unethical conduct.

The Tenderer/Service Provider/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

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

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- 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.

INDEPENDENT TENDERING

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.

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.

In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

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-
- a) prices;
 - b) geographical area where 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.

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.

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.

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.

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.

DISQUALIFICATION FROM TENDERING PROCESS

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.

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.

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.

TRANSNET'S LIST OF EXCLUDED TENDERERS (BLACKLIST)

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.

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.

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.

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.

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.

A Service Provider or Contractor to Transnet may not subcontract any portion of the contract to a blacklisted company.

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.

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.

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.

PREVIOUS TRANSGRESSIONS

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.

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.)

SANCTIONS FOR VIOLATIONS

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

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- 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.

CONFLICTS OF INTEREST

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.

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.

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/

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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.

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.

DISPUTE RESOLUTION

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 0 above, Transnet will not do business with a company that litigates against it in bad faith or is involved in any action that reflects bad faith on its part. Litigation in bad faith includes, but is not limited to the following instances:

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

GENERAL

This Integrity Pact is governed by and interpreted in accordance with the laws of the Republic of South Africa.

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.

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.

Should one or several provisions of this Integrity Pact turn out to be invalid the remainder of this Integrity Pact remains valid.

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

T2.2-28: Supplier Code of Conduct

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

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

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

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

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

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

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

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

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

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

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

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

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Conflicts of Interest

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

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

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

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

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

Signed this on day _____ at

Signature

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T2.2-29 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 DPIP/FPPO		Closely Associated to a DPIP/FPPO		
List all known business interests, in which a DPIP/FPPO may have a direct/indirect interest or significant participation or involvement.						
No	Name of Entity / Business	Role in the Entity / Business (Nature of interest/ Participation)	Share holding %	Registration Number	Status (Mark the applicable option with an X)	
					Active	Non-Active
1						
2						
3						

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

2. SERVICE LEVELS

- 2.1 Transnet reserves the right to request that any member of the Service provider's team involved on the Transnet account be replaced if deemed not to be adding value for Transnet.
- 2.2 The Service provider guarantees that it will achieve a 95% [ninety-five per cent] service level on the following measures:
- a) Random checks on compliance with quality/quantity/specifications
 - b) On-time delivery
- 2.3 The Service provider must provide a telephone number for customer service calls.
- 2.4 Failure of the Service provider to comply with stated service level requirements will give Transnet the right to cancel the contract in whole, without penalty to Transnet, giving 30 [thirty] calendar days' notice to the Service provider of its intention to do so.

Acceptance of Service Levels:

YES	

NO	

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 (.....) 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 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.

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Signed at _____ on this _____ day of _____ 20

Name: _____

Title: _____

Signature: _____

.....

(Operator)

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

AS WITNESSES:

1.	Name: _____	Signature: _____
2.	Name: _____	Signature: _____

T2.2-31: 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 R10 000 000.			
Insurance in respect of loss of or damage to own property and equipment.			
Marine Craft Hull insurance in respect of all marine craft or vessels utilised in performance of the Works for a sum sufficient to provide for their replacement			
Protection and Indemnity Insurance in respect of all marine craft or vessels utilised in performance of the Works extended for Specialist Operations with a minimum indemnity limit of R 50,000,000			
(Other)			

T2.2-32: 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

APPROVED GUARANTEE ISSUERS

ABSA BANK LIMITED GROUP
BANK OF AMERICA, N.A
BANK OF CHINA LIMITED GROUP
BARCLAYS BANK PLC GROUP
AFRICAN IMPORT-EXPORT BANK
BNP PARIBAS GROUP
CHINA CONSTRUCTION BANK GROUP
CHINA DEVELOPMENT BANK
CITIBANK GROUP
CREDIT SUISSE GROUP
DEUTSCHE BANK GROUP
FIRSTRAND BANK LIMITED GROUP
GOLDMAN SACHS INTERNATIONAL
HSBC HOLDINGS GROUP
INVESTEC BANK LTD
JPMORGAN CHASE BANK GROUP
MORGAN STANLEY
MACQUARIE BANK LIMITED
NEDBANK LTD
SOCIETE GENERALE BANK GROUP
STANDARD BANK GROUP
STANDARD CHARTERED BANK GROUP
AFRICAN BANK LTD
BIDVEST BANK LTD
CAPITEC BANK LTD
DISCOVERY BANK LTD
GRINDROD BANK LTD
SASFIN BANK LTD
ABN AMRO Bank N.V.
BANCO BILBAO VIZCAYA ARGENTARIA S.A
Coöperative Rabobank U.A.
CREDIT AGRICOLE CORPORATE AND INVESTMENT BANK
DANSKE BANK
INDUSTRIAL DEVELOPMENT CORPORATION
ING Bank N.V.
KBC BANK
LANDESBANK BADEN-WUERTTEMBERG
MIZUHO BANK, LTD
NATIONAL AUSTRALIA BANK LIMITED
SKANDINAVISKA ENSKILDA BANKEN
SUMITOMO MITSUI BANKING CORPORATION
SVENSKA HANDELSBANKEN AB

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AIG SOUTH AFRICA
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

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T2.2-33: Foreign Exchange Requirements

If Secondary Option X3 is included in the *conditions of contract* of the NEC3, the Tenderer to provide detailed breakdown of items that will have a foreign exchange implication.

Justification and full details supporting foreign currency requirements to be appended to this Schedule.

Items & activities	Currency	Bank	Maximum payment

The *exchange rates* to be used are stated in the Contract Data provided by the *Employer*.

It is expected that the percentages of foreign currency or currencies quoted are realistic and that they adequately reflect the overall foreign component of cost.

Due to the introduction of International Financial Reporting Standards IS32 and IS39, the *Employer* may not be able to accommodate a tenderer's requirements in full or at all.

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T2.2-34: Forecast Rate of Invoicing

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

Index of documentation attached to this schedule:

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.....

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.....

.....

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.....

.....

T2.2-35: 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:

REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

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:**

Name &
signature of
witness

(Insert name and address of
organisation)

Date



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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).

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

Signature(s)

Name(s)

Capacity

**for the
Employer**

Transnet SOC Ltd

Name &
signature of
witness

*(Insert name and address of
organisation)*

Date

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Schedule of Deviations

Note:

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

No.	Subject	Details
1		
2		
3		
4		
5		

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

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

For the tenderer:

For the Employer

Signature

Name

Capacity

On behalf of *(Insert name and address of organisation)*

Transnet SOC Ltd

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Name &
signature
of
witness

Date

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



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C1.2 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		B: Priced contract with bill of quantities
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	
		X1: Price adjustment for inflation
		X2 Changes in the law
		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)



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	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 55 Bland Street Port Of Mossel Bay 6500
10.1	The <i>Project Manager</i> is: (Name)	TBA
	Address	TBA
	Tel	TBA
	e-mail	TBA
10.1	The <i>Supervisor</i> is: (Name)	TBA
	Address	TBA
	Tel No.	TBA
	e-mail	TBA
11.2(13)	The <i>works</i> are	Rehabilitation of the Ship Repair Facility in the Port of Mossel Bay for a Period of 24 Months.
11.2(14)	The following matters will be included in the Risk Register	Controlled entry to the Port Facilities Security of the Port during installation
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



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13.3	The <i>period for reply</i> is	Two (2) weeks	
2	The <i>Contractor's</i> main responsibilities	No additional data is required for this section of the <i>conditions of contract</i> .	
3	Time		
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	TBA	
11.2(9)	The <i>key dates</i> and the <i>conditions</i> to be met are:	<i>Condition to be met</i>	<i>key date</i>
		1 Safety File	TBA
		2 Construction Start Date	TBA
		3 Completion date	TBA
24	People	The Contractor shall ensure that each key personnel to be submitted to the Project Manager in terms of the requirements of clause 24.1 shall be the same key personnel as submitted with its tender proposal. No replacement personnel shall have any connection to the work unless replaced or employed in terms of Clause 24.	
30.1	The <i>access dates</i> are	Part of the Site	Date



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	1 Port of Mossel Bay	On approval of Contractor's SHE file and all applicable HSE requirements (Letter of good standing) and site access certificate
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	two (2) weeks of the Contract Date.
31.2	The <i>starting date</i> is	TBA
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	two (2) weeks.
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.	N/A
4	Testing and Defects	
42.2	The <i>defects date</i> is	52 (fifty-two) weeks after Completion of the whole of the <i>works</i>.
43.2	The <i>defect correction period</i> is	2 weeks
5	Payment	
50.1	The <i>assessment interval</i> is monthly on the	15th (Fifteenth) 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 (RMB) of South Africa.
6	Compensation events	



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60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are, The place where weather is to be recorded (on the Site) is: The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at: and which are available from:	the number of days with rainfall more than 10 mm A weather measurement is recorded • Within a calendar month • Before the completion date for the whole of the works and • At the place stated in the Contract Data The value of which, by comparison with the weather data, is shown to occur on average less frequently than once in ten years. Only the difference between the weather measurement and weather which the weather data show to occur on average less frequently than once in ten years is taken into account The <i>Contractor's</i> Site establishment area Mossel Bay 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.



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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.



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Note:

The deductibles for the insurance as stated above are listed in the document titled "Certificate of Insurance: Transnet (SOC) Limited Principal Controlled Insurance."

84.2

The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract for any one event is

The *Contractor* must comply at a minimum with the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended.

The *Contractor* provides these additional Insurances

- 1 Where the contract requires that the design of any part of the *works* shall be provided by the *Contractor* the *Contractor* shall satisfy the *Employer* 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 R5 000 000. 5 Marine Craft Hull insurance in respect of all marine craft or vessels utilised in performance of the Works for a sum sufficient to provide for their replacement 6 Protection and Indemnity Insurance in respect of all marine craft or vessels utilised in performance of the Works extended for Specialist Operations with a minimum indemnity limit of R 20,000,000 7 The insurance coverage referred to in 1, 2, 3, 4, 5 and 6 above shall be obtained from an insurer(s) in terms of an insurance policy approved by the <i>Employer</i>. The <i>Contractor</i> shall arrange with the insurer to submit to the <i>Project Manager</i> 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 <i>Contractor</i>.
84.3	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.



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84.4	The insurance against loss of or damage to the works, Plant and Materials as stated in the insurance policy for contract works and public liability selected from:	Principal Controlled Insurance policy 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 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	Cape Town, South Africa



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	The person or organisation who will choose an arbitrator			
	- if the Parties cannot agree a choice or			
	- if the arbitration procedure does not state who selects an arbitrator, is			
	The Chairman of the Association of Arbitrators (Southern Africa)			
12	Data for secondary Option SEIFSA clauses			
X1	Price adjustment for inflation			
X1.1(a)	The <i>base date</i> for indices is	One month before tender closes		
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:	Pro-portion	linked to index for	Index prepared by
		0.15	Labour (People) SEIFSA – Table C3	The SEIFSA Labour Indices: Table C-3
		0.10	Plant (Equipment)	The “Plant and Equipment” index in P-2 (Mining and construction plant and equipment price index) of the SEIFSA latest table of indices
		0.10	Material (Civil)	The “Civil Engineering Material - Total” index in Table 6 (Civil engineering material price indices) of the SEIFSA table G-3



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		0.15	Material (Electrical)	The Electrical motor indices SEIFSA table J4 and ruling price of electrical cable manufacturing material table N	
		0.35	Material (Mechanical)	The Electrical motor indices SEIFSA table J4 and ruling price of electrical cable manufacturing material table N	
		0.10	Fuel	The SEIFSA petroleum product index table L-2	
		0.05	Material (Structural) SEIFSA – Table Q-1(A)	Stainless Corrosion Resisting 3CR12	Steel Steel
TOTAL		1.00			
		0.15	Non-adjustable		
*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			
X3	Multiple Currencies (used only with Options B)				
X4	Parent company guarantee	No additional data is required for this Option refer NEC ECC book			
X7	Delay damages				
X7.1	Delay damages for Completion of the whole of the <i>works</i> are	R30 000 per day			



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X13	Performance bond	
X13.1	The amount of the performance bond is	10% of the total of the Prices, on demand. Original to be handed over to the Project Manager
X16	Retention	
X16.1	The retention free amount is	Nil
	The retention percentage is	5% 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:	The deductible of the relevant insurance policy And the actual consequential loss
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 Total of the Prices
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:	5 years after Completion of the whole of the works
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	5 years after Completion of the whole of the works
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 Contractor must contribute to the Employer's job-creation objectives as set out in Returnable Schedule T2.2-19

Z1.2

The Contractor's undertaking as to the number of new jobs created due to the award of this contract as set out in Returnable Schedule T.2.2-19 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 this specific material term of the contract, which may constitute a reason for termination.

Z1.3

The Contractor shall provide to the Employer, on a monthly basis or upon receiving an instruction to do so by the Project Manager, any documentation and/or evidence required by the Employer, which in the Employer's opinion would be necessary to verify whether the Contractor has maintained the job-creation undertaking as stipulated in Returnable Schedule T.2.2-19. The Contractor 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.



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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 Additional obligations in respect of Termination

Z4.1

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)

Z4.2	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"
Z4.3		Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."



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Z7	Protection of Personal Information Act	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.
Z7.1		
Z.8	Obligations in respect of Subcontracting	
Z8.1		It will be a material term of this contract that the Contractor must subcontract a minimum of 30% of the value of the contract.
Z8.2		The Contractor's Subcontracting percentage as detailed in the tender submission Returnable T2.2-17 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.
Z8.3		The Contractor shall report to the Employer on a monthly basis during the term of the Contract, the amounts spent on each sub-contractor.
Z8.4		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



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Z8.5

T2.2-17, 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 to the Employer, upon receiving an instruction to do so, any documentation and/or evidence required by the Employer, which in the Employer's opinion would be necessary to verify whether the Contractor has maintained the subcontracting percentage.

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.



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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:(Where this schedule is inadequate, the tenderer shall supplement this schedule with an attachment). All of the key personnel that are submitted with T2.2-03 for Technical Evaluation shall be captured in this Contract Data part 2.	
	1 Name:	
	Job:	
	Responsibilities:	
	Qualifications:	
	Experience:	



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	2 Name:	
	Job	
	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	
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)

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

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 Parent Company Guarantee (for use with Option X4)*(to be reproduced exactly as shown below on the letterhead of the Contractor's Parent Company)*

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

Date:

Dear Sirs,

Parent Company Guarantee for Contract No.

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

{Transnet SOC Ltd, 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
Contractor's parent
company

of physical address

and duly authorised thereto do hereby unconditionally guarantee to the *Employer* that the *Contractor* shall Provide the Works in accordance with the above numbered Contract.

1. If for any reason the *Contractor* fails to Provide the Works, we hereby agree to cause to Provide the Works at no additional cost to the *Employer*.
2. If we fail to comply with the terms of this Deed of Guarantee, the *Employer* may itself procure such performance (whether or not the Agreement be formally determined). The *Employer* is to notify us and we shall indemnify the *Employer* for any additional cost or expense it incurs.
3. Our liability shall be as primary obligor and not merely as surety and shall not be impaired or discharged by reason of any arrangement or change in relationship made between the *Contractor* and the *Employer* and/or between us and *Contractor*; nor any alteration in the obligations undertaken by the *Contractor* or in the terms of the Agreement; nor any

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indulgence, failure, delay by you as to any matter; nor any dissolution or liquidation or such other analogous event of the *Contractor*.

4. The *Employer* shall not be obliged before taking steps to enforce the terms of this Deed of Guarantee to obtain judgement against the *Contractor* in any court or other tribunal, to make or file any claim in liquidation (or analogous proceedings) or to seek any remedy or proceed first against the *Contractor*.
5. This Deed of Guarantee shall be governed by and construed in accordance with the laws of the Republic of South Africa, and we hereby submit to the non-exclusive jurisdiction of any Supreme Court of South Africa with competent jurisdiction.

Signed at _____ on this _____ day of _____ 20__

Signature(s)

Name(s) (printed)

Position in parent company

Signature of Witness(s)

Name(s) (printed)

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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.

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.

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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.
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

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Signed _____ on this _____ day of _____ 20__
at _____

Signature(s)	
Name(s) (printed)	
Position in Guarantor company	
Signature of Witness(s)	
Name(s) (printed)	

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PART 2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option B	3
C2.2	The <i>bill of quantities</i>	

C2.1 Pricing instructions: Option B

1. The *conditions of contract*

1.1. How the contract prices work and assesses it for progress payments

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 <i>bill of quantities</i> 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 <i>Contractor</i> 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 <i>Contractor</i> 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 Option B is a re-measurement contract and the bill comprises only items measured using quantities and rates or stated as lump sums. Value related items are not used. Time related items are items measured using rates where the rate is a unit of time.

1.2. Function of the Bill of Quantities

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

1.3. Guidance before pricing and measuring

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

Historically bill of quantities based contracts in South Africa have been influenced by the different approaches of the civil engineering and building sectors of the industry through their respective discipline based standard forms of contract and methods of measurement. This is particularly apparent in the approach to the Preliminary and General 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

1.1. 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 ⁴	provisional sum
PC-sum	prime cost sum
R/only	Rate only
sum	Lump sum
t	ton (1000kg)
W/day	Work day

1.2. 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*

⁴ 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

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.

1.3. Departures from the *method of measurement*

2.4. 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.

C2.2 The *bill of quantities*

Refer to Annexure A of the Tender

REHABILITATION OF THE MOSSELBAY SHIP REPAIR FACILITY TRANSNET NATIONAL PORTS AUTHORITY				
<u>FINAL SUMMARY</u>				
SECTION NO.		DESCRIPTION	PAGE NO	AMOUNT
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2		Building Works	89	
3		Slipway Deck	96	
4		External Works	115	
5		Cradles and Associated Items	125	
6		Electrical Installations	146	
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8		Provisional Sums	179	
TOTAL (CARRIED TO FORM OF OFFER) Excl VAT				

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

PART C3: SCOPE OF WORK

Document reference	Title	No of pages
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C3.2	<i>Annexures</i>	229
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PART C3: SCOPE OF WORK

SECTION 1

1 DESCRIPTION OF THE WORKS

1.1 Executive Overview

The Port of Mossel Bay has an approximately 85year old end haul type slipway currently installed, the original design capacity of the slipway being 500Ton (long). The existing cradle is made from wood and is supported by a 3-way system. The cradle was originally constructed as a 42m long structure but had a section cut-off around 10years ago, reducing its effective length to 35m. The timber cradle, when fully extended into the water, straddles two wooden lead-in jetties on either side of it. Both jetties are approximately 62m long and supported on wooden piles.

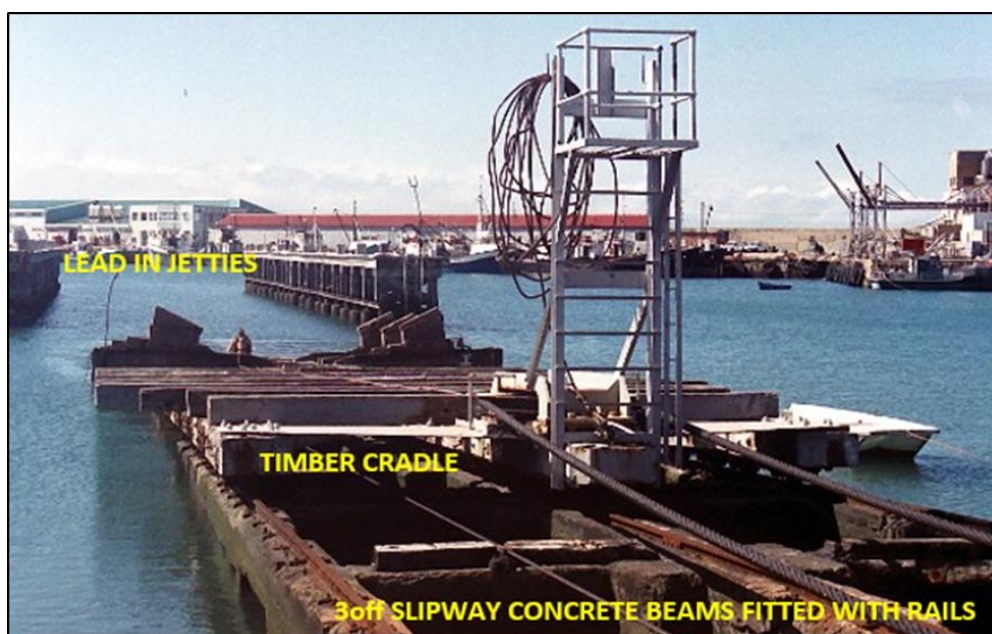


Figure 1: View from land to water showing slipway and jetties

The slipway was originally designed for accommodating side slipping, where vessels are brought to land on the main cradle and then shifted off the main cradle to either side of it. Some of the side slipping infrastructure, like the upstand concrete beams that used to support the side slip rails, are still present at the site. Side slipping has however not been practiced at the slipway for the last 50 years at least. The Port of Mossel Bay has clarified that it intends to undertake side slipping activities in future but only on one side (Starboard Side) as indicated on the site plan.

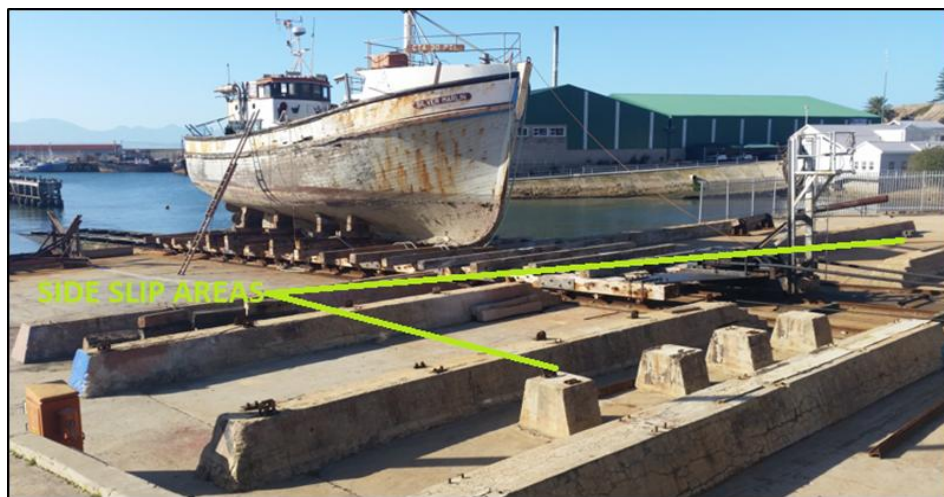


Figure 2: Original Side Slip Areas either side of the main cradle

Due to poor condition of the slipway, the vessel handling capacity was downgraded to the current 200Ton (metric). The lead-in jetties are also in a poor condition, with major deterioration of both the pile supports and superstructure. There is particular concern that any impact by vessels could result in a catastrophic structural failure of the jetties.

There is also an operations building on the site that was constructed at the same time as the slipway. The building is old, of outdated construction and does not meet the Port's future operational requirements.



Figure 3: Slipway operations building

To align with the Transnet National Port Authorities' Market Demand Strategy (MDS) and to meet the burgeoning demand from industry the TNPA initiated the project; "UPGRADES OF EXISTING SHIP REPAIR FACILITIES AT THE PORT OF MOSSEL BAY" aimed at investigating, identifying and completing the activities required for the following:

- Remediation and improvement of the slipway facility back to original design capacity
- Removal of the existing lead-in jetties and recovery of the structure with minimal damage. TNPA considers the structure to have heritage value
- Implementation of side-slipping activities on the Starboard side and the construction of all infrastructure required to support it
- Upgrade, modernisation and retro-fit of the existing operations building
- Upgrade, expansion and modernisation of the slipway electrical reticulation network and civil and stormwater infrastructure

The scope of works shall be broken down into the following work packages:

- M1 – Cradles and Associated Items
- C1 – Site Civil Works
- S1 – Structural Works

- B1 – New Operations Building (This package is for the complete building and includes all multi-disciplinary engineering requirements)
- E1 – Site Electrical

The Works shall be as described in the construction drawings issued to the Contractor and shall include the planning, procurement, offloading, material and equipment handling, storage, fabrication, site refurbishment, engineering, detailing, main and sub-assemblies, tolerance machining, welding, bolting, jig fabrications, production, corrosion protection, rigging, trial fitting, marking, packing, transportation, installation, punch listing, cold and hot commissioning, trial operation, handover and project management of the following:

M1 WORK PACKAGE

- Main Cradle including sheaves, rolling element assemblies and wooden chock blocks
- Docking Towers and all ancillary equipment mounted on the towers eg access bridges, adjustment mechanisms, hydraulic equipment etc
- Side Slip Cradle on Starboard side including rolling element assemblies and wooden chock blocks
- Uphaul, Downhaul and Side slip cradle winches complete with steel wire ropes, drives, support structures, actuating mechanisms, control panels etc.
- All rails, associated fixing elements and stainless steel sole plates with rubber pads under the rails that together form the complete rail assemblies above and below water level
- Wire rope supports, complete
- All mechanical components for the stormwater management and recycling system
- Demolition of old lead-in jetties
- Corrosion Protection
- Commissioning, Testing and Handover

E1 WORK PACKAGE

- New site wide low voltage reticulation upgrades excluding equipment requirements within the new operations building
- New site wide medium voltage reticulation upgrades excluding equipment requirements within the new operations building if applicable

C1 WORK PACKAGE

- All site wide civil works including stormwater infrastructure as indicated on the drawings.

S1 WORK PACKAGE

- Remediation of existing structural infrastructure site wide
- New construction of structural works throughout the slipway site excluding those associated with the new Operations building

B1 WORK PACKAGE

- All works comprising the complete new operations building including architectural requirements, civil/structural, electrical and mechanical works

1.2 Employer's Objectives

The Employer, Transnet National Ports Authority, requires the *Works*, comprising the architectural, mechanical, civil, structural and electrical upgrades to the ship repair facility at the Port of Mossel Bay to be carried out in the shortest possible time.

Note: The ship repair facility is an operational environment requiring the Works to be planned and executed in a manner which results in minimal operational disruption and this requirement is considered to be a primary concern of the Employer. The Contractor shall, in its submitted (Microsoft Office Project 2016 or earlier version) Level 4 project execution schedule, clearly define the extent of the period that the slipway shall need to be out of operation. The Contractor shall also be responsible for supplying a detailed project execution method statement with its tender submission, which shall align in

respect of activities needing completion, to the project execution schedule. The project execution schedule shall be supplied to the Employer within two weeks following the contract award date.

1.3 Scope Of Works Table

The **SCOPE OF WORKS** pertinent to the slipway upgrades shall be as described in the construction drawings issued to the contractor and shall include the planning, procurement, offloading, material and equipment handling, storage, fabrication, equipment refurbishment, engineering, detailing, main and sub-assemblies, tolerance machining, alignment, welding, bolting, jig fabrications, production, corrosion protection, rigging, trial fitting, marking, packing, transportation, installation using standard methods and any specialist equipment, waste management and disposal, punch listing, cold and hot commissioning, trial operation, handover and project management of the following:

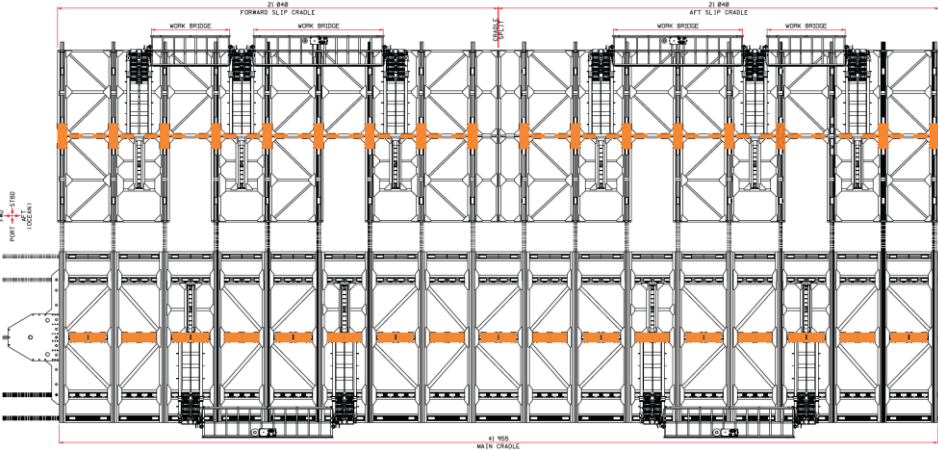
DESCRIPTION OF THE WORKS	LOCATION
1. Main Cradle and Side Slip Cradle (Starboard) inclusive of wheel assemblies, collapsible steel supports and wooden chock blocks attached to the cradles, rails, sole plates with rubber pads, clips, fixing and securing elements – The cradles are steel structures, assembled together with forged fabricated wheels similar to gantry crane wheels. The wheels are supported on A65 designation rails designed to suite the wheel profiles, with the rails being supported in turn on stainless steel sole plates and rubber pads that are fixed to the slipway concrete beams. The sole plate, pad and rail assemblies are secured to the concrete beams by a combination of chemical anchors and rail clips. Vessels are mounted onto the cradles using a technique called ‘slipping’. 	Contractors workshop/ Slipway

Figure 4: New cradles and rails layout



Figure 5: Ship on existing cradle

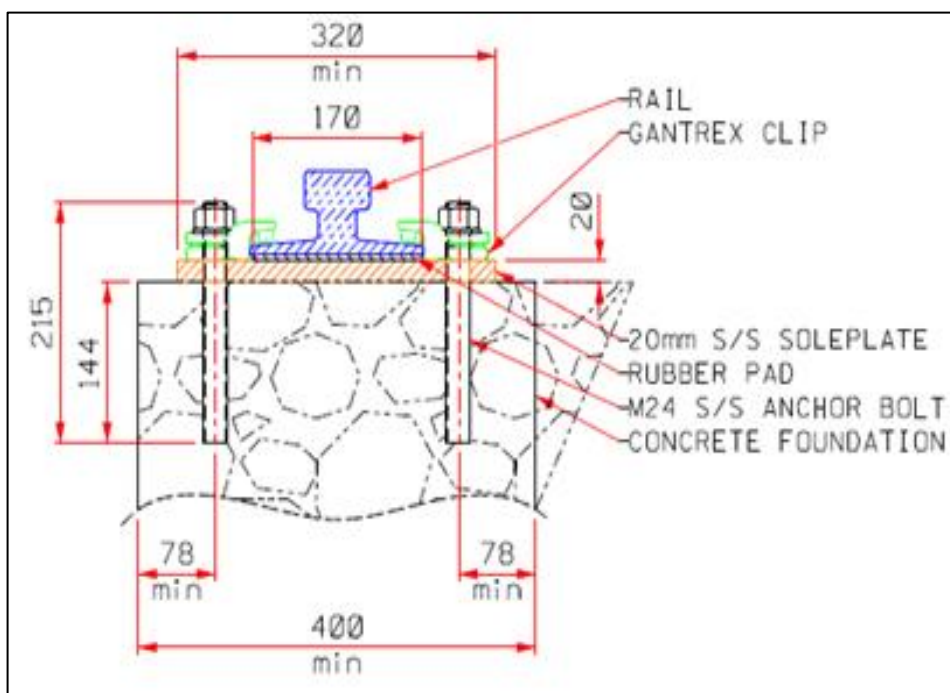


Figure 6: Detail of new rail and fixing

The cradles are moved in and out of the water using a winching and sheave wheel arrangement.

The cradles shall be manufactured according to the manufacturing drawings supplied to the Contractor. The cradles shall be fabricated in bogey sections, each individual section being fully assembled with its rolling assemblies, corrosion protected and transported to site. A jig, comprised of the same rails as those specified for installation at the slipway site, shall be constructed in the fabricators workshop so that each completed bogey section can be mounted on the jig before the bogey section is released from the fabricators workshop. The Engineer shall assess the bogey section on the rail jig to determine its suitability in respect of alignment tolerances and rolling motion. On-site, the individual bogey sections shall be lifted from the truck directly onto the slipway rails to avoid double handling unless there is reason not to do so. In this case the bogey section shall be removed to the designated laydown area. The Contractor is required to carefully remove the existing cradle of its rails. Due to the age of the cradle, it is considered to possess heritage value for TNPA. The cradle must not be damaged during its removal and recovery. The Contractor shall advise TNPA of the procedure that it will employ when removing the cradle, possibly in sections, to minimise the potential for damage. The Contractor shall suitably pack and transport the cradle to the location stipulated by TNPA.	
 Figure 7: Typical cradle wheel 2. Docking Towers – The main and side slip cradles are fitted with adjustable docking towers with hydraulically driven support arms as shown on the drawings. The scope includes the complete towers with all ancillary equipment and components	Contractors workshop/ Slipway

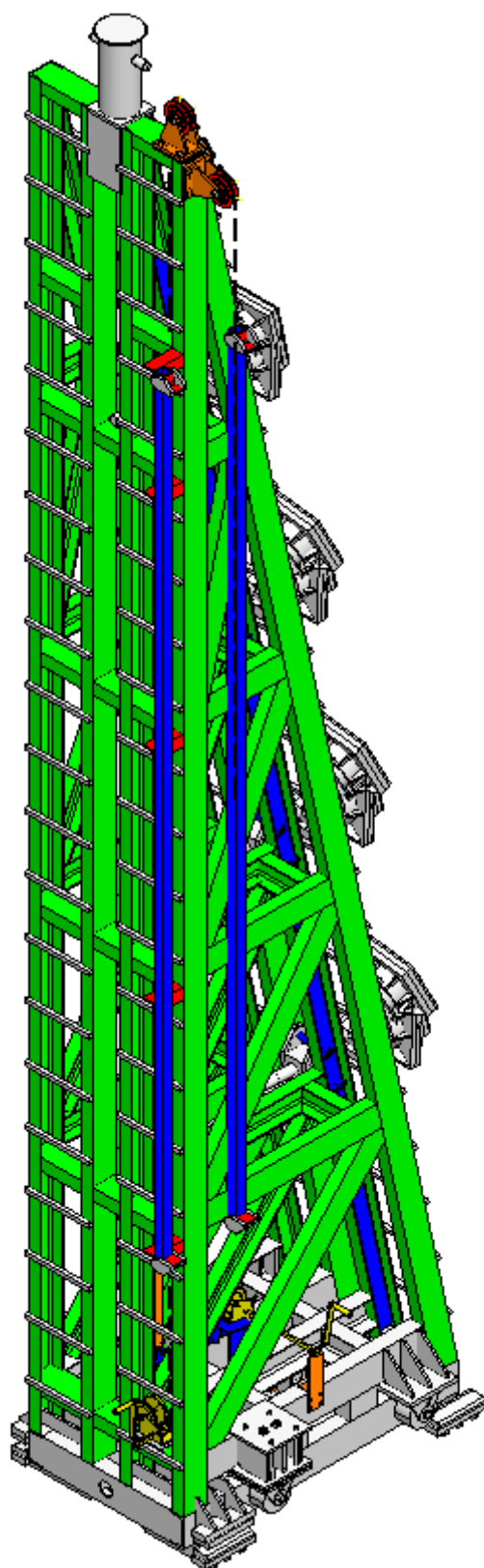
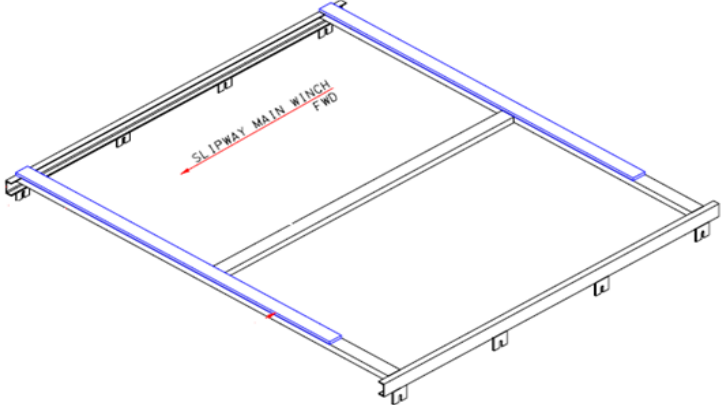


Figure 8: Typical docking tower

3. New cable supports – The uphaul and downhaul cables rest on and slide on a sacrificial wear material fitted to a steel frame that gets bolted onto the slipway concrete beams. The sacrificial material supports the wire ropes and prevents and limits damage as the ropes slide over them. New rope supports shall be constructed as per the detail drawings supplied to the Contractor. The Contractor is required to demolish and dispose of the existing cable supports.  Figure 9: Wire ropes supports	Contractors workshop/ Slipway
4. Uphaul, downhaul and sideslip winches: Currently a winch system pushes and pulls the cradle in and out of the water.  Figure 10: Existing cradle winch drive	Slipway

Due to poor condition, the existing winch shall be replaced with hydraulically driven replacements for both uphaul and downhaul motions. The Contractor shall remove and recover the existing winch. The existing winches have historic significance to the TNPA, the utmost care shall thus be taken by the Contractor when removing the existing winch. The recovered winch shall be carefully moved to the site laydown area and handed over to TNPA.

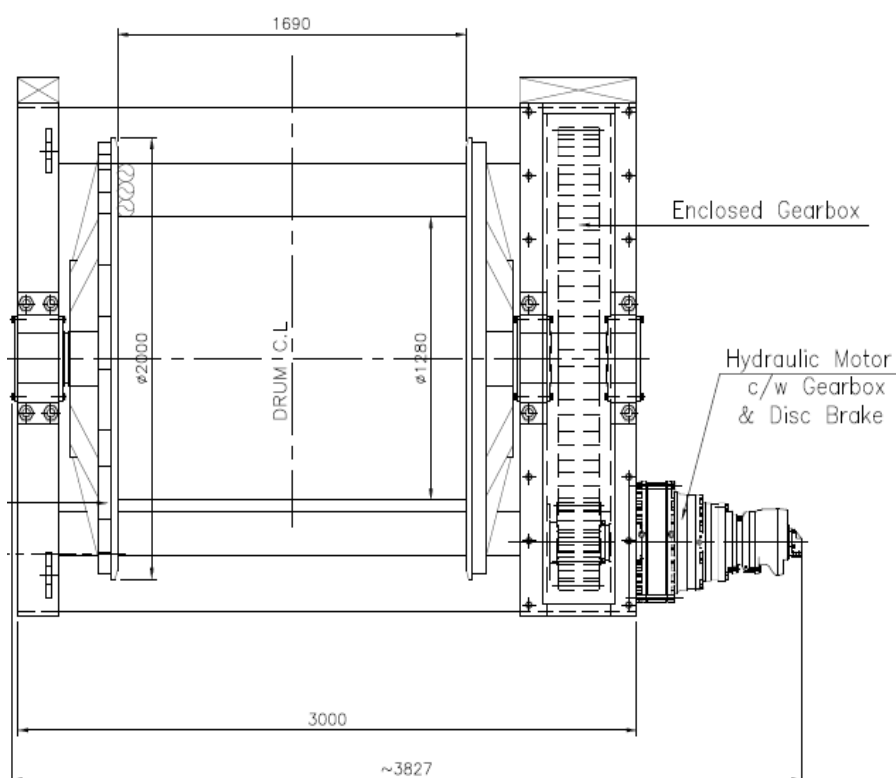


Figure 11: New uphaul winch

Uphaul Winch Specifications

- Drum Capacity: 250m; Dia=80mm rope (SWR 3-layers)
- Duty Pull: 55Ton @ 0.7m/min (1st layer)
- Brake Assembly: (Hydraulic disc brake)
- Brake Holding: 75Ton (Static @ 1st layer)
- Ratchet Assembly: RAWL Type; Manually Operated

- Ratchet Holding: 90Ton (Static @ 1st layer)
- Control: Local Panel

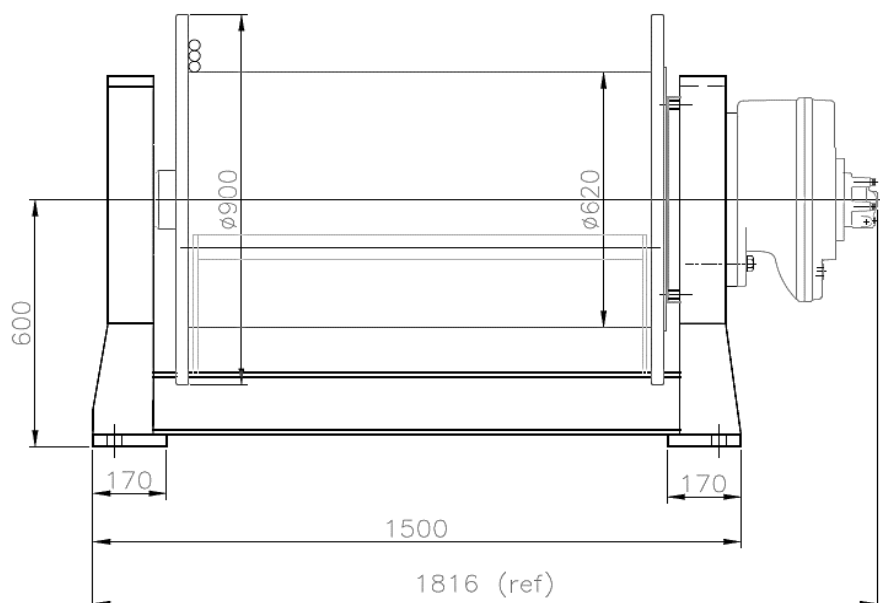


Figure 12: New downhaul winch

Downhaul Winch Specifications

- Drum Capacity: 250m; Dia=26mm rope (SWR 3-layers)
- Duty Pull: 20Ton @ 0.7m/min (1st layer)
- Brake Assembly: (Hydraulic disc brake)
- Brake Holding: 25Ton (Static @ 1st layer)
- Control: Local Panel

Side slipping was not previously practiced at the ship repair facility but will now be reinstated on the Starboard side, requiring the installation of a new side slip winch to move the new side slip cradles. A two drum winch operating is specified. The side slip winches are not housed in the existing winch room but outside near the side slip cradles.

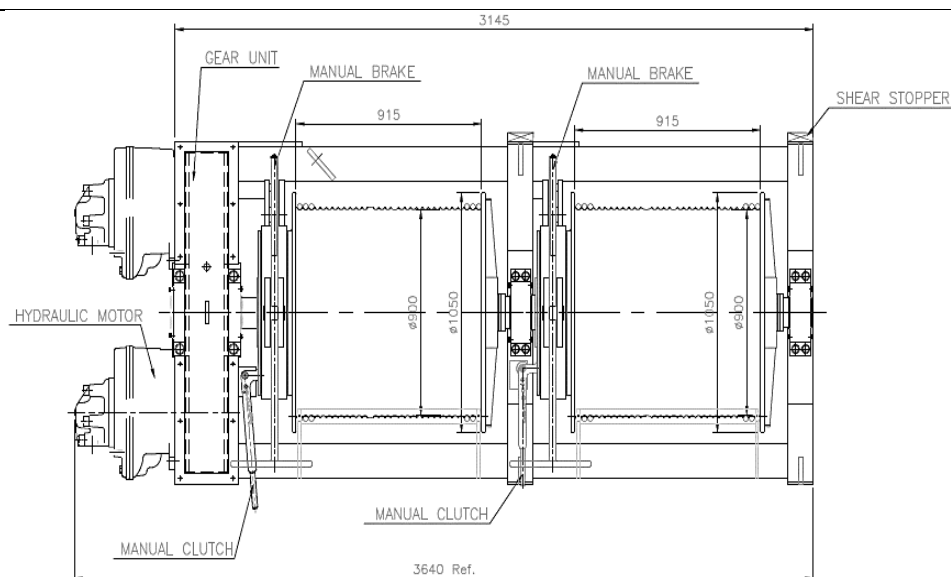


Figure 13: New side slip winch

Side Slip Winch Specifications

- Drum Capacity: 95m; Dia=26mm rope (SWR 3-layers both drums working)
- Duty Pull: 10Ton @ 0.5m/min (1st layer each drum)
- Brake Assembly: (Hydraulic disc brake)
- Brake Holding: 15Ton (Static @ 1st layer)
- Control: Local Panel

It is expected that all the winches shall be driven from a single common hydraulic power pack.

All winches shall be supplied mounted on a common baseplate with its drive and fully coupled and aligned. The winches shall be supplied with their individual operating panels mounted on the winches' common baseplate. A point of supply will be provided for the Contractor to terminate its winch control panel. The Contractor shall allow for 100m distance between the point of supply and the control panel, applicable to all winch installations. The Contractor shall make provision in its offer for any specialist resources required to complete the installation of the new winches. No deviations shall be accepted in respect of the specified performance parameters of the individual winches. All load test and any other conformance certification shall

be supplied by the Contractor to the Supervisor for review prior to installation of the ropes.	
5. Slipway Operations Building – The existing slipway operations building is old and does not meet the future expected requirements of the slipway facility. A fabrication workshop and the winch house also form part of the existing building.  Figure 14: Existing Operations building The Contractor shall demolish and dispose of the existing building. There are potential elements of the building that TNPA may choose to recover due to heritage value, like the roof trusses, TNPA shall advise regarding the need to recover any items of the building. A new building for housing the slipway management staff and containing a new workshop and winch house shall be constructed. It shall be noted that the existing footprint of the existing building shall not be modified i.e.: the new building shall have an identical footprint as the existing building. The building shall comprise the following on the different levels: Lower Ground	Slipway

- Winch House - Millwright Workshop - Store Room Ground Floor - Reception - Waiting Areas - Slipmasters Office - Office x 2 - Visitors Ablutions - Workshop - Storage Space - Strong Room - Kitchen and Mess Facilities - Ablution Facilities - Balcony The scope for the building shall include the involvement and integration of the following construction engineering disciplines: - Civils – stormwater, sewage - Structural - Electrical - Electronics - Mechanical – wet services, HVAC, fire protection	



- Landscaping

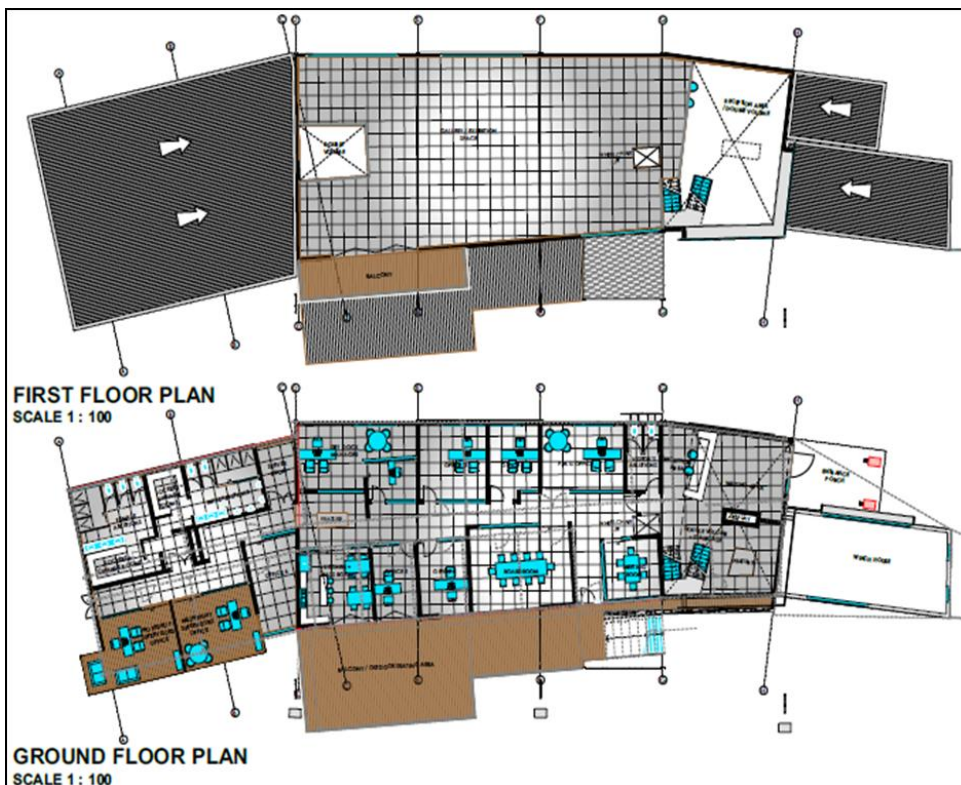


Figure 15: Floor plans for new operations building

6. Electrical Works complete as stated herein, on the construction drawings and in the BOQ

- New substation with medium voltage switchgear and 1MVA, 11kV/400V transformer to feed the slipway and TNPA buildings (operations and administration building). To replace the existing municipality, ring main unit;
- Two additional 500kVA, 11kV/400V mini-substations; one at the Recreational area and one at the Quay 3
- Replacement of existing mini-substations within Port of Mossel Bay to vacuum mini-substations;
- Mini-substation no.5 Seavuma to be fed directly from the Church Street and Slipway substations
- Revised the electrical reticulation layout to reflect new layout as discussed above;
- Electrical installation for the new building;

Contractors workshop/Slipway

• New Street lighting and new high mast in the slipway and around the new building as per the master plan and along Bland Street inside the port. • Access control, security and CCTV installation for the new building	
7. Complete structural remediation works to the slipway facility – The slipway structural elements are of reinforced concrete construction with most of the existing concrete being exposed to varying degrees of operation damage/wear and tear. The following are the component areas which shall be the focus of the structural remediation works: • Remediation of existing concrete slipway cradle beams above water level and surface beds around the slipway. To complete this work will require dredging. The Contractor is responsible for all dredging works that is required in order to execute the work properly  Figure 16: Typical condition of slipway concrete beams above water • Rebuild of portions of the surface slabs either side of the cradle to support side slipping operations and remediation of existing concrete surface beds around the slipway • Rebuild the section of the slipway concrete beams between the transition point where the beams enter the water to the start of the slipway under the water. Only the superstructure shall be rebuilt on top of the existing pile support structure.	Slipway

• New concrete installations to support side slipping and installation of new anti-tilt beams • New environmental catchment trap – The trap is a new reinforced concrete wall that shall be cast between the existing slipway rail carrying beams to prevent waste materials generated during ship repair activities from being washed into the ocean • General remediation of various concrete elements around the slipway area including retaining walls • Construction of various foundation plinths on and around the site as required e.g.: plinths for high mast lighting, pump plinths • Extension of the existing slipway deck It is expected that underwater concrete repairs shall require the use of commercial divers to execute. Take note that the Contractor is responsible for all dredging works required. The Contractor shall only procure the services of diving entities that have permits to dive with TNPA controlled infrastructure. The structural construction and remedial works shall conform in every way to the design drawings supplied to the Contractor. No deviations shall be accepted.	
8. Demolition and disposal lead-in jetties. The jetties shall be carefully removed and recovered from the water and transported to the designated laydown area, for handover to TNPA. The existing wooden piles are collared with an outer concrete layer. The concrete layer can be broken off from the wood pile and does not need to be recovered. The Contractor is fully responsible for engaging the relevant specialists required to remove the jetties, like commercial diving entities. The Contractor shall also be responsible for providing any specialised tools, equipment, plant, consumables, marine vessels etc. that are required for the removal (with minimal or no damage) of the jetties.	Slipway



Figure 17: Existing lead-in jetties

9. Stormwater management and Recycling system - A system for recovering and disposing of most of the waste generated from the cleaning and surface preparation of vessel's steelwork, while on the slipway, has been designed. The system, is also capable of processing stormwater that may ingress into the system. The system comprises the following:

- Settling tank
- Transfer and recirculation pumps
- Multi-media sand filter
- Filtered water, termed "grey water", storage tank
- Piping and valves
- Removable basket strainer

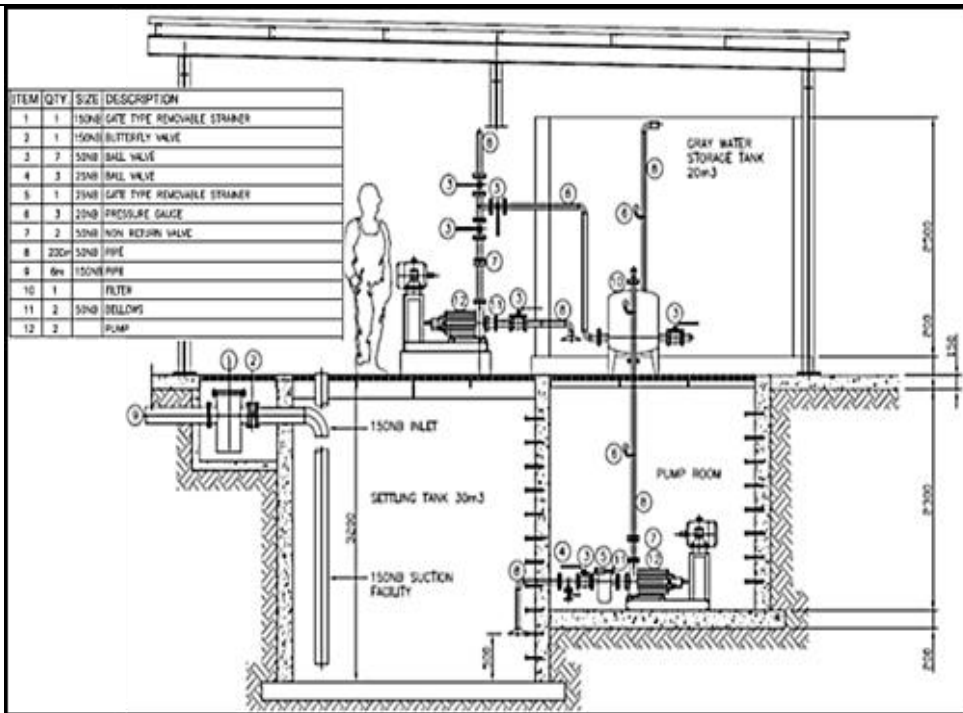


Figure 18: Existing lead-in jetties

Water containing grit and paint flakes is accumulated in catchment channels located above the water line on the slipway and toward the water side on the sideslips. The channels are designed with sufficient slope to promote gravimetric flow and are meant to transfer the water to the concrete settling tank. Some grit will settle in the channels before reaching the settling tanks, requiring that the channels themselves be periodically washed down. Stormwater is also expected to enter these channels and as a result will find its way into the settling tanks. The settling tank, located below ground level, is covered by rectagrid. This enables operators to regularly monitor the tanks volume from the top. Grit settles to the bottom of the tank. The settling tank is fitted with a suction pipe and has a floor that is sloped to the vicinity of the suction pipe so that when the accumulated sludge from the floor of the tank needs to be removed, a honeysucker can hook-up to the pipe from ground level and suck up the sludge. The separated water in the tank is pumped through a sand filter, as it is still expected to containing floating particles like paint flakes, into a storage tank. The settling tank pump is used to reduce the tank volume before the sludge clean-out can proceed. The storage tank is also fitted with a pump to transfer water back to the work area. The complete installation is covered by a lean-to roof structure that will assist in reducing stormwater ingress directly into the settling tank.

All civil works required as described herein, on the construction drawings and BOQ. The scope of work for civil works will be repairs, renovation and upgrades to the existing building, driveway entrance and slipway. The scope includes the following elements. • stormwater drainage • sidewalks – wheelchair access • driveways/access roads - wheelchair access • slipway channel for polluted water and stormwater • settling chamber and pumpstation	Contractors workshop/ Slipway
10. Supply and installation of Anodes on the cradles conforming to TNPA specification	Contractors workshop/ Slipway
11. Quality control, monitoring, documentation, generation of quality and management packs/dossiers	Contractors workshop/ Slipway
12. Operational testing, performance testing, trial operation, cold and hot commissioning activities and equipment handover	Contractors workshop/ Slipway
13. All permitting, licencing, technical documentation, reports, Safety Files etc related to all specialist, diving works and dredging works	

***NOTE:**

And any other work arising out of or incidental to the above, or required of the Contractor for the proper completion of the Works in accordance with the true meaning and intent of the Contract document.

The Employer aims to achieve minimal downtime of the slipway facility over the duration of the project. Thus, the completion of the Works shall be carefully planned and executed in order to align with the Employer's aim of minimal facility downtime. The Contractor is therefore required to comply with the following schedule:

SUBMISSION	TIMEFRAME
1. Detailed method statement	1Week after contract award
2. Level 4 Project schedule in MSP format	1Week after contract award
3. Procurement Plan	2Weeks after contract award

It is envisaged that the project shall be rolled out as follows:

The construction phase of the project is expected to last 17months (this timeframe is a worst case estimate and it is expected that the Contractors first submitted programme will show how the Contractor will achieve a quicker completion time) with the first 5months focused on keeping the slipway operational while off-site fabrication proceeds, the next 12months will require the slipway to be shut to complete the site activities.

During the first 5months, any site work that can be completed without disrupting the slipway operations will be completed. Consideration of the fishing seasons also needs to be considered as the slipway will be busiest during this time. The activities expected to begin in the first 5months are as follows:

- Procurement of materials (steelwork, rails, cradle wheels, wire ropes)
- Procurement of all winches
- Workshop fabrication of cradles
- Procurement of items for stormwater management and recycling system (pumps, piping, valves etc.)
- Procurement of electrical equipment
- Relocation of staff and equipment to the newly completed administration building

- Demolition of the existing operations building
- Begin construction of the new operations building
- Begin construction of new substation
- Structural concrete repairs that won't interfere with operations

During the 12 month shut period of the slipway, the following activities will be completed:

- Dredging
- Demolition and removal off-site of existing cradle, winch, rails and fixings above and below water level
- Repairs to existing concrete beams
- Rebuild of new slipway beams below water
- Demolition of Lead-in jetties
- Construction of new anti-tilt beams
- Construction of catchment trap wall
- Construction of new side slips
- Installation of new rail sole plates, rails and fixings
- Installation of new main and side slip cradles and sheaves
- Installation of new uphaul, side slip and downhaul winches
- Complete construction of new substation building
- Demolition and Installation of new electrical equipment
- Complete construction of new operations building
- Commissioning
- Punchlist the Works
- Commissioning

- Trail operation under TNPA supervision
- Handover

On award the Contractor must provide a well thought-out and highly detailed (MSP 2016 or earlier, LEVEL4) implementation schedule/programme for the Employers review, that aims to ensure a smooth execution of the project and shows that the Contractor will be able to complete the project in less than the estimated 17months.

1.4 Location of Works

The slipway is located at the Mossel Bay Harbor. The Chart Datum for Mossel Bay is 0.233m below Mean Sea Level. The approximate coordinates of the slipway are S-34°10'59.05" and E22°08'45.78".



Figure 19: Location and Layout of the Slipway

Site conditions are generally as follows:

- Altitude: At sea level

- Ambient temperature: 15-22 °C
- Relative humidity: Frequently 100%
- Air pollution heavily saline; industrial and locomotive fumes;
- General wind velocities: Up to 60 km/h
- Storm wind velocities: Up to 180 km/h

1.5 Access to the Works

Access to the works is from existing public road networks and roads internal to the Port of Mossel Bay. Access will be subject to Transnet National Ports Authority security and safety requirements and regulations

Due allowance must be made for any potential delays arising from vehicular congestion due to the large number of trucks entering the Port facilities.

The Contractor, its employees and its sub-contractors shall be required to complete a full induction from TNPA before being allowed on the site.

1.6 Interpretation and terminology

The following abbreviations are used in this *Works* Information:

Abbreviation	Meaning given to the abbreviation
CA	Contract Administrator
CQA/QCM	<i>Contractor's</i> Quality Assurance/Quality Control Manager
CDR	<i>Contractor</i> Documentation Register
CDS	<i>Contractor</i> Documentation Schedule
CSHEO	<i>Contractor's</i> Safety Health and Environmental Officer
CHSMP	<i>Contractor's</i> Health and Safety Management Plan
CM	Construction Manager
PSIRM	Project Site Industrial Relations Manager
PSPM	Project Safety Program Manager
PSSM	Project Site Safety Manager

ProjM	Project Manager
ProjEM	Project Environmental Manager
ProjEO	Project Environmental Officer
QA	Quality Assurance
SANS	South African National Standards
SES	Standard Environmental Specification
SHE	Safety, Health and Environment

Where in these documents the words TNPA is used, read “TRANSNET NATIONAL PORTS AUTHORITY”.

Where in these documents the words or expression “Engineer” or “engineer” is used, read “Supervisor” as the context requires.

2 ENGINEERING DESIGN

2.1 Employer’s design

The Contractor shall conform in every aspect to the specifications and details as presented on the drawings supplied to the Contractor. The size of steelwork details supplied shall not be less than that represented by specifications and/or drawings included in this document. The acceptance of the information in this document shall in no way relieve the Contractor of its responsibilities in terms of the performance of the Works. The Contractor shall remain solely responsible for the Works.

The Employer supplies the following:

- Construction Drawings
- Works Information
- Technical specifications or reference thereto.
- Engineering Drawings appended herewith.
- Bills of Quantities

The following “Transnet General Specifications” are applicable:

Hydraulic Equipment	EEAM-Q-002
Structural Steelwork	EEAM-Q-006
Compressed Air Systems	EEAM-Q-007
Steel Wire Ropes	EEAM-Q-003
Quality Management	EEAM-Q-009
Reinforced concrete	EEAM-Q-010
Maintenance of cranes and hoists	EEAM-Q-011
General electrical equipment	EEAM-Q-012
Motors and generators	EEAM-Q-014
MV switchgear	EEAM-Q-017
Lighting	EEAM-Q-018
Tests on electrical equipment	EEAM-Q-020
Gears, shafts, bearings, brakes	EEAM-Q-004
Corrosion Protection	EEAM-Q-008

The following “Material Specification” for structural steel is applicable:

- S355JR or S355JOW (...J2W preferred)
- Any other specific material specifications are provide on the detailed manufacturing drawings

The following “Welding Consumable Specifications” are applicable:

- Electrodes: BOEHLER (or similar approved) E7018L
- MIG Wire: BOEHLER (or similar approved) SG2 / BOEHLER (or similar approved) EMK 6
- Flux Core: BOEHLER (or similar approved) TI 46-FD

The following “Corrosion Protection Specifications” are applicable:

- Jotun, Hempel or International Paints or similar, 60 month marine guaranteed, corrosion protection specification

2.2 Part of the Works which the Contractor is to Design

The Contractor is to design the following parts of the works:

- Scaffolding – The Contractor is responsible in his design for the overall integration of the design of the Works with the design of the Employer as stated under 2.1 Employer's design above. Additionally, the Contractor shall be solely responsible for the design of any temporary Works required to execute the scope of works.

2.3 Standards

The latest editions and/or revisions of the following:

- BS: British Standards
- ISO: International Standards Organisation
- SANS: South African National Standards
- IEC: International Electro-Technical Commission
- AGMA: American Gear Manufacturers association

2.4 Codes

The following codes form part of this document:

- BS 8007 – Water Retaining Structures
- SANS 1200 A – General
- SANS 1200 AH – General (Structural)
- SANS 1200 G – Concrete

- SANS 1200 H – Structural Steel
- SANS 2001-CC1 – Construction works – Part CC1: Concrete Works (Structural)
- SANS 2001-CS1 – Construction works – Part CS1: Structural Steelwork
- SANS 10100-1 – The structural use of concrete Part 1: Design
- SANS 10100-2 – The structural use of concrete Part 2: Materials and execution of work
- SANS 10144 – Detailing of steel reinforcement for concrete
- SANS 10160 – Basis of structural design and actions for buildings and industrial structures
- SANS 10162-1 – The structural use of steel Part 1: Limit-states design of hot-rolled steelwork
- SANS 10162-2 – The structural use of steel Part 2: Cold-formed steel structures
- SANS 10400 – The application of the National Building Regulations
- Lloyd's Register Rulefinder 2015 – Version 9.24
- BS EN 14492-1:2006 – Power driven winches
- BS 6349-3: 2013 – Maritime works
- BS EN 15427: 2008 – Rail applications
- BS EN 13674-1 – Rail applications - Track
- BS EN 12385-1 – Steel wire ropes
- SANS 10142 -1 - Code of Practice for the wiring of premises.
- SANS IEC 60614 (1) - General requirements of conduits.
- SANS 61035 - Installation of Conduit Fittings.
- SANS IEC 61084 - Electrical Installation Ducting & Trunking Systems.
- SANS 1507 & 1574 - PVC Insulated Single Core Voltage Conductors.

- SANS 1464 and IEC 598-1 - Mounting & Positioning of Luminaries.
- SANS 10114 - Code of Practice for Artificial Interior Lighting.
- SANS 1973/61439 - Distribution Boards.
- SANS 1973-1 - Low voltage switchgear & control gear.
- SANS 10313 - Code of Practice for the Protection of Structures against Lightning.
- SANS 286-1 AND SANS 286-2 – ISO system of limits and fits
- SANS 1700-5-1 TO -18 - Fasteners
- Occupational Health & Safety Act 85 of 1993.
- The Local Authority by-laws and any special requirements for the district concerned.
- Local Fire Regulations.
- National Building Regulations
- SANS 10142-1 Code of Practice for the wiring of premises.
- Standard Building Regulations

Note: all mechanical drives shall be designed, fabricated, assembled and tested according to an internationally accepted standard, for instance:

- American Gear Manufacturing Association (AGMA) Standards
- Relevant specifications from suppliers e.g. Fenner.

2.5 Specification – Dredging

The Contractor is solely responsible for undertaking all dredging work that is required in order to complete the project and disposal of all dredged material at an approved disposal site. TNPA shall not be providing any dredging services. The Contractor is to carefully examine the scope of the works and itself identify which portions of the scope are to require dredging. Prior to the start of the construction, the Contractor is to conduct underwater surveys and compile a technical report for submission to TNPA engineer

which describes at minimum the underwater conditions and sediment buildup in the areas where construction needs to take place. The report should recommend the type of dredging technology that the Contractor recommends and should also include a detailed Bill of Quantities that describes the dredging work. TNPA shall review the report and give guidance to the Contractor in relation to undertaking the dredging. The Contractor is requested to engage with diving entities that are already in possession of TNPA approved diving and other permitting so that there will be no delay in the permitting application process. TNPA does not expect that the Contractor shall take more than 2 weeks to get all safety and permitting approvals completed and be in a position to start the dredging and other underwater work.

The Contractor is to ensure that it is responsible for the compilation and production of all technical, safety and approval documentation required.

2.6 Specification – Removal and Recovery of Old Jetties

The Contractor shall make all necessary allowances in the P&G section of its offer to cater for the complete execution of the scope of the demolition Works.

Expected Composition of the Dive Team Required

- 1 x commercial diving supervisor
- 4 x commercial divers/line tenders
- 1 x first aider
- 1 x skipper
- 1 x deck hand

Site Establishment

- Deployment of a surface supply container
- Establishment of site offices
- The container will be placed in such a way that it will have the maximum effective range
- Oxygen tank racks will be placed on the key side where it is out of harm's way but still usable.

- A mooring block for the dive support vessel will be used
- Safety reasons require that the slip master block access to the key side
- Contractor to remove all equipment that cannot be safely stored at the Contractors site office to its own Workshop. TNPA will not provide additional storage space over and above the space allocated to the Contractor for its site facility
- A lay down will be set up where the old jetty components can be stored, dismantled and handed over to the TNPA
- TNPA will approach the market via an on line auction and the successful bidder will be issued with a permit to handle the recovered jetties

Execution of the Works

- It is proposed that the jetty structure will be cut with the hydraulic grinder and chainsaw
- A decision will be made by the dive supervisor as to when removing the cut off structure will begin
- A suitably sized crane will be brought in once there is enough cut material to remove to justify it
- Divers will rig up the structures directly to the crane and the crane will subsequently remove it and place it on a truck
- The truck will drive to a laydown area that is still to be decided on to store all the structure
- The Contractor shall adequately demarcate its laydown area with fencing and shade cloth all the way round.
- All cutting and rigging to remove the structure will be done using a full surface supply dive system with a full dive team consisting of a dive supervisor, 4 fully trained commercial divers who also act as line tenders when they are not diving, 1 first aider and 1 skipper
- A safety boat will be on standby at all times, this boat will act as a dive platform to remove divers from the water once they have completed their dive. This boat will ensure safe entry and exit to the water for the divers at all times

2.7 Specification – Civil

2.7.1 STANDARD SPECIFICATIONS

The Standard Specification for all associated civil work shall be the SANS 1200 – Standardized Specification for Civil Engineering Construction.

The following Codes are applicable:

- SANS 1200 A – General
- SANS 1200 C – Site Clearance
- SANS 1200 D – Earthworks
- SANS 1200 DB – Pipe Trenches
- SANS 1200 LB – Bedding (Pipes)
- SANS 1200 LC – Cable Ducts
- SANS 1200 LD – Sewers
- SANS 1200 LE – Stormwater Drainage
- SANS 1200 LG – Pipe Jacking
- SANS 1200 MF – Bases
- SANS 1200 MH – Asphalt Base and Surfacing
- SANS 1200 MJ – Paving
- SANS 1200 AH – General (Structural)
- SANS 1200 G – Concrete
- SANS 10400 – The application of the National Building Regulations
 - PART A – General Principles and Requirements
 - PART C – Dimensions
 - PART D – Public Safety
 - PART F – Site Operations

- PART G – Excavations
- PART P – Drainage
- PART R – Stormwater Disposal
- Occupational Health & Safety Act 85 of 1993.
- The Local Authority by-laws and any special requirements for the district concerned.
- National Building Regulations
- SABS 0140-1978 - Identification colour marking
- Machinery and Occupational Safety Act

2.7.2 PROJECT SPECIFICATIONS

2.7.2.1 Scope of Work

Construction of new sewer reticulation network

- Installation of gravitational sewer network (110mm to 160mm diameter class 34 uPVC) including construction of rodding eyes, junctions and precast manholes
- the old system will be kept in operation during construction, then removed. The pipework that cannot be removed will be sealed by grouting and abandoned.

Construct new stormwater drainage network

- Installation of concrete stormwater pipe culverts (450mm to 1000mm dia), rectangular concrete manholes with built in grating, and structures including kerb inlets and precast manholes
- Pipejacking of new concrete culver (1000mm dia) under existing building
- Reinforced concrete and brickwork for kerb inlets and manholes
- the old system of pipework and manhole structures is to be removed. Pipework and manhole structures that cannot be removed will be filled with 20MPa mass concrete and abandoned.

Construct new stormwater channels

- Installation of rectangular channel culverts with built-in grating (500mm width), from slipway to settling chamber and pump station

Construct of stormwater management and recycling system

- Civil works for settling tank and pump station including tie-in to stormwater channels

Construct Sidewalks and Driveways

- Earthworks and layerworks for walkways and driveways
- Paving for walkways and driveways
- Raised kerbing and walkways to prevent stormwater flooding and for traffic control, with wheelchair ramps for access.
- Revised driveway kerb boundary at vehicle entrance to accommodate electrical substation.

2.7.2.2 Portion B: Variations and Additions to The Standard Specifications

The following variations and additions to the SANS 1200 Standardised Specifications referred to in the last clause of Portion 1 apply to this Contract. The prefix PS indicates an amendment to SANS 1200. The letters and numbers following these prefixes respectively indicate the relevant Standardised Specification and clause numbers in SANS 1200.

PSA 3 MATERIALS

PSA 3.1 QUALITY

ADD THE FOLLOWING:

"All manufactured materials supplied shall be new materials unless the contrary is specified. All materials specified in accordance with SANS Specifications shall bear the SANS mark, whether so specified or not."

ADD THE FOLLOWING SUBCLAUSE:

"PSA 3.3 ORDERING OF MATERIALS

The quantities set out in the Bill of Quantities have been carefully determined from calculations based on data available at the time and should therefore be considered to be approximate quantities only. Before ordering materials of any kind the Contractor shall check with the Engineer whether or not the scope of the work for which the materials are required is likely to change substantially. No liability or responsibility whatsoever shall be



attached to the Employer for materials ordered by the Contractor except when ordered in accordance with written confirmation issued by the Engineer."

PSA 5 CONSTRUCTION

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

REPLACE THE HEADING AND THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"PSA 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES

PSA 5.4.1 Location of existing services

Before underground or excavation work is carried out, the Contractor shall ascertain the presence and position of all services likely to be damaged or interfered with by his activities. He shall obtain up-to-date plans from the Engineer for this purpose, showing the position of services in the area where he intends to work. As services can often not be reliably located from such plans, the Contractor shall determine the exact position of such services by means of suitable detecting equipment and afterwards by careful hand excavation where necessary in order to expose the services at the positions of possible interference by his activities. This procedure shall also be followed in respect of services not shown on the plans but believed to be present.

All such services, the positions of which have been located at the critical points, shall be designated as 'known' services and their positions shall be indicated on a separate set of Drawings, a copy of which shall be furnished to the Engineer.

While he is occupying the Site, the Contractor shall be liable for all damage caused by him to known services as well as for consequential damage, whether caused directly by his operations or by the lack of proper protection.

PSA 5.4.2 Protection during repair and maintenance work

The Contractor shall exercise all the necessary care to prevent damage to known services during repair and maintenance work. Where applicable, major excavating equipment and other Plant shall not be operated dangerously close to these services. Where necessary, excavation in close proximity to these services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. No additional payment will apply to such more difficult work.

Services left exposed shall be suitably protected from damage.

PSA 5.4.3 Alterations and repairs to existing services

Unless the contrary is clearly specified or ordered, the Contractor shall not carry out alterations to existing services. When this is necessary, the Contractor shall inform the

Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.

When existing services are damaged by the Contractor, he shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases the Contractor shall take the necessary steps to minimise damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted.

The Employer will accept no liability for damages due to a delay in having such alterations or repairs effected. The Contractor shall provide all reasonable opportunity, access and assistance to persons carrying out alterations or repairs of existing services."

PSA 8.8 TEMPORARY WORKS

REPLACE ITEM 8.8.4 WITH THE FOLLOWING:

"PSA 8.8.4 Location and protection of existing services:

PSA 8.8.4.1 Provision of detecting devices for:

- (a) Water and sewer pipes Unit : Sum
- (b) Electrical and other cables Unit : Sum
- (c) LP Gas Pipes, Fuel pipes and other cables Unit : Sum

The bid sums shall cover the cost of providing and operating suitable equipment for as long as it is needed to locate all the existing services likely to be affected by the construction activities. Alternatively, an approved specialist firm may be employed to carry out the work.

PSA 8.8.4.2 Hand excavation necessary for locating and exposing existing services in all material:

- (a) In roadways Unit: m³
- (b) In all other areas Unit: m³

The rates shall cover the cost of excavating by means of hand tools within authorised dimensions, for all precautionary measures to protect the services from damage during excavation and backfilling, and for subsequent backfilling and compacting. Compaction of material in all areas except in roadways shall be to 90% of the modified AASHTO density.

The rate for hand excavation in roadways shall include compensation for compacting excavated or selected backfill material to 93% of modified AASHTO density.

The bid rates shall also include for keeping excavations safe, for dealing with surface and subsurface water, for removing surplus excavated material from the Site, for transporting all material, and for supplying adequate supervision during both excavation and backfilling operations."

PSD EARTHWORKS

PSD 2 INTERPRETATIONS

PSD 2.1 SUPPORTING SPECIFICATIONS

REPLACE SUBCLAUSE 2.1.2 WITH THE FOLLOWING:

"PSD 2.1.2 Any of the other SANS 1200 specifications may form part of the Contract documents."

PSD 2.3 DEFINITIONS

REPLACE THE WORD AND THE DEFINITION FOR "Borrow" WITH THE FOLLOWING:

"Borrow material: Material, other than material obtained from excavations required for the works, obtained from sources such as borrow pits or the authorised widening of excavations. 'Borrow' shall have a corresponding meaning."

REPLACE THE DEFINITION FOR "Specified density" WITH THE FOLLOWING:

"Specified density: The specified dry density expressed as a percentage of modified AASHTO dry density."

REPLACE THE DEFINITION FOR "Stockpile" WITH THE FOLLOWING:

"Stockpile (verb): The process of selecting and, when necessary, loading, transporting and off-loading material in a designated area for later use for a specific purpose"

ADD THE FOLLOWING DEFINITIONS:

"Commercial source: A source of material provided by the Contractor, not the Employer, and including any borrow pit, provided by the Contractor

Fill: An embankment or terrace constructed of material obtained from excavations or borrow pits. In roads it includes the earthworks up to the underside of the selected subgrade level.

Fill (material): Material used for the construction of an embankment or terrace

Roadbed: The natural *in situ* material on which the fill or, in the absence of fill, the pavement layers are constructed"

PSD 3 MATERIALS**PSD 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES****PSD 3.1.1 Method of classifying**

ADD THE FOLLOWING:

"The classification of material other than 'soft excavation' shall be agreed upon before excavation may commence.

The Contractor shall inform the Engineer immediately if and when the nature of the material being excavated changes to such an extent that a new classification is warranted for further excavation. Failure on the part of the Contractor to advise the Engineer in good time shall entitle the Engineer to reclassify, at his discretion, such excavated material."

PSD 3.1.2 Classes of excavation

DELETE THIS SUBCLAUSE AND REPLACE WITH THE FOLLOWING:

"The excavation of material shall be classified as follows for purposes of measurement and payment:

a) Soft excavation

Soft excavation shall be excavation in material which can be efficiently removed with a pick and shovel.

b) Intermediate excavation

Intermediate excavation shall be excavation in material which cannot be efficiently removed with a pick and shovel and in which blasting or drilling and wedging is not required. It shall therefore be material which can be removed by machine.

c) Hard rock excavation

Hard rock excavation shall be excavation in material which cannot be removed without blasting or without wedging and splitting.

The Engineer's determination of the classification of the excavation shall be final and binding."

PSD 5.1.2 Existing services**PSD 5.1.2.2 Detection, location and exposure**

REPLACE THE CONTENTS OF SUBCLAUSE 5.1.2.2 WITH THE FOLLOWING:

"The exposure by the Contractor of underground services, as required in terms of subclause 5.4 of SANS 1200 A (as amended) shall be carried out by careful hand excavation at such positions and to such dimensions as are agreed to by the Engineer.

Unless otherwise instructed or agreed by the Engineer, no service shall be left exposed after its exact position has been determined and all excavations carried out for the purposes of exposing underground services shall be promptly backfilled and compacted to the following densities:

(a) In roadways: 95% Mod AASHTO density; and

(b) In all other areas: 93% Mod AASHTO density.

Where hand excavations to expose underground services have to be carried out in roadways, the Contractor shall reinstate the road layerworks in accordance with the provisions of subclause 5.9 of SANS 1200 DB.

Payment in respect of exposing the services by means of hand excavation as described above, will be made in accordance with subclause PSD 8.3.8.1.

Payment in respect of reinstating layer works in roadways will be made in accordance with subclause 8.3.6.1 of SANS 1200 DB (as amended)."

PSD 5.1.2.3 Protection of cables

REPLACE SUBCLAUSE 5.1.2.3 WITH THE FOLLOWING:

"5.1.2.3 Protection during construction

Further to the requirements of subclause 5.4.2 of SANS 1200 A (as amended), major excavating equipment and other plant shall not be operated dangerously close to known services. Where necessary, excavation in close proximity to known services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. No additional payment will apply to such more difficult work.

Should any service not being a known service be discovered or encountered during the course of the Contract, the Contractor shall, in addition to complying with the requirements of subclause 5.4.2 of SANS 1200 A (as amended), immediately notify the Engineer thereof and implement such measures as will prevent damage of such service or, if it was damaged in the course of discovery, will prevent and minimise the occurrence of any further damage occurring."

PSD 5.2 METHODS AND PROCEDURES

PSD 5.2.2 Excavation

PSD 5.2.2.1 Excavation for general earthworks and for structures

*ADD THE FOLLOWING TO PARAGRAPH (b):*

"When the nature of the material precludes the above procedure, additional excavations shall be carried out to provide working space for the erection of formwork. In general, payment will be made for excavating a working width of 600 mm, but the Contractor may excavate a greater working width at no additional cost to the Employer."

REPLACE THE FIRST SENTENCE OF PARAGRAPH (e) WITH THE FOLLOWING:

"Where excavations have been carried below the authorised levels, the Contractor shall backfill such excavations to the correct level with approved gravel compacted to at least 90% of modified AASHTO density, or to the density of the surrounding material, whichever is the higher density.

Where excavations for structures have been carried out in hard material, the Engineer may direct that over-excavation be backfilled with weak concrete or soilcrete if there is a danger of settlement or differential settlement of the foundations.

Where the sides of excavations against which concrete is to be cast have been over-excavated or have collapsed partially, the Contractor shall retrim the excavations if necessary and, unless other remedial measures are agreed to by the Engineer, shall cast the concrete for the structure, including the additional concrete that may be required as a result of the over-excavation or partial collapse. The cost of the additional concrete or remedial measures shall be for the Contractor's account."

PSD 7 TESTING**PSD 7.2 TAKING AND TESTING OF SAMPLES***REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:*

"The Contractor shall arrange with the approved independent laboratory engaged by the Contractor in terms of subclause PS 8.2.1 of Portion 1 of the Project Specifications to carry out sufficient tests on a regular basis as agreed between him and the Engineer to determine whether the degree of compaction, and, where applicable, the quality of materials used, comply with the Specifications and shall submit the results of these tests to the Engineer in a form approved by him.

The compaction requirements for fills shall be deemed complied with when at least 75% of the dry-density tests on any lot show values equal to or above the specified density and when no single value is more than five percentage points below the specified value."

PSLB BEDDING (PIPES)

PSLB 3 MATERIALS

PSLB 3.1 SELECTED GRANULAR MATERIAL

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"Selected granular material shall have a PI not exceeding 6 and shall be free from sharp-edged particles exceeding 19 mm."

PSLB 3.2 SELECTED FILL MATERIAL

ADD THE FOLLOWING:

"Selected fill material used for bedding shall be stabilized with 5% cement as specified under subclause PSDB 3.5(c)."

PSLB 3.4 SELECTION

PSLB 3.4.1 Suitable material available from trench excavation

REPLACE THE WORDS "(but is not required)" IN THE FIFTH LINE WITH THE WORDS "(at his own cost)".

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1 PRINCIPLES

PSLB 8.1.5 Disposal of displaced material

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"Material displaced by the pipeline and by imported material from sources other than trench excavation, shall be disposed of at an approved site furnished by the Contractor. No haulage is payable for such material."

PSLB 8.1.6 Free-haul

No separate payment for haul is applicable to this contract.

PSLB 8.2 SCHEDULED ITEMS

ADD THE FOLLOWING ITEM:

"PSLB 8.2.6 Extra over items 8.2.1 and 8.2.2 for bedding stabilized

with 5% cement Unit: m³

The tendered rate shall include full compensation for selecting, mixing, backfilling and compacting the stabilized material to 93% of modified AASHTO density."

PSLE STORMWATER DRAINAGE

PSLE 8 MEASUREMENT AND PAYMENT

PSLE 8.2 SCHEDULED ITEMS

ADD THE FOLLOWING ITEMS:

PSLE 8.2.15 Compaction of excavation floors

The tendered sum shall include full compensation for levelling the surface, adjusting the in-situ moisture content, compacting soil to 150mm thick to 93% of modified AASHTO density."

2.8 Specification – Structural Works

*Note, the Contractor shall include in its price for providing a detailed condition assessment report detailing the structural condition of all existing structural concrete both above and below the water and the report should highlight any deviations between the Contractors assessed condition and what is catered for on the drawings and BOQ. The Contractors Condition report shall be provided a maximum of 2 weeks after the Contractor has established on site.

2.8.1 Side Slip Raft Foundation and Anti-Tilt Beams

The footprint of the two new raft foundations must be marked out on top of the existing concrete surface bed. The contractor must carefully break out and remove the concrete within the marked-out area without damaging the remaining slabs. The in-situ material must be ripped and re-compact to 93% MOD AASHTO. Where fill is required, a G5 or similar approved material must be imported and compacted to 93% MOD-AASHTO in layers not exceeding 150mm.

The raft foundation beams must be excavated and all surplus excavated material must be carted away from site. A 250 Micron Damp Proof Membrane conforming to SANS 952-1:2011 laid with minimum 150mm overlaps and sealed with pressure sensitive tape must be installed below the raft slab soffit and against all sides and under the ground beams.

The raft reinforcement and the starter bars for the reinforced concrete walls supporting the rails for the side slip cradle must be fixed in place prior to the first concrete pour. While the concrete is still green, the top surface must be floated with a wood float and finished with a brushed non-skid surface.

The side slip winch and sheave blocks must be mounted on top of the raft foundations. These panels where the above mentioned mechanical equipment is located must be solidly filled with concrete.

The top of the rail support walls and anti-tilt concrete wall must be floated with a steel float to a dead level, hardwearing, smooth surface.

After all formwork have been stripped, V-Channels as shown on the layout drawing must be constructed from 35 MPa concrete reinforced with Mesh Ref 193.

All concrete work must be in accordance with SANS 10100-2.

2.8.2 Environmental Catchment Trap

A concrete bund wall must be constructed in the tidal zone in-between the side beams and the center beam to prevent contaminants from washing back into the ocean.

2.8.3 Spalled Concrete

Spalled concrete is visible on some concrete elements and must be repaired in following way:

Surface Preparation

Mark out all of the defective areas of concrete to be removed. These shall be agreed with the Supervisor and recorded before proceeding with the repair works.

The concrete surfaces to be repaired must be free from dust, loose or friable materials, surface contaminants and any other materials which could reduce the bond of the repair materials.

All delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete, shall be removed by suitable mechanical means or very high pressure water techniques (Up to 110 MPa). Tie-wire fragments, nails and any other metal debris embedded in the concrete must also be removed.

The edges of areas where concrete is removed shall be cut to an angle of more than 90° to avoid undercutting but not more than 135° to reduce the possibility of shrinkage / debonding / cracking at the adjacent sound concrete interface. These areas shall be roughened sufficiently to provide a mechanical key between the original concrete and the repair mortar.

Where the repair depth corresponds to the depth of concrete cover and the concrete removal exposes steel reinforcement; the breaking out shall continue to expose the full

circumference of the steel, plus a further 20mm behind the bars. Breaking out shall continue along the reinforcement until non-corroded steel is reached. Care must be taken to ensure that any reinforcement exposed is not cut or damaged.

Steel Reinforcement

Rust, millscale, mortar, concrete, dust and other loose and deleterious material which could reduce bond, or contribute to corrosion, shall be removed. The steel surfaces shall be prepared to a minimum standard equivalent to SA 2 ½ according to ISO 8501-1. The steel surfaces shall be prepared using abrasive blast cleaning or high pressure water techniques (Up to 60 MPa). Where exposed reinforcement is contaminated with chlorides or other materials which could cause corrosion, the reinforcement shall also be cleaned by low pressure water jetting techniques (Up to 18 MPa).

Corrosion Protection

Apply the anti-corrosion protective coating by brush or by spray onto the prepared reinforcement. Care must be taken to ensure complete application behind the reinforcement. Two coats must be applied and sufficient time must be allowed for first coat to harden before applying the second coat.

Bonding Primer

Apply the bonding primer into the substrate with a stiff brush, filling all of the profile. The subsequent application of the repair mortar shall then be done 'wet on wet'.

Repair Mortar

The repair work can either be hand placed or can be poured with a free-flowing structural repair concrete whichever is the most practical.

Ensure that the bonding primer is still 'tacky' when the repair material is applied using 'wet on wet' techniques.

Hand Placement – Apply a wet sprayed / hand placed fibre reinforced repair mortar or high build repair and profiling mortar depending on depth by hand using traditional techniques, or mechanically using 'wet' spray equipment. When the repair depth exceeds the maximum allowable thickness of the repair material, it shall be applied in several layers. The previous layer must have hardened sufficiently, so as not to be disturbed by the subsequent application. The first layer must not be smoothen in order to provide a mechanical key and ensure a good mechanical bond for the subsequent layer.



Repair Grout – Fix the formwork prior to the mixing of the material and seal grout tight. Different ways of grouting are applicable, such as pouring from the top as well as pumping from the bottom. Care must be taken that air can escape. The use of a rod will assist in releasing entrapped air. Slight knocking on the formwork might be of help to avoid air pockets. Place the free-flowing structural repair concrete directly after mixing ensuring that any displaced air is not allowed to escape. A sufficient hydrostatic head must be maintained to keep the product flowing. The repaired area must be protected from rain until initial set has been achieved. The repair grout must be cured by keeping wet to avoid rapid loss of water. Normal curing practices should be applied as for any other cementitious material.

2.8.4 Concrete Surface Beds

All defective surface bed panels will be identified by the Supervisor on site and clearly marked out. The contractor must carefully break out and remove the concrete within the repair area without damaging the remaining slabs and with the minimum amount of damage to the subgrade. The subgrade must be reinstated as necessary.

R20 Dowel bars (350mm long at 300mm c/c) must be installed centrally into the existing surface bed and fixed with a fast curing anchoring adhesive. The other side must be treated with a bond-breaking compound (230mm length min) and cast into the new concrete surface bed panel. Saw cut (8mm x 30mm deep) along the shrinkage crack and install a 10mm dia. backer chord and seal with a Polysulphide sealant (8mm x 15mm deep).

All joint spacing must be limited to 4.5m in both directions and the length-to-width ratio of panels should be limited to between 1.0 and 1.25.

Isolation joints should be provided between new surface bed panels and a fixed part of the facility (For example the slipway beams, retaining walls and plinths) to prevent the development of stresses that may result from restraint.

2.8.5 Retaining Walls

Retaining walls adjacent to the slipway with visible cracking, honeycombing, spalling and movements joints which have failed. The following remedial work is required to increase the service life of the walls as well as improving the appearance of the walls:

Surface Preparation

The concrete surfaces must be free from dust, loose or friable materials, surface contaminants and any other material which could reduce the bond of the repair materials.

All delaminated, weak, damaged and deteriorated concrete and where necessary sound concrete, shall be removed by suitable mechanical means or very high pressure water techniques (Up to 110 MPa). Tie-wire fragments, nails and any other metal debris embedded in the concrete must also be removed.

Crack Repairs

The surface over the entire length of the crack should be wire brushed to remove laitance from the concrete. If the surface of the concrete is unsound chase a "V" cut at least 10 mm deep and 20 mm wide into the crack. All debris should be removed.

Drill into the crack using the 6 mm bit. Drill at least 50 mm deep. Ensure that the crack lies within the sides of the hole.

Using a fine stiff wire, scratch out the debris/dust that may block the crack in the sides of the hole.

Holes should be between 250 mm and 300 mm centres, the finer the crack the less the centre spacing.

Seal the grease nipples into the holes with a collar of a two-component repair epoxy mortar. Cover the head of the nipple with a short length of rubber or plastic tubing to ensure the inlet is kept free of epoxy. Also ensure that the outlet is kept free of epoxy.

Having sealed the nipples into the crack, seal the entire face of the crack applying about 3 mm thick and approximately 50 mm wide. Where the crack is chased out the chase should be filled and finished flush with the concrete surface.

Allow to cure overnight.

After curing (24hrs), open the non-return ball valves of the nipples by forcing in pins.

Fill the injection gun with correctly mixed low viscosity injection liquid.

Starting at the lowest point of the crack or at one end, if the crack runs horizontally, pump in liquid resin. Continue pumping until resin exudes from the next nipple. Remove pin and carry on pumping for a few more strokes of the gun.

Disconnect gun from inlet and attach it to the nipple from which resin exuded.

Continue this sequence working either up or along the crack. After about 30 minutes return to the first nipple that was filled, re-open the ball valves with pins and try to pump in further resin. This can usually be done as the resin may have seeped away into finer cracks or pockets of honeycomb. If foamy resin extrudes continue filling until clear resin is evident.

Once injection of crack has commenced, work must continue until the crack has been filled.

Before injection work starts, a rough calculation should be made as to the amount of resin that will be needed to fill the crack. This need to be approved by the Supervisor before the contractor continues with the work.

Twenty four hours after injection, the surface seal and protruding nipples may be cut off with a grinding wheel.

Movement Joints

All contaminants, especially dried laitance from saw-cutting and previous sealants, must be removed with a high pressure water wash followed by a sand blast.

The joints must be sawed and reamed out to form a width of 10mm. Install a 12mm dia. backer chord and seal with a Polysulphide sealant (10mm x 15mm deep).

Minor Honeycombing

The concrete surface should be sound, clean, properly cured, free from oils, grease or surface contaminants. All loose materials and surface laitance must be removed by high pressure jet blasting or similar mechanical means. The prepared surface should be thoroughly soaked with clean water until uniformly saturated, leaving no standing water.

Apply the cementitious pore sealer and leveling mortar by trowel to the pre-wetted substrate. As soon as the mortar has started to set, it can be rubbed down with a wooden or plastic float or sponge finished. Extra water should not be added to improve workability once setting has started.

Appearance Enhancement of Retaining Walls

Once all remedial work on the retaining walls have been completed the walls must be painted with a one part plasto-elastic coating to enhance the appearance of the concrete.

The concrete surface should be sound, clean, properly cured, free from oils, grease or surface contaminants. All loose materials and surface laitance must be removed by high pressure jet blasting or similar mechanical means.

One coat primer and two coats of the plasto-elastic coating must be applied with a waiting time of 8 hours between each coat.

The coatings can be applied by brush, roller or airless spray.

2.8.6 New Slipway Structure

Demolition work must be carried out in accordance with BS 6187: 2000 Code of Practice for Demolition.

A commercial diving company will have to be appointed for all underwater activities.

The structure must be demolished in the following way:

- Remove the old rails
- Cut the beams
- Prepare the pylons for construction

Removal of the old rails

The contractor must cut off the nuts and brackets on the old railway lines and safely dispose at a stockpile site confirmed by the Employer.

The sections of the railway lines must be rigged up and removed with a crane truck. The crane truck will place the railway lines at the stockpile site.

A diving team must make use of hydraulic grinders and specialized cutting tools to cut through the concrete beams.

After the cutting is done the cut off sections will be removed from the water and placed in a laydown area confirmed by the Employer.

The beams on the shallow side of the slipway will be dragged out to the key on the western side of the slipway where they will be lifted out of the water.

The deep end of the slip's cuts will be lifted by a lifting bag and floated out to the lifting point.

Preparing pylons for reconstruction of new slipway beams

After all the concrete beams have been removed the dive team must break the top of the pylons and expose the reinforcement. The depth will be determined by the depth of the new beam that will span over the existing pylon.

The dive team will use a jackhammer to break the pylons up and expose the reinforcing.

Construction Work

The divers will build the formwork box and fix it in place to the specifications. The divers will then inspect after boxing complete to ensure that it is to the scope of work.

The divers will then fix the reinforcement to the specifications and inspect afterwards to ensure that it is in accordance with the scope of works.

A concrete mix design must be submitted to the engineer for approval and must comply with SANS 10100-2.

Testing of concrete and frequency of sampling must be done in accordance with SANS 1200 G and SANS 10100.

The concrete shall be placed by means of the tremie method by pumping the concrete into the box formwork.

The divers will use the concrete pump nozzle to fill the box up from the bottom up. The diver will cast the concrete and move the nozzle upwards in a slow and steady movement as the box fills with concrete.

After casting of concrete the divers must inspect the box formwork for deformities

After the concrete has set the divers will remove the box formwork and move it to the next bay.

2.8.7 Demolition of Existing Slipway Management Building

The contractor shall provide and will be responsible for safe access structures and work platforms to all areas requiring demolition work. The access and temporary works shall be designed, constructed and maintained in accordance with the current relevant safety regulations, all in compliance with the Occupational Health and Safety Act (Act 85 of 1993) and its applicable Regulations, and shall remain in place until removal is authorized by the engineer. Appropriate allowances shall be made for screening of the work and other protective measures required by the various work activities.

Access to work platforms must be provided from temporary works supported from the ground or fixed to structural members. The design and erection/construction of such temporary works shall be certified by a professional engineer on behalf of the contractor to comply with the relevant safety regulations regarding strength and stability for all imposed loads that can be anticipated to arise from the specified work activities.

Notwithstanding approval given by the engineer for the design and drawings prepared by the contractor and the acceptance of temporary works including the working platform(s) and access structure(s) as constructed, the contractor shall be solely responsible for the safety and adequacy of the temporary works and shall indemnify and keep indemnified the employer and engineer against any losses, damage to persons or property, all claims, demands, proceedings, damages, costs, charges and expenses whatsoever, which may arise out of or in consequence of the design, construction, use and maintenance of the temporary works.

The method of demolition is the contractor's choice and is to be detailed in the method statement submitted to the engineer prior to the commencement of demolition work.

The method and sequence of demolition shall be in accordance with BS6187: 2000 Code of Practice for Demolition and the approved method statement submitted by the contractor or as directed by the engineer.

All debris from the demolition activities must be hauled and dumped at an approved municipal waste disposal site.

2.8.8 New Slipway Operations Building

The new building consists of a structural steel mono-pitched frames with a combination of brick and curtain wall (Glass) infill panels.

All stanchions must be founded on isolated reinforced concrete bases and brick walls on 700 x 300mm reinforced concrete foundations which must be cast monolithically with the isolated bases.

The crane structure must be designed and supplied by a specialist. The foundation for the crane structure will be designed in accordance with SANS 0160-6. All loading (Dynamic, dead, etc.) to be confirmed by the specialist. The base must be constructed on a soil mattress as specified.

The site is Classified as C1 in accordance with the Building Regulations and the all foundations are designed for a safe bearing capacity of 90kPa.

All steel work must be hot dip galvanized in accordance with SANS 121 / ISO 1461.

The contractor must prepare a set of shop drawings. These must be approved by the engineer in writing before any manufacturing commences.

The building floor will be a floated floor slab which must be isolated from the walls except in certain cases where 110mm internal walls can be constructed on top of the floors. Where a wall is constructed on top of the floor slab, the slab must be constructed with a thickening as specified.

2.8.9 New Substation Building

To be constructed as per the drawings na provided specifications

2.8.10 Concrete Slipway Repairs Above Water

The remedial work and material required is exactly the same as for spalled concrete as described above with the exception of the corrosion inhibiting impregnation product and the Silane based water repellent impregnation cream.

After the repair mortar has been applied as specified for spalled concrete, all the exposed faces of the slipway beams must be treated as follows:

Corrosion Inhibiting Impregnation Paint

Apply 3 coats of the corrosion inhibiting impregnation paint to saturation by brush, roller, low pressure or airless spray equipment.

After the application of the last coat, as soon as the surface becomes mat, do a low pressure water cleaning (water hose).

The day after application, the treated surfaces shall be cleaned by pressure washing (10 MPa) to remove any traces of soluble salts that may have deposited at the surface.

Silane Based Water Repellent Impregnation Cream

Apply one coat of the Silane Based Water Repellent Impregnation Cream using a brush, roller or airless spray.

2.8.11 Concrete Slipway Repairs Below Water

Completely remove all loose, delaminated and weak concrete, oil, grease, laitance, organic growth and other contaminants. Prepare concrete using acceptable mechanical means and concrete cleaners or degreasers as necessary to obtain clean, sound and rough concrete surfaces exposing coarse aggregate.

Where surfaces are not underwater or are in tidal zones, pre-soak concrete surfaces thoroughly for a minimum of eight hours with potable water. Concrete shall be saturated and free of standing water at time of placement.

Where reinforcement is exposed, mechanically prepare surfaces to remove all rust, scaling, oxidation, marine growth and other contaminants.

All repair / grouting should be done at a minimum 25mm thickness to a maximum of 150mm in thickness. Larger/deeper placements may be accomplished by extending grout with a clean washed coarse aggregate to Supervisors specification.

We recommend that all underwater grouting should be dry-packed. It must be noted that dry-pack placement should be limited to small application areas. However, should we discover excessive structural damage after the dredging process alternative methods like underwater pouring or pumping should be adopted where it is not practical for dry-pack placement.

A dry-pack consistency is achieved when the mixed grout can be squeezed into a ball by hand without crumbling. Only enough water should come to the surface to moisten the hands.

Use a ram with a square cut end and hammer to evenly compact the grout against solidly braced backing boards, combining each layer (approximately 12mm thick) to the previously placed layer over its entire surface.

Each placed layer shall be visually inspected for placement uniformity.

Striking force should be sufficient for compaction of the grout without affecting plate alignment.

Placement shall be continuous until grouting is complete.

The contractor must follow all processes specified on the material data sheets when preparing the repair areas.

The applicator must apply the repair mortar to the repair area as per the requirements of the supplier's material data sheet.

2.8.12 Method Statements

The contractor shall note that detailed method statements are required for all facets of the construction works.

No work shall be undertaken by the Contractor prior to submission of method statements. These will be agreed in principle with the Employer and his agent. All standing time due to the submission of insufficient or incomplete information shall be to the Contractors account.

The Contractor, Employer and his agent will agree a suitable timeframe for the approval of method statements before the contractor mobilizes staff and equipment to site.

The contractor will maintain all project equipment in a reasonable working condition which does not compromise safety.

All unsuitable or unsafe equipment will be replaced at the Contractors expense.

2.8.13 Safe Disposal of Rubble

The contractor will also ensure that rubble is removed and disposed of in an acceptable manner.

Rubble shall not free fall in an uncontrolled manner. Rubble should be removed on a continuous basis; and not limit daily site operations or personnel access. The Contractor will identify a suitable licensed dump site in conjunction with the local municipality.

The design of any purpose made access platforms must be signed off by a professionally registered engineer or technologist (ECSA).

2.9 Specification – Main and Side Slip Cradles

The Contractor is required to fabricate 1off main cradle and 1off side slip cradles. The purpose of the the main and side slip cradles is to support and transport vessels as they are brought from the water onto the land. Separate winch systems, termed 'uphaul' and 'downhaul' move the cradle in and out of the water. The cradles have wheels which run on rails that are secured to concrete support beams. The side slip cradles mount, one at a time, onto the main cradle. Thus the main cradle, main beams have rails mounted on top of them to effect sideways motion of the side cradles relative to the direction of motion of the main cradles.

The cradles are designed to be fabricated in maintainable, handleable, road transportable, individual bogey sections. The bogey sections are comprised of standard steel sections which are bolted and welded together. The bolted sections require a wet assembly method requiring that the bolts, nuts and attachment areas on the steel sections be saturated on all surfaces with paint and then clamped together, so that when the joints are fastened the paint 'oozes' out of the joints. The bogie's joining plate faces shall be machined to ensure accurate mating between the individual bogie sections.

The cradle wheel assemblies are comprised of duplex stainless steel drive shafts, marine grade bushes and locking plates together forming a wheel assembly. An assembled bogey section shall be defined to include wheel assemblies.

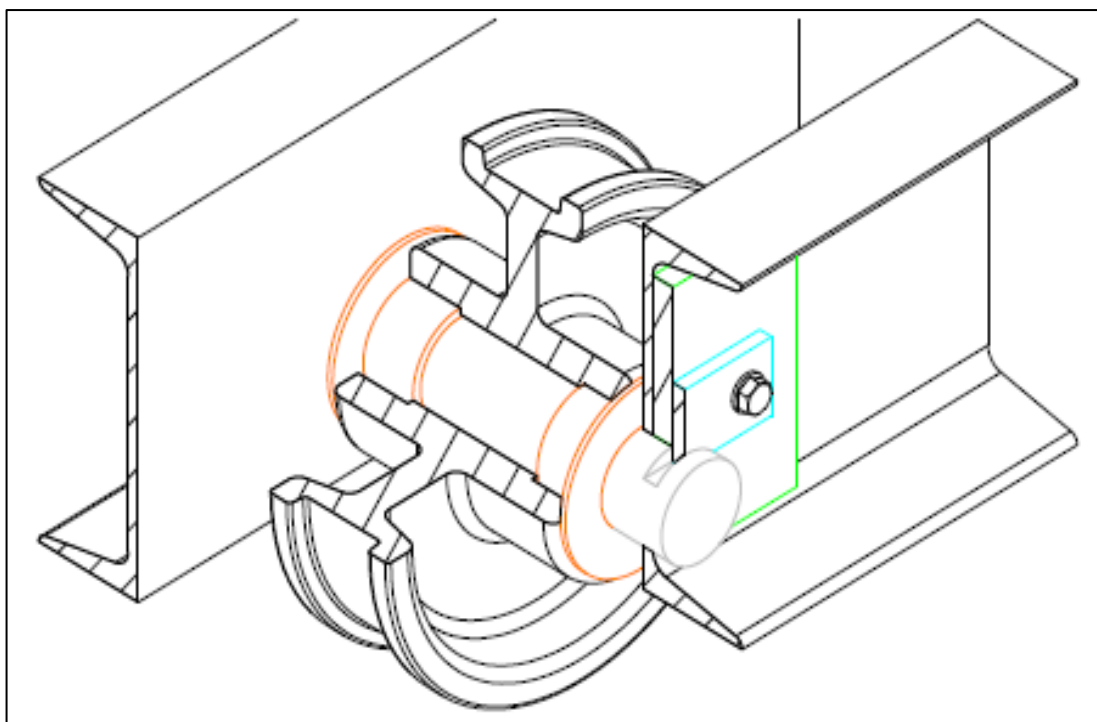


Figure 20: Cradle wheel assembly

The main cradle has a sheave wheel attached to it, around which a large diameter steel wire rope is attached.

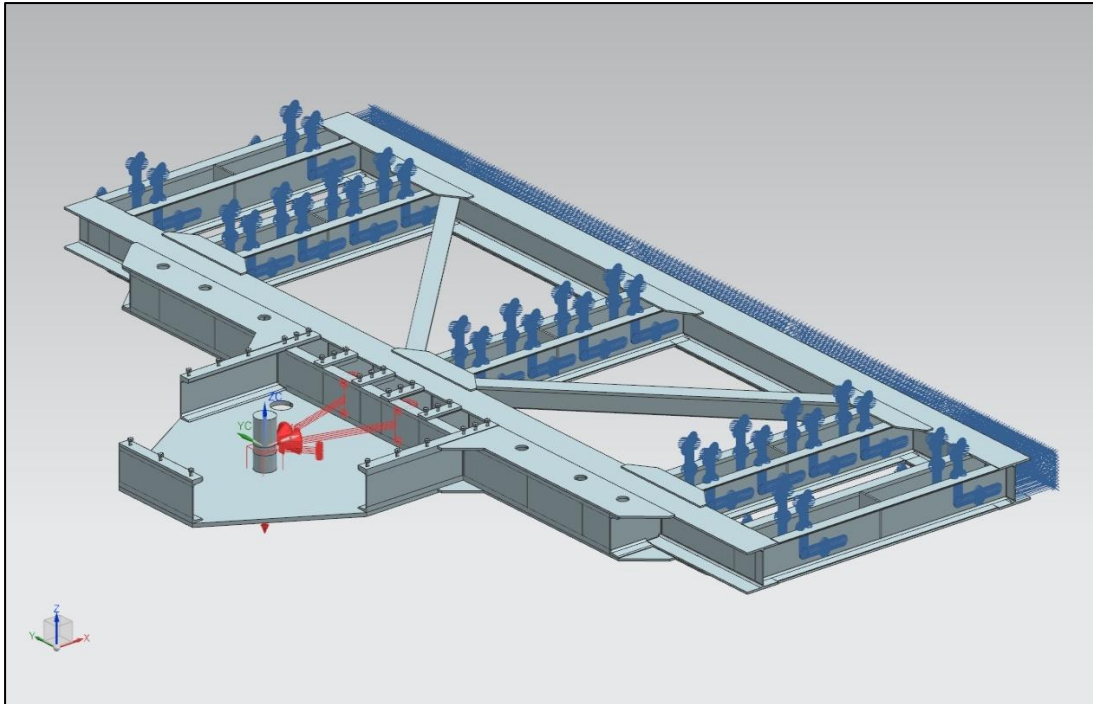


Figure 21: Sheave wheel bogie section

The wire rope is attached to a winch, allowing the cradle to be ‘pulled’ out of the water. Sheaves shall also be attached to the side slip cradles to enable their motion via winching. Squareness of all assembled individual parts comprising the bogies shall be “over-checked” routinely by the Contractor and rechecked by the Supervisor. Thus all loose members and steel pieces comprising the bogies shall be first tacked together, checked for dimensional and squareness accuracy before being finally fully welded.

Steel frames called ‘Docking Arms’ shall be fabricated and installed on the main and sideslip cradles. The arms are designed to be able to rotate in position and are also removable.

2.10 Specification – New Uphaul, Downhaul and Side Slip Winches

The new cradles shall require the installation of new winches for uphaul, downhaul and side slipping.

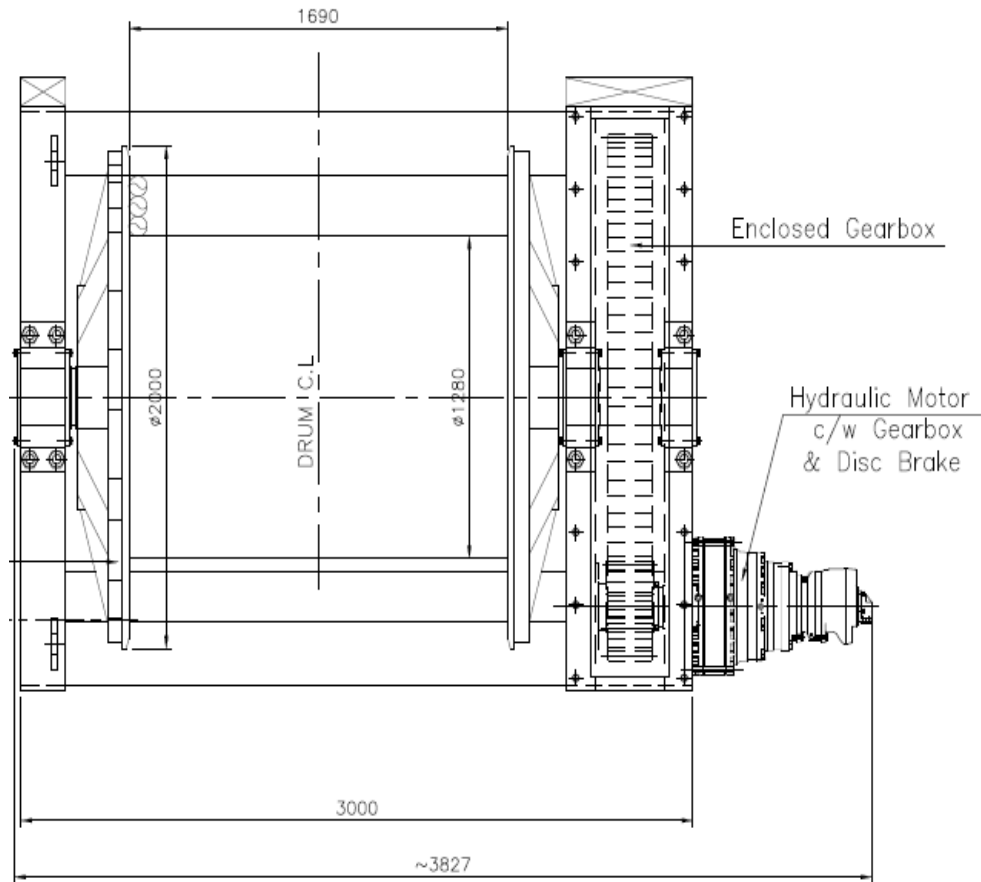


Figure 22: New uphaul winch

Uphaul Winch Specifications

- Drum Capacity: 250m; Dia=80mm rope (SWR 3-layers)
- Duty Pull: 55Ton @ 0.7m/min (1st layer)
- Brake Assembly: (Hydraulic disc brake)
- Brake Holding: 75Ton (Static @ 1st layer)
- Ratchet Assembly: RAWL Type; Manually Operated
- Ratchet Holding: 90Ton (Static @ 1st layer)
- Control: Local Panel



TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

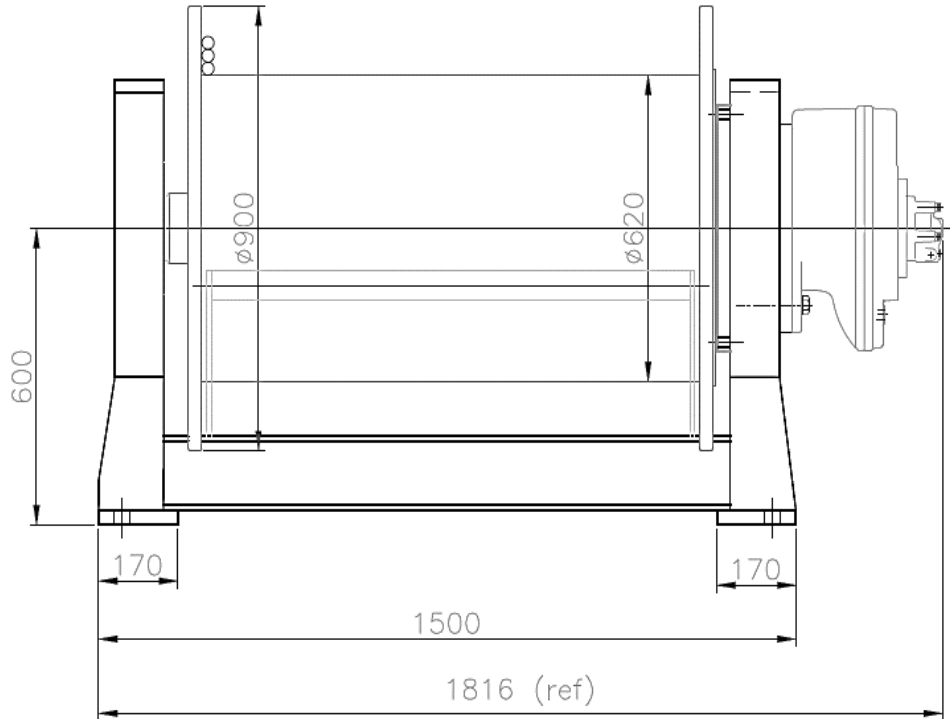


Figure 23: New downhaul winch

Downhaul Winch Specifications

- Drum Capacity: 250m; Dia=26mm rope (SWR 3-layers)
- Duty Pull: 20Ton @ 0.7m/min (1st layer)
- Brake Assembly: (Hydraulic disc brake)
- Brake Holding: 25Ton (Static @ 1st layer)
- Control: Local Panel

Side slipping was not previously practiced at the ship repair facility but will now be reinstated, requiring the installation of a new side slip winch to move the new side slip cradles. A two drum winch operating the FWD and AFT cradles is specified. The winch is hydraulically driven using a hydraulic power pack pumping through a hydraulic motor. The



side slip winches are not housed in the existing winch room but outside near the side slip cradles.

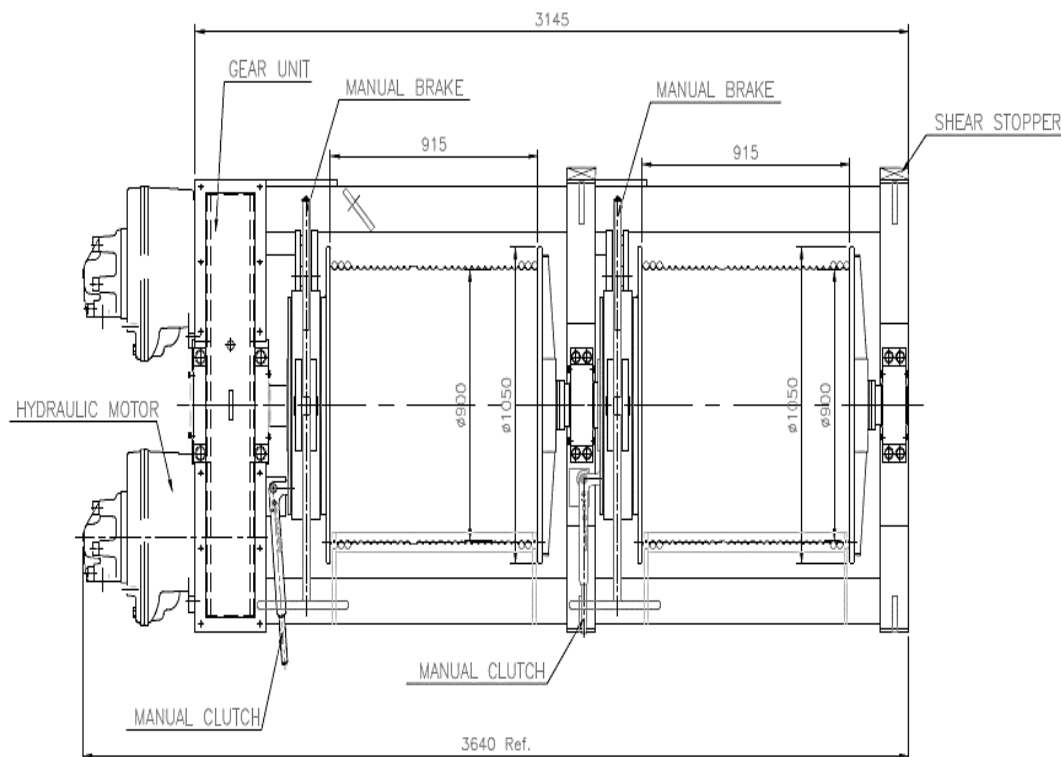


Figure 24: New side slip winch

Side Slip Winch Specifications

- Drum Capacity: 95m; Dia=26mm rope (SWR 3-layers both drums working)
- Duty Pull: 10Ton @ 0.5m/min (1st layer each drum)
- Brake Assembly: (Hydraulic disc brake)
- Brake Holding: 15Ton (Static @ 1st layer)
- Control: Local Panel

This specification covers the design, fabrication, delivery to site, erection, installation, testing and commissioning of the new winches to be supplied by the Contractor.

All winches supplied shall be complete, installed – including connecting up to an isolator box approximately 20m away, tested and commissioned. They shall be of a modern design and built to good Engineering practice. All parts and components shall be adequately protected against corrosion during transit and storage. Each winch shall be designed to prevent the accumulation of product or standing water on it.

The work shall be carried out in an efficient and workmanlike manner in accordance with this specification and to the satisfaction of the Supervisor.

As part of the construction documents, the successful tenderer will be required to present the technical characteristics of the equipment supplied.

The following information must be supplied for each winch by the Contractor:

- Drum Capacity:
- Pull Capacity Required:
- Manufacturer and model of each drive unit
- Speeds of each motion:
- Brake Holding required:
- Brake assembly:
- Clutch assembly:
- Type and size of each hoist wire
- Reeving and winding arrangement
- Maximum loads imposed on foundations
- Maximum power consumption: kW
- Power Factor
- Installation tolerances

The design life for the winches must be 50 years, taking due consideration of the marine operational environment and the effects of corrosion.

All maintainable parts must be easily accessible for maintenance through secure and easily removable covers that do not require specialised tools or machinery to remove.

The use of any asbestos parts or materials is not permitted

All wire ropes shall be of the galvanised type and fully lubricated.

All winches shall be suitable for extended use in the highly corrosive wet saline atmosphere, and shall comply in all respects with Corrosion Protection specification

The winches are hydraulically driven from a common power pack feeding all 3 winches hydraulic motors. The power available to supply the common hydraulic powerpack shall be 400V three phase, 50Hz, with earthed neutral

The supply voltage may vary within the range of 90% to 110% of the nominal, and all equipment shall be suitable for continuous operation in this range

All supplies are to be taken between phases (i.e. the supply system shall be regarded as a 3 phase 3 wire system), and the fourth wire shall be used only for the earthing of the winch

The winches must be controlled from the floor by using a robust push-button controller. The Contractor shall supply the local operating panel with all drive electronics contained therein. The control panel supplied and installed by the Contractor shall be supplied with a power supply point in the site MCC. The Contractor shall connect the winch drive panel with required cabling to the MCC which is located approximately 100m away.

A complete and detailed test and inspection protocol for the commissioning of the winches shall be submitted by the Contractor for approval two weeks before the anticipated date for commissioning. The test and inspection protocol shall include all tests and inspections deemed necessary by the Contractor to prove to the Employer's satisfaction that the winches have been delivered according to the contract.

The manufacturer shall carry out proof load tests at 125% of the rated load on the winches at its workshop and supply certification to such effect approved by SANAS.

After manufacture and erection, the Contractor shall satisfy himself that the equipment is complete and in accordance with the contract in all respects, and shall carry out the necessary precommissioning tests on the equipment. During this period the Employer's representatives will carry out visual inspections of the equipment.

After approval of the commissioning test and inspection protocols by the Employer, the Contractor shall fully test the winches according to the protocol in the presence of Employer's representatives.

On completion of the tests, a report shall be prepared by the Contractor and submitted to the Supervisor in which the Contractor, lists the conclusions and findings of the tests. The report shall identify the equipment tested, and shall give the date and location of the tests and the name of the test supervisor. It shall be specific as to the loads, positions, configurations, procedures and findings in each case.

The Contractor shall provide all initial lubrication and consumables required to carry out the tests. All personnel, equipment, test devices and materials required for the approved tests shall be provided by the Contractor, at his cost.

The Contractor shall provide training to the Employers staff in operating and maintaining the winch and shall supply all operation and maintenance manuals.

Notwithstanding the successful completion of the commissioning tests and inspections, the Contractor shall remain liable for defects in the equipment during the defects liability period.

2.11 Specification – New Steel Wire Ropes for Uphaul, Downhaul and Side Slip Winches

The steel wire ropes shall conform to a recognised international specification

The ratio of the diameter of the rope to the diameter of the rope drums and sheaves, over which the rope passes shall be supplied by the Contractor

All steel wire ropes used must be freely obtainable from local suppliers

The ropes shall be tested and a test certificate issued by an approved organisation must be supplied with the ropes

The Contractor shall supply the following information for all the wire ropes offered:

- Construction
- Type of lay
- Finish
- Type of core
- Tensile grade of steel wire
- Nominal diameter (mm)

- Estimated breaking force (kN)
- Estimated mass/metre (kg/m)
- International specification to which steel wire ropes have been manufactured
- Expected life of rope
- Recommended fabrication of rope

2.12 Specification – Electrical Works

2.12.1 General

The Contractor will be responsible for the supply, delivery, installation, testing, commissioning and handing over in proper working condition of the complete upgrading of the new electrical installation, as specified in detail in these documents. Also included in the scope is the supply of as-built drawings, operating and maintenance manuals and on-site training of the Employer's staff.

The Scope of Work shall include the supply of all necessary required Equipment and Contractor's Personnel to properly perform the Contractor's obligations under the Contract, including:

- Construction Site surveys (dimensional, layout, checking etc.);
- Ensuring that the completed Works shall comply with the Codes and Standards and any applicable statutory requirements;
- Selection of suitable Plant and Materials (where not already specified herein);
- Offloading of Plant and Materials at Site;
- Safety equipment (guards, notices, etc.);
- Construction, erection and the supervision of the Works;
- Specialist installation and installation supervision;

- Removal and disposal, as approved by the Employer, of all scrap and rubble generated by the Contractor within the Site to a demarcated area on the Site;

The Contractor must return all returnable documents on the attached specification of this document with the tender's returnable document.

2.12.2 Summary of Scope

Mossel Bay Municipality Ochre Substation supplies Port of Mossel Bay through Church Street substation with an 11 000V, 3-phase supply. An alternative point of supply is through Bland Street Substation via a Ring Main Unit (RMU) which is on normal open position. Both substations are fed through a 35mm² 3core medium Voltage (MV) cable and each has a capacity of +/-2,5MVA at 11000V, 50Hz.

A new Slipway Substation shall replace a Municipality's RMU that is fed from Bland Street substation. Removal of RMU shall be at municipality's cost. Slipway Substation building shall be constructed and shall have new medium voltage switchgear with 6 tier, medium voltage power factor correction, 1MVA Dry type transformer with copper windings, backup generator and low voltage distribution boards. The 650kVA, 400VAC backup generator shall supply the entire operations buildings including the MCC feeding the slipway winches, kiosks and high mast or floodlights.

The Transnet National Port Authority (TNPA) network shows that they are 5 existing mini-substations which have corrosion and are fed from Church Street substation with a 70mm²-3core MV cable. Four (4) out of five (5) existing oil insulated mini-substations within the existing network shall be replaced with new vacuum type 630kVA mini-substations with corrosion protection and a new 70mm²-3 core MV XLPE cabling. There shall be two (2) additional 500kVA mini-substations, one at the Recreational Area and the other at the Quay 3. The fifth existing mini-substation shall be fed directly from the Church Street and Slipway Substations with an open point. The new Slipway Substation shall be fed from Bland Street Substation (alternative Mossel Bay Municipality substation point of supply). The network shall have an open point to prevent a parallel feed or back fed to the Municipality Substations. New master metering shall be installed in both substations and all 6 mini-substations. A mini-substation in Quay 3 shall be fed from new Slipway substation.

The existing streetlights along Bland Street inside TNPA shall be replaced with new LED streetlights technology. New 15meters high masts with 3 LED floodlights each shall be installed in the container area and slipway area next to TNPA operations building. The streetlights and flood lights shall be fed from new kiosks and shall have light switches inside the kiosk and or as indicated on the drawings.



Currently mini-substation number 3 feeds TNPA buildings and the slipway kiosk 1. These circuits shall be removed from mini-substation 3 and shall be fed from the new low voltage main distribution board in the Slipway substation low voltage room.

Existing operations building shall be decommissioned, stripped and demolished. New Operations building shall be constructed with new electrical installations. New building shall have only latest LED lighting technology, industrial welding sockets, new telecommunications systems and new security systems. Telecommunications wireways shall be installed by the Contractor, but the cabling/conductors for telecommunications shall be installed by TNPA accredited installer under this Contract. Security system wireways shall be installed by the Contractor, but the cabling/conductors for security system and equipment shall be installed by TNPA accredited installer under this Contract.

Lower ground floor Operations building winch room shall have a new motor control centre (MCC). The MCC shall feed the workshop at lower ground floor and slipway area which has kiosks with industrial sockets. MCC shall control system for slipway motors and field controls from MCC. Control systems for winches shall be of Star Delta control system for main haul winch, downhaul winch and sideway winch motors. The 2x pumps shall be fed from MCC have shall have field start/stop buttons and shall be direct-on-line system.

The operations building, Slipway and Church Street substation shall have lightning protection. All distribution boards, kiosks and MCC shall have surge arrestors. New earthing and bonding shall be installed at the Slipway substation and operations building.

Test and commissioning shall be carried out by the Contractor. Test results, operations manual, Certificate of Compliance (COC) and 'As Built' drawings shall be issued by the Contractor.

The electrical installations shall comply with TNPA standards, SANS 10142-1 and SANS 10142-2 and OSH Act and all other related and relevant standard.

Medium Voltage Scope

The existing medium voltage (MV) mini-substation, sizes 630kVA, 500kVA, 400kVA and 315kVA on an 11000V network shall be decommissioned and removed off site and handed over to TNPA. New mini-substations vacuum type, copper windings shall be installed under this contract with new 70mm² 3 core MV cable as per the drawings. New Slipway substation shall be constructed and installed with new MV switchgear, new 1MVA, 11kV/400V Dyn11 dry transformer. Final power factor correction size shall be determined based on the site findings by the protection specialist, to correct the power system to 0,99 lagging.

The electrical work includes, but is not restricted to the following:

- Decommissioning and strip all existing MV electrical installation within the MV network as per the drawing and redundant cables and hand them to TNPA and some are for disposal. (This exclude Church Street substation)
- Supply, deliver, install, test and commissioning of new 1MVA, 11kVAC/400VAC Dyn11 dry transformer as per specification
- Supply, delivery, install, test and commissioning of 630kVA, 11kVAC/400VAC and 500kVA, 11kVAC/400VAC mini-substations as per specification
- Supply, deliver, install, test and commissioning of medium voltage switchgear 6 tier as per specification
- Supply, delivery, installation, test and commissioning of medium voltage power factor correction for Church Street and Slipway substations
- Supply, delivery and installation of MV 70mm² 3core XLPE cables
- Supply, delivery and installation of cable glands IP66 onto cables and suitable for coastal environment
- Termination of cables on respective panels and switchgears
- Excavations for all cable trenches, compaction, backfill and making good of existing surfaces.
- Construction of manholes as per drawing
- Supply, delivery and installation of battery tripping unit complete with cabling
- Supply, delivery, installation test and commissioning of 1 No. 230V/32V DC 10A/H battery tripping units complete with it cabling
- Supply, deliver and install plinths for mini-substations as per manufactures specification
- Construction of manholes
- Supply, delivery and installation of Earthing and bonding
- Excavations for all cable trenches, compaction, backfill and making good of existing surfaces



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- Protection settings calibration and configuration between Church Street Substation and Ochre Substation and between Slipway substation and Bland Street Substation including testing and commissioning
 - Setting configuration between Church Street Substation and mini-substation 5 and Slipway Substation
 - Supply delivery and install new OHS Act signage & fire & resuscitation notices on MV and metering/LV rooms of substation
 - The existing MV cable at the Municipality RMU shall be jointed and a MV cable extended to the new substation MV switchgear
 - Co-ordination with Mossel Bay Municipality representatives and TNPA electricians when required, etc
 - Testing of all new installations in accordance with the latest requirements of SANS 10142, the Electrical Contracting Board of South Africa and the issue of a certificate of compliance test report for the electrical installation in the buildings.
 - Any other work deemed necessary by the Project Manager for the completion of the project.

Low Voltage Scope

At the existing operations buildings the Contractor shall decommission and strip low voltage (LV) distribution boards, existing motor panels & controls and existing lighting and handed over to TNPA. New Motor Control Centre (MCC) shall be installed tested and commissioned as per specified on electrical documentation. There will be new LED luminaires, occupancy sensors, light switches, switched socket outlets on wall and on power skirting and conductors, new welding sockets to be installed in the new operations building workshops. New hot dip galvanised cable tray, cable ladder, P9000 trunking and any other required wireways shall be installed in the Operations buildings. New motor control centre with new controlling system and new cabling to be installed from winch room as per drawings. Lightning protection, Earthing and bonding shall be provided including clean earth for the any future instrumentation. Slipway Substation shall have LED luminaires, occupancy sensors, switched socket outlets and conductors

The scope includes the new reticulation from main distribution board in the substation LV room to the sub-distribution boards and MCC in Operations building and winch room respectively. New cabling from the Slipway substation to kiosks for area lighting, kiosk for street lighting shall be installed under this contract.

New LED flood light on new high mast and LED streetlights shall be installed.

All equipment offered shall comply with the Specific Requirements, Standard Specifications, SABS, SANS and other standards as detailed in the specifications.

The Contractor is to note that the entire installation is classified as a Class II Division 2 installation and the minimum rating is to be IP65. All equipment used is to comply with all relevant SANS standard.

The electrical work includes, but is not restricted to the following:

- Strip all existing electrical installation and redundant cables and hand them to TNPA and certain rubble is for disposal at Contractors cost
- Decommissioning of motors and disconnecting of cable trays and handing them over to the Employer
- The supply, delivery, installation, connections and testing of any material and equipment associated with the electrical supply connections to the winch room, slipway area and operations building equipment's
- The supply, testing and inspection at the manufacturer's premises, installation, connection, testing and commissioning of new Motor Control Centre (MCC), kiosks, distribution boards and switchgears
- Supply, delivery, installation and connection of all power and lighting, distribution, cabling, conductors i.e. socket outlets, light switches, isolators, etc.
- Supply, deliver, installation, testing and commissioning of high mast complete with concrete base
- Supply, installation and connection of all circuit wire ways, cable trays, cable ladders, conduit, draw and outlet boxes and sleeves as per the drawings
- Supply, delivery and installation of earthing and bonding
- This includes the installation of a earthing, bonding, lightning protection system as per the drawings. A suitably certified Contractor shall install the lightning protection system and all earthing points shall be tested and the results recorded. All test results shall be submitted to the Project Manager in the form of a test report/certificate. Payment for this portion of the project cannot be made until the Project Manager has accepted the results of the tests
- Supply, delivery, installation and connection of all circuit wiring, cables and conductors;

- Provide labelling on MCCs, distribution boards, kiosks, street lighting, high mast and equipment and cover plates as per specification
- Supply, delivery and installation of concrete cable markers
- Supply, delivery, installation and connection of all luminaries as per specification
- Connection of electrical power to all mechanical equipment/motors and systems
- Supply, installation, connection and testing of an earthing system for MCC and at the LV distribution boards including providing clean earth for instrumentation
- Excavations for all cable trenches, compaction, backfill and making good of existing surfaces
- Construction of manholes
- Co-ordination with TNPA electricians when required etc
- Testing of all new installations in accordance with the latest requirements of SANS 10142, the Electrical Contracting Board of South Africa and the issue of a certificate of compliance test report for the electrical installation in the buildings
- Any other work deemed necessary by the Project Manager for the completion of the project.

Redundant equipment

The Contractor shall be responsible for disconnecting and removing redundant electrical equipment and cables handed over to TNPA.

2.12.3 Electrical Supply

The supply comes from existing Mossel Bay Municipality substations as explained above. The available capacity from the Mossel Bay Municipality is +/-2,5MVA 11000V 50Hz through a 35mm²-3core cable.

The low voltage supply comes from new Slipway substation via a backup generator set to a low voltage distribution board and to sub-distribution boards, kiosk and motor control centre. The main breaker at the main DB in LV room slipways substation is 1600A, 3-

TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

phase + neutral + earth, 400V, 50Hz. The supplying cables from LV room substation to feeding circuits are as follows:-

Fed from	Location	Provision Amperes	3-phase (400VAC) / 1phase (230VAC)
Main DB	DB-1 – TNPA Operations building - Ground Floor	200A	3-Phase – 400V
Main DB	MCC 1 - Slipway	800A	3-Phase – 400V
Main DB	Slipway Kiosk 1 Field – next to Slipway substation	300A	3-Phase – 400V
Main DB	Streetlight Kiosk 1 Filed – next to New TNPA building	32A	3-Phase – 400V
Main DB	Streetlight Kiosk 2 Filed – next to New Slipway Substation	32A	3-Phase – 400V
Main DB	DB - X TNPA Administration building 1	250A	3-Phase – 400V

All above cables are PVC/SWA/PVC earth continuity conductor copper cable except for 1 core cable.

*1c core unarmoured XLPE insulated PVC sheathed 600/1000

Refer to schematic drawings for details.

Temporally LV supply shall be made available by the Contractor for other services such as lighting, small and welding points during construction, etc. These shall form part of the Contractors' scope and contract.

2.12.4 Installation of Equipment

The Contractor shall be responsible for the installation of all equipment supplied by him/her under the contract.

General

All electrical equipment supplied under this contract shall be designed to perform effectively under the full range of conditions of temperature, pressure and voltage regulation prevailing.

The equipment shall also be capable of withstanding the highly corrosive effects of a moist saline atmosphere. All enclosures of electrical equipment and indoor electrical equipment shall have a minimum degree of protection of IP 54 and all equipment shall be able to withstand the vibrations present on the structures. Junction boxes shall be of the bottom gland-entry type only.

Electrical Equipment

All equipment and fittings supplied and installed under this contract, shall be in accordance with the standard and project specifications of this document. All distribution boards and motor control centre shall be manufactured as per SANS 1973. All motor control centres and equipment shall be designed and manufactured in accordance with SANS 1973/60439. The equipment shall conform to SANS 60947 Parts 1 -7, unless otherwise stated, and shall be suitable for operation on supply voltages of 230/400 Volts, plus neutral and earth, 50 Hz, AC. MCC and DB shall be 3CR12 or as specified on the drawing.

Low Voltage Switchgear

All LV installation work shall be carried out strictly in accordance with SANS 10142-1. The Contractor working on the 400V system and equipment must be deemed competent electrician and authorised to work on LV switchgears by the Department of Labour with particular regard to safety rules, systems operating regulations, underground mains cabling and substation maintenance.

Motor Ratings and Details

The following table is an indicative list of all motors to be installed and is for preliminary assistance only. It is the Contractor's responsibility to advise the switchboard manufacturer of any changes in motor ratings.

Equipment/ Motor	Power (kW)	Voltage (V)	Control/ Starting	Power Factor correction	Source Supply
Uphaul Motor 1	90	400V	YD	0.87	MCC1
Sideway Motor 2	37	400V	YD	0.84	MCC1
Downhaul Motor 3	45	400V	YD	0.84	MCC1
Pump Motor 1	7,5	400V	DOL	0.85	MCC1
Pump Motor 2	5,5	400V	DOL	0.85	MCC1

General Requirements

The Contractor shall ensure that each starter panel incorporates the following:

- 1 No. Running indication light (green)
- 1 No. Stopped indication light (red)
- 1 No. Tripped indication light (amber)
- 1 No. Power on indication light (white)
- 1 No. Selector switch - Local/Remote/Off
- 1 No. Start button (green)
- 1 No. Stop button (red)
- 1 No. digital meter
- Suitably rated controls for motor heating.
- RTD's sensors protection for windings and bearings

Refer to the drawings for a typical wiring diagram for Drive starters.

- All supply circuit breakers are to be supplied with lockable isolation handles and are to comply with the OHS Act and N.O.S.A. standard for “locking out” electrical equipment.
- Main incoming circuit breakers are to be housed in their own individual panel
- All busbars are to run at the top of the panels. All busbars are to be insulated and coloured to correspond to the appropriate phase
- The panels are to have vertical ways for easy accessibility to distribution cables
- All cables will be top entry and top exit
- The control circuitry voltage shall be 220V AC and be protected by means of a circuit breaker. Interposing relays are to be provided to pick up the start and stop signals from the PLC where applicable
- All contactors are to be type 2 co-ordination is called for
- The start and stop stations that are on the field shall be make of 3CR12 and supporting structure shall be stainless steel
- For motors below 18.5kW, overloads are to be Thermal Overloads (to suit the above contactors). Motors of 18.5kW and above are to have electronic overloads
- Motors above 18.5kw shall have Star-Delta (YD) control system or as per drawing

MCC Feeders

Metering

Metering shall be provided for the main low voltage distribution board as per specification of this document.

The power monitor master meter complete with CT's and fuse protection with facilities using Modbus communication.

MCC Panel

The MCC panels shall consist of the incoming circuit breaker, DOL, YD starter, local board with small breakers, PLC section with fuse and breakers board metering.

The MCC shall be as a minimum partially type tested with type 2 co-ordination and have a minimum internal separation of "Form 3b". The MCC and all internal control shall be rated for maximum full load currents and a minimum three phase fault level of 22kA.

The MCCs shall be designed for front access with bottom cable entries and bottom cable exit and shall be enclosed.

All motors shall be DOL & YD controlled as per the operational control philosophy.

The panel shall be constructed of 3CR12 and powder coated with electric orange.

The MCC shall include for a marshalling PLC and all auxiliary equipment sections.

The marshalling/PLC section will communicate linked with the TNPA SCADA system where applicable.

Incomer Compartment

The incomer main ACB shall be rated as follows:

- MCC1 Winch room at 800 Amps 3 phase.

Each MCC incomer section shall include but not necessarily be limited to the following equipment:

- 1 No. suitably rated 3 pole 22 kA withdrawable Air Circuit Breaker complete with integral power measurement equipment or door interlocked MCCB of suitable KA rating with extended rotary handle 400V, Amps as per MCC withdrawable Air Circuit Breaker;
- Digital Power Monitor Meter;
- Surge Arrestors. To be installed on its own compartment

Starters

All direct on line starters shall incorporate intelligent motor protection relays using Profibus communication.

All starters will be installed with a lockable isolating switch but some with additional installation of a Manual/Remote/Off selection switch.

MCC Equipment's

A Local/Remote/Off selector switch will be provided at MCC starter panel with the following control modes:

- Local Position – Starter Control Panel

When the selector switch on the motor starter panel has been set on local the latching start button on the motor starter panel will be enabled and the remote PLC and Field Wireless control disabled. This is for future connections.

The emergency stop and stop button shall always be enabled. A new emergency stop station shall be installed at the motor for safety operation control. A control cable shall be installed and terminated from the station back to the MCC.

- Remote - PLC (for future connections)

This starter panel shall house the following:

- Primary short circuit protection by means of HRC fuses.
- Suitably rated contactor for DOL/YD starting.
- Suitably rated current transformers for measuring purposes
- 96mm square ammeter with thermal maximum demand indication.
- Suitably rated Siemens electronic overload to suit motor.
- Running indication light (green)
- Stopped indication light (red)
- Tripped indication light (amber)
- Power on indication light (white)
- Selector switch - Local/Remote/Off

- Start button (green)
- Stop button (red)
- Digital meter (Run hour, amps, kVA, kVAr, Hertz, line voltage. Phase voltage, etc)
- Suitably rated controls for motor heating.
- Panel anti-condensation heater

400V Motor Starters

All motor starters shall be in accordance with the Transnet standard specifications and drawings.

All starter equipment shall be suitable for a 3 phase, 400VAC, 50Hz system with a fault current level rating of 10kA.

Starter Control Philosophy For 400V

The motor starter at the MCC shall have two modes of control, namely local, manual and remote.

The operation is as follows:

- Field - When selected this gives total control to the operator in the field through the stop/start station. This mode is used to facilitate plant maintenance.
- Remote - When selected in this mode, control is through the PLC system. This mode is used during normal plant operation. The PLC system shall not be installed under this contract, this is the facility to prepare for future PLC installation. Unless otherwise the Employer/Project Manager issue an instruction to add the PLC.

400V Motors

The Contractor is responsible for the supply, installation, testing and commissioning of all the 1000/600V cables from the MCCs to the motors. All cables will be installed on cable tray and/or cable trench. The Contractor will be responsible for the terminating up to and including the motor terminal box. The Contractor shall ensure that all terminations and isolators have Class II Division 2 classification.

The 3-phase/400V, 50Hz motors shall be IP 66 (minimum), cast iron motor, class H insulation, and suitable for a coastal environment. Motors to have a minimum guarantee of 5 years. A 90kW motor, minimum power factor of 0.87 at Efficiency of 92.5%. The 45kW & 37kW motors, minimum power factor of 0.84 at efficiency of 92.3%.

Contractor shall be responsible for motor installation details which will include motor base plate.

Refer to motor schedule for detailed motor specification requirements of which the contractor must submit with returnable documents.

Ancillary Equipment

Control Panel and stop/start station

All local stop/start field stations with control panel for the winch speed shall be integral units with a spring return start button, latching mushroom head stop button. They shall have a minimum hazardous protection of IP 65 unless otherwise specified. Control panel shall be the latest control panel and user friendly. Control panel to match/be able to control the current winches with new motors.

Control station for uphaul shall be replaced with new. The control station for downhaul winch shall be replaced with new. These control shall be interconnected with the respective MCC.

These shall be installed adjacent equipment to be controlled and shall be mounted on suitable 1200mm structure stainless steel Pedestals as per drawing.

The local control station shall have the following as a minimum and as per manufacturer's specification:

- IP65 corrosion proof enclosure
- Start push button (green)
- Stop mushroom head push button (red) "Twist-to-release"
- Power signal
- A 2.5mm² x 4core cable shall be installed between each starter and pedestal

2.12.5 Cables

General

The Contractor shall allow for the numbering and labelling of cables. The Contractor shall produce a cable-pulling schedule, which must be approved by the Project Manager prior to the installation of any cables.

The entire cable installation must meet with the Employer's requirements and standards. Should any cable be installed and not meet with these requirements it will be re-laid at the Contractor's own cost. All cables are to be meggered or pressure-tested prior to final connections after termination.

Low Voltage Cables

All low voltage (LV) cables are to be manufactured in accordance with the SANS 1507 standard code of practice and shall be of the 600/1000V PVC/SWA/PVC type with stranded copper conductors unless otherwise specified. Four core cables shall be used to supply motors with the fourth core used as the earth conductor.

Cables shall be provided with a separate earth conductor strapped to the cable at intervals not exceeding 1 (one) metre.

The power cable to the DOL motors shall be of the trailing cable, 4 cores cable plus separate earth conductor. It shall be incorporated in a cable carrier system.

Corrosion proof Enviro cable glands with an IP65 rating shall be used.

All cables shall bear the SANS mark.

All cables shall be installed in accordance with SANS 10198, Transnet standards and the Manufacturer's specifications.

No cable joints shall be permitted unless otherwise approved by the Employer.

All exposed copper conductors shall be tinned.

After installation of cables, all sleeves, cables etc. entering buildings shall be sealed with fire retardant "Pratliperl" to prevent ingress of vermin and water.

Instrument Cables

Single pair overall screened cable shall be used for cables between instruments and junction boxes. Conductor size shall be 1.5 mm² minimum.

Cabling between junction boxes, control stations, purpose made control panels and MCC marshalling cubicles shall be multi-core and multi-pair, armoured, overall screened, conductor size shall be 1.5mm² minimum.

Cable Slack

At every termination, sufficient slack shall be provided for future repairs to the cable end should this become necessary due to a fault or some unforeseen circumstances on site.

Cable Identification

Every power distribution cable, switchboard interconnecting cable, and any other cable, shall be provided at both ends of the run with an approved Bowthorpe Hellerman tag showing the size and details of the cable. All identifications shall correspond with the Employer's requirements.

Cables shall be labelled at all terminations with suitable and approved labels (stainless steel Dymo-tape or Irvone white ivorene label written in black) indicating:

- i) Origin and Destination; (e.g. from Substation to MCC1);
- ii) Cable size and no. of cores; (e.g. 16 mm² 4-core);
- iii) Conductor type. (e.g. PVC/SWA/PVC Copper ECC cable).
- iv) Phase rotation

Cable Glands

All cable glands shall be rated for IP 65 outside.

All cable glands shall conform to SANS 1213.

Cables Installed Underground

Cables shall be laid with the upper surface at the following minimum depths below ground level:-

- LV Cables : 700mm
- MV Cables : 1000mm

Before excavation of cable trenches the Contractor shall acquaint himself with the route and site conditions and with existing services.

The Contractor shall ensure that the excavation can cause no danger or loss to property, structures or equipment on or adjacent to the site. The sides of trenches shall be shored up and the trenches pumped to maintain them dry. Temporary access bridges shall be provided where the route crosses paths and roads. Any nuisance to other services, works or access shall be avoided.

Excavated material shall be placed alongside the trench. The base of trench shall be smoothed.

Cables shall be bedded in river sand or soil, (no clay), sifted through 6mm mesh, 75mm below and 75mm over the cables before backfilling. The bedding under joint boxes shall be compacted to prevent later settling.

Concrete cover blocks shall be placed over the length of the cable trench in accordance to Transnet standards specifications, to protect them against accidental damage from future excavations. Surplus material shall be removed from site.

Yellow PVC marker tape, 150mm wide, inscribed "Buried electric cable below – caution", shall be laid 300mm below final ground level.

Cable markers shall be installed on cable routes at every change of direction and at spacing's not exceeding 50m on the straight routes. The positions shall be confirmed with the Employer prior to installation. The cable markers shall consist of 150mm x 150mm x 300mm high concrete blocks with "Electric Cable" and with the voltage rating and the route direction.

Where Cables run beneath roads and built structures then the cables shall run in cable sleeves.

All Cable sleeves shall be of the PVC type and shall be installed in the ground.

The cables shall be removed from the cable drum without stressing the cable beyond manufacturer's recommendations.

For cable runs exceeding 50 metres in length then cable rollers shall be used to prevent any damage occurring to the cables during installation.

Parallel cables shall be spaced apart by the following minimum distances:

- LV/LV/Instrument : 2 (two) diameters of the larger cable horizontally.
- LV/MV : 300mm horizontally.
- MV/MV : 300mm, horizontally or vertically.

Communication cables shall be spaced at least 1 (one) metre from nearest low voltage and high voltage cables.

Cable Support Systems

All cable rack shall be hot dip galvanised steel with a minimum required thickness as per SANS for cable ladder and cable tray. The Contractor shall allow for all brackets as detailed, fixings, cutting, welding and cleaning of welding. All spring nuts are to be hot dip galvanised. The cable ladder/tray routes are indicated on the drawing. Care has been taken in planning the routes; however the Contractor is still to check with other services routes to ensure that there are no clashes.

Additional earth terminals are to be provided on the cable rack, as the use of a joiner clip is insufficient.

The method of fixing the cable racks shall be confirmed with the Supervisor prior to installation. No drilling of structures shall be permitted for mounting of cable racking.

All cable ladder and cable tray are to be unpainted only hot dip galvanised finish.

Cable racks carrying cables of other voltages shall not be painted but shall be marked at 10m intervals by a 100mm thick paint strip of the relevant colour (as per the Employer's painting specification).

Sizes of racks used are generally:

- MV and LV power cables : 300mm

-
- Instrumentation cables : 300mm
 - Lighting and Power cables : 200mm

Details of the routing of cable racks are shown in the layout drawing.

Cable Rack

All cable trays and ladders shall be hot dip galvanised steel. Cable tray shall be in accordance with IEC 61084-1 specifications. It shall be of the Cable tray type with a specified on the drawing. The cable tray width shall be sized as required with a + 20% spare capacity and the side wall height shall be no less than 100mm. Cable tray mounting height shall be as per site requirement and all trays shall be mounted above all access openings.

Cables shall be strapped to the cable tray with stainless steel cable straps.

Allowance must be made for all brackets and additional hot dip galvanised supports that are required to adequately support the fully loaded tray in accordance with the manufacturer's specifications.

MV and LV and instrument cables shall be installed on separate trays with a minimum spacing of 300mm where practical. Cables shall be individually strapped to the cable tray with PVC cable ties or clamps.

All new cabling will be run on new cable racking fixed to buildings or existing structures where possible.

Cable trays shall be earthed at the point closest to the source of supply and continuity shall be maintained across joints by means of jumpers. The minimum size of the earth continuity conductor shall be 6mm² and it shall be green PVC insulated with tinned lugs.

40mm x 40mm x 5mm angle iron manufactured from hot dip galvanised shall be used to support short lengths of cable from the cable tray to the equipment.

2.12.6 Lighting

Slipway lighting installations are shown on the drawing and the Contractor shall carry out this work in accordance with the relevant specifications. The layout of the luminaires as indicated on the drawings must be adhered to as far as possible.



The final mounting positions of luminaires shall be verified on site. All luminaires shall be placed symmetrically with respect to beams and columns or other architectural features of the space. The layout as shown in the lighting drawing shall generally be adhered to, but any discrepancies of clashes with structural or other features must be referred to the Supervisor, before commencing installation.

Where provision has not been made for the fixing of luminaires, the Contractor shall supply the necessary supports, hangers, conduit extensions, angle brackets or any other fixing method approved by the Supervisor.

All luminaires comply with the SANS safety standard.

Details luminaire specification refer to document number C1002-002-EE-001.

Samples of all luminaires must be approved by the Supervisor before any order is placed. All luminaires must be complete with lamps and where necessary, control gear. All control gear shall bear the SANS mark.

All luminaries are to have respective control gear/electronic ballast. All luminaries to be supplied by an approved SANS supplier and must meet all minimum requirement, and SANS approved standard.

Bulkhead luminaires

Bulkhead luminaires shall not be screwed directly to conduit ends. The conduit shall terminate in a round draw-box at the top or rear of the luminaire.

The PVC-insulated conductors shall terminate in a porcelain terminal strip in the draw-box. Silicon-rubber insulated conductors shall be installed from the terminal strip to the luminaire lamp holder. "Screw-it" or similar connectors are not acceptable.

Earthing

Earth conductors shall be drawn in with the circuit wiring and connected to the earthing terminal of all luminaires in accordance with the SANS 10142-1.

Lighting luminaires

The Contractor shall supply and install the light fitting as per the following specifications:

Photo cell

The external lighting shall be switched by contactor mounted in the distribution board, which is controlled by a photocell or direct by the photocell. The photocell shall comply with NRS 025.

The photocell must be linked with the distribution board by 3 x 2,5mm² PVC conductors.

The photocell must comply with the following: -

- area lights shall be switched on when the illumination drops to 54 Lux;
- area lights shall be switched off when the illumination reaches 108 Lux;
- it shall be weather proof and be resistant to ultra violet light;
- it shall have a built in time delay of approximately 30 seconds;
- built in protection against voltage surges shall be provided;
- a sample of the proposed photocell shall be submitted to the Supervisor for approval prior to placing the order;
- 20 A rating shall be provided

External Lighting

The Contractor shall supply, install and connect the external lighting installation as indicated on the drawing and specified in this document.

The external lighting shall consist of street lighting mounted on a 7 meter hot dip galvanised pole and 15 meter hot dip galvanised high mast pole as per specification.

The site lights shall be powered with cable which shall be looped from pole luminaire to pole luminaire, with photo electric cell as shown on the drawing. Sizes and number of cores are also indicated on the layouts.

The high mast shall be installed by specialist contractor as per manufacturer's specification. They shall be a 15 meter high mounted on a concrete coring. Pole shall be hot dip galvanised and including the bolts and nuts. All high mast shall be earthed.

Specialist contractor shall submit detailed design of high mast for acceptance prior and manufacturing.

2.12.7 ELECTRONICS

Telecommunications

Telephone and data systems, cabling and telecommunications equipment shall be installed by the TNPA accredited installer under this contract. Wireways such as cable tray and conduit shall be installed by the Contractor under this contract. Contractor shall submit quotation from the accredited installed for Project Manager's/Electrical Engineer's approval, provisional sum has been allowed for.

Security Systems

Biometric finger scanner with key pads and closed circuit television (CCTV) and all required security system equipment shall be installed by the TNPA accredited installer under this contract. The Babylon system shall be linked with TNPA main frame system complete with Ethernet cabling. Wireways such as cable tray and conduit shall be installed by the Contractor under this contract. Contractor shall submit quotation from the accredited installed for Project Manager's/Electrical Engineer's approval, provisional sum has been allowed for.

2.12.8 Lightning Protection

The Lightning Protection installation shall be carried out by a specialist in accordance with the applicable SANS 10313.

Reinforced or structural steel is to be used as down-conductors. These are to be bonded to a central area conductor at suitable spacing's as specified in SANS 10313. Finials are to be installed if they are required by the SANS standards.

The new installation will comply with the SANS codes and Occupation Health and Safety Act of South Africa and certificates will be handed over on takeover by the Employer.

SANS 10313 states the site should have a valid Lightning Protection system installation safety report which is completed by a Lightning Protection System designer or an SABS approved installer, this report will also include a Lightning protection system maintenance certificate.

The Contractor will ensure the compliance to SANS 10142-1 and lightning protection test results and certification shall be issued.

Earthing rods are to be sleeved/conduits. Test box shall be installed above ground as per drawing.

The Contractor shall allow for a soil testing.

Tests results are to be submitted to the Project Manager.

All new MCC's and distribution boards must have surge arrestors.

2.12.9 Earthing and Bonding

The Contractor is to ensure that all earthing and bonding is carried out in accordance with SANS 10142, Transnet standard specifications and the local authority's requirements. The earthing installation is to be carried out by a specialist.

The Contractor should note that as this installation is a Class II Division 2, all metal parts, and equipment are to be earthed and bonded to eliminate static build up. An earth mat is to be installed and the Contractor shall allow for a survey by a specialist and installation of it according to the relevant SANS code. The Contractor shall submit all test results to the Project Manager.

The Contractor shall install an earth point on all motors and metal structures in the slipway buildings.

A schedule of the work shall be carried out by an Earthing Specialist.

Earthing shall be provided for the MV installation and LV installation equipment.

The earthing shall be carried out by a specialist and comply with SANS 61024 Parts 1 and 2.

2.12.10 Drawings

The Contractor produces the detailed layout design and individual wiring diagrams for each starter, panel and MV switchgear panel in AutoCAD format fully in compliance with the Project Manager's requirements. All drawings are to be submitted for approval prior to the start of manufacture.

In addition, the Contractor submits all cable pulling schedules, termination schedules as well as lightning protection and earthing system designs, for approval. Any installation or manufacture of equipment prior to the approval of drawings is entirely at the Contractor's own risk. Similarly, the cable numbering systems, plant ID numbers and tag numbers will be in accordance with the Employer's requirements.

2.12.11 Work Required in the Commissioning of Protection Equipment

The commissioning of protection equipment for LV systems can be broken up into a number of broad categories.

- Panel tests and visual Inspection;
- Implementation of applicable technical instructions;
- Secondary tests;
- Primary tests;
- Review and submission of documentation;
- Energisation and on load checks;
- Sign off and handover of electrical plant for use and operation by the owner.

Each of the categories requires documentation to reflect that the test(s) required have been completed. The documentary evidence must include:

- The relevant equipment or panel name.
- The checks performed;
- The name of the person who performed the checks;
- The date on which the checks were performed;
- The signature of the person who performed the checks.

2.12.12 Panel Tests and Visual Inspection.

The purpose of this group of activities is to check and produce documentary evidence that:

- The panel and all contained equipment is visibly intact and mechanically sound,

- The panel and contained equipment has not been damaged in transit,
- The panel is wired according to the application drawings supplied, and that the design version between the equipment and the drawings is the same.
- The equipment contained in the panel corresponds in make, model and function to the application drawings.
- The panel and associated equipment is correctly earthed according to the SANS standards.

2.12.13 Implementation of Applicable Technical Instructions.

The purpose of this activity is to ensure that modifications to the protection panels required by approved technical instructions are implemented to the protection equipment prior to secondary injection. Documentation is to be in the form of the instruction with reference number, the name of the person who implemented the instruction and the date of implementation is required.

2.12.14 Secondary Tests

This group of activities comprises the following:

- Application of settings of all protection devices.
- Relay characteristic tests and logic functions according to settings provided and manufacturer specifications.
- End to end checks for Impedance and current differential schemes.
- Verification that any transducer outputs are correct.
- Supervisory controls, alarms, indications and analogue outputs are correct to the control centre.
- To ensure that test blocks and shorting strips function correctly.

2.12.15 Primary Tests

All primary tests must be according to relative SANS regulation.

2.12.16 Normalisation of Circuits

During the primary and secondary injection tests, the trip and alarm circuits are usually rendered inoperative by the removal of isolating links, relay trip latches and so on. It is therefore essential that, when the primary and secondary injection tests have been completed, the tripping and alarm circuits be checked. Certain settings may have been altered during testing and these have to be normalized. Certain protection functions may have been deactivated in order to test other complimentary functions and these have to be reactivated as per the settings and configuration documentation.

2.12.17 Consolidation and Review of Test Results

The purpose of this group of activities is to consolidate the test results and;

- Ensure sure that all tests originally planned have been completed
- Ensure that all test results are consistent with reasonable Employer expectations
- Ensure that any defects have been addressed
- Ensure that the head of commissioning is satisfied that the equipment is ready to be made live and arrangements have been made with an authorized person and to clear all outstanding work permits.
- Complete the equipment test sheet that permits the equipment to be energised.
- Certificate of Compliance (CoC) must be issued with all other test results reports.

2.12.18 Energisation and on load checks

There are some checks and tests that cannot be performed while the equipment is de-energised.

It must be stressed that the equipment cannot be considered to be completely commissioned until on-load checks have been completed and results documented.

The following checks are required:

- Correct phase rotation.
- Current measurement checks / on-load confirmation of CT ratios.

- On-load stability checks for differential schemes
- On-load directional checks for directional overcurrent and impedance relays.
- Confirmation of transducer loading if applicable.

On the successful completion of the on-load checks, a handover document / mechanism is required that indicates that the equipment has been fully commissioned.

2.12.19 Training

Contractor shall train the TNPA staff on new equipment on how to operate the MV and LV panel/ MCC, transformer and other electrical related installations. Training shall include how to clear faults on the system once it has been attended to. Training to include all other electrical related issues that will be require by maintenance and operating TNPA staff.

2.12.20 Final Documentation

The purpose of this phase of the process is to ensure that all documentation and test results are compiled and submitted to the *Employer*.

- Handover Certificate:** is to be signed by the *Contractor* and the *Supervisor*.
- Completed Checklists:** A hard copy of the all of checklists of completed activities to be forwarded to the *Project Manager*. All appropriate tests, dates, responsible persons and signatures are required. Electronic copies of scanned hard copy documents are also acceptable.
- Commissioning Test Results:** four sets of hard copies of the Commissioning Test Results, including hard copies of manuals, etc are required to be submitted to the *Employer*. Dates, responsible person's name and signatures are required. Electronic copies of scanned hard copy documents are acceptable. The above shall be included in the data packs to prove completion.
- Proof that all applicable technical instructions have been implemented:**
Technical Instructions that may be applicable to the equipment concerned.

- e. **Proof of Applied Settings:** All settings applied to all relays to be retrieved from the relays (downloaded) and hard or electronic copies to be forwarded to the *Project Manager*.

2.12.21 Specifications

Detailed specification for medium and low voltage materials and equipment is attached with this document. The *Contractor* must complete and submit technical returnable documents attached on the specification.

2.12.22 LV SPECIFICATION

General

The motor control centre (MCC) and equipment shall be designed and manufactured in accordance with SANS 1973/60439. The equipment shall conform to SANS 60947 Parts 1 -7, and shall be suitable for operation on supply voltages of 230/400 Volt at 50 Hz, AC. Reference must be made to the schematic/line diagrams, as well as to the following specific requirements.

The motor control centres (MCC) shall be of the free standing, floor mounted, multi-tiered, individual motor starter with individual main MCCB/Isolator for each motor starter, with front and back access, suitable for top cable entries and top exit cable. The schematic drawings show the specific requirements applicable to each assembly.

The assembly shall be constructed of and manufactured from 3CR-12.

The minimum thickness of 2mm thick MCC panel.

The metal enclosures, internal panels and all equipment support frames shall be manufactured from the same type of plate stated above.

The degree of protection shall not be less than IP54 in accordance with SANS 1222 and capable of withstanding the temperature, humidity and coastal conditions. The assembly shall be fully vermin proofed.

A hot dipped galvanised steel base frame with predrilled holes for fixing the MCC to the floor shall be provided and removable lifting eyes with blanking off plugs shall be provided for lifting heavy assemblies. The panel shall be suitably braced to ensure rigidity. The method of preparing plate-work, priming and painting shall be in accordance with the standard painting specification.

The MCCs are to be fully assembled in the manufacturer's factory for final acceptance tests. Where broken down for transportation to site, the MCC will be provided with all items required for re-assembly. Provision must be made for future extension at either side of the MCC. All holes provided for such extension to be suitably plugged or covered.

The overall outside dimensions of the assembly shall be suitable for easy handling of the switchgear as indicated on the drawings.

All hinged front panels shall be fitted with stainless steel or heavy duty rustproof hinges of an approved manufacture with a 180° movement and shall be secured in the closed position by means of locking devices of approved quality. Hinged front panels in excess of 450mm height shall be secured at both the top and bottom. Lockable catches are required on all hinged front panels. All hinged front panels are to be fitted with earth straps.

Covers, other than the hinged type, shall be provided with chromium plated handles to facilitate removal. Removable covers shall be secured in position by means of patent screw locking devices approved by *Engineer*. All removable covers and hinged front covers shall have a neoprene or rubber gasket to ensure that the required IP rating of the panel is achieved.

All the equipment shall be mounted behind the hinged front panels and neat machine punched openings shall be provided for the purpose of operating handles etc. The drawings will detail the instruments required which will be flush mounted. The positions of instruments shall be such that the glass cannot be broken by other equipment when the hinged front panels are in the fully open position.

Cut outs which are provided for future equipment and instruments shall be neatly blanked off by means of removable dummy frames. Back plates shall be provided in all spare cubicles for the specified future starters.

To avoid damage to paintwork, screws, bolts, door lock, etc. must not be in direct contact with painted surfaces.

The *Engineer* shall approve the manufacturer's detailed working drawings of the assembly before any fabrication commences. Any other construction or type of assembly proposed as an alternative to that specified must have the approval of *Engineer* in writing. The drawings will detail all dimensions of busbars, connections, electrical component make, type and rating. Positions and layout of busbars, earth bars and gland plates will be shown in front and side elevation drawings.

Starter Cubicle Sizes

MCC general arrangement drawings shall be provided with the tender submission. A typical MCC panel has been issued with the minimum recommended cubicle size for motor starter sizes for this MCC. However, these must be verified with the equipment manufacturer.

Paint Specification

All metal used for the fabrication of the board shall be painted, i.e. internally and externally. Baked enamel, electro statically applied powder coating or similar proven methods, other than standard enamel paint applied by brush, shall be used.

In general, the following standard colours shall be used, but the final colours are to be confirmed with TNPA and the Engineer.

- Non-essential sections Electric orange
- Essential sections Signal red
- Uninterrupted power (UPS) Purple
- Instrumentation and control Blue

Edges

Care shall be taken to ensure that all edges and corners are properly covered, after all burrs and sharp edges have been removed.

Surface Preparation

Surface preparation shall comply with SANS 10064. Prior to painting, all metal parts shall be thoroughly cleaned of rust, mill scale, grease and foreign matter to a continuous metallic finish. Sand or shot blasting or acid pickling and washing shall be employed for this purpose.

The corrosion inhibiting process shall be suitable for the environmental conditions to be encountered on site and full details shall be provided at the time of tendering. Details of the chemical process employed and the method of application shall also be provided at the time of tendering.

Finish on 3CR12

Minimum requirements - One (1) coat of suitable etch primer (15 microns). Apply epoxy polyester powder coat (60 microns final thickness). 3CR12 steel shall be correctly pickled and passivated prior to being painted. Pickling and passivation shall be undertaken after basic manufacture of the Enclosure is complete.

Busbars

All busbars shall be manufactured from solid high conductivity copper and shall comply with the requirements laid down in SANS 1195. The completed busbar system shall be a standard modular system and shall have been tested to SANS approval and a certificate shall be made available confirming the full busbar technical description, current rating and fault rating together with full details of the test results. Busbars shall be designed to withstand a test voltage of 2.5kV AC for one minute.

The busbar assembly shall be rated in accordance with the specified ultimate projected fault level, which will be not less than the short-circuit stresses limited by the protective device(s) on the supply side of the busbars, as well as the specified continuous full load current, with a current density not exceeding 1,60 Amps per mm². The busbars shall withstand a fault current

under test conditions of the specified fault level for 1 second. If a fault level is not specified, the busbars shall be tested at 20 times rated current for 1 second.

The fault current during tests shall be:

- between all three-phases
- any two phases
- neutral and the adjacent phase, and
- earth conductor and the nearest phase conductor.

The busbars shall be continuously rated for the specified current with a maximum temperature rise of 40°C relative to a peak ambient temperature of 40°C giving a maximum peak busbar temperature of 80°C.

Busbars shall be mounted in the top section of the assembly and shall be rigidly supported by means of approved insulated busbar clamps (at intervals not exceeding 500mm) to prevent damage resulting from the specified short circuit conditions.

The busbars shall run along the entire length of the assembly up to 76mm from either end. The phase busbars shall be identified in the phase colours red, white and blue.

The busbars shall be arranged horizontally with the longer side of the cross-sections in the vertical plane and one behind the other in the horizontal plane. The minimum clearance between live conductors and live conductors and earth shall be 40mm.

Earth Busbar

A solid copper earth bar shall be provided inside each assembly at the back and along the entire length, at a height of approximately 500mm above floor level, or 200 mm above the gland plates. A bar is to be provided at the top of the assembly where top entries exist and this shall be solidly connected to the bottom earth bar.

The bar will be supported on robust spacers and will have a minimum clearance of 40mm to the sheet steel panel.

The earth bar shall have same size as the phase busbars and shall be drilled with the requisite number of holes for the individual connection of all cable ECC and other earth conductors.

The earth bar, busbar joints and cable terminations must not be insulated.

Stainless steel bolts and lock washers shall be provided through the earth bar at each earthing position and at least 5 additional holes will be provided for future connections, each being fitted with nuts and bolts as above.

The earthing positions shall be evenly spaced along the length of the earth bar and the bar must be clearly identified as the earth.

Neutral Busbars

Neutral busbars in 3 phase, 4 wire supplies shall have a cross-section of the same area and size as of the phase busbars. Where single-phase circuits (e.g. lighting and general power circuits) are protected by single-phase circuit breakers or fuses, all neutral conductors shall be connected to a separate neutral busbar mounted in a suitable position. The cross-section of the busbar shall be at same as phase busbars and the busbar shall be long enough for the lug of each conductor to be bolted separately to the busbar. Only one neutral conductor is allowed per nut and bolt combination.

A separate neutral bar shall be provided for each earth leakage unit provided on the switchboard.

Busbar Droppers

All busbar droppers must be suitably supported (maximum spacing @ 500mm centres) and braced to suit the specified and/or projected short circuit conditions. They should be fully insulated and screened against accidental contact.

The droppers to the supply side of a single functional unit, as well as the components included in this unit, may be rated on the basis of the reduced short-circuit stresses occurring on the load side of the short-circuit protective device in this unit provided that these conductors are arranged such that under normal operating conditions an internal short-circuit between phases and/or between phases and earth is only a remote possibility, for example by being provided with adequate insulation or shrouding.

Particular attention shall be paid to the provision of adequate facilities for making off the main power supply cables. Attention must be paid to the vermin proofing of single core cabling.

Bunched cable connections will not be accepted between busbars and outgoing power circuit breakers, fuses or isolators.

Busbar Connections

All connections and extensions to busbars shall be effected by means of stainless steel nuts, bolts and washers or cadmium plated, high tensile steel bolts and nuts which shall also be provided for future extensions. The minimum diameter of any hole will be 10 mm.

In exceptional cases a relaxation of SANS 1973 may be permitted to allow the drilling of holes, in which case the cross-sectional area as measured is to be reduced by the area of the holes.

Equipment

Unless otherwise stated on the drawings the latest version of the following minimum specifications shall be assumed for equipment to be installed in the switchboards:

SANS 60947 relates specifically to equipment for use at voltages up to 1000V AC.

All contactors and/or starters shall be protected with suitable back-up current limiting circuit breakers to protect the equipment against abnormally high currents or short circuits developing in the system.

The manufacturer will be required to ensure the correct co-ordination between circuit breakers, contactors and overload relays to comply fully with SANS 60947 Part 4, in order to achieve 'Type 2' co-ordination.

Unless otherwise stated, contactors and/or starters shall be rated for 10 million operations for making and breaking no-load currents to category AC3 as laid down in SANS 60158. Note that SANS 60947 requires equipment and wiring to be suitable for 7.2 x full load current for Direct-On-Line starters.

Each switchboard shall be provided with a means to isolate the incoming supply. This may be achieved by the use of an isolator, circuit breaker (fixed or draw-out), rated to make against the full system fault at the point and break the full load current. The incoming supply section containing switchgear, protection equipment, controls and instrumentation shall form a clearly labelled, self-contained unit behind one or more hinged panels. The operating handle of the isolator, circuit-breaker or fuse switch controlling the incoming supply shall protrude through the panel and shall be interlocked to ensure that the panel can only be opened when the supply is off.

Equipment that cannot be flush mounted on the panel, shall be mounted on a suitable metal chassis and shall protrude through a close fitting cutout in the panel. All protection relays



contained in enclosed units with glass fronts shall be flush mounted on the hinged panels, contactors, thermal overload relays, etc. shall be mounted on a chassis behind the panel.

Access to the various starters shall be possible without isolation of the entire MCC, but the hinged front panels corresponding to each compartment shall be inter-locked with a local isolator in order that any compartment must be isolated before access to the equipment can be obtained. A mechanical device shall be incorporated in each isolation in the off position to provide a locking out facility during maintenance periods.

All over current reset buttons (22mm diameter) shall be mounted on the front panel enabling operators to reset the unit without having to open the panel.

Timers and relays controlling a starter shall be mounted in the compartment with the starter. All timers and relays must be clearly labelled with the identity given on the schematic diagrams.

Equipment to be supplied under this contract must be identical in all respects and it shall be possible to interchange such equipment should it become necessary.

All material and equipment must be suitable for 400/230V-supply voltage, 50 Hz supply frequency and must be approved by the Engineer. In addition all equipment shall be designed, manufactured and tested in accordance with the relevant IEC Standard Specification.

Derating of Equipment

Full cognisance must be taken of manufacturers derating tables for equipment located in enclosures and the rating of that equipment must be increased accordingly. In all such cases labels must be provided on the front of the associated cubicle stating the maximum permitted circuit loading.

Cable Terminations

Due to the continuing miniaturisation of equipment, difficulties can be experienced in terminating power cables onto equipment terminals, particularly where more than one cable has to be terminated. The manufacturer shall ensure that suitably designed and rigidly braced copper stubs are extended from such terminals to facilitate the termination of all cables. Flash barriers must be used between the phase terminals of circuit breaker equipment.

Instrumentation

All instruments shall be of a matching flush pattern. The single line diagram will indicate the ratio of CTs where required. The instruments shall be suitable for the environment in which

they are installed. All instruments shall withstand a test voltage of 2kV for 1 minute and the terminals of all instruments mounted on hinged panels shall be shrouded.

MCC shall be provided with digital meter to measure voltages, amperes, kWh, Hetz, etc. the meter shall be able to measure each motor power consumption.

Protective Devices And Protection Settings

The switchgear shall be provided with the specified protection and auxiliary relays, which must be of a modular pattern, readily accessible, replaceable and extensible.

The thermal overload releases and instantaneous magnetic short circuit trips are to be adjustable over the trip ranges as specified by Engineer.

The Contractor must allow to grade, set and test the protection devices for the main switch, bus section switches and each motor circuit.

The following minimum motor protection shall be provided unless otherwise specified elsewhere:

TYPE OF PROTECTION	APPLICATION
Short Circuit	All motor starters
Thermal Overload	Motors 7.5kW and Below
Electronic Overload	Motors greater than 7.5kW
Unbalanced/Single Phasing	All three phase motors
Earth Fault	All three phase motors
Phase Reversal	All three phase motors
Undervoltage	All motors
Overvoltage	All motors
Undercurrent	All motors

Bearing Temperature	All motors fitted with sensors

Push Buttons And Indicating Lights

These shall be 22mm diameter unless otherwise specified and shall be suitable for the environment conditions. Emergency Stop push-buttons shall be 40mm diameter “Twist to Release”

Unless otherwise specified, the following is the minimum requirement for illuminated push buttons and indicating lights: Illuminated Push buttons may be offered.

PUSH BUTTON / LABEL	INDICATION / LABEL	COLOUR
MOTOR START	MOTOR RUN	GREEN
MOTOR STOP	MOTOR STOPPED	RED
	MOTOR TRIPPED	AMBER
TRIP RESET		BLACK
LAMP TEST		WHITE
	MOTOR HEATER ON	WHITE
	OTHER	BLUE

Indicator lamps may only be of the Cluster LED types. Where LED's are specified as indicators on main supply voltages, a suitable current limiting capacitor and reverse voltage protection diode must be used. For low AC or D.C. voltages ($\pm 24V$) a current limiting resistor will suffice.

Site Tests

After completion of erection, cabling and field wiring, the Contractor shall set all overloads, protection devices etc. and shall again carry out a full functional test to prove the correct

operation of the entire MCC, including the simulation of all remote devices. A signed compliance certificate by the Contractor's accredited person for the MCC and its installation shall be handed over to Engineer on Completion.

The tests shall be witnessed by the Engineer.

Workmanship Guarantee

A 12 month guarantee shall cover the sheet metal enclosures and all the equipment installed therein against faulty workmanship and materials. The guarantee period shall begin from the date the MCCs are completely installed and accepted by Engineer.

DISTRIBUTION BOARDS

General

Distribution board shall comply with the requirements of the standard specifications of these documents or shown on the drawings. All distribution boards must be dustproof with an IP54 rating and 1,6mm 3RC12 and/or as per drawings specification. Floor standing distribution boards shall be have sheet of 2,0mm (minimum) 3CR12. They must have an epoxy finish.

Distribution boards are to be manufactured by an approved switchboard manufacture and to have a SABS approved manufacturer circuit breakers and/or isolators (as per drawing) and lightning/surge arrestor. All DB's to have surge arrestors as per drawings. A thirty percent (30%) space must be included on all DB's.

Drawings of all distribution by the manufacturer shall be submitted by the *Contractor* to the Engineer for approval before commencement of manufacture of distribution boards. After construction all DB must be inspected by the *Engineer* before installation.

Installation Of Distribution Boards

Distribution boards shall be installed in the positions as shown on the respective drawings. The *Contractor* shall ensure that the distribution boards with the necessary conduits, sleeves, and channels as required are placed in position and mounted when required, and he shall ensure that all equipment is installed in the correct positions. It must be emphasised that no chasing will be allowed in walls built with face-bricks on the side in which distribution boards and ancillary equipment are installed. In all such cases the *Contractor* shall place his equipment in its proper place for the building contractor to build.

The costs of any additional work caused by late, incorrect or defective positioning of equipment and/or material by the *Contractor*, shall be recovered from him.



The *Contractor* shall, while material and/or equipment forming part of the electrical installation are/is being built in, and have a competent representative present to ensure that no unnecessary stress is placed on the material that will influence subsequent installation of equipment. Care shall be taken that all equipment of the board fit properly in their respective position without distortion which can lead to a poor installation and appearance. All bolts, clamps and fasteners shall be examined and properly tightened.

The *Contractor* shall ensure that all circuit breakers and other equipment can be changed and replaced if and when required.

All support props and struts, packing pieces and material used by the board manufacturer to prevent damage during transit, shall be removed by the *Contractor*. The *Contractor* shall examine all boards and ensure that all equipment shown on the appropriate relevant drawings has been supplied and fitted.

Any conspicuous damage like scratches or chafe marks to paint work, shall be touched up with the same colour paint as supplied by the board supplier.

The mounting height of all distributions measured to the top of the edge of the board shall be 2 000 mm above finished floor level, unless otherwise specified or the position and circumstances dictate differently. The *Contractor* shall ensure that cables sleeves and provision for the entry of cables to distribution boards as shown on drawings are done properly and neatly.

Surge arrestors on Slipway main DB shall have own compartment as specified on the drawing.

Exposed cables above or below the surface distribution board must be covered with a metal cover of the same colour as the DB.

Earthing

Earthing shall be done in accordance with the requirements of the standard specifications and those of the Supply Authority.

Earth system neutral and all non-current carrying metal parts of electrical equipment, conduit, cable racks, etc.

Earth metal parts of distribution boards, switch boxes, conduit, wash-hand basins, working surfaces, cable armouring and electrical equipment.

A separate isolated earth-bar shall be fitted in each distribution board for the dedicated computer socket outlets. These earth-bars shall be earthed with an insulated earth conductor to a separate earth spike from the main earth. The computer earth spike shall be inter-linked outside the building to an earth conductor, to the main earth spike of the building.

Additional equipment.

Install three phase lightning arrestor in the Distribution board as per drawing.

Labels

All distribution boards shall be marked as follows:

- a) Name and number of distribution board and Fault level rating of distribution board, example "DB - A, 5kA";
- b) Origin of supply, and size of all cables, example "Supply from main DB - 25 mm² x 4c
- c) All circuit breakers shall have its current rating clearly indicated on the handle, or on the panel adjacent to the switchgear;
- d) All circuit breakers shall be properly labelled as to its service, as indicated on the drawings.

Colour coding and labelling of the Distribution board

The distribution board must be white in colour, with the following specification.

- **Non-essential DB** colour to be white with white colour face plate. The label will have black engraved letters on white ivorene label. Ivorene label super-glue or pop riveted to face plate or frame. Distribution board number as per drawing, e.g. DB-A. Content of internal label on face plate – DB number indication of a feeder source, size of a feeder cable, fault level rating of a distribution board and phase rotation direction. The label of a DB will be 6 mm label on face plate to be 3 mm. labelling of cables – all incoming and outgoing cables shall be labelled with ivorene labels indicating the size of the cable.
- **Essential DB colour to be white with red colour face plate for sub-distribution boards.**

Essential DB colour to be electric orange with red colour face plate for main-distribution board.

The label will have black engraved letters on red ivorene label. Ivorene label super-glue or pop riveted to face plate or frame. Distribution board number as per drawing, e.g. DB-E/G. Content of internal label on face plate – DB number indication of a feeder source, size of a feeder cable, fault level rating of a distribution board and phase rotation direction. The label of a DB will be 6 mm label on face plate to be 3 mm. labelling of cables – all incoming and outgoing cables shall be labelled with ivorene labels indicating the size of the cable.

- **Uninterrupted Power Supply - DB** colour to be white with blue colour face plate. The label will have black engraved letters on white ivorene label. Ivorene label super-glue or pop riveted to face plate or frame. Distribution board number as per drawing, e.g. DB-AU. Content of internal label on face plate – DB number indication of a feeder source, size of a feeder cable, fault level rating of a distribution board and phase rotation direction. The label of a DB will be 6 mm label on face plate to be 3 mm. labelling of cables – all incoming and outgoing cables shall be labelled with ivorene labels indicating the size of the cable. Uninterrupted Power Supply - DB colour to be white with blue colour face plate.

Balancing Of Load and Phases

In multiphase distribution boards, all single phase circuits shall be equally distributed over all three phases so as to balance the electrical load as far as possible.

Each type of sub-circuit shall separately be balanced over all three phases as far as possible.

Provision for Future Equipment

Where space is required for future switchgear, the panel shall be correctly punched for such future switchgear.

Approved blank-covers must be provided.

EARTHING

Earthing shall be done in accordance with the requirements of these documents and those of the Supply Authority.

Earth system neutral and all non-current carrying metal parts of electrical equipment, conduit, cable racks, etc.

Earth metal parts of distribution boards, switch covers, conduit, wash-hand basins, working surfaces, cable armouring and electrical equipment.

The current carrying capacity of earth conductors shall in general be not less than 50 % of that of the largest conductor which is protected, except that earth conductors smaller than 2,5 mm squared may not be used.

All luminaires shall be earthed to an earth conductor.

A specialist and approved lightning & earthing protection contractor will be appointed by the Contractor. A provisional amount for this work has been allowed for in the tender summary. The lightning protection system shall comply with the latest relevant requirements of the specification:

SANS 10313: Protection of structures against lightning.

Kiosks

Kiosk shall comply with the requirements of the standard specifications of these documents or shown on the drawings. 2,0mm 3RC12 All kiosks must be dustproof with an IP65 rating and floor standing shall be have sheet of 2,0mm (minimum) 3CR12 and/or as per drawings specification. They must have an epoxy finish..



Kiosk are to be manufactured by an approved switchboard manufacture and to have a SABS approved manufacturer circuit breakers and/or isolators (as per drawing) and lightning/surge arrestor. All DB's to have surge arrestors as per drawings. A thirty percent (30%) space must be included on all DB's.

Shop drawings of all kiosks by the manufacturer shall be submitted by the *Contractor* to the Engineer for approval before commencement of manufacture of kiosks. After construction all kiosk must be inspected by the *Engineer* before installation.

Installation Of kiosks

Kiosk shall be installed in the positions as shown on the respective drawings. The *Contractor* shall ensure that the Kiosk with the necessary sleeves, and channels as required are placed in position and he/she shall ensure that all equipment is installed in the correct positions. In all such cases the *Contractor* shall place his equipment in its proper place for the civil *Contractor* to build. *Contractor* must include materials and concrete for each kiosk raised 100mm above ground.

The costs of any additional work caused by late, incorrect or defective positioning of equipment and/or material by the *Contractor*, shall be recovered from him.

The *Contractor* shall, while material and/or equipment forming part of the electrical installation are/is being built in, and have a competent representative present to ensure that no unnecessary stress is placed on the material that will influence subsequent installation of equipment. Care shall be taken that all equipment of the board fit properly in their respective position without distortion which can lead to a poor installation and appearance. All bolts, clamps and fasteners shall be examined and properly tightened.

The *Contractor* shall ensure that all circuit breakers and other equipment can be changed and replaced if and when required.

All support props and struts, packing pieces and material used by the board manufacturer to prevent damage during transit, shall be removed by the *Contractor*. The *Contractor* shall examine all kiosks and ensure that all equipment shown on the appropriate relevant drawings has been supplied and fitted.

Any conspicuous damage like scratches or chafe marks to paint work, shall be touched up with the same colour paint as supplied by the board supplier.

The *Contractor* shall ensure that cables sleeves and provision for the entry of cables to kiosk as shown on drawings are done properly and neatly.

Surge arrestors shall be provided as specified on the drawing.

Earthing – as per Distribution board above.

Additional equipment – as per Distribution board above.

Labels – refer narrative of the distribution board above, refer to the drawings for reference.

Balance of load – as per distribution board narrative above

The Kiosk must be white in colour, with the following specification.

- **Non-essential Kiosk** colour to be white with white colour face plate. The label will have black engraved letters on white ivorene label. Ivorene label super-glue or pop riveted to face plate or frame. Kiosk number as per drawing, e.g. Kiosk-A. Content of internal label on face plate – Kiosk number indication of a feeder source, size of a feeder cable, fault level rating of a distribution board and phase rotation direction. The label of a Kiosk will be 6 mm label on face plate to be 3 mm. labelling of cables – all incoming and outgoing cables shall be labelled with ivorene labels indicating the size of the cable.

- **Essential kiosk colour to be electric orange with red colour face.**

The label will have black engraved letters on red ivorene label. Ivorene label super-glue or pop riveted to face plate or frame. Distribution board number as per drawing, e.g. Kiosk-E/G. Content of internal label on face plate – Kiosk number indication of a feeder source, size of a feeder cable, fault level rating of a Kiosk and phase rotation direction. The label of a Kiosk will be 6 mm label on face plate to be 3 mm. labelling of cables – all incoming and outgoing cables shall be labelled with ivorene labels indicating the size of the cable.

Where space is required for future switchgear, the panel shall be correctly punched for such future switchgear.

Approved blank-covers must be provided.

Provision of Control Devices on Kioks

The switchboard manufacturer shall install the following control devices as indicated on the drawings

- Switched socket outlets – 16A, 250VAC 3 round pin, 2-pin/Euro pin surface mounted inside the kiosk.
- An industrial socket outlet 5-pin, 63A, 400VAC, rate IP66, electric orange mounted outside the kiosk
- An industrial socket outlet 3-pin, 63A, 230VAC, rate IP66, electric orange mounted outside the kiosk
- A photo-electric cell mounted, as per specification of this document, on top of the kiosk as indicated on the drawing
- A industrial light switch for floodlights installed inside the kiosk where applicable or as indicated on the drawing

Where space is required for future switchgear, the panel shall be correctly punched for such future switchgear.

Approved blank-covers must be provided.

NB: *Contractor* to ensure that the control devices comply with the colour coding source. If the supply comes from backup generator, the control devices must reflect correct colour coding as indicated below

CONDUIT AND FITTINGS

Flush In Walls, Floors and Concealed In Roof Spaces

Conduit fittings and their installation shall comply with these documents. All conduits shall be concealed by laying in concrete, chasing in walls or running in ceiling/roof spaces. All chase work and making good thereof shall form part of this contract.

Contractor is to install PVC conduits in all electrical installation. Conduits jointing to be done with couplings or approved jointing accessories for conduit jointing and contractor is to use glue to make sure that the jointing or connection of conduits is permanently fixed.

All conduit shall be painted and match the wall after installation where applicable.

Power skirting and Trunking (P9000)

The Contractor shall be responsible for supply and installation of all power skirting and trunking complete with corner pieces, splices, end pieces, junction pieces, supply conduits, cover plates and power outlets as specified and indicated on the drawing.

The power skirting/trunking must comply with SANS 1197. The Contractor must ensure that the power skirting is installed to the satisfaction of the Engineer before commencing with the wiring of the power skirting.

Two compartments with two cover power skirting shall be supplied and installed as indicated in the drawings. The compartments shall be switched socket outlet (normal and dedicated), and data.

Power skirting and trunking P9000 shall be hot dip galvanised and painted black in colour.

COVERPLATES

Switched socket outlets and switches are mounted in hot dip galvanised wall outlet boxes and for blank cover plates they shall be white.

All cover plates shall be PVC and white in colour with 3mm engraved lettering indicating distribution board and circuit number.

Colour coding is to be done as per SANS standard, namely:-

- Normal /Non-essential Supply: white,
- Emergency/Essential Supply: signal red
- UPS supply: blue



CABLE SLEEVES

All cable sleeves inside the building and on the site across roads and under hardened surfaces shall be supplied and installed by the Contractor and shall form part of his contract.

Cable sleeves shall be made from PVC and shall be at least Class 34, unless otherwise specified and shall be installed at all entrances to building, road and street crossings and such other entrances to building, road and street crossings and such other places as may be specified elsewhere in these documents or shown on the drawings. Sleeves used at entrances to building shall be sealed at both ends after the cable has been installed. During installation and until final sealing is done, the sleeves shall be kept clean of debris and blockage by temporary plugs. Final sealing shall be done with a weak cement mixture. Sleeves for future use shall be likewise sealed.

The sizes and number of cable sleeves are indicated on the drawings.

Where the diameter of cable sleeves are such that it cannot be hidden behind a plastered slot in the wall, an acceptable and suitable cover shall be provided and screwed over the cable slot.

The Contractor shall ensure that the correct sizes, number and length of sleeves are supplied and installed so that the cables can be pulled-through and installed.

CABLE MARKERS

Cable markers shall be buried on the ground and appear with +/-50mm, along the cable route to indicate the route of the cable as indicated on the drawing. The cable marker shall be 160mm x 76mm top, 170mm x 127mm base. Height: 450mm, Weight: 18,5kg. Reinforcing rod protruding 150mm base. Lettering indented on top "CABLE" AND "TRANSNET" as indicated below.



ARRANGEMENT OF CIRCUITS

The arrangements of the various circuits are indicated on the drawings, together with the required protection (switchgear), control and the type and number of wiring (conductor or cable) of each circuit.

All protection shall be done with moulded case circuit breakers (MCCB's) from a SABS approved manufacturer.

No mixing of different types, ratings and manufacture of switchgear shall be allowed.

The Contractor shall check and make sure that the conductors as given for the various circuits, comply with the requirements of the standard specifications of these documents, as well as those of the SANS Code of Practice, SANS 10142-1 as amended.

The Contractor shall ensure that all circuits are connected such that the load is equally balanced over all three phases.

Isolators, Circuit Breakers, Earth Leakage Relays and Surge Arrestor

Isolating switches, circuit breakers and earth leakage units shall comply with the relevant requirements and shall be of the SABS approved manufacture (commercial/industrial circuit breakers and switch disconnectors), or as may be specified elsewhere in these documents or shown on the drawings. The circuit breakers must be hydraulic magnet type.

SWITCHED SOCKET OUTLETS

Switched socket outlets (s.s.o) shall be 250V 16A 3 round pin, 2-pin / Euro pin and dedicated switched socket outlet shall be 250V 16A 2 round pin/Euro pin and chamfered and shall be of approved manufacture and shall bear a SABS mark. The position of the sockets out will be 300 mm above floor finishing level (AFFL) or/and as per drawing. Sockets outlets with waterproof housing must be provided and must be installed as shown on the drawings be the same height of 300mm AFFL, or as specified on the drawing.

Labelling on the cover plate is to be engraved or with pop riveted to cover plate with black letters. Content on label shall be the distribution board number and circuit number feeding socket outlet, e.g. DBA/PD1/1. Each socket outlet on a circuit shall be labelled.

All s.s.o shall be wired with 4,0mm² conductors that is red, white or blue for live circuits, black conductors for neutral and green for earth.

Dedicated switched socket outlet shall not be linked with earth leakage.

Cover plates for normal s.s.o shall be white with red toggle.

Cover plate for dedicated s.s.o shall be white with red toggle and chamfered earth.



DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

POWER SOURCE	NORMAL	ESSENTIAL (Gen set)	UPS	DEDICATED This socket outlet shall be used for computer equipment only and shall not be on earth leakage units.
Cover Plate Colour	White	White	White	Red
Switch / toggle Colour	White	Red	Blue	Red
Label Type	Black letters on white Ivorene label or Black engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.	White letters on red Ivorene label or Red engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.	White letters on blue Ivorene label or Blue engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.	Black letters on white Ivorene label or Black engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.
Contents On Label	Distribution Board Number and Circuit number feeding the socket outlet as per example DBA/ P1/1 Each socket outlet on a circuit shall be labelled.	Distribution Board Number and Circuit number feeding the socket outlet as per example DB/E-A/ P1/1 Each socket outlet on a circuit shall be labelled.	Distribution Board Number and Circuit number feeding the socket outlet as per example DB/U – A / P1/1 Each socket outlet on a circuit shall be labelled.	Distribution Board Number and Circuit number feeding the socket outlet as per example DB-A/ PD1/1 Each socket outlet on a circuit shall be labelled.
Letter Size	3 mm	3 mm	3 mm	3 mm
Earth Pin	Round	Round	Round	Chamfered
Female Socket	White	White	White	Red

LIGHT SWITCHES



Switches shall comply with the requirements of these documents, shall have a rating of not less than 16A 240V and shall be suitable to break the load which is typical of LED luminaries. Light switches shall be of approved manufacture and shall bear a SABS mark. The position of the light switch must be 1 400 mm above floor finishing level (AFFL) or/and as per drawing. Light switches with waterproof (IP65) housing must be provided and must be installed as shown on the drawings.

Light switch cover plates are to be provided with an engraved label or pop riveted to cover plate with black letters. Content on label shall be the distribution board number and circuit number feeding light switch, e.g. DBA/L1/1. Each light switch on a circuit shall be labelled. All switch covers must be PVC steel.

All lighting circuit shall be wired with 2,5mm² conductors that is red, white or blue for live circuits, black conductors for neutral and green for earth.

Where applicable, lighting circuit shall be wired or connected with 2,5mm²-2core PVC/SWA/PVC Ecc copper cable. This shall be shown on the drawing.

POWER SOURCE	NORMAL	ESSENTIAL (Gen set)	UPS
Cover Plate Colour	White	White	White
Switch / toggle Colour	White	Red	Blue
Label Type	Black letters on white Ivorene label or Black engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.	White letters on red Ivorene label or Red engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.	White letters on blue Ivorene label or Blue engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.
Contents On Label	Distribution Board Number and Circuit number feeding the socket outlet as per example DBA/ P1/1 Each socket outlet on a circuit shall be labelled.	Distribution Board Number and Circuit number feeding the switch as per example DB/E-A / L1 Each socket outlet on a circuit shall be labelled.	Distribution Board Number and Circuit number feeding the switch as per example DB/U – A / L1 Each socket outlet on a circuit shall be labelled.
Letter Size	3 mm	3 mm	3 mm



INDUSTRIAL ISOLATORS

All welding/industrial isolators shall be 5-pin, 400V, 3-phase, neutral, earth and shall be weatherproof to IP65 / IP66 standards. Colour to be Electric orange.

Industrial isolators to be mounted on the kiosk as indicated on the drawings shall be 5-pin female, 400VAC, rate IP66 and a 3-pin female, 230VAC, rate IP66.

Isolators shall be connected with 16mm²-4core and 16mm²-2core - PVC/SWA/PVC ECC copper Cable and or as indicated on the drawing.

All final connections shall comply with the requirements of SANS 10142-1.

Isolators shall IP65 / IP66 weatherproof surface mounted isolators wall-mounted at ± 1 300 m AFFL or as indicated on the drawing.

POWER SOURCE	NORMAL	ESSENTIAL (Gen set)	UPS
Cover Plate Colour	White	White	White
Switch / toggle Colour	White	Red	Blue
Label Type	Black letters on white Ivorene label or Black engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.	White letters on red Ivorene label or Red engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.	White letters on blue Ivorene label or Blue engraved letters on cover plate. Ivorene label glued with super glue or pop riveted to cover plate.
Contents On Label	Distribution Board Number and Circuit number feeding the socket outlet as per example DBA/ P1/1 Each socket outlet on a circuit shall be labelled.	Distribution Board Number and Circuit number feeding the switch as per example DB/E-G/ S1 Each socket outlet on a circuit shall be labelled.	Distribution Board Number and Circuit number feeding the switch as per example DB/U – G / S1 Each socket outlet on a circuit shall be labelled.
Letter Size	3 mm	3 mm	3 mm
Comments	n/a	Where red switches are not obtainable the illuminated type red switch may be used or a white	Where blue switches are not obtainable the illuminated type blue switch may be used or a



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POWER SOURCE	NORMAL	ESSENTIAL (Gen set)	UPS
		switch may be used but the switch shall be tagged with a non-removable red sticker.	white switch may be used but the switch shall be tagged with a non-removable blue sticker.

DESIGN DRAWINGS

The design drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power points, switches and light points that may be influenced by built-in furniture must be established on site, prior to these items being built in.

LOW VOLTAGE CABLE

The sizes and routes of low voltage cables are indicated on the drawings and in these documents.

Low voltage cables shall be PVC/SWA/PVC ECC type with copper conductors which shall comply with the requirements of SANS 1507 in those of the standard specifications, in all respects.

Cables shall bear the SABS mark. The supply, installation, termination and jointing of cables shall comply with SANS 10198 and with the requirements of these documents. No jointing will be allowed in cables unless authorised by the Engineer.

Earth Conductors

Earthing shall comply with the requirements of the Supply Authority and SANS 10142-1 as amended.

Cable Glands

All cable glands shall be of the SABS approved IP 65 rated and shall conform to SANS.

Marking

The Contractor shall mark & label of all substation equipment. Supply and install laminated single line schematic diagram of the MV/LV reticulation and state the feeder. Labelling with ID

codes of all MV, LV & control cable ends at substation. Supply and install new OHS Act signage & fire & resuscitation notices on MV and metering/LV rooms of substation.

Cables shall be labelled at all terminations with suitable and approved labels (stainless steel Dymo-tape or Irvone white ivorene label written in black) indicating:

- i) Origin and Destination; (e.g. from Meter room to DB - C)
- ii) Cable size and no. of cores; (e.g. 16 mm² 4-core)
- iii) Conductor type. (e.g. PVC/SWA/PVC Copper ECC cable)

Cable Routes

The final cable routes shall be determined on site before installation commences. Concrete cable markers shall be installed along the cable routes.

Cable Trays and Racks

All cable wireways, channels, trucking, ladders and trays shall be SABS manufacture and shall be hot dip galvanised steel finish.

All cable wireways, trunking, channels, trays, etc. shall be neatly and properly fixed, suspended, clamped or supported with hot dip galvanised steel finish mechanical support accessories specially engineered and manufactured as per detail specifications of the manufacturer.

All cable trays/racks/ladders exposed to view shall be provided with galvanised steel finish galvanised steel in-fill plates to prevent cables being visible from the bottom.

The Contractor shall note the minimum mounting height requirements of all ducting and wire ways.

Allowance must be made for the installation of a new heavy hot dip galvanised cable ladder that will support the cables as specified. This shall include all fixing materials, risers, bends and splice kits.

Description

Duty	:	Heavy
Material	:	hot dip galvanised
Span	:	6m with loading of 144 kg/m
Side rail	:	100mm high

Cross rung	:	150mm, 300mm,
Cable ladder width	:	As required + 20% spare capacity

LUMINAIRES

General

Luminaires which comply with the requirements of the standard and detail specifications of these documents shall be supplied and installed in accordance with these documents and/or drawings. The tender rates shall be for the type specified and if alternatives are offered it shall be under a covering letter submitted with the tender documents. The onus will be on the Contractor to prove that the alternatives are in all respects equal or better to the types specified by means of a supplying SABS approved photometric data.

Luminaire positions indicated on drawings are diagrammatic, and all positions, spacing, etc. must be determined in accordance with drawing.

Fixing Of Luminaires

Luminaires shall be installed in the position(s) indicated on the drawings. Final positions shall be determined by the engineer when in doubt.

Supply and Installation of Luminaires

The contractor shall allow for ordering, receiving, packing out, storing, mounting/fixing and final connections, of all the luminaires indicated on the drawings, in his tender sum.

No luminaires shall be ordered prior to the Engineer's official written approval.

Damage to Luminaires

All luminaires damaged by the contractor or his staff before first delivery shall be replaced with new luminaires at his own cost.

SANS Specification

Luminaires shall comply with the relevant SANS specification where such specification exists and shall carry the SANS mark of approval.

Where a SANS specification does not exist for complete luminaires, the accessories and control gear shall be SANS approved and carry the SANS mark of approval.

Photo-Electric Daylight Sensitive Switch

Exterior lighting shall be controlled by a photo-electric cell mounted against the exterior of the building with the unit positioned so that the extraneous light shall not affect its operation.

The unit shall comprise a photocell, thermal actuator and change-over switch, rated at not less than ten ampere (20A). The cover of the unit shall be manufactured from a tough, destruction resistant material for protection against tampering. The cover shall have good weather proofing properties, be ultra violet resistant and shall not deteriorate when exposed to sunlight for prolonged periods. Switch contacts shall be silver plated and shall be capable of breaking the load associated with fluorescent lamp luminaires. Contact rating shall be not less than 10 A.

The operational level shall be factory preset for "ON" at a light level of approximately 54 LUX and "OFF" at approximately 108 LUX. Voltage variations shall not materially affect the operational levels.

A time delay of not less than 30 seconds shall be provided to prevent the unit from functioning due to lightning or other short period changes in illumination.

The unit shall be effectively safeguarded against surges by means of a suitable surge protector which shall preferably form an integral part of the unit.

Bypass switches shall be provided for exterior lights controlled via photocells so that testing and maintenance can be done at any time.

External lighting shall be controlled via a photo-cell mounted on a wall.

Schedule and Specification of Luminaires

TYPE	DESCRIPTION	TYPE
A1	Surface mounted 65W LED light fitting Surface mounted 65W / +/-5850lumen (4000K) LED light fitting 1200mm x 600mm. The luminaire must produce approximately 5850lumen, wattage may differ from supplier to supplier. The luminaire shall consist of a polycarbonate body and an opal diffuser. Must be 600mm x 600mm on size. A surface mounted, hot dip galvanised steel and powder coated enclosure. The luminaire shall bear the SANS 60598-2-1 safety mark and shall have an ingress protection of IP20 in compliance with SANS 60598-2-1, certified by an SABS test report. Use of high efficiency LED's >120 lumens per watt and CRI >80. The standard LED's colour temperature provided shall be neutral white (4000K). The surface mounted LED fitting shall operate LED light sources of 65W/ +/-5850lumen in ambient temperatures without reducing the LED lifetime of 50 000hrs, at a lumen depreciation of not more than 30% (L70). The fitting shall be tested and comply with the requirements of SANS IEC 60598:1.	
A2	Same as type A1 above, but shall have a back-up battery to operate for 1 hour. A self-contained emergency/standby integrated back-up power. The driver shall operate at a power factor of >0,94 and the total harmonic distortion levels are < 20% and do not cause interference on the electrical network.	



DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

TYPE	DESCRIPTION	TYPE
A3	Surface mounted IP65 43W or +/-6700lumen LED. Correlated colour temperature (CCT): Neutral white light (4000K) – 43W/ +/-6700 lumen. Operating hours 60 000 minimum. The luminaire must consists of a high-impact polycarbonate with a robust clear polycarbonate diffuser and is designed to operate LEDs of 43W. The luminaire must bear the standard code SANS 60598-2-1 safety mark. The body and diffuser must be designed in such a way to prevent collection of dust and moisture on the accessible surface of the body, thus also preventing any grip of the luminaire. The luminaire must be designed to allow entry of surface conduits via 20mm conduit or and 2,5mm 3 core cable threaded entries at both ends, as well as a 25mm hole in the centre of the back of the body. A silicone sponge gasket ensures reliable IP 65 rating. The one-piece, injection-moulded polycarbonate diffuser must be vandal resistant. It must be secured to the body by six stainless steel Allen head screws. The removable gear tray must be manufactured from stainless steel, powder coated white to optimise luminaire efficiency. All control gear components are mounted on the gear tray. The gear tray can be removed by loosening four Allen head screws in keyhole slots, which allow the gear tray to be relieved into a suspended position, ensuring ease of maintenance. All control gear components are removable and bear the relevant SABS mark. All screws, bolts and metal parts must be stainless steel or non-corrosive material. Mains connections are by means of a suitable screw terminal block with a wire clamping contact. The luminaire must have an electronic temperature monitoring prevents overheating of LEDs and power supply. Power factor $\geq 0,95$. Uniform luminance with low glare due to prismatic diffuser design. Long service life: over 60 000 hours (L70B10). No ingress of dust and moisture into the LED and controller compartment - IP 65 The fitting shall be tested and comply with the requirements of SANS IEC 60598:1	



DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

TYPE	DESCRIPTION	TYPE
A4	Same as type A5 above, but shall have a back-up battery to operate for 1 hour.	
A5	Surface mounted IP65 luminaire 30W or +/-4440lm LED. Correlated colour temperature (CCT): Neutral white light (4000K) – 40W/ +/-4440lm. Operating hours 60 000 minimum. The luminaire must consists of a high-impact polycarbonate with a robust clear polycarbonate diffuser and is designed to operate LEDs of 30W. The luminaire must bear the standard code SANS 60598-2-1 safety mark. The body and diffuser must be designed in such a way to prevent collection of dust and moisture on the accessible surface of the body, thus also preventing any grip of the luminaire. The luminaire must be designed to allow entry of surface conduits via 20mm conduit or and 2,5mm 3 core cable threaded entries at both ends, as well as a 25mm hole in the centre of the back of the body. A silicone sponge gasket ensures reliable IP 65 rating. The one-piece, injection-moulded polycarbonate diffuser must be vandal resistant. It must be secured to the body by six stainless steel Allen head screws. The removable gear tray must be manufactured from stainless steel, powder coated white to optimise luminaire efficiency. All control gear components are mounted on the gear tray. The gear tray can be removed by loosening four Allen head screws in keyhole slots, which allow the gear tray to be relieved into a suspended position, ensuring ease of maintenance. All control gear components are removable and bear the relevant SABS mark. All screws, bolts and metal parts must be stainless steel or non-corrosive material. Mains connections are by means of a suitable screw terminal block with a wire clamping contact. The luminaire must have an electronic temperature monitoring prevents overheating of LEDs and power supply. Power factor $\geq 0,95$. Uniform luminance with low glare due to prismatic diffuser design. Long service life: over 60 000 hours (L70B10). No ingress of dust and moisture into the LED and controller	

TYPE	DESCRIPTION	TYPE
	compartment - IP 65. The fitting shall be tested and comply with the requirements of SANS IEC 60598:1	
A6	Same as type A5 above, but shall have a back-up battery to operate for 1 hour	
A7	Decorative suspended downlighter LED Disc luminaire 65W / +/- 8600 lumen (4000k) complete with fold rope suspension The luminaire consists of a housing - Heatsink: Marine grade high-pressure die-cast aluminium (EN 1706 AC-44300), enclosed by an acrylic diffuser. The luminaire is suspended by means of a 3-fold wire rope suspension. It is designed to operate an LED engine of up to 144W. The luminaire bears the SANS 60598 safety mark. The electronic power supply is suitable for operation with a 189-265V 50Hz single phase system. The power factor is rated at >0,95. The efficiency must be rated >89%. Must be a flicker-free lighting, Low glare lighting. Must be designed to operate ED light sources 75W in an ambient temperature environment of up to 35°C, without reducing the useful lifetime of up to 98 000 hours, at a lumen depreciation of not more than 20% (L70B10), lifetime of driver	



DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

TYPE	DESCRIPTION	TYPE
	100 000 hours. Flicker-free lighting, low glare lighting, no upward lighting. Luminaire must have 5 year warranty. Electronic temperature monitoring shall prevents overheating of LEDs and power supply (ThermiX®)	
A9	LED low-Bay 144W/ +/- 20 000 lumen (4000K) LED lowbay 144W / +/- 20 000 lumen (4000K) complete with aluminium body, IP66. Housing shall be marine grade high-pressure die-cast aluminium and protection glass IK 08 Designed to operate LED light sources of 144W / in an ambient temperature (Ta) environment of up to 40°C. The luminaire must have a lifetime of 100 000 hours, at a lumen depreciation of not more than 10% (L70B10) at an ambient temperature (Tq) of 25°C. Luminaire shall have an easily accessible power supply/driver. Compartment. Glare-reduced light distribution, Flicker-free lighting. 5 year warranty. The luminaire bears the SANS 60598 mark. Shall be wall mounted. SANS approved control gear bearing the SANS 60598-2-1 safety mark.	
A10	Same as A9 type above, but shall have a back-up battery to operate for 1 hour.	
B1	Bulkhead LED 20W / +/-2300lumen (4000K) with electronic gear, rated IP65. The luminaire must produce approximately 2300lumen, wattage may differ from supplier to supplier. Surface mounted bulkhead luminaires complete with high-pressure die cast aluminium base, with trim ring casting mounted onto the base casting by stainless steel M5 Allen head screw, located outside lamp. With silicon sponge gasket. IP65 protection. Effective high-power LEDs, 4000K at a colour rendering index>80. Minimum 50 000 hours useful lifetime.	



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TYPE	DESCRIPTION	TYPE
	SANS approved control gear bearing the SANS 60598-2-1 safety mark. With black base, opal diffuser.	
B2	Same as B1 type above, but shall have a back-up battery to operate for 1 hour.	
C1	LED Floodlight 80W/ +/-9 500 lumen (4000K), rated IP66 Designed to operate LED light sources of 80W without reducing the useful lifetime of up to 100 000 hours, at a lumen depreciation of not more than 10% (L90B10). Housing shall be marine grade high-pressure die-cast aluminium and protection glass IK 07. Unpainted aluminium finish Designed to operate LED light sources of 144W / in an ambient temperature (Ta) environment of up to 40°C. The luminaire must have a lifetime of 100 000 hours, at a lumen depreciation of not more than 10% (L70B10) at a temperature (Tq) of 45°C. Luminaire shall have an easily accessible power supply/driver. Surge protection 10kV/10kA, Power factor >95% at full load. Compartment. Glare-reduced light distribution, Flicker-free lighting. 5 year warranty.	
D	10W/ / +/-1200 lumens 4000K LED down lighter 10W / +/-1200 lumens LED down lighter recessed on ceiling. The luminaire consists of an LED engine and power supply. Shall have a design to operate LED light sources of 10W/ +/-1200lumen in an ambient temperature environment of up to 35°C, without reducing the LED lifetime of 50 000hrs, at a lumen depreciation of not more than 30%. The power supply shall be located outside of the luminaire housing. The luminaire shall be secured into the ceiling by	



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TYPE	DESCRIPTION	TYPE
	means of two springs located on either side of the luminaire. Housing – white – frosty Glass. Neutral White (4000K), IP20.	
Exit	LED Exit signage Synthetic housing shall be manufactured to EN 60598-1 and EN 60695-2-10 (850°C). Array of 40 high-brightness LEDs, shall provide excellent uniformity. Multiple circuits shall result in no single point of failure. The NiMH battery shall have no memory effect, and shall contain no Cadmium and shall have double the capacity of NiCad batteries. The LISU range shall be built to EN 60598-2-22 standards and shall comply with EN 1838 standards: EN 60598-1, EN 60695-2-10. Double-sided ceiling mounted (Ceiling or trunking mounted plate with plug-in terminal block.) Emergency duration shall be 3 hours. Emergency Lumen Output: Single: 60 lm	
F	LED Floodlight 412W / +/- 54 000 lumen (4000K), rated, IP66 The luminaire shall have of an LED engine, power supply and spigot compartment. Must have easy installation of the LED engine by means of a hinging action onto a spigot base casting and with incorporated levelling device. It must be secured by stainless steel latches and an access screw. The bottom-entry mounting stirrup is manufactured from 6mm x 60mm hot-dipped galvanised steel. The LED engine, consisting of the LED light source and the power supply, shall be easily replaced or upgraded for future additions. Both compartments shall be rated IP 66. The power supply shall be automatically disengaged when opening the luminaire. The luminaire housing must be manufactured of Marine grade, high-pressure die-cast aluminium housing. Protector – high impact clear glass UV resistant polycarbonate. Glass IK10. Unpainted aluminium finish. The floodlight must be compliant with UHD/HD/4K broadcast and super slow motion replays (flicker-free). Surge protection 10kV/10kA. The floodlight must have a lifetime of 100 000 hours (L70B10). These shall be installed on a hot dipped galvanised steel high mast pole. Floodlight must have a 5 year warranty minimum.	

TYPE	DESCRIPTION	TYPE
	Contractor to make allowance for high mast mounting and floodlight aiming	
G	LED streetlight 78W / +/- 11 000 lumen (4000K), IP66. The luminaire shall have of an LED engine, power supply and spigot compartment. Housing - Marine grade high-pressure die-cast aluminium. Must have easy installation of the LED engine by means of a hinging action onto a spigot base casting and with incorporated levelling device. It must be secured by stainless steel latches and an access screw. The luminaire must have pole mounted version. The LED engine, consisting of the LED light source and the power supply, shall be easily replaced or upgraded for future additions. Both compartments shall be rated IP 66. Electronic temperature monitoring prevents overheating of LEDs and power supply, positioned directly next to LEDs (ThermiX®). The power supply shall be automatically disengaged when opening the luminaire. The luminaire housing must be manufactured of marine grade aluminium. Surge protection 10kV/10kA. Unsurpassed light uniformity. The streetlight must have a lifetime of 100 000hrs, at a lumen depreciation of not more than 5% (L95B10). Streetlight luminaire must have a 5 year warranty minimum. Contractor to make allowance for pole mounting.	
R1	Recessed mounted 65W / +/- 5850 lumen (4000K) LED light fitting Recessed mounted 65W / +/-5850lumen (4000K) LED light fitting 1200mm x 600mm. The luminaire must produce approximately 5850lumen, wattage may differ from supplier to supplier. The luminaire shall consist of a polycarbonate body and an opal diffuser. Must be 1200mm x 600mm on size. A recessed mounted, hot dip galvanised steel and powder coated enclosure. The luminaire shall bear the SANS 60598-2-1 safety mark and shall have an ingress protection of IP20 in compliance with SANS 60598-2-1, certified by an SABS test report. Use of high efficiency LED's >120 lumens per watt and	



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TYPE	DESCRIPTION	TYPE
	CRI >80. The standard LED's colour temperature provided shall be neutral white (4000K). The recessed mounted LED fitting shall operate LED light sources of 65W/ +/-5850lumem in ambient temperatures without reducing the LED lifetime of 50 000hrs, at a lumen depreciation of not more than 30% (L70). The fitting shall be tested and comply with the requirements of SANS IEC 60598:1.	
R2	Same as type R1 above, but shall have a back-up battery to operate for 1 hour. A self-contained emergency/standby integrated back-up power. The driver shall operate at a power factor of >0,94 and the total harmonic distortion levels are < 20% and do not cause interference on the electrical network.	
OC	Occupancy sensor High performance relay for connecting all types of lights, e.g. including LED luminaires etc. Flexible and wide mounting methods: Flush mount with spring clip. High sensitivity to be provided with "no dead spot" zones in its 360 high intensity of detection. Must have a built-in red LED is used as an indicator for easy test operation and different operation modes clear identification. Manually switch on the loads by wire connected to an external N.C. type push button switch when the ambient light level exceeds the pre-set Lux value. Time delays: Smart Set (automatic), 30 minutes), walk-through, test-mode. To cover area of 25m² minimum. To operate on a 230V. Built-in light level sensor.	

NB: All luminaires must have a 1,5mm² cabtyre cable / conductor which is 1,5m long and must have 3-pin socket. The contractor shall install an unplugged socket for each internal luminaire on the trunking. All light luminaires / fittings must bear SANS approval.

LIGHTING POLES

The nine meter pole shall be manufactured from hot dip galvanised steel including the base plate. The filament winding shall be continuously applied with uniform tension onto a rotation mandrel, resulting in a minimum mass glass to resin ratio of 70:30, for optimum rigidity. The

pole shall be seamless and circular in shape with a continuous taper of 16-18 mm diameter change per metre. A 80mm diameter hole shall be provided at 400 mm below ground level for the cable entry.

The pole surface shall be finished in a gel coat that complies with the requirements of SANS 141 and be applied to a uniform thickness of between 250 and 500 microns, achieving a smooth finish that provides a weatherproof, UV resistant, flame resistant and impact strong surface in the colour specified.

The minimum mechanical strength of the pole shall be designed for a fluctuating wind pressure of 500 Pa onto a wind surface area of 0.20 m² under which a maximum deflection of 5 % of its height above ground shall be permissible. The pole shall have a safety factory of 2.5 and be able to be manufactured to any other strength required.

An access door opening is required, the 250 mm x 80 mm cut-out shall be covered by an access door cover manufactured from glass filled nylon impregnated in the same colour as that of the surface coat. It shall be fixed securely by two M4 stainless steel captive Allen head screws that locate into M4 brass nut inserts embedded in the pole.

The pole shall be supplied complete with a hot dipped galvanised baseplate with a minimum size of 300 mm x 300 mm x 1.6 mm, two hot dipped galvanised steel M8 hook bolts and nuts, a hot dipped galvanised gland plate suitable for the incoming and outgoing cables complete with terminal block and mounting rail and a 5A, 5kA single pole miniature circuit breaker. The wiring from the MCB shall consists of 2,5 mm² 3c trailing cable and shall be taken up to the luminaire within the pole.

The supply cable to each pole shall be 2 x 16 mm² x 4-core ECC cable. A hole shall be provided at 0.4m below ground level for the supply cables.

Suitable brass terminal shall be provided within the pole and all earth conductors installed with the underground cables shall be connected to this terminal. The fitting shall be earthed to this terminal.

The pole shall bear the SANS 1749 mark and be manufactured by an ISO 9002 accredited factory.

Poles shall be buried as per manufacturer's specification.

Final Colour – to be confirmed on site.

HIGH MASTS

General

The specialist Contractor is responsible for detailed design of the high mast from the foundations, concrete and the hot dip galvanised steel mast. All designs shall be submitted to the Project Manager for acceptance. The specialist Contractor shall be full responsible for design and approval of high mast design. The designer must be registered with Engineering Council of South Africa as a Professional Engineer or Professional Engineering Technologist in the respective discipline.

The issued drawing and specification below is the guideline and minimum requirements, final drawings shall be accepted after engagements with the Project Manager.

Mast must have a guarantee of 12 months against faulty workmanship.

Construction

The masts shall be constructed from conical sections which, when assembled, will form a tapered column of circular cross section.

The masts shall be of lightweight construction and a base plate shall be welded to the bottom end of the lowest section suitably drilled for foundation bolts.

All welding shall comply with SANS 10225 1991-1 specifications. Welding Procedure Specification and shall only be carried out by coded welders, tested according to the AWS specification. Proof of the relevant Welding Procedure Specification and Welding Qualification documents must be submitted on request. Inspection and acceptance certificates shall be furnished on request.

The steel used in the manufacture of the mast shall have an ultimate tensile strength of between 460 and 680 MPa and identical to SABS 1431 grade 355WA steel.

Proof must be supplied that the manufacturer is ISO 9001:2008 accredited.

Dimensions

The masts offered shall give an overall floodlight mounting height of 15 m. The cross-section and wall thickness of the mast is determined on the basis of the working loads.

Working Loads

The masts shall be designed in accordance with the SANS 10225 1991-1 Code of Practice for the design and construction of lighting masts. The following site factors shall be considered:

Design wind speed = 40m/s



Category of terrain	=	3
Altitude of site	=	1000 m

The mast shall carry at its top 3 x 412W / +/- 54000 lumen LED Floodlights evenly around its circumference in the ship court yard and floodlight shall be close to each other in the slipway yard.

Data on wind induced oscillations and the dynamic behaviour of the mast shall be submitted by the manufacturer.

UV Protected fibre glass canopy

Each mast shall have an UV protected fibre glass canopy that will cover all electrical material on top of the mast against UV light. This will be of the round design to match with the mast and reducing the wind load that is applied to the mast.

Raising and Lowering Device

Each mast shall be equipped with a three point hoisting mechanism, consisting of three 6mm diameter stainless steel wire ropes, running over three pairs of Aluminium pulleys on the head frame of the mast running on shafts manufactured from Stainless steel and the bearing/housing are manufactured from UV protected UHDPE. All split pins, bolts, nuts and washers shall be of stainless steel. Pulley shafts shall be positively prevented from rotating in their housings. 2 – Rope systems shall not be considered.

The luminaire carriage shall be drawn against three inverted cones to ensure level positioning of the fittings in the operating position. The hoisting ropes, which will remain under tension at all times, shall terminate inside the mast on a clevis plate, to which the rope of the hoisting unit can be connected or to which, when in the raised position, the locking device can be attached. The locking device shall be secured to a structurally sound member of the mast base. The other ends of the hoisting ropes shall be firmly secured to the luminaire carriage. Rope ends shall not be secured by Crosby clamps and only "Talurit" type ferrules of compatible material shall be used. In addition, a safety chain shall be provided between the clevis plate and a structurally sound member of the mast base.

All fasteners connected with the raising and lowering device shall be secured by Nylok type nuts or stainless steel split pins.

Access Opening

An access door adequately protected against the weather shall be provided in the mast, with the bottom lintel 600mm above the base plate. The door shall be adequately protected against vandalism and secured by three screws requiring a special opening tool.

A doorframe shall reinforce the opening in the mast.

The mounting strips welded opposite the door opening shall be drilled for the mounting of a control board. Earth terminals, as well as a support bar for the incoming supply cables, shall be provided below the door opening.

Corrosion Protection

All parts of the mast and raising and lowering device, not specified as manufactured from stainless steel, shall be hot dip galvanised in compliance with the requirements of SANS 121 (ISO 1461) 2000-1 and test certificates shall be provided if required.

No welding, drilling, punching, bending or removal of burrs shall be carried out after galvanising.

Electrical Connection to the Luminaires

A flexible, heavy-duty 5-core trailing cable, which runs over a separate set of Aluminium sheaves at the head frame, shall be provided. Sheaves shall be of Aluminium, running on UHDPE shafts. The shafts shall be positively secured from rotating in their housings. The Aluminium sheaves shall be adequately sized to prevent deformation of the cable

The trailing cable shall be firmly connected to the luminaire carriage at its one end and to the clevis plate at the other end. Suitable connectors of the CEE type with an IP44 rating shall be provided.

A fully enclosed IP30 distribution board shall be provided for mounting inside each mast, containing:

- 1 – 3 pole isolator (main switch)
- 3 – single pole MCB's (lights)
- 1 – single phase switched socket outlet for the use of a power tool
- 1 – 5 pin CEE socket

- 1 – adequately rated contactor
- 1 – single pole MCB acting as by-pass switch
- 1 – single pole MCB protecting the contactor
- 1 – rated photocell

The photocell of the National type shall be mounted 4m above ground level on the outside of the mast under a vandal proof cover by means of a special locking device.

A Splitter box with IP65 rating shall be mounted on top of mast, fitted with a test socket of the CEE type with at least IP44 rating at the bottom of the box.

All circuit breakers and isolators shall have a rupturing capacity of 5 kA and shall bear the mark of the S.A.B.S. and shall be accessible through cut outs in the cover without having to remove the cover.

All equipment shall be clearly marked with engraved labels. No stick-on embossed tape shall be used.

The distribution board shall be fully wired and ready for connection to the incoming supply cables.

Foundations

Each mast shall be supplied with foundation bolts and templates. The bolts shall be hot dip galvanised over their entire length in compliance with SANS 121 (ISO 1461) 2000-1. Two galvanised nuts, two washers and one spring washer shall be supplied for each bolt. The number of foundation bolts shall be determined according to the design of 1.3 above. Calculations shall be submitted upon request.

A foundation plan, adequately designed for the conditions as per 1.3 of this specification, and based on a soil bearing capacity of 150kPa, giving details of the reinforcing required shall be submitted. Soil pressure and overturning safety factor shall be stated.

All reinforcing and foundation bolts shall have a minimum of 100mm concrete cover. The 28 days cube strength of the concrete shall be 25 MPa.

All foundations shall have a circular flat base from which a square plinth shall rise to above the surrounding ground level.

One or two PVC, Class B cable sleeves shall be provided from the centre of the top of the foundation plinth, through the concrete to a point below ground level on the side of the plinth.

After casting of the foundation, the slab shall be covered by earth, properly compacted. The area around the plinth shall be brought to the original level and shall be left neat and tidy.

Earthing Of Mast

High mast standard system consisting of 2 x 1.2m earth spikes, installed under foundation and connected to foundation bolts via 70mm² copper conductors with brass clamps.

Earthing and Lightning Protection

Earthing

The entire installation shall be properly and effectively earthed as prescribed in the the Wiring Regulations and to the requirements of the relevant supply authority.

The existing plant earthing system and main earth bus bar shall be tested for 5 Ohm. If the amount not reach additional earthing equipment shall be installed by the *Contractor*. Earthing and bonding of the new transformer shall consist of 70mm² copper earth wire and 16mm diameter stainless steel core copper coated earth rods.

The earthing installation shall be integrated with the instrumentation system earth and all other services.

The Contractor, however, will be responsible for the equipotential bonding of installed equipment, e.g. transformers, mechanical equipment, pumps, electrical equipment, cable ladders etc.

The connections for the 70mm² multi-stranded conductors shall be based on M10, high tensile, stainless bolts and nuts or equivalent. The minimum size bolts permitted for connections below 70mm², i.e. 16mm², shall be M8.

The Contractor shall provide these as well as the 70mm² green/yellow insulated conductor from the main earth loop.

The main cable support system as provided by the Contractor may also be used to support these conductors in the most economical route.

Under no circumstances shall any connection points, bolts, screws, etc., used for earthing be utilised for any other purpose.

It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on Goods and Materials that must be earthed where these are not provided. Unless earth conductors are connected to proper terminals, the end shall be tinned and lugged. Earth conductors for individual circuits branching from the ring main shall be connected to the common earth conductor by means of exothermic welds. Insulation tape shall be used to cover all exposed metal and a PVC cable tie strapped over the tape ends to prevent unwrapping. The common earth shall not be broken.

Earth conductors shall be connected to the earth rod by means of Exothermic Welds. Insulation tape shall be used to cover all exposed metal and a PVC cable tie strapped over the tape ends to prevent unwrapping

All rods shall be threaded at either end so that extensions can be added to where dip driven installations are required. All connections shall be taped or waterproofed to ensure that corrosion does not affect the joint during the life of the installation.

The rods shall be supplied complete with a driving bolt for protecting the ends of the coupling whilst being driven into the ground.

The top of the rods, after installation, shall be 400mm below final ground level.

Lightning Protection Testing And Commissioning

The entire installation shall be tested and commissioned in the presence of the Engineer. On completion and handover "As Built" drawing and test results (COC) shall be handed over to the Engineer. The drawings shall depict the location on the earth rods and mats and their respective readings.

2.12.23 MV SPECIFICATION

MEDIUM VOLTAGE AND SUBSTATION

The contractor working on the 11,000 volt system and equipment must be deemed competent electrician and authorised Department of labour with particular regard to safety rules, systems operating regulations, underground mains cabling and substation maintenance.

New 11kV switchgear and medium voltage (MV) cabling shall be supplied, delivered to site, installed and commissioned to feed the new 1MVA transformer and mini-substation within the new MV network.

The ring main unit shall be a unit with arc detect and integrated remote terminal unit. The RMU contains two vacuum gas insulated 630 amp circuit breakers and one combined fused-switch for the transformer all 3 switches be provided with voltage presence indicators. Each cable of the ring circuit shall be provided with earth fault (E/F) indication. The RMU shall have a mimic

display with three position indicators for each switch. Natural interlocks and earthing shall be visible.

The transformer breaker shall be provided with on OC, EF relay, CT's and relay for the Buchholz and the temperature alarm/trip.

All MV installation work shall be carried out strictly in accordance with SANS 10142-2.

MEDIUM VOLTAGE SWITCHGEAR

General

The MV switchgear shall be of the indoor, metal clad type and shall be suitable for the coastal environment and prevailing climatic conditions on site. The switchgear shall have a vacuum extinguishing medium. The panel shall be powder coated grey.

Standards

The switchgear shall be manufactured to the relevant section of SANS 62271.

Equipment

The following shall be provided on each section, as a minimum;

- Voltage Meter with Selector (Digital)
- Current Meter (Digital)
- Local / Remote Switch and indication.
- Earth Switch and Indicator.
- Relay HMI (Where applicable)
- Fault Passage Indicator (Where applicable)
- Cable Live Indicators

Cubicle

The cubicle shall be manufactured from 2mm (minimum) sheet 3CR12 steel. The steel shall be treated to prevent corrosion and shall be powder coated in grey.

Cable Entries

Both incoming and outgoing cables shall enter from the bottom. Suitable termination facilities shall be provided. The internal reticulation on the site consist of 70mm²-3core XLPE MV cable. Terminations facilities shall be sufficient for this size cable.

Name Plates

Each panel shall be labelled to indicate the function of the panel, where it is fed from and the cable size. The labels shall be traffolyte engraved labels and shall be permanently fitted to the panel.

Busbars

Panel Busbars shall be rated at a minimum 1250A. A single busbar system shall be used. Busbars shall be manufactured from Copper.

The busbars shall be rated for 12kV. The fault level on the system shall be 25kA with an impulse withstand of 95kV.

Circuit Breakers

The circuit breakers shall be rated as indicated on the attached schedule and on the accompanying schematic diagram. The Contractor shall duly allow for all remote operation signals to be wired to a terminal strip in the control and metering section of each panel where the controls contractor will terminate his cables.

To this end, the motorised panel shall be supplied with the following signals;

- Command: Close Breaker
- Command: Open Breaker
- Status: Breaker Closed
- Status: Breaker Open
- Status: Breaker Tripped
- Status: Ready to Close

The motor shall automatically wind the breaker spring when the breaker is in the open position.

Auxiliary Power

All relays, controls, motor mechanism etc. shall be fed from a separate power supply with battery backup.

The batteries shall supply the auxiliary voltage at the Voltage required by the Spring Winding Motor and Relays. The battery shall be sized by the supplier to provide sufficient power to wind each of the motors on the assembly in a substation five consecutive times without mains power present.

Batteries shall be of the NiCd type and shall be supplied complete with a suitable charger. The charger shall be supplied with "Mains Fail" indication as well as a Voltmeter and Ammeter indicating Charge. A "Battery Charged" indicator shall be provided as well.

Once the battery is fully charged, the charger shall automatically maintain the voltage of the battery to within manufacturers' specified limits.

The charger shall be powered from the VT of the MV Switchgear Panel and shall also accept a mains, 230V Single phase supply from the LV system.

The battery unit shall be included with the main medium voltage switchgear as per below.

Description	Unit	Quantity
Battery Cabinet Suitable for 85 x LCE30P. Top compartment for rectifier. - Battery trolley. - D-DC-9202 - SAFETY SIGN DCSS 2 INCLUDED - Dimensions: 900 x 720 x 1300	each	1
Battery Linking Connectors set consisting of the following.	each	32

- 4 x 220mm x 10mm² Link - 1 x 3000mm x 10mm² Link (POS) - 1 x 2500mm x 10mm² Link (NEG) - Suitable for connecting 85 x LCE30P cells in battery cabinet		

System Requirements

The system requirements shall be as follows:

Nominal Voltage (kV)	Number of Phases	Nominal Frequency (Hz)	Phase Rotation and Colours	3 Phase Fault Level (kA)
11	3	50	Clockwise (Red ,White ,Blue)	25

Basic Insulation Levels

All 11 kV equipment and materials shall be rated to comply with the following requirements:

Nominal Voltage (kV)	Highest r.m.s Voltage (kV)	Rated short duration power-frequency voltage (kV)	Rated peak lightning impulse withstand voltage (kV)
11	12	28	95

IP Ratings

The enclosure protection rating shall be IP42 with all doors closed.

With the with-drawable unit removed, shutters shall provide an IP32 or better degree of protection.

All arc vents and pressure relief flaps shall be covered on the inside with a non-removable IP20 rated grid.

MV Switchgear – Equipment Schedules – Slipway Substation

Panel Function		MSB Incomer (x1)	Feeder (x1)	Feeder (x1)	Feeder (x1)	Transformer
Busbar Rating		1250A, 25kA, 50Hz				
Equipment		Under / Over Voltage Relay, 11000/110V VT				
Rated Short Time Current (3 s)		18,3 kA				
Impulse Withstand		95kV				
Insulating Medium		SF6				
Spare Contacts		2 N/O & 2 N/C				
BREAKER / SWITCH	Type	Circuit Breaker	Circuit Breaker	Circuit Breaker	Circuit Breaker	Circuit Breaker
	Current Rating (A)	1250	630	630	630	630
	Motorised	Yes	Yes	Yes	Yes	Yes
	Open & Close Control	Yes	Yes	Yes	Yes	Yes
INSTRUMENT PANEL	Remote Controller	Yes	Yes	Yes	Yes	Yes
	Local/Remote Switch	Yes	Yes	Yes	Yes	Yes
	Trip / Close Switch	Yes	Yes	Yes	Yes	Yes
	ON / OFF Lamp	Yes	Yes	Yes	Yes	Yes
	Breaker Earth Indication LED	Yes	Yes	Yes	Yes	Yes
	Cable Live Indication	Yes	Yes	Yes	Yes	Yes
	Lamp Test Facility	Yes	Yes	Yes	Yes	Yes
	Heater & Switch	Yes	Yes	Yes	Yes	Yes
	Current Transducer	Yes	Yes	Yes	Yes	Yes
	Voltage Transducer	Yes	Yes	Yes	Yes	Yes
	Power Transducer	Yes	Yes	Yes	Yes	Yes
	Frequency Transducer	Yes	Yes	Yes	Yes	Yes
INSTRUMENTS & RELAYS	Ammeter	Digital	Digital	Digital	Digital	Digital
	Voltmeter	Digital	Digital	Digital	Digital	Digital
	kWh Meter	Master Meter	Master Meter	Master Meter	Master Meter	Master Meter
	Protection Relays	IDMT OC & EF	IDMT OC & EF	IDMT OC & EF	IDMT OC & EF	IDMT OC & EF
	Differential Relay					Yes

Panel Function		MSB Incomer (x1)	Feeder (x1)	Feeder (x1)	Feeder (x1)	Transformer
	Transformer Temp					Alarm & Trip
	Bucholtz Trip					Yes
	Arc Protection					Yes
	Test Blocks	Yes	Yes	Yes	Yes	Yes
CT	Protection Class	550/250/ 1A	550/250/ 1A	550/250/ 1A	550/250/ 1A	200/100/1A
	Class	5P20	5P20	5P20	5P20	5P20
	Metering Class	550/250/ 1A	550/250/ 1A	550/250/ 1A	550/250/ 1A	200/100/1A
	Class	0,5	0,5	0,5	0,5	0,5
	VA of CT	10VA	10VA	10VA	10VA	10VA
Cable	Entry	BOTTOM	BOTTOM	BOTTOM	BOTTOM	BOTTOM
	Quantity	1 x 3core	1 x 3core	1 x 3core	1 x 3core	1 x 3core
	Cable Type	XLPE, Copper	XLPE, Copper	XLPE, Copper	XLPE, Copper	XLPE, Copper
Other						

The CT general requirements are a guide only and the *Contractor* shall confirm all calculations and specifications.

Protection, Metering and Control (PMC) Schemes

General Requirements

The PMC equipment offered shall comply with the following requirements:

- Be standard 'off the shelf' type
- Have a proven track record in the utilities application worldwide. Service records on voltage levels similar to that of the substation specified shall be made available on request

All PMC equipment shall utilize the following supply voltages:

- Signal Supply Voltage: 110 V DC
- Control Supply Voltage: 110 V DC
- Trip Supply Voltage: 110 V DC
- Remote Control Supply Voltage: 110 V DC

The Contractor shall submit details of the stability of digital inputs and EMC withstand of the Goods offered, and certified copies of supporting type test certificates from an internationally recognised testing authority, accompanied by the associated manufacturing documents and drawings.

Battery Charger and Tripping Unit

AC Supply

The battery charger shall be supplied from the main distribution board in the low voltage room.

A pilot light shall be provided on the charger to indicate when the AC supply to the charger is switched on. The pilot light shall preferably be of the LED type.

Battery Charger Requirements

Thyristor controlled constant voltage current limit (CVC) units will be acceptable.

To facilitate equalising charging after a prolonged AC mains supply failure or charger failure the charger shall be fitted with boost charging facilities, which shall be both manually initiated and automatically controlled either by means of a timer or other suitable control circuitry. To prevent unauthorised operation of boost charging the initiating device shall be concealed or shall be lockable. After elapse of the set boost charging time, the charger shall revert back to trickle float charging automatically.

Battery charger shall be capable of supplying its portion of the following station standing load and still charge the batteries from the fully discharged state to a fully charged state in less than 12 hours.

The battery charger shall also be capable of the tripping all breakers simultaneously.

TRANSFORMER

General

Transformers shall be of the Dry Type with copper windings encapsulated in epoxy resin. The transformer shall be supplied in a cubicle manufactured from sheet metal and powder coated to grey. The transformer shall be of the low loss type. The transformer shall be suitable for coastal environmental conditions and shall be 1MVA, for 50 Hz, three-phase, 11 kV (nominal) primary and three-phase four-wire 400 V (nominal) secondary systems.

The transformers shall be of the low loss type and shall comply with SANS 780.

Only 1x 1000kVA transformer is required on at the Slipway substation and shall meet all minimum standard in accordance with SANS 780.

Contractor to complete and return with returnable document the schedule E2 below.

Standards

Transformers shall be manufactured to the following standards;

- SANS 780
- IEC 60076-1 to 60076-5

Windings

The transformer winding shall be wound around three separate limbs and shall be of the copper type. Windings shall have Class F insulation.

Temperature measurement shall be included for each of the cores. The probes shall be installed in such a position to prevent heating due to stray flux.

The alarm management may be mechanical or powered from an external supply. Two levels of alarms shall be provided, a warning alarm 10deg Celsius before critical temperature is reached and a second on critical temperature. The critical alarm shall be connected to the MV Switchgear and shall cause the MV switchgear to trip.

A 5 position off-load tap changer shall be provided on the windings of the transformer. The taps shall range from 90% to 110% of the nominal voltage with Tap 3 being the nominal rating. The tap changer should be lockable in any of the positions.

Cubicle

The cubicle shall be manufactured from 2,0mm (minimum) sheet hot dip galvanised steel. The steel shall be treated to prevent corrosion and shall be powder coated, colour to be confirmed on site.

Cable Entries

Both MV and LV connections shall be made from the bottom.

Name Plates

Transformers shall be provided with traffolyte Engraved Nameplates indicating Substation Name and Transformer Number. The name plates shall be permanently fixed to the transformer cubicle.

Vector Groups

Transformer supplied shall be of the Dyn11 vector group.

Cooling

The transformer shall be supplied with two fans to force air through the transformer cores. The fans shall be provided with controls to provide adequate ventilation to the transformer. The cubicle shall incorporate the necessary amount of louvers and openings to allow for sufficient airflow around the transformer.

The *Contractor* shall indicate, as part of the tender submission, what the maximum I²R Losses for the transformer, at full load, as well as the maximum ambient temperature at which the transformer may be operated.

Noise

The transformer shall be designed in such a way to minimise noise to within accepted levels, as per NEMA requirements. Acoustic pressure LPA dB(A) shall be 60 at 1 m and acoustic power LWA shall be 73 dB(A).

Transformer Voltage and Rating

Transformer supplied to this project shall be of the 11000V/400V step down type, 6% impedance, efficiency at 98,7% at 120 degrees Celsius and at 100% load. Rated insulation level shall be 12kV.

Corrosion Protection

Corrosion protection shall comply strictly with SANS 780. The transformer total dry film thickness of the paint shall be at least 0,125mm.

MINI-SUBSTATION – 630 KVA AND 500KVA**General**

The mini substation will consist of three compartments housing the MV switchgear, transformer and LV switchgear. The Ring Main Unit with padlocking facilities, will be a 24kV rated vacuum Ring Main Unit complying with NRS and IEC Specifications for medium voltage switchgear. Each unit will comprise of the following minimum configuration: 630A circuit breaker ring incomer, 200A combined fuse-breaker feed to transformer and a 630A circuit breaker for the outgoing ring.

The transformers shall be of the low loss type and shall comply with SANS 780.

The Contractor must refer to the schedules and schematic drawings issued with the tender document to determine the detailed requirements of each compartment to suit. The Contractor must submit a dimensioned drawing showing details of their proposals indicating all instruments, MCB's etc.

Under no circumstances is manufacture to proceed until drawings have been approved by the Engineer.

Robust, good quality brass padlocks will be supplied with every door latch and these shall match the client's standard requirements.

Allowance will be made for all necessary notices complying with the Factories, Machinery and Building Work Act to be affixed to every door and a designated nameplate is to be attached to the front of the casing identifying the unit in accordance with the Client's requirements.

A "Schedule of Technical Data: Mini Substations" is included in this document and must be completed in full and return with returnable documents.

Base

The mini substations will be provided with an acceptable hot dipped galvanised robust steel base of sufficient rigidity to allow the unit to be lifted without being deformed.

Materials

The mini substations shall have roof, walls and doors of 3CR12.

Minimisation of Condensation

The unit shall be designed to minimise internal condensation but all louvres and openings shall be vermin proofed and screened.

Paintwork

The colour shall be to SANS 1091 and as per TNPA specification, unless otherwise specified.

The base shall be hot-dipped galvanised after manufacture, and shall be treated with 2 coats of black epoxy tar paint over the appropriate priming coat.

Power Rating

The rating of the transformer shall be 630kVA, 11000V/400V, 4-wires + earth, 50Hz, Dyn11.

The rating of the second transformer shall be 500kVA, 11000V/400V, 4-wires + earth, 50Hz, Dyn11.

Service Conditions

The miniature substation shall be designed to operate under the following conditions.

- Altitude - From sea level to 250m;
- Ambient Temperature 50°C Maximum;
- Humidity - 95%.

Foundations and Concrete Plinth

Reinforced concrete foundations must be supplied and installed by the *Contractor* in accordance with the requirements of the manufacturer. The *Contractor* will also be responsible for the supply of all foundation drawings, together with final location plans of the substation. The concrete foundations shall form part of this contract.

Plinths shall be a manufactured precast plinth suitably to support the load bearing forces of the mini-substation acceptable, provided the plinth(s) are placed / positioned on levelled platform of well compacted erf.

The *Contractor* shall provide a detailed plinth drawing for these mini-substations.

The top of the plinth shall be at least 150mm above the final surrounding ground level. The concrete plinth shall protrude beyond the sides of the mini-substations by approximately 100mm to form an apron.

The concrete apron and plinth shall be wood float-finished before the packaged substation is mounted and shall slope from the channel-iron foundation to permit the run-off of rain water. A 3mm thick gasket of approved malthoid shall be inserted between the packaged substation and the concrete surface. The gasket shall be as wide as the channel-iron base.



Cable ducts shall be provided in the plinth to accommodate all the incoming and outgoing cables. The cable ducts shall be sealed to prevent ingress of rodents. The sealing shall be such that it can be readily removed in the event of future cable work and may consist of a filling of sand covered with approximately 10mm thick 10:1 sand and cement and finished flush with the top of the concrete plinth.

Medium Voltage Compartment

The medium voltage equipment shall be rated at 20KA for 3 seconds at 11 kV, as specified, using metal clad ring main switchgear of the non-extensible type including a fused tee-off switch to protect the step-down transformer.

An approved receptacle shall be fitted with three spare MV fuses of the correct rating and all operating handles and tools will be neatly clipped to the inside of the compartment.

All materials required for the assembly and operation of the switchgear and all compounds and jointing material for terminating the cables shown in the schematic layout will be supplied to complete the medium voltage cable installation.

The MV unit shall incorporate two ring type current transformers on the ring main cables with associated hand reset earth fault relays to indicate whether an earth fault has occurred on the system.

Test plugs and earthing switches are to form part of the ring main unit to facilitate cable tests and maintenance operations. Interlocks, to prevent mal-operation of the system, must form part of the MV switching units.

Transformers

The transformer will comply with the requirements of SANS 780 and SANS 1029. An off load tap change switch with ± 2.5 and $\pm 5\%$ tapplings to be fitted to every unit. For free-breathing transformers, silica gel breathers are to be installed in such a position that easy maintenance and inspection can be carried out without disconnecting the supply.

The transformers shall be supplied in accordance with the schedule of ratings shown in the schematic drawing. Low loss transformers with copper windings are required. Dial thermometers with resettable maximum temperature indicators are to be fitted. The transformer shall be capable of being removed from the mini substations without interference to other gear.

Lifespan

The mini-substation shall have a lifespan of not less than 25 years.

Low Voltage Compartment

a) Busbars, Connections and Instrumentation

The low voltage (LV) incoming section will generally be protected with withdrawable air circuit breaker which is positioned between the LV bushings and the busbar system. The rupturing capacity of all ACB's shall suit the transformer rating and an upstream fault level of 20kA at 11kV.

Latest technology digital metering with CTs and measure amperes, voltage, kw, etc.

The busbars and connections to all ACBs, etc will be rated at a maximum of 1,60 amps/mm² to suit the maximum output of the transformer and the loads on the outgoing circuits. All busbars will be taped with the appropriate colour using an approved insulating tape.

b) Feeder Circuits

The arrangement of the LV outgoing feeders is shown on the schematic layout and will comprise ACB's having a rupturing capacity to suit the transformer with sufficient space for at least two future circuits which may be added at a later stage. All busbars must be drilled to accommodate these future units. These future connection spaces are not to be taped. No tapped holes will be permitted.

The low voltage side shall have the following circuit breakers:

- For 630kVA MSS – 3x500A, 3pole circuit breakers, space for 3 space for 3 spare circuit breakers, kA to suit the busbar
- For 500kVA MSS – 3x400A, 3-pole circuit breakers, 1x250A, 3-pole circuit breaker, space for 3 spare circuit breakers, kA to suit the busbar

The LV compartment will be equipped with four lightning surge arrestors bearing the SANS mark which will be connected to the busbars on the incoming side of the power supply. The earth connections will terminate on the common earth bar inside the compartment.

A bolted, removable 3mm thick stainless steel gland plate correctly drilled at the factory to suit all the cable glands shown in the schematic layout, will be mounted 300mm above the base.

Note: Holes are also to be provided for future cables.

All cables and connections will terminate on a robust insulated terminal strip SANS approved type mounted 200mm above the gland plate and the position of each terminal will coincide with the outgoing cable gland position to facilitate terminations of large cables.

All wiring between the busbars and the ACB's etc, will be neatly installed at the factory and no wiring between the busbars and the terminals will be permitted on site. Wiring must conform to SANS Standards and colouring as follows:

- Phases Red, white, blue
- Neutral Black
- Earth Green
- Control circuits - Brown or yellow

Every wire and feeder cable termination will be fitted with a numbering or identification tag which must conform to the wiring diagram of the LV panel. A copy of the drawing of each panel is to be mounted inside the door of the LV compartment showing all the relevant data with destination and size of every outgoing feeder cable.

An industrial type 16 Amp, 3 pin, 2pin/Euro pin, 220 volt, socket outlet protected with a 30mA earth leakage relay, will be provided in the LV panel, protected by circuit breaker.

A suitable bulkhead with a LED lamp fitting will be mounted in each of the HV and LV compartments which will enable sufficient LED light to illuminate the panels for night-time operations. The switch for the lights will be situated inside the doors of each compartment. The lighting circuits will be protected by 5/6 Amp circuit breaker.

Any tools required for normal operation of the LV equipment will be clipped to the inside of the door.

One continuous tinned copper earth bar, having a minimum cross-sectional area of 40mm X 6mm, shall be provided and suitably drilled with 10mm holes to accommodate connections to surge arrestors, ECC's from every outgoing cable, and at least two earth rod connections, external to the mini substations.

70mm² bare stranded copper conductor will be connected to the earth connections of the metal work, switchgear, transformer tank and a 70mm² insulated stranded copper conductor will be connected to the neutral of the transformer and these will be supplied and connected separately to this earth bar during manufacture of the substation. Only stainless steel nuts, bolts and washers will be permitted for all fixings and all stranded copper connections will be terminated in a compression type cable lug.

METERING

Meter meters must be installed in MV switchgears and new mini-substations to match existing TNPA systems.

Energy meter shall be equal to Landis+Gyr ZMD405CT44.2407 meter for the measurement of kWh, kVarh and kW or kVA in a three (3) phase, three or four wire, 50 Hz network; and meet the following specification:-

a) Energy meter specification

- Accuracy: Class 0.55 (kWh) Class 1.0 (kVarh)
- Voltage 3 x 58/100...230/400V
- Current: -/5A
- Tariffs: 24 energy registers
- 08 total energy registers 24 demand registers
- 04 power factor registers
- Other data: Instantaneous values
- Switching: Internal clock
- Stored values: 15 per register
- Load Profile: 14 channels
- Outputs: 5 Input, 6 outputs contacts
- Standard: IEC 60687 & IEC 61035
- Data output: LCD,

Construction:

- Display: Programmable 8 digit liquid crystal display while un-powered
- Figure height: 8 mm

- Housing: Projection pattern
 - Dimensions: Height: 281.5 mm Width: 177 mm Depth: 75 mm
 - Construction: Anti-static, glass-fibre re-enforced plastic
- b) 1 x Landis+Gyr CU-E22 communication module for use with Item 5(a) above. The module includes: Ethernet port -1 x RS485 port
- c) 1x Landis+Gyr CU-~20 communication module for use with Item 5(a) above. The module includes; -Ethernet port
- d) 1 x Landis+Gyr CU-B2 communication module for use with Item 5(a) above. The module includes: 2 x RS 485 port

MEDIUM VOLTAGE CABLES

All 11kV feeder cables are cross linked polyethylene (XLPE) insulated, copper tape screened type, the specifics are as follows:

Conductor Size	:	70mm ² (3CORE),
Conductor Material	:	Stranded Plain Annealed Copper
Number of Cores	:	3-core
Voltage Grade	:	6.35kV/11kV
Bedding	:	PVC
Armouring	:	SWA for 3-core
Screen	:	Copper tape
Sheath	:	PVC (UV retardant)
Colour	:	Black

Conductor core outer layers shall be numbered to enable positive core identification. Cable dimensions and final tests shall be in accordance with relevant SANS.

Terminals shall be properly drilled and tinned. The Contractor shall provide suitable tinned lugs, bolts, nuts and washers for the cables sizes as indicated on the drawings.

Lugs shall be crimped to cable core ends using mechanical or hydraulic tools designed for this purpose.

Cables in floor trenching shall be installed parallel to each other. Where the MV cables enter the panel through the substation floor they shall be mechanically protected by a galvanized steel pipe or another approved suitable mechanical protection, extending 50mm above floor level.

All medium voltage cables shall be buried 1000mm below ground.

A separate 185mm² separate insulated earth wire shall be run with the power cable.

Note: No cable joints will be accepted.

EARTHING

The Contractor shall provide a 500mm x 50mm x 6mm thick copper bar fixed to the substation room wall on two insulators rated at 500V. The earth bar shall be installed in the Slipway Substation – MV room, transformer room, LV room and generator room. The earth bar shall be installed in the winch room.

The earth mat shall consist of 70mm² bare standard copper conductor and 4 or more 1500mm long x 16mm diameter earth spikes to achieve a maximum resistance of 5 OHMS. The earth mat shall be spaced at least 4 metres from the substation room. Two 70mm² insulated copper conductors shall connect the diagonal ends of the earth mat and earth bar within the substation room.

TESTING OF EQUIPMENT

The *Contractor* shall ensure that all equipment are tested at the supplier premises and on delivery on site. All necessary testing including and not limited to pressure tests and all other relevant testing for the equipment. Certificate and test results shall form part of the document submission.

The Contractor shall carry out cold and hot commissioning before inviting the Engineer for final testing and commissioning.

SETTING CONFIGURATION

Settings configurations shall be executed in all medium voltage equipment and network under this contract by the Contractor. This includes liaising with the municipality representative with protection system and all associated settings for the medium voltage network for this project.

PROTECTION SYSTEM

The Contractor shall provide and finalise the final protection settings with their electrical protection specialist engineer – an ECSA professional engineer or professional technologist. The new substations protection system shall be integrated and trips before the Municipality's substation on any fault. The specialist engineer shall be signing off testing and commissioning certificate and handed over to the Project Manager.

SIGNAGE

The Contractor shall supply, install the substation signage that comply with safety act and SANS regulations. The signage shall be installed in the MV room, transformer room and low voltage room.

The signage shall include the following and not limited to the list below:

- Danger High Voltage EL8
- Substation – No Unauthorised entry – EL 20
- Transformer – EL 21
- Sub-Station Safety sign – E42
- Generator room – EGE002
- And other related signage's for the substations and generator room

This shall include name of the substation inside on the wall and outside the substation door.

All equipment in the substation shall have labelling and description of the equipment, e.g. 11kV/400VAC, 1000kVA Dry transformer.

SCHEDULE E1

TECHNICAL SPECIFICATION FOR 11 kV MEDIUM VOLTAGE MINI-SUBSTATION

This Schedule shall be completed, signed and returned with tender documents of which it forms part.

Ref No.	Technical details	Projects requirement	Bidder's offer
1	Name of manufacturer		
2	Place of manufacture		
3	Manufacturer's identification reference		
4	Insulation medium of circuit breaker	Vacuum	
5	Material of bushing		

6	Minimum nominal creepage distance	20 mm/kV	mm/kV
7	Type of RMU	Item 3 Three circuit RMU	
		2 Circuit Breakers & 1 combined fuse breaker	
8	Size - kVA	kVA	
9	Frequency	50 Hz	Hz
10	Rated voltage	12 kV	kV
11	Rated 1 min power frequency withstand voltage (rms value):		
12	To earth, between poles and across opening switching devices	28 kV	kV
13	Across isolating distances	32 kV	kV
14	Rated lightning impulse withstand voltage (peak value):		
15	To earth, between poles and across opening switching devices	75 kV	kV
16	Across isolating distances	85 kV	kV
17	Rated short-time withstand current	20 kA rms (3 sec)	kA rms
18	Rated current - feeders	630 A	A
19	Rated current - transformer	200A	A
20	Rated peak withstand current		kA
21	Circuit earthing facilities	Integral earthing through ring main unit	
22	Busbar earthing facilities	Integral earthing through ring main unit	
23	Type of trip indication required on switchgear	Mechanical indication	
24	Specification to which cable termination compartment complies	NRS 012	
25	Vacuum insulated, type of Vacuum pressure indication fitted	Vacuum pressure gauge	

SCHEDULE E1_(continued)

This Schedule shall be completed, signed and returned with tender documents of which it forms part.

Ref No.	Technical details	Projects requirement	Bidder's offer
24.0	Earth fault indicator (EFI)	YES	*YES/NO
24.1	Voltage sensing indicators	YES	*YES/NO
24.2	Manufacturer		
24.3	Place of manufacture		
24.4	Manufacturer's identification reference		
24.5	Is the EFI supplied fully wired as a composite unit	YES	*YES/NO
24.6	Minimum earth fault current indication level	50 A	
24.7	Minimum response time for indication	15 ms	
24.8	Is EFI immune to current spikes and magnetizing inrush current?	YES	*YES/NO
24.9	Type of indicating device	Mechanical flag	
24.10	Method of resetting	Reset automatically with 230 V, 50 Hz supply	
24.11	Standard to which current transformer complies	SANS IEC 44	
24.12	IP rating of complete EFI relay	IP54 of SANS 1222	
24.13	Distance from which indicating device is visible in daylight?	5 m	
24.14	Length of lead to connect ICU to a 230 V, 50 Hz auxiliary supply	2 m	
24.15	Diameter range of current transformer	50 to 80 mm	mm

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

24.16	Method of mounting ICU to panel	threaded stud and nut, or screws	
24.17	Material of mounting components	stainless steel	
24.18	Are the markings on the EFI in accordance with 9.2 of this specification?	YES	*YES/NO
24.19	Test facility to confirm functionality of the relay	jack plug	
24.20	Quantity of EFI's for 3 way RMU	3 each	
24.21	Colour of panel	As per TNPA spec	

* Delete whichever is not applicable

Ref No.	Technical details	Projects requirement	Bidder's offer
1.0	Manufacturer		
2.0	Place of manufacture	RSA	
3.0	Manufacturer's identification reference		
4.0	Material of enclosure	stainless steel or 3CR12	
5.0	Material of hinges and all fasteners	stainless steel (grade 316)	

SCHEDULE E2

11000/400 VOLT TRANSFORMER

This Schedule shall be completed, signed and returned with tender documents of which it forms part.

1000KVA TRANSFORMER FOR SUBSTATION

Ref No.	Technical details	Projects requirement	Bidder's offer
1	Name of manufacturer		
2	Place of manufacture	RSA	
3	Manufacturer's identification reference		
4	Overall dimension		Length: Width: Height:
5	Mass of core and windings		kg
6	Mass of complete transformer		kg
7	Type of windings	Copper	
8	Impedance voltage	6 %	%
9	Loss at rated voltage and frequency		No load: W Limit: W
10	Load (at 75 °C winding temp)		W
11	Temperature rise of windings at rated voltage and power		°C
12	Temperature rise of top oil at rate voltage and power		°C
13	Winding dimensions		MV: mm LV: mm
14	Rated kVA	1000 kVA	
15	Nominal primary voltage	11 000 volts	
16	Nominal secondary voltage	400/230 volts	
17	Vector group and symbol	Dyn 11	

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

Ref No.	Technical details	Projects requirement	Bidder's offer
Ref No.	Technical details	Projects requirement	Bidder's offer
18	Insulation level	To SANS 780 – table 11, list 2 for rated voltage of 12kv	
19	Earthing methods (a) MV system (b) LV system	Solidly earthed	
20	MV system prospective fault level	20kA	
21	Tap change switch	Off load, externally operated, lockable in any position	
22	MV tappings single ratio	+2.5% & +5% at 11kv	
23	CT bushings on 11 000 volt side		
24	Transformer terminal connections: MV LV	Enclosed busbar trunking	
25	Drawings showing the dimensions of the transformer offered, the arrangements of the connection and the position of the tapping switch	Required	

POWER FACTOR PROTECTION

GENERAL TECHNICAL COMMENTS

The capacitors shall be fully interchangeable between the banks thus reducing the number of spares required.

The reactors shall be made from low-loss plate metal and a copper coil. Once assembled they are impregnated using a sophisticated vacuum system that guarantees minimum loss, greater mechanical consistency, increased insulation and low noise emissions.

- The *Contractor* shall furnish and install metal enclosed capacitor equipment as specified herein
 - This specification contains the minimum requirements for the design, manufacture and testing of metal enclosed capacitor bank rated 12 KV
 - This specification covers the electrical characteristics and mechanical features of a three phase, 50hertz, self-contained, free standing, metal enclosed capacitor bank. The application of these units is for power factor correction.
-
- **Group Fusing**

Good engineering practice requires that the line protection fuses should be properly co-ordinated with individual groups of capacitors in order to reduce the risk of can rupture during fault conditions.

STANDARDS

The metal enclosed capacitor equipment shall be designed, manufactured and tested in accordance with the latest standards of NEMA, SANS.

RATINGS

- The system operating nominal voltage and frequency shall be 11kV at 50Hz.
- the total capacity of the metal enclosed capacitor unit shall be 1500KVAR.
- The capacitor bank shall have a fixed stage 1500KVAR.
- The capacitor bank shall be rated for continuous duty at 40°C ambient at 1,000 meters and below.
- Total harmonic distortion (THD) of up to 5% of voltage waveforms shall not affect the life of capacitors.
- A +/- 10% variation in line voltage shall not affect the life of the capacitor.

CAPACITOR VOLTAGE RATINGS

Over voltage Margins as Specified by International Standards

ANSI STD 18/1980

- + 10% rms continuously
- + 20% peak continuously

IEC 871-1 (Current standard for MV capacitors)

- +10% rms 12 hours out of 24

Multifunction Meter & Relay (MMR)

- Each stage shall have a digital multifunction meter/relay (MMR) for 3-phase True RMS current, voltage, & KVAR sensing and display.
- The multifunction meter/relay (MMR) shall provide current unbalance, current overload, & overvoltage protection functions for each stage.
- The MMR trigger parameters shall include adjustable pick-up, drop-out, on delay and off delay settings.
- The MMR I/O shall have 2 digital outputs and 4 digital inputs.
- The MMR sampling rate measurement shall be 128 samples per cycle.
- The MMR shall have bright 3-row LED display.
- The MMR shall have 2-wire RS-485 communications port with Modbus RTU, DNP3 and ASCII communications protocol.
- The MMR shall be suitable for 60°C ambient temperature and 95% humidity.
- The MMR current input shall be rated to withstand suitable RMS continuous

ENCLOSURE

- Enclosure shall be NEMA 3R outdoor enclosure with gaskets and air filters.

- The structure shall be front accessible, free standing with necessary provisions for ventilation and handling. There shall be no side access or operating handles mounted on the side of the enclosure. (For harmonic filter applications: Provide rear doors for access to the iron core reactors for easy access to reactors).
- The steel thickness of enclosures shall be 11 gauge or equivalent.
- The capacitor bank line-up shall not have any side access panels. The capacitor bank main and ground switch operators shall be mounted on front so that there is no side access required and side operator clearances are not required.
- There shall be thermostatically controlled heaters for condensation control. Each section shall have a space heater and thermostat.
- Disposable air filters and stainless steel screens shall be provided to prevent dust and insect entry. Filters shall be removable for replacement or cleaning purposes from outside without opening enclosure door. Air filters shall be industrial grade and meet SANS and manufactures standards. Air filters shall be constructed with heavy duty, premium grade fiberglass media. Air filters shall have double-sided expanded metal retainers, on both the air-entering and air-leaving sides, for maximum rigidity and durability.
- Structures shall be bolted steel frame, formed steel doors and side sheets, flat and sloped to rear steel top and rear covers. All enclosure outside sheets shall be internally bolted such that no bolts or hardware is exposed to outside.
- Thermostatically controlled forced air ventilation shall be provided in all compartments. Each section with capacitor and reactor shall have minimum two cooling fans controlled by a dedicated thermostat. Reactor sections shall have redundant cooling fans and redundant power circuit. All louvered openings for air flow shall have stainless steel insect screens.
- The capacitor bank shall be modular design for ease of future expansion. If future expansion is required then the last section shall have a bus cut-out opening with weather proof bolted gland plate.
- Each section door shall have a viewing window. Viewing window shall be reinforced with brackets on the rear side of the door.
- Each stage of the capacitor bank shall be installed in an individual compartment isolated by steel sheets from other stages.
- Each modular wide section shall have dedicated thermostats, space heaters, and cooling fans.
- Each section door shall have warning labels, danger high voltage and caution labels.
- The enclosure steel shall be fabricated at the same facility where the capacitor bank is assembled.
- The doors shall have gaskets, heavy-duty non-corrosive hinges, pad lockable and keyed heavy-duty non-corrosive handles. The doors shall be latched at three points. Doors shall have welded grounding studs and shall be bonded to the equipment ground bus.

- The door hinge pins shall be stainless steel. There shall be six heavy duty hinges for each door. The doors shall have door stops. The door latching mechanism shall have heavy duty rollers on all three latching points.
- The roof shall be sloped to the rear. There shall be a drip shield provided over each door. The drip shield shall be welded to the top of the frame. The top roof sheet shall have welded braces for rigidity and weight support.
- Each unit shall have a rating nameplate. The main incoming section shall have a rating nameplate located on the inside door in addition to the external nameplate.
- Metal enclosed capacitor equipment enclosures shall be provided with a powder coat paint finish.
- Automated and continuously monitored electrostatic powder coat line operation shall be used

SWITCHGEAR

Continuous current rating

Because of permitted positive capacitance tolerance, possible upward excursions of system voltage, and taking into account the possibility of r.m.s. current increase due to harmonic currents, the circuit breaker or contactor shall be capable of carrying continuously a current equal to 1.43 times the nominal capacitor current calculated at nominal kVAr and nominal voltage.

Current breaking

The circuit breaker or contactor shall be re-strike free when interrupting a power-frequency capacitor current of 1.2 times the nominal power-frequency current at 1.1 times the rated voltage. The device shall be type-tested as in accordance with IEC 56 Part 4 (or equivalent) to prove this and should have remained re-strike free during the whole test sequence.

Current making

When a capacitor bank is energized, a large transient inrush current flows at high frequency, an effect which is intensified when a capacitor bank is switched in to busbars to which another capacitor bank is already connected. The magnitude and frequency of this inrush current flowing between capacitors is dependent on the inductance of the circuit linking the capacitors and can be calculated if the details of the layout, interconnections and fault level are known. The manufacturer of the switching device must state the maximum making-current so that the necessity or otherwise for additional series reactance may be determined.

In addition, the switching device shall be so designed so that the period between initial current-make and final contact closure of each individual phase is not more than 150 μ sec. The transient voltage on energising shall not exceed 2.2 times the normal voltage.

EARTHING

Indoor installations

The *Contractor* shall include for connection to the substation earth bar via a 70mm² bare stranded copper conductor.

Note: Connection points shall be made off with compression type bolted lugs.

Cables

Unless otherwise stated power cables shall be XLPE Copper SWA/PVC (non-individually screened type) and control and protection Copper PVC/SWA/PVC.

SITE, TESTING AND COMMISSIONING

A Commissioning Specialist shall perform all necessary inspection and tests to prove that all equipment has been satisfactorily installed and cabled, and is in perfect condition and safe working order prior to energisation of any equipment, in accordance with all statutory. (2 visits one for Cold and one for Hot Commissioning).

PROTECTION LEVEL

The capacitors shall be manufactured in a controlled environment under strict quality control procedures governed by a formal Quality Assurance Policy.

The relevant protection levels for MV capacitor banks are:

- Instant over-current / Short-circuit relay
- Timed current relay
- Minimum voltage relay
- Maximum voltage relay

Description	Project requirements
Nominal Reactive Power	1500kVAr
Rated voltage	12 kV
Frequency	50 Hz
Insulation level	
Voltage	12kV
Short term voltage	28kV
Ray-type impulse	75kV peak
High Voltage	12kV
Assigned short term voltage	28kV
Voltage assigned with ray-type impulse	75kV peak
Maximum overvoltage (as per IEC)	Network voltage regulation and fluctuation
Overcurrent	1.3·IN
Capacity tolerance	-5%...+10%

Total losses	< 0.15 W / kvar
Statistical mean lifetime	>130,000 hours
Discharge resistors	75 V-10 minutes
Current limits	Maximum 200 x IN
Ambient temperature category -	40°C
Ventilation	Natural
Protection degree	IP 54
Humidity	Maximum 95%
Service altitude	At sea level
Assembly position	Vertical
Assembly attachments	Lateral supports and leg anchors
Container	Stainless steel for internal
Dielectric	All polypropylene film
Saturant	PCB free, biodegradable
Internal safety device	Internal fuses
External safety device	Pressure switch
Terminals	Porcelain
Terminal tightening torque	10 Nm
Colour	TBC

ADDITIONAL COMPONENTS**Pressure switch**

It enables the step/capacitor bank to be disconnected based on pressure arising from a serious defect inside the capacitor, thereby preventing it from further damages. It enables the power circuit to be disconnected and signals the fault when the pressure reaches the maximum value.

Voltage presence indicator

A unit that lights (LED) up permanently when the power circuit is fed in order to provide greater safety during operations made on the unit.

Smoke detector

Smoke detectors to give warning of the possibility of internal combustion in the capacitor bank and send a signal to activate an alarm (in the unit) disconnecting the bank if required.

Vacuum off-load and/or earthing switch

The off-load and/or earthing switch enables the unit to be visually disconnected and isolated at the capacitor bank input.

Ventilation

In batteries installed in environmental conditions where natural convention cooling is insufficient, an auxiliary thermostat-controlled forced air system is essential for evacuating the internal heat of the battery.

**GENERATOR PLANT – 650kVA, 400VAC****SCOPE OF WORKS****GENERAL**

The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act no. 38 of 2000) / latest document, the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

The *Contractor*, under this contract, shall supply, install and commission a new emergency generating plant to provide emergency power to the Operations Building at the Port of Mossel Bay.

It is a specific requirement of this enquiry that the successful contractor must have permanent premises situated in a suitable geographic location in order to provide a standby response of two hours maximum to the Port of Mossel Bay, Mossel Bay.

Tenderers are to note that typical basic standard offers by their suppliers will not be acceptable. All offers must be fully in accordance with the specifications in these tender documents inclusive of all extra items specified.

The scope of work is to procure, manufacture, supply, store, assemble, deliver, install, test and commission, guarantee and maintain for first 12 months a new **650 kVA** 3 phase, 400VAC, 50 Hz emergency generator plant at the Operations Building, which will enable the plant to provide a reliable system of emergency power should the normal mains power supply fail at the Operations Building in Port of Mossel Bay Slipway substation. The generator shall have a guarantee of 12 months or 1200 hours, whichever comes first, from the hand over date. During that first 12 months contractor shall provide free spare parts caused by contractor's quality of product. Contractor shall carry out service 4 times during the year as per the scheduled attached on annexure of the document.

The complete diesel generator installation shall comply with the requirements of the Transnet National Ports Authority (TNPA) / Transnet General Technical Specification for emergency generator plant and the additional requirements in this section of the document.

The generator contractor will be responsible for the complete diesel generator installation and associated equipment and power and communication cabling between the generator set and the AMF panel, the set is to include the metal clad insulation of the complete exhaust pipe and silencer system within the enclosure and the supply, oil resistant hose pipes and a funnel. The fuel line from the fuel tank must be fitted with a fuse link operated shut-off valve. Fuse link to be mounted above the plant in the event of a fire. The drain from the radiator and oil sump must be extended to outside the base frame. **The exhaust pipe must discharge outside the building** and be fitted with a mesh at the end to prevent entry of small birds.

It is the generator contractor's responsibility to ensure that the container manufacturer / supplier provides adequate ventilation within the enclosure for the efficient operation of the plant at full load condition.

Adequate electrical protective devices must be provided to shut the engine down before any permanent damage can result to the generator equipment. Refer to 'Alarm and Protection Equipment' clause in the General Technical Specification. The following equipment must also be provided:

A low level cut out probe in the diesel day tank to prevent the engine running dry, in addition to the low level alarm probe.

A low level cut-out probe near the top of the radiator to provide engine cut-out in the event of low coolant or a water leak.

In general, the essential outgoing circuits will be the:

The supply to the kiosk / electrical board on the essential side of the electrical board.

The electrical contractor shall provide the cabling and connections from the TP electrical panel to the generator change over, to the generator and back to the essential electrical panel.

Part of this contract is to provide:

A 12 month guarantee of all new diesel generator plant from the date of hand over to the employer.

A day time emergency call out service with a response time of 2 hours during the first year.

A three monthly maintenance inspection including a 30 minute on-load run test and checking the battery charging system and replacing the fuel filters.

A full annual service of the generator plant and replacement of the battery at the end of the 12 month guarantee period.

**Guarantee**

A guarantee period of 12 months shall apply to all new plant and equipment supplied and installed under this contract. The guarantee period shall commence from the practical completion date.

For details refer to the clause Guarantee in the General Technical Specification.

Maintenance

Maintenance of the specified systems, services and / or parts of equipment and infrastructure shall all be referred to as "Maintenance of an Installation". Maintenance of all completed installations shall ensure reliable functioning and optimum service life thereof. Maintenance responsibilities for each installation including all units and components as specified shall commence after practical completion of the installation and shall leave the Contractor with a functional installation to maintain and guarantee for 12 months.

Maintenance of an installation shall be performed in accordance with the Technical Specifications, the Operating and Maintenance Manuals (where applicable) and the Maintenance Control Plan.

Drawings

Final position of the generator set is indicated on the drawing. Further details shall be discussed on site by the generator specialist and the engineer.

Engine Instruments

Refer to clause Panel Equipment in the General Technical Specification for equipment to be provided.

Battery Charging System

This shall include the engine alternator and regulator (12V or 24V system). Battery specification to suit manufacturer.

Electrical Reticulation

Electrical reticulation work under this contract will involve the installation of the new AMF panel and interconnecting of the power and control cabling and earthing between the generator set, alternator and the AMF panel. Also included under this scope of work is the separate earthing to ground of the generator set and the AMF panel. An emergency stop button shall be fitted on the outside of the enclosure. Wiring between this stop button and the AMF panel shall be undertaken by the generator contractor.

The electrical contractor will install and terminate the out-going cables from the AMF panel to the TP electrical board and / or as per drawings.

Cabling between the alternator and the AMF panel shall be suitably rated for the full load rating of the alternator and shall be suitably supported on stainless steel Gr316L cable tray.

All new electrical installation work shall comply with the SANS 10142-1 as amended.

After completion of the work, a compliance certificate for the new electrical installation work for the generator and AMF panel shall be issued to the Engineer.

AMF Panel

The diesel engine must be started automatically when the mains power fails.

The AMF panel must be mounted on the base frame of the engine or alternatively mounted at the end of the set and be visible through a window in the enclosure door.

A 1000 amp TP 25 kA MCCB shall be provided as the main switch for the incoming supply from the TP supply source. A separate main generator circuit breaker rated for the FLC of the alternator, to protect the alternator against short circuit and overload is to be mounted in the AMF panel. The electrical / mechanical change over switch / contactors shall be mounted in the AMF panel. A by-pass switch for maintenance is also to be provided.

In addition, there shall be a cable to the main distribution board to an essential supply side to feed essential busbar which shall have circuit breakers feeding other distribution boards. Refer to the single line diagram for detailed drawing.

The AMF panel shall be fully equipped (including battery charger) and wired as detailed in the standard specification. An approved generator controller unit shall be used – Levato RGAM 20 or similar.

In addition to the power cabling a 2,5 mm² 7 core armoured (control) cable and a 4 mm² 4 core armoured cable (for battery charger) will be required. The AMF panel shall also incorporate a red alarm indicator with audible electronic siren and reset button which must be clearly visible through the window in the door. A remote panel to be provided under this scope of works shall consist of a red indicator lamp for a general generator alarm (labelled GENERATOR ALARM)

The remote panel is to be handed over to the Electrical contractor and or client.

Fuel / Water Separator

The diesel generator set shall be provided with an approved fuel separator/filter unit.

The fuel filter unit and replacement filters are available suitable supplier.

Tenderers shall allow for the separator / filter to be installed in the fuel line from the tank to the diesel engine. The unit shall be positioned above the engine drip tray. The separator shall be manufactured to the following specifications.

The filter cartridge must be changed every 3 months even if the diesel engine does not run. Tenderers must allow for the cost of replacing the cartridges in their service rates.

Technical Specification

The diesel / water separators:

- Shall be manufactured from die-cast aluminium.
- Shall be Robust Double Epoxy powder coated.
- Shall have a 10 micron filter cartridge with mechanical shut off, for overwhelming by water.
- Shall have a flow rate of ± 4 litres per minute minimum.
- Shall have an Inlet / Outlet port.
- All parts shall be corrosion resistant and float shall be solid.
- Approximate measurement of unit shall be, Height - ± 325 mm, Width - ± 99 mm, Depth ± 125 mm.
- Shall be 4 Bar pressure tested.
- Shall have a ± 300 millilitre per minute water dump – differential head pressure dumping.
- Shall have a 2mm dump valve aperture.

Operation

- No visual inspections i.e. automatic water dumping.
- No electrical circuits required.
- Complete water separation.

Fuel

Fuel supplied and used in the diesel engine shall be commercially obtainable automotive diesel fuel to SANS 342.

The new generator set shall be provided with a full tank of diesel fuel. The fuel shall be pumped into the day tank for use during testing and commissioning.

A spare 1000 litre tank and bund wall shall be provided under this contract by the generator specialist. The diesel tank shall have a bund wall to catch any fuel spillage. The automatic pump shall be provided under this contract by generator specialist.

Generator Room

There is a generator room provided. No need for a generator enclosure / generator canopy. However, the generator to have lowest noise level. Lift points shall be provided in the base frame of the generator set for lifting the plant.

Annual Service

At the end of the guarantee period a full annual service shall be undertaken in accordance with the following table. Should this service schedule not include all the requirements deemed necessary by the manufacturers of the relevant generator sets, then the contractor is to ensure that the omitted schedule maintenance items are included and that the annual service is in accordance with the manufacturer specifications.

Should the engine use for less than 400 hours in the twelve month period, the schedule below must be used:

The preventive maintenance operations must be applied at the interval (hours or months) which occurs first.

To ensure consistency in tendering, tenderers shall allow in the priced bill of quantities for 3 inspections and the replacement of filters and a full annual services at the end of the guarantee period.

A = 3 Monthly inspection / service and initial training of operators

B = Every 400 hours or 12 months

A	B	Operation
☐	☐	Check the amount of coolant
☐	☐	Check the level of the lubricating oil
☐	☐	Check the restriction indicators for the air filters and, when necessary, renew the filter elements.

A	B	Operation
☐	☐	Start and run the engine with 30% load (minimum), until normal temperature of operation is reached. Engine must run for a minimum of 1 hour.
☐	☐	Drain the water / sediment from the primary fuel filter.
	☐	Check the condition and the tension of all drive belts.
	☐	Check the specific gravity and the pH value of the coolant.
	☐	Renew the lubricating Oil
	☐	Renew the canisters of the lubricating oil filter
	☐	Renew the canister of the main fuel filter
	☐	Clean the primary fuel filter
	☐	Ensure that the mounting nuts for the turbochargers are tightened securely.
	☐	Check the timing of the fuel injection pump
	☐	Check that the drive coupling bolts of the fuel injection pump are tightened to 120Nm (88lbf ft)
	☐	Ensure that the fuel injectors are checked and corrected or renewed, if necessary *
	☐	Ensure that the tappet clearances are checked and adjusted, if necessary *

In addition to the operations listed above, the following must be included in the 12 month annual service.

- Drain and flush the coolant system and renew the coolant mixture.
- The operation of the turbochargers be checked and repaired if necessary by a competent person.
- Check that the air charge cooler and the radiator are clean and free from debris
- The operation of the alternator be checked and repaired if necessary by a competent person.
- Check the battery charging system, and adjust the charging rate if necessary.
- Install a new heavy duty battery each 12 month interval.

Quarterly Maintenance Inspections

A quarterly maintenance inspection is required every 3 months throughout the guarantee period for the plant providing emergency power. A quarterly maintenance schedule is attached which must be photocopied and completed by the service Contractor. The engine must be started by simulating a mains failure and run for at least 30 minutes.

The price for the quarterly inspections shall include all necessary costs such as travelling, labour, tools, cleaning materials, replacing fuel filter cartridges etc. Contractors are advised to assess the rising costs and price these services accordingly, as these costs are fixed and no additional escalation on rates will be permitted.

Monthly Maintenance Services

A monthly maintenance service will not be required for the generator set unless otherwise recommended by the diesel generator set manufacturer. This generator is not a **base load set** that would run continuously day and night to provide electricity.

Emergency Call Outs

Should a breakdown occur during the 12 month free maintenance period, the contractor is expected to visit site within two hours of receiving written notification from Transnet Agent. Any faulty electrical or mechanical equipment shall be replaced at the contractor's cost under the guarantee.

Reimbursement (including travelling) will not be made for call outs to faults on new equipment installed under guarantee unless it can be proven wilful damage or negligence by the Employer's operating staff.

Servicing

All parts and components shall be approved and in accordance with the manufacturer's spare parts' list. Generic or similar parts not approved by the manufacturer of the plant may not be used.

Documentation

General Technical Specification: INSTRUCTION MANUALS. The same clause also specifies the requirement for wall mounted drawings in plant rooms, which are to be provided for in the enclosure of the new generator set.

Four copies of an A4 size hard covered spiral binder with 12 coloured plastic fly sheets suitable to contain the following information shall be provided for the new generator and handed to the Engineer:

- 1) Cover page with title of contract and file numbers
- 2) Contractors details – name, address, contact names and phone/cell numbers
- 3) Consultants details as above
- 4) Hand over certificates – compliance forms, practical completion forms

- 5) AMF panel routine test certificates from supplier – refer SANS 1973 and a schedule of all controller programmed settings
- 6) Site instructions
- 7) Technical data sheets with supplier's names and model numbers – radiator level probes, battery charger unit, generator controller, plug-in relay types and replaceable filter cartridges.
- 8) As built drawings of AMF panel and genset
- 9) Operating and maintenance manuals
- 10) List of all consumables with make and type number – oil, filters etc.

Log Book

An A4 size hard covered service logbook on a chain shall be provided in a metal envelope or chain the book so it will not get lost. The logbook shall be chained to the inside of the enclosure. The logbook is to be filled in each time anyone opens the doors to the enclosure after the set is commissioned. A full detail of servicing and repairs is to be recorded in the book with the run hour reading.

Cleaning / Clearing

Cleaning during maintenance service refers to the high pressure hosing of the engine. Removal and disposal of any oil or diesel in the drip tray.

All mechanical and electrical equipment must be cleaned of dust and oil. The electrical switchboard must be blown out of dust with an air blower.

Clearing refers to the removal of all unauthorised items stored within the canopy to ensure fire safety and compliance with the OHS Act. The enclosure may not be used as a storeroom.

Signage

Mandatory signs to SABS shall be installed inside the enclosure – first aid, resuscitation, fire, etc. All other signage shall be approved by the TNPA Agent (Consultant) before purchasing.

A sign as indicated in clause 11 of the General Technical Specification must be installed inside the enclosure at the electrical indication/control panel.

In addition to the mandatory OHS signs, a plastic laminated schedule shall be mounted inside the enclosure with the contractor's name and contact details together with the name of the Transnet service/maintenance manager and his/her contact details.

A plastic laminated schematic wiring diagram of the electrical control system must also be mounted inside the electrical enclosure.

Two signs shall be installed outside on the door. One at high level with the words "GENERATOR PLANT" and the other with the words "UNAUTHORISED ACCESS NOT PERMITTED"

The generator set plant and the control panel shall also be provided with a unique alpha numeric label identifying the plant for the TNPA e.g. TNPA – 005.

All signs must be fixed with non corrodible screws.

Commissioning

The diesel generator set and AMF panel is to be tested in the supplier's workshop prior to dispatching to site. Tests in the workshop shall include a load test with a dummy load, equivalent to the full output of the particular alternator and in the presence of the TNPA Agent (Consultant). Temperature rise tests shall also be taken within the enclosure during the load tests.

Training

The contractor shall ensure that the relevant Transnet personnel (at least two persons) are fully versed with the operation, starting procedure and monthly maintenance requirements of the generator sets. The names **and signatures** of the trained officials indicated on the handover certificate shall be forwarded to TNPA Agent (*Project Manager / Engineer*).

Electrical Competent Person & Identification

The *Contractor* must have in his permanent employ a person deemed to be electrically competent. Such a person must be in possession of a valid and current certificate certifying he/she is an Installation Electrician. This person will accept a permit to work on behalf of the Contractor associated with system outages. It is a requirement that the above person be resident on the site whenever installation work is being carried out. Work on site shall at all times be supervised by a designated responsible person appointed in writing in terms of the OHS Act No. 85 of 1993.

Whilst on site all staff and labourers employed by the generator contractor shall wear distinctively marked clothing bearing the name of the mechanical contractors or his identification logo.

Visits to Site

Tenderers are advised to visit the site and acquaint themselves with the existing installation, working, site and access conditions. A compulsory site visit will be held as per the details noted in the Tender Notice.

No claims whatsoever shall be entertained due to lack of knowledge of the site conditions.

Attendance on Principal Contractor

It is a requirement that the generator contractor liaise closely with the *Contractor* on all aspects of the generator plant installation. The generator contractor will be required to attend regular (2 weekly) site meetings with the *Contractor*.

Indemnity

In carrying out his obligation as the Mandatory to the Employer for this Contract in terms of Section 37(2) of the Occupational Health & Safety Act No. 85 of 1993, the Contractor ensures that he complies with the Act when providing the Works or using plant, materials or equipment. The *Contractor* indemnifies the Employer and the Engineer and their representatives against loss and damage to property, death of, or injury to, a person and claims, proceedings, compensation and costs arising from the Contractor's transgression of the Act, except to the extent that the Employer caused the transgression.

QUALITY CONTROL

The *Contractor* shall specify to what standards the equipment will be Manufactured e.g. ISO, EN, IEC, CENELEC.

The *Contractor* shall supply all necessary compliance certificates, handover documents, drawings,

**GENERAL TECHNICAL SPECIFICATION
GENERAL**

This is a typical standard specification that covers the supply, delivery, complete installation and testing on site in full working order and the guarantee of new diesel generator plant as detailed below. Brochures with full technical particulars, performance curves and illustrations of the equipment offered must be submitted with the tender.

The schedules following this specification must be completed by the Contractor in all respects.

The Employer reserves the right to accept any portion of any tender and does not bind itself to accept the lowest or any offer.

REQUIREMENTS

The diesel engine alternator set shall be robust in construction, of the heavy duty, industrial engine type with speed not exceeding 1500 RPM and shall comply with SANS 8528. The set shall be fully automatic, i.e. it shall start when any one phase of the main supply fails, and shall shut down when the normal supply is re-established. The set shall be capable of delivering the specific output continuously under the site conditions, without overheating. Maximum ambient temperature can be assumed to be 40° C and the maximum ambient humidity at lowest temperature to be 80 %. The altitude is between below 1 m above sea level. The engine shall be capable of delivering 110% of the specified output for one hour in any period of 12 hours consecutive running, in accordance with BS 5514.

Full particulars, including detailed descriptions, illustrations and curves, with engine performance (output of engine against speed for both intermittent and continuous operation) and fuel consumption curves shall be submitted with the tender.

This shall be an open set frame, the engine and alternator shall be mounted as a complete set on a common steel base, which shall incorporate anti-vibration dampers. The set must be placed on a level concrete floor. A drip tray, large enough to catch a drip from any part of the engine and water discharged from the fuel / water separator filter, must be fitted under the engine. All diesel engines must be fitted with a charging alternator for charging the battery.

VOLTAGE AND OUTPUT

The output shall be rated to suit the specified, kVA, power factor and voltage ratings as shown on the specification schedule. The engine size shall not exceed the specified ratings by more than 25%. Contractor to complete the attached schedule and return it with the BOQ for evaluation.

CONCRETE BASE

The generator plant shall be installed on a reinforced concrete plinth, which must be raised above ground line to prevent water ingress and corrosion. A concrete base shall be cast in situ for each generator plant. The base shall be made of reinforced concrete at least 350mm thick and overlap the plant by 500mm all round. The plinth must protrude 150mm above ground line. The concrete shall have strength of 30MPa after 28 days. It is essential that the base is level. The edges of the base shall be tapered for neatness. Concrete bases shall be cast in position at least 28 days prior to installation of the plant. The base frame of the plant must be bolted / bracketed to the concrete base. Provision must be made in the base for the cable entry and the main earth wire connection. A molthoid strip shall be placed between the concrete base and the generator plant. The generator floor shall withstand

a maximum weight of 15 tons. Any designs required for this plinth shall be made by the Contractor and must be approved by a Professional Registered Engineer / Professional Registered Technologist where applicable.

DIESEL ENGINE

Diesel engines shall be manufactured in accordance with BS 5514. The engine must be of the solid injection, compression ignition type, running at a speed not exceeding 1500 r.p.m. The engine must be amply rated for the required electrical output of the set, when running under the specified site conditions. **The engine shall be de-rated for the site conditions.** Unless otherwise indicated, the starting period from either automatic or manual switching-on until the taking over by the generating set, in one step, of a load equal to the specified site electrical output shall not exceed **15 seconds**. This must be guaranteed by the Tenderer. The engine shall be easily started from cold, without the use of any special ignition devices, under summer as well as winter conditions, against full load. Water cooled engines shall be fitted with immersion heaters. Turbo charged engines will only be accepted if the Tenderer submits a written guarantee that the engine can deliver full load within the specified period. Emissions from the exhaust shall be kept to a minimum and shall be given at the time of tender.

A remote drain for draining the sump oil and water from the radiator must be extended to the outside of the base frame.

Battery

The set must be supplied with a fully charged **heavy duty, industrial**, maintenance free lead-acid/calcium type battery, complete with the necessary electrolyte. Batteries shall be of the DELTEC or as approved by the Engineer and shall not be less than 120 Ah rating. The battery will be of sufficient capacity to provide ample starting torque for the engine, which could require up to six consecutive starts. However the battery capacity shall not be less than that recommended by the diesel plant manufacturer.

The battery shall be mounted on a painted non corrodible, battery shelf secured to the base frame. Rubber insertion shall be installed at the bottom of the shelf. The terminals of the battery shall be sprayed red and green with a terminal spray protector.

Where plant is installed indoors within a plant room, a complete set of distilled water bottles, funnel, hydrometer, etc. will be provided in a glass case fixed on to the plant room wall to maintain and test the battery.

Cooling

Air cooled or water cooled engines shall be acceptable. To prevent excessive running temperatures on water cooled engines, an engine-mounted, tropicalised, pressurised radiator with blower-type fan shall be provided to maintain safe operation at 43°C ambient temperature. The radiator shall be designed for an ambient air temperature of 50° C. Total air flow restriction to and from the radiator shall not exceed 0,12 kPa. The Contractor shall provide duct work with flexible connecting section between radiator and discharge louvre frame. Radiators must be dosed with anti-freeze and a suitable corrosion inhibitor. A low level probe shall be mounted near the top of the radiator to alarm with visual indicator and shut-down the plant. Should the radiator be too narrow to accommodate the probe, then

the probe shall be installed in an enclosed cylinder with extension pipe fixed to the radiator. The probe shall be of the Electromech AC DC Dynamics LS 103-3 or similar make.

An audible alarm and visual trip system shall be provided on the control panel to indicate that excessive temperatures have been reached.

Lubrication

The main bearings and other important moving parts in the engine shall be lubricated by a forced feed system. An audible alarm and visual trip system shall be provided on the A.M.F. panel to operate the stop solenoid in the event of low oil pressure.

Fuel Pump

An automatic fuel pump must be permanently connected to the fuel tank to enable refuelling from 1000 litre fuel tank. The fuel injection equipment must be suitable for operation with all commercial brands of diesel fuel.

Fuel Tank

The generator shall have its own diesel tank that shall run for 6 hours at full load. There will be an additional external 500 litre tank nearby the site.

All fuel pipes shall be hot dip galvanised with appropriate bends to provide an expansion facility and flexible connections with armoured covering for vibration isolation at the engine. Copper shall only be used from the primary filter to the engine pump.

Fuel / Water Separator

A fuel / water separator unit with automatic water dump feature shall be installed in the fuel line from the tank to the diesel engine and shall be mounted above the engine drip tray. The unit shall be of the Duvalco Mk3 DSF type with 10 micron filter cartridge and have a flow rate of +/- 4 litres/min.

Governor

The speed of the engine shall be controlled accurately by a mechanical governor complying with class A1 to BS 5514 such that when full load is suddenly switched off the temporary increase in speed will not exceed 10% above 1500 rpm. The permanent speed variation shall not exceed 2½% of the nominal engine speed. Manual adjustment must be provided on the engine to adjust the normal speed setting. Engines delivering an output **650 KVA** shall be provided with an electronic governor where the engine is electronic.

Flywheel

A suitable flywheel must be fitted that is large enough to prevent any visible flicker in the lights. The cyclic irregularity of the set must be within the limits specified in BS 5514. The fly wheel must be covered/enclosed.

Silencer and Exhaust System

The complete exhaust system shall be made of stainless steel.

A residential exhaust silencer (to 65 dB (A)), muffler companion flanges, and flexible stainless steel (suitable for coastal conditions) bellows-type exhaust fitting properly sized shall be furnished and installed according to the manufacturer's recommendation. The generator set should be sound attenuated to achieve an ambient sound level 79dB(A) at 7 metres from the plant. The exhaust pipe shall be secured by flanges both sides of the wall of the plant room at the point of exit and shall extend



0,5m above the room gutters and must be fitted with a weather flap. Exhaust pipes through canopy walls must be flanged where it penetrates the canopy wall to permit ease of removal of the canopy. The exhaust pipe must be flexibly connected to the engine to take up vibrations transmitted from the engine. The exhaust pipe and silencer must be lagged inside the generator room to reduce heat and noise transmission.

The silencer shall be mounted so that its weight is not supported by the engine nor will exhaust system growth, due to thermal expansion, be imposed on the engine penetration. Exhaust pipe size shall be sufficient to ensure that exhaust back pressure does not exceed the maximum limitations specified by the engine manufacturer.

The muffler and all indoor exhaust piping shall be lagged by the installing Contractor to maintain a surface temperature not to exceed 150°F (65.5°C). The insulation shall be installed so that it does not interfere with the functioning of the flexible exhaust fitting. Insulation between the manifold and silencer shall be double 25mm layers of FIBREFAX and the silencer and piping to the outer wall insulated using 50mm thick wire backed INSULWOOL of at least 80kg density. The insulation shall be cladded under tension and riveted with 3mm stainless steel rivets. The cladding shall be 0,7 mm thick 430 stainless steel.

ALTERNATOR

Alternators shall be manufactured in accordance with BS 5000. Unless otherwise specified, the alternator shall be of the self excited brushless type enclosed in a ventilated drip-proof housing, and must be capable of supplying the specified kVA continuously with a temperature rise not exceeding the limits laid down in BS 5000 for rotor and stator windings having 'Class H' insulation.

The alternator shall be capable of delivering an output of 110% of the specified output, for 1 hour in any period of 12 hours consecutive running.

The alternator windings will be suitably impregnated and tropicalised to withstand the specified climatic conditions. Alternators shall be of the low harmonic type. An alternator heater will not be required. Contractors are to list the number of similar installations operating in similar climatic conditions.

Regulation

Since the alternator set could be installed in an area where maintenance staffs are not readily available it is essential to offer regulating equipment which is simple and robust in construction. Complicated equipment requiring specialised knowledge will not be considered.

The alternator shall be self regulated and the voltage regulation limits shall not exceed $\pm 1\%$ of the nominal specified voltage, under all load conditions and at the specified power factor, while the engine speed "droop" variations between no load and full load shall not exceed $4\frac{1}{2}\%$.

Performance

The excitation system shall be designed to promote rapid voltage recovery following the sudden application of full load. The voltage shall recover to within $2\frac{1}{2}\%$ of the steady state within 300 milliseconds following the application of full load and the transient voltage dip shall not exceed 15%.

Coupling

The engine and alternator must be directly coupled with a high class quality flexible coupling which is designed to cope with the most severe torque changes, due to instantaneous load changes in the alternator from no load to full load. The flexible coupling shall be of the HOLSET type or equal and similar.

Computer Power Supply

The Contractor shall ensure that the output has low harmonic distortion and voltage regulation of less than 4%.

AUTOMATIC MAINS FAILURE PANEL

The panel will incorporate all of the specified control and protection equipment required to operate and protect the alternator. Control units must be supported by GSM and have modem support with auto-call function for e-mail or SMS sending. It is important that the equipment used in the control panel has a history of use in RSA and that parts are readily available off the shelf.

The visual and audible alarms, battery-charging unit and mains failure sensing relays will also be incorporated in the panel. All instruments are to be flush mounted.

Where solid-state equipment is used for control circuits etc, these shall be of the printed circuit board design, which can be easily unplugged and replaced with standard replacement cards in the event of failure, testing etc. Spares of these PCB cards etc must be available at all times from the supplier of the emergency equipment.

The *Project Manager / Engineer* must approve the panel manufacturer's detailed working drawings of the assembly before any fabrication commences. Any other construction or type of assembly proposed as an alternative to that specified must have the approval of the *Project Manager / Engineer* in writing. The drawings will detail all dimensions of busbars, connections, electrical component make, type and rating.

Positions and layout of busbars, earth bars and gland plates will be shown in front and side elevation drawings.

All panel and equipment shall to be designed in accordance with SABS IEC 60439-1 and SANS 1973-1-2 and shall be suitable for operation on supply voltages of 230/400 Volts, 50 Hz, AC.

Panels designed for plant within plant rooms shall generally be of a floor standing cubicle type assembly, suitable for top and bottom cable entries. Schematic drawings will show the specific requirements applicable to each assembly.

Panels designed for plant shall be mounted on the base frame of the plant and provided with vibration isolation from the generator set.

The entire assembly shall be of strong and rigid construction with suitable folded 3CR12 stainless steel frame work, totally enclosed by means of removable 3CR12 stainless steel covers and hinged 3CR12 stainless steel doors where required. The entire assembly shall be manufactured from 3CR12 sheeting of a minimum 2mm thick.

The overall outside dimensions of the assembly shall be suitable for easy handling of the switchgear as indicated on the drawings. The height of the assembly shall generally not exceed 2 100mm above floor level.

All removable covers shall be secured in position by means of patent screw locking devices approved by the *Project Manager / Engineer*. All panels shall be suitably braced to ensure rigidity. Identification labels in accordance with the specification will be screwed to the front of each door on the panel. The label will describe the purpose of the equipment contained within each compartment. All hinges and door handles shall be of the bolted-on type and shall be manufactured from non-ferrous materials or stainless steel, suitably finished and treated against corrosion by an electro-plating process. All hinges are to be of the lift-off type and samples shall be submitted to the *Project Manager/Engineer* for approval.

Hinges and door locks shall be of approved SABS quality to ensure satisfactory operation and a pleasant appearance, and where possible the lock and door catch shall consist of one combination unit.

Door latching and de-latching operations shall be smooth and quick, whilst ensuring proper compression of the sealing gaskets.

The repeated opening and closing of the hinged doors and the operations of the door locks and catches shall not cause chipping or scratching of the painted surfaces or any other blemishes to the finished panels.

Each lock shall have two keys, and where more than one locked panel is specified the locks shall be in one master series. All keys, plus one master key, shall be handed to the Department for which a receipt shall be obtained. One master key shall in addition, be handed to the TNPA representative (Consultant).

All keys submitted by the Contractor shall be suitably tagged with the panel designation and location.

Bolts, nuts and washers used throughout the panel shall be of stainless steel with the exception of busbar bolts, nuts and lock-washers which shall be of stainless high tensile steel or high tensile phosphor bronze material.

All screws, bolts, door locks, etc must not be in direct contact with painted surfaces, to avoid sticking or damage to the paintwork.

The 3CR12 panel shall be epoxy powder coated Red (Colour VEP 2002).

This inside of the cabinet door shall be fitted with a suitable holder for the schematic control diagrams, schedules of equipment of the method of operation specification.

All busbars shall comply with the requirements laid down in SANS 1195. The completed busbar system shall be a standard modular system and shall have been tested to SABS approval and a certificate shall be made available confirming the full busbar technical description, current rating and fault rating together with full details of the test results. Busbars shall be rigidly supported by means of approved insulated busbar clamps to prevent damage resulting from the specified short circuit conditions,

Solid high conductivity copper busbars shall be rigidly mounted in the top section of the switchpanel. The busbars must be rated for the continuous full load current, as stated, at a current density not exceeding 1,60 Amps per mm².

If a relaxation of SANS 1973 is agreed to permit the drilling of holes, the cross-sectional area as measured is to be reduced by the area of the holes.

The busbars shall run along the entire length of the assembly up to 76mm from either end, and the incoming collector bars shall be fitted directly below the main circuit breaker or incoming HRC fuse unit.

Sufficient space must be allowed for the connection of all the incoming cables as specified. All busbars shall be identified in the phase colours red, white and blue.

The busbars shall be arranged horizontally with the longer side of the cross-sections in the vertical plane and one behind the other in the horizontal plane at 90mm centres.

All connections and extensions to busbars shall be effected by means of high tensile phosphor bronze nuts, bolts and washers or cadmium plated, high tensile steel bolts and nuts which shall also be provided for future extensions. The minimum diameter of any hole will be 10 mm.

A solid copper earth bar shall be provided inside each assembly at the back and along the entire length, at a height of approximately 500mm above floor level, or 200 mm above the gland plates. A bar is to be provided at the top of the assembly where top entries exist and this shall be solidly connected to the bottom earth bar.

The bar will be supported on robust spacers and will have a minimum clearance of 40mm to the sheet steel panel.

The earth bar shall have a cross-section of not less than 40mm X 6mm and shall be drilled with the requisite number of holes for the individual connection of all cable ECC and other earth conductors.

High tensile phosphor bronze or cadmium plated nuts, bolts and lock washers shall be provided through the earth bar at each earthing position and at least 5 additional holes will be provided for future connections, each being fitted with nuts and bolts as above.

The earthing positions shall be evenly spaced along the length of the earth bar and the bar must be clearly identified as the earth.

Alternator Protection

Small alternators shall be protected by a triple pole MCB or air circuit breaker with instantaneous short circuit trips and adjustable thermal overload protection of the correct characteristics which shall be provided on the front of the panel. The settings of this unit will ensure that the alternator is adequately protected against all short circuit conditions. Alternatively, on small alternators, fuse protection may be used in conjunction with a phase failure monitor.

Larger alternators shall be protected by an adjustable electronic circuit breaker.

Parallel Operation

Should parallel operation with other sets or any supply network be specified, it must be possible to synchronise such machines without creating any undue shock or fluctuating conditions.

Alarm and Protection Equipment

Alarm relays with re-set push buttons are required to give visible and audible alarm signals to protect the plant by shutting it down before any permanent damage results. The visual indication will remain uncanceled until the problem causing the trip has been returned to normal.

The protection required will be:

- OVERLOAD
- TEMPERATURE HIGH
- LOW OIL PRESSURE
- OVER SPEED
- UNDERSPEED
- START FAILURE
- LOW WATER LEVEL
- In addition, one DIESEL FUEL LOW level alarm and indication as well as one BATTERY/CHARGER FAILURE alarm and indication must be provided which does not trip the engine. Provision must be made for both these items to be remotely alarmed.
- FUEL TANK EMPTY – to trip the engine before the fuel runs out completely so as to avoid bleeding the engine on refuelling. The lights and associated push buttons will be engraved accordingly.

One common hooter (Klaxon type SY2/725) and red flashing light is required to be mounted on the outside wall of the plant room with the alarm cancel button mounted on the control panel. The alarm system must be supplied from the starting battery.

Provision is also to be made for remote alarm indication and remote cancellation in the charge office. A remote alarm panel shall be supplied and installed in the charge office with a connecting 2,5mm² 4 core pvc/swa/pvc cable from the generator control panel. The remote alarm panel shall incorporate a mains on and generator on and not in auto indicators, a low fuel, low battery, start fail, and genset fault indicators and relays as well as an electronic sounder (with low sound level) and a silence button. The silence button shall not switch off the pilot lights – pilot lights can only be switched off when the fault has been cleared at the generator panel.

Start and Stop Delay Timers

Where connected to a rural supply system with auto-reclosing protection, an adjustable timer (0-180 sec) will be fitted to prevent starting as a result of transient faults. The engine control system is also to be fitted with an adjustable timer (0-3 minutes and set on 1 minute) which will keep the engine running on load for a pre-set time after the mains power has been restored to normal. An additional timer (0-10 minutes and set on 8 minutes) will keep the engine operating on no load for its 'run-down' period. It shall be possible for the set to take load again without adverse effects.

Operation Selector

A four-position selector switch is to be provided on the AMF panel to select the mode of operation, which could be – 'Auto', 'Manual', 'Test' and 'Off'.

With the selector in the 'Auto' position, the set is to automatically start and stop, according to the mains supply condition.

In the 'Test' position the engine shall be capable of being manually started and stopped without the alternator picking up any electrical load, to ensure that starting equipment, battery etc. are in operational condition. This routine will be repeated every week and a logbook recording this fact must be provided in the plant room.

With the selector in the 'Manual' position, the set must pick up the electrical load when started but it must not be possible for this supply to be paralleled with authorities supply. A change over relay/contactors is therefore to be provided in the main distribution board.

In the 'Off' position the set shall be completely isolated and cannot be started manually or automatically. This setting will be used for maintenance of the machine only.

Battery Charging

The AMF panel is to include a fully automatic battery-charging unit to keep the battery at its optimum condition at all times. The preferred charger unit is the LAVATO model BCE or equal and approved. The system shall ensure that the batteries are not overcharged by being permanently connected to the charging system. The charging current must reduce to 30% when the battery voltage is above 50%. The charging circuit must be able to inhibit:

A short circuit at the battery charger terminals

Inverse battery polarity

Low battery charge ($< 0.2 U_c$)

The output current of the charger shall not be less than 3 amps at 12 volts.

An alarm relay output will be required.

Fuse protection must be provided on the input supply and on the battery output.

An ammeter and voltmeter suitably scaled to indicate the trickle charging supply will be flush mounted in the front panel. The voltmeter will operate by depressing a spring loaded push button and will not remain in the circuit continuously.

Panel Equipment

The following items of equipment will be fitted to the panel:

- One flush mounted 72mm x 72mm PCI voltmeter scaled to the specified voltage to read all phase-neutral voltages.
- One 7 way voltmeter selector switch to suit item 7.7.1 above.
- One 72mm x 72mm frequency meter showing alternator frequency.
- One run hour meter with cyclometer counter showing the actual running hours of the engine.
- 3 - 2 amp HRC fuses for the voltmeter circuit, including spare fuses.
- 3 - 72mm x 72mm maximum demand indicating ammeters scaled to the specified maximum load current, complete with current transformer, to indicate the current in each phase of the alternator.

- One phase rotation indicator.
- One suitable rated main isolating switch to isolate the complete board.
- One adjustable type triple pole MCB or air circuit breaker rated to protect the alternator.
- One four-position selector switch as specified.
- One emergency stop push button behind a hinged cover.
- Two push buttons (green and red) marked 'Start' and 'Stop' for test operation.
- One complete battery charger with instrumentation to be operated from the mains supply.
- One alternator charge indicator with 30-amp deflection.
- One start-delay timer.
- One stop-delay timer.
- Relays and reset push buttons for engine protection with spare lamps.
- One lube oil pressure gauge and relay with shutdown for low pressure.
- One low fuel level relay device and spare lamps.
- One fuel tank empty cutout relay and spare lamps.
- One low water level relay device and spare lamps.
- One battery/charger relay device and spare lamps
- One 12 Volt DC. Hooter/alarm with protection fuses, cancellation button, etc and terminals for the operation of a remote alarm.
- One push button for manual start operation.
- One set of terminals and all interconnecting wiring including earth connections.
- One on-load by-pass switch in separate cubicle as specified.
- One spring-reserve seasonal time switch or photocell.
- Surge arrestors for all 3 phases and the neutral.
- Any other equipment necessary for the correct and safe operation of the installation.

Marking

All instruments, lights, push buttons etc are to be provided and will be marked with Trafolyte engraved labels, screwed to the panel. The lettering shall be 6mm high. All labels will be in English and any other Official Language as directed by the TNPA representative (Consultant).

All engine instruments shall have clear markings on the faceplates, indicating the normal operating zone(s). Maximum and minimum allowable values/limits and danger zone(s).

The base frame or other suitable location shall be marked with the recommended oil type to be used in the engine.

Change Over System

The main switchboard shall be divided into two sections for 'mains supply' and 'mains/emergency generator supply'. Two specified three pole contactors rated for AC3 operation or two motorised circuit breakers shall be incorporated in the switchboard to facilitate the automatic change over of supplies, but they shall be electrically and mechanically interlocked to prevent the generator from running in parallel with the mains supply.

An engraved plastic danger notice is to be prominently fixed on the switchboard stating that "This switchboard can be automatically energised from the emergency generating set."

By-pass Switch

The main switchboard must be equipped with a manually operated on-load by-pass switch, which shall connect the incoming mains to the automatic control gear or directly to the outgoing feeder. In the latter position, the automatic control gear, including the main contractors, shall be isolated for maintenance purposes. A triple pole on-load isolator is to be provided to isolate the mains. It shall not be possible to start the engine except with the selector switch in the "Test" position.

It is required that this by-pass switch and mains isolator be mounted away from the automatic control gear in a separate compartment either on one side or in the lower portion of the switchboard and that the switches are operated from the front of the cubicle.

EARTHING & LIGHTNING PROTECTION SYSTEM

The system shall comply with the relevant requirements of the following specifications.

- SANS 10313 : Protection of structures against lightning
- SANS 10199 : Design and installation of earth electrodes
- SANS 1063 : Earth Rods and Couplers

Only SABS approved earth rods and couplers bearing the SABS mark must be used.

Earthing

The neutral of the system and the alternator must be solidly earthed. The Contractor shall provide a 500 x 50 x 6mm thick copper bar fixed to the plant room wall on two insulators rated at 500V. The earth mat shall consist of 70mm² bare standard copper conductor and 4 or more 1500mm long x 16mm diameter earth spikes to achieve a maximum resistance of 10 OHMS. The earth mat shall be spaced 4 metres from the plant room. Two 70mm² insulated copper conductors shall connect the diagonal ends of the earth mat and earth bar within the plant room.

Lightning Protection

Aluminium roof conductor shall be installed on the roof and bonded to a down conductor and then connected to the 1500mm long earth spike via 70mm² insulated copper conductor. Bi-Metallic connectors are to be made at all aluminium and copper connections. The lightning protection and earthing system shall be bonded to ensure that they are at the same potential

Suitable surge arresters must be installed on each phase and the neutral in the AMF control panel and connected to the earth bar.

WARNING NOTICES

A non-corrodable and non deteriorating engraved warning notice will be wall mounted in a conspicuous position reading:

“Danger: This engine will start without notice. Turn selector switch to ‘Off’ position before working on plant. (Do not forget to reset)”.

In addition all statutory notices required by the Occupational Health and Safety Act No. 85 of 1993, for the handling and generation of electrical equipment.

INSPECTION AND TESTING**General**

Because of the number of Contracts and the need for the project to function as a co-ordinated whole, particular emphasis will be paid to testing. No test will be recognised unless it is documented in a previously agreed format. The test procedure shall ensure that every combination of switches and events is tested for correct functioning and each such combination is recorded in a test sheet and checked off.

No plant or equipment may be energised until testing is complete and the results accepted by the *Project Manager/Engineer*.

The Contractor shall supply all test equipment and consumables.

The *Contractor* shall conduct tests at the following stages. The *Project Manager/Engineer* shall be advised of the tests one week in advance of the test dates.

- a) At manufacturer's work before equipment is released to site.
- b) During installation where testing is necessary
- c) Before final connections are made
- d) After installation is complete

After the tests are complete the Contractor shall compile and submit a report to the Representative/Agent (Consultant). After submission of the test report the Representative/Agent

(Consultant) may call for all or some of the tests to be repeated in his presence. Should any test be unsatisfactory at this time the Representative/Agent (Consultant) reserves the right to have his reasonable abortive costs deducted from the contract sum.

Inspections during Manufacture

The *Project Manager/Engineer* shall have access at all reasonable times to any works where materials are being manufactured for the purpose to the contract and shall be at liberty to inspect the manufacture at any stage and to witness the carrying out of the specified tests. Every reasonable facility and assistance shall be provided by the Contractor and/or his supplier for the purpose of such inspection by the Representative/Agent (Consultant) or his representative. The Representative/Agent's (Consultant) may reject at any stage of manufacture any material which does not comply with the specification or such modifications thereof as have been agreed by the Representative/Agent (Consultant).

Factory Testing

It shall be the responsibility of the *Contractor* to carry out such factory tests as are practicable to ensure that all plant, equipment and components supplied under this Contract comply fully with the relevant specifications and can function as intended. Dummy load tests of the alternators full rated output shall be carried out in the suppliers workshops prior to the plant being despatched to site.

Inspection on Arrival at Site

On delivery direct to the erection position or to the storage area, the plant and equipment shall be inspected by the *Project Manager/Engineer* and the Contractor or his agent. The *Project Manager/Engineer* shall be at liberty to carry out any tests he may deem fit before acceptance.

Payment for delivery to site shall not be made until the relevant items of plant and equipment have been inspected and accepted by the *Project Manager/Engineer*.

Repairs to Damage

Damage or defects of any kind, which become apparent on inspection or delivery, shall be repaired by the supplier of such items to the satisfaction of the Representative/Agent (Consultant) immediately upon detection. Where damage is such that, in the opinion of the Representative/Agent (Consultant), satisfactory repairs are not practicable, the damaged articles shall be replaced at no cost to the Department which shall accept no responsibility for any loss or damage which may be suffered as a result of delays in obtaining the necessary replacements.

Testing After Installation

On completion of the installation of all plant and equipment the Contractor will be required to make appropriate arrangements and supply any instruments or apparatus etc. necessary for the testing of all plant and equipment supplied by the Contractor. Testing shall be in the presence of the Representative/Agent's (Consultant's) representative in order to demonstrate compliance with the requirements or the specification.

All load resistance equipment and instruments including fuel oil will be provided by the Contractor and test reports in duplicate for both series of tests will be submitted to the Representative/Agent (Consultant) within 7 days of such tests.

Site tests must include function tests of all operating systems and protection devices.

**Insulation Testing**

Before starting the generator set after installation, test the insulation resistance of the alternator windings. The automatic voltage regulator (AVR) must be disconnected and the rotating diodes either shorted out with temporary links or disconnected. Any control wiring must also be disconnected. A 500 volt Megger or similar instrument should be used. Disconnect any earthing conductor connected between neutral and earth and megger an output terminal to earth. The insulation resistance should exceed 5 megger ohm to earth. Should the insulation resistance be less than 5 megger ohm, the winding must be dried out.

COMMISSIONING

Commissioning shall proceed in accordance with a previously agreed procedure which shall be documented and which shall form the basis of the commissioning report.

During commissioning the operating parameters of each piece of equipment and each device shall be established and recorded at no-load, average and full load conditions.

The final set of points of all adjustable devices shall be recorded.

The Contractor will be required to make appropriate arrangements, and supply the necessary instruments and apparatus, etc., for the testing of all plant and equipment, in the presence of the Representative/Agent's (Consultant's) representative in order to demonstrate compliance with the requirements of the specification.

The *Project Manager/Engineer* may require valid calibration certificates to be submitted to cover any meters, gauges, or other instruments used in the tests and may, if considered necessary, arrange for the use of additional meters or other instruments in order to establish the degree of accuracy of the tests.

The *Contractor* shall be responsible for performing all tests on completion and shall provide the services of an approved Commissioning *Project Manager / Engineer* and all necessary skilled and unskilled labour, as well as the required tools and test equipment. The *Project Manager / Engineer* shall approve the procedure for carrying out the tests on completion and shall witness all tests and shall approve any adjustments or modifications necessary to achieve satisfactory operation.

The *Project Manager / Engineer* shall also witness and approve the tests for demonstrating the plants ability to meet the specified duty. Should the *Contractor* fail to provide the necessary staff to undertake the tests on completion timeously or efficiently, the *Project Manager / Engineer* may, in order to meet the programme for start-up, make arrangements to have the outstanding duties undertaken by others for the *Contractor's* account.

Load Balancing

It is important to ensure that a balanced load is presented to the generator set. If loading in one phase is substantially higher than the other phases, it will cause overheating in the alternator windings, imbalance in the phase to phase output voltage and possible damage to the sensitive 3 phase equipment connected to the system. Ensure that no individual phase current exceeds the current rating of the generator set. For connection to an existing distribution system, it may be necessary to reorganise the distribution system to ensure these loading factors are met.

SAFETY PRECAUTIONS**Protection of Persons and Plant**

Due cognisance shall be taken of the need to provide adequate protection of persons and plant, from accidents arising or likely to arise from whatever source. To this end, all units of plant which may possibly be subject to damage or become a source of danger to human life either in itself or by virtue

of its operation shall be adequately protected as laid down in the Occupational Health and Safety Act No. 85 of 1993.

Appointment of Responsible Person

(a) The Contractor shall cause all work to be carried out under the general supervision of a responsible person appointed by the Contractor in writing in accordance with the provisions of the General Safety Regulation R.11. Supervision of any work; made in terms of the Occupational Health and Safety Act No. 85 of 1993.

(b) A copy of the letter of appointment and of the appointee's written acceptance thereof, shall be lodged with the Representative/Agent (Consultant).

(c) Work on site shall not commence until the documents referred to in sub-clause (b) have been received by the Representative/Agent (Consultant).

(d) Due cognisance shall be taken by the Contractor of Regulation 5 "Work in Confined Spaces", of the O.H.S.A. Regulations and further to this no clearance certificates shall be given by this Department.

Precautions shall be taken to avoid safety and health hazards to workmen. The Contractor shall be responsible for supplying protective clothing etc. for use of the workmen.

DEFECTS LIABILITY PERIOD

The Contractor shall be responsible for the initial routine maintenance and provision of all lubricants, etc., until such time as the plant and equipment is capable of fulfilling its specified operational duties. Once the plant and equipment has been successfully commissioned and accepted, the Contractor's staff will undertake the routine maintenance of the plant and equipment for a period of 12 months in accordance with operating procedures and routine maintenance requirements to be furnished by the Contractor prior to acceptance.

The Defects Liability Period shall commence concurrent with the guarantee period.

All cos of servicing and maintenance during this period is to be included in the tender price.

Under the agreement the Contractor will arrange for qualified maintenance staff to visit the plant once every three months and shall, in the presence of the Officer –in-Charge:

- Enter into the log book the date of the visit, the tests carried out, adjustments made and any further notes concerning the condition of the plant and its operation. Also log the hour meter reading.
- Lubricate, grease all moving parts and check and clean all items of equipment as specified in the quarterly maintenance schedule addendum "A" and in accordance with the manufacturer's instructions. Replace all fuel filter cartridges.
- The plant to be tested for automatic starting by simulating a mains failure, and run on maximum possible load for at least half an hour. During this test all mechanical and electrical equipment will be checked for correct operation. All trip alarms and change over relays will be tested for correct operation. All necessary adjustments will be made and recorded in the log book.

Should the Contractor find **any** item which may require replacing due to fair wear and tear or any item which has become unserviceable for the same reason, he will immediately report this matter and submit a quotation in writing to the Representative/Agent (Consultant), detailing the cost of such repair.

The Contractor will advise when it becomes necessary to decarbonise the engine and will indicate the cost of this service.

After the expiry of the 12 month guarantee/defects liability period the Contractor will be required to maintain the generator sets and associated equipment for a further 2 year period.

GUARANTEE

The Contractor shall guarantee all plant, equipment and fittings supplied by him and installed under this contract for a period of **twelve months**. The guarantee shall include any latent defects in the plant, equipment, fittings and installation thereof and any labour or other costs inherent in repairing any defects and ensuring that the plant, equipment and fittings remain free of defects and in good working order to the satisfaction of the Representative/Agent (Consultant).

This guarantee shall not be applicable to existing plant and equipment previously installed by others. Fair wear and tear shall not be considered as requiring any action by the Contractor under the requirements of the contractual guarantee.

Inspection of the plant shall be made by the Contractor in the presence of the Representative/Agent (Consultant), at suitable intervals, to confirm that the plant is operating in a satisfactory manner.

Provision, as required, shall be made in the contract rates, or elsewhere, for any additional costs incurred in providing this contractual guarantee.

TRAINING AND INSTRUCTION

On completion of the installation on site, the Contractor will be required to instruct the Staff member-in-Charge in the safe and satisfactory operation of the plant and will ensure that he/she is fully conversant with the equipment.

INSTRUCTION MANUALS

Three (3) copies of the operating and maintenance manuals shall be provided on delivery of the plant and equipment. These shall come in the form of plastic covered ring files with the following information indelibly printed on their covers.

OPERATING AND MAINTENANCE INSTRUCTIONS FOR THE
GENERATOR SET AT
Port of Mossel Bay - TNPA

SUPPLIED BY

(Name, address, email, telephone and fax number of Contractor).

Each page, pamphlet, booklet, diagram, drawing etc. shall be separately bound into the manuals in a clear plastic pocket. Each pocket shall be numbered and indexed.

The first page of each set of manuals shall be an index which shall include a list of the numbers and descriptions of all drawings and pamphlets included in the set and also a list of the Representative/Agent (Consultant)'s drawings relating to the relevant sections of the Contract.

The instructions shall include the following:

- a. A list of spares, tools and testing equipment supplied under the Contract.
- b. A list of spare parts and testing equipment which are not supplied under the Contract but which may be required for future major overhaul and/or testing of electrical plant and equipment.
- c. For (a) and (b) above for spares, tools and testing equipment the Suppliers' names, addresses, telephone numbers, fax numbers and costs must be listed.
- d. List of "Name Plate Data" giving full particulars of serial numbers and other descriptive data pertaining to the plant and equipment installed.
- e. List of points requiring lubrication, stating for each point the type and grade of lubricant recommended and full details as to quantity, timing and renewing of lubrication. Before typing the manuals, the Contractor shall contact the Representative/Agent (Consultant) to obtain the name and brand of lubricants generally in use by the Representative/Agent (Consultant) and, wherever possible, suitable grades of lubricant of that particular brand shall be nominated by the Contractor in the manuals.
- f. Particulars of bearings, contacts and other moving parts with instructions relating to any special attention which may be required.
- g. Precautions to be taken in starting, running and stopping the plant or equipment by remote or manual control.
- h. Routine tests which the Contractor/Supplier(s) would suggest be carried out.

All information mentioned above shall be cross-referenced to the drawings.

Additionally the manuals shall provide the following information which shall also be cross-referenced to the drawings:

- All technical and other information, in English, concerning the equipment.
- Equipment layout drawings.
- Power single line diagrams.
- Control schematic diagrams.

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

- Narrative description of the control circuit operation.
- Fault finding routines.
- Routine maintenance instructions, procedures and frequencies.
- Equipment and component specification sheets.
- List of equipment and components including manufacturer, catalogue number and suppliers address, fax and telephone numbers.
- Instrument data sheets
- Cable block diagram
- Cable schedules
- Termination schedules
- Issue a certificate of compliance for electrical installations signed off by a currently registered Installation Electrician.

Copies of all computer generated drawings compatible with Autocad version 2002 shall be submitted to the Department on a Compact Disk.

Further one (1) set of drawings relevant to a particular generator and a hard covered A4 size log book shall be placed in a weatherproof glass fibre enclosure adjacent to the generator. This enclosure shall be electric orange in colour, be sized to accommodate drawings folded to A4 format, be labelled "Electrical Drawings" and shall have provision for fitting a standard padlock.

SAFETY ARRANGEMENTS AND PROCEDURAL COMPLIANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993) AND APPLICABLE REGULATIONS.

- The Contractor shall accept his obligation to complying fully with the Act and applicable Regulations and with Transnet safety requirements.
- The Contractor shall provide a written Health and Safety plan, the file shall be approved before starting with the work
- The Contractor shall keep a safety file at all times.
- The Contractor shall keep a site diary and instruction book.
- The Contractor shall attend Transnet safety induction training before starting with the work.

ENVIRONMENTAL RESPONSIBILITY.

- The Contractor shall separate hazardous or non-hazardous waste and where practical, waste for recycling prior to disposing thereof.
- The Contractor also undertakes to minimize the amount of waste generated or released, whether it is hazardous or non-hazardous waste, as far as possible to reduce the impact on the Environment.

The *Contractor* undertakes to dispose of all waste generated, albeit hazardous or non-hazardous waste in a responsible manner and submit proof of all disposal documents to the *Project Manager / Engineer*.

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

ADDENDUM "A"

GENERATOR : 3 MONTHLY MAINTENANCE
(STANDBY PLANTS)

ITEMS CHECKED TO BE TICKED OFF

[1]	CHECK AND TOP UP WHERE NECESSARY (SPECIFY TOTAL QUANTITY). EXCESS OF 10 LITRES WILL BE REIMBURSED	YES	NO	[5]	VISUAL INSPECTION OF ELECTRICAL APPARATUS	YES	NO
A	CRANKCASE OIL (QTY)			A	LV CABLES IN ORDER		
B	INJECTOR BOX OIL (QTY)			B	LV CABLE TERMINATIONS IN ORDER		
C	RADIATOR			C	ALL LV SWITCHGEAR COVERS & PANELS INTACT		
				D	ALL SWITCHGEAR INTACT		
[2]	CHECK FUNCTION ADJUST, TIGHTEN AND LUBRICATE (WHERE NECESSARY)			E	SWITCHES / CIRCUIT BREAKERS IN "ON" POSITION		
A	FUEL PUMP TIMING			F	ARE CIRCUIT LEGENDS AVAILABLE?		
B	PUMP DRIVE			G	ARE CIRCUIT LEGENDS COMPLETE?		
C	OIL FEED PUMP			H	ARE CIRCUIT BREAKERS PROPERLY LABELLED?		
D	EXCESS FUEL DEVICE			I	TIME SWITCHES / SET ACCORDINGLY?		
E	GOVERNOR			J	ARE INDICATING PANEL LIGHTS WORKING? IF NOT INDICATE QUANTITY REPLACED		
F	TURBO CHARGER			K	CHECK SELECTOR SWITCH IN ALL POSITIONS		
G	HEAT EXCHANGER			L	CHECK ALARM ENGINE SHUTDOWN FUNCTION ON :		
H	FAN BEARINGS				LOW FUEL WARNING		
I	DYNAMO BEARINGS				START FAILURE		
J	STOP SOLENOID			M	CHECK ALARM ENGINE SHUTDOWN FUNCTION ON :		
K	HAND / ELECTRIC DAY TANK PUMP				HIGH TEMPERATURE		
L	LUBRICATING OIL FILTER ELEMENT				LOW OIL PRESSURE		
					OVER-SPEED		
[3]	CHECK CONDITION, TIGHTEN (WHERE NECESSARY)			N	TEST PLANT FOR 30 MIN ON FULL LOAD		
A	RADIATOR CORE			O	CHECK AND RECORD THE METER READINGS		
B	RADIATOR HOSES				3PH..... PH1.....V PH2.....V PH3.....V		
C	RADIATOR PRESSURE CAP / VALVE				 A A A		
D	WATER HEATER ELEMENT & THERMOSTAT			P	RESET ALL MAXIMUM DEMAND AMMETERS		
E	VEE BELTS						
F	ENGINE MOUNTING			[6]	CLEANING		
G	ENGINE / ALTERNATOR COUPLING			A	CLEAN AIR CLEANER DRY ELEMENT & BATH		
H	EXHAUST SILENCER & PIPES			B	CLEAN FINS AND OIL COOLER		
I	DAY TANK CONDENSATE			C	CLEAN ENGINE		
				D	CLEAN DRIP TRAYS (WHERE FITTED)		
[4]	CHECK FOR LEAKS & TIGHTEN (WHERE NECESSARY)			E	CLEAN DAY TANK AND GAUGE GLASS		
A	DRAIN PLUG						
B	OIL LINES AND SEALS			[7]	DUST AND CLEAN		
C	FUEL LINES AND SEALS			A	DOORS AND FRAMES		
D	INJECTOR SEALS			B	WINDOW PANES AND FRAMES		
E	ALL PACKING SEALS			C	WINDOW GUARDS		
				D	WINDOW CILLS		
				E	WALLS AND CEILINGS		
				F	CABLE DUCTS		
				G	LV SWITCHGEAR		
				H	LV DISTRIBUTION BOARD / CONTROL PANEL		

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

[1]	CHECK AND TOP UP WHERE NECESSARY (SPECIFY TOTAL QUANTITY). EXCESS OF 10 LITRES WILL BE REIMBURSED	YES	NO	[5]	VISUAL INSPECTION OF ELECTRICAL APPARATUS	YES	NO
[8]	INSPECTION & ATTENDANCE TO SUNDRY ITEMS	YES	NO	[10]	CLEAN AND OIL	YES	NO
A	CABLE DUCT COVERS TO BE IN POSITION			A	DOOR HINGES		
B	WARNING SIGNS IN POSITION ON OUTSIDE DOOR			B	DOOR LOCKS		
C	WARNING / FIRST AID SIGNS IN POSITION ON INSIDE OF PLANT ROOM						
D	FIRE EXTINGUISHER PRESENT AND SERVICABLE						
[9]	REPORT UNDER REMARKS THE CONDITION			[11]	CLEAN AND POLISH		
A	DOORS (HINGES, LOCKS, ETC.)			A	PLANT ROOM FLOORS		
B	WINDOWS INCLUDING GLASS, CILLS, ETC.						
C	YARD FENCING AND GATES (WHERE APPLICABLE)			[12]	REPLACE FUEL FILTER CARTRIDGE		
D	WALLS (ANY CRACKS?)			A	CHANGE FILTER CARTRIDGE - EVERY 3 MONTHS		
E	ROOFS (ANY LEAKS?)						

Contractors are to note that all maintenance to Nickel Cadmium Alkaline batteries, charging equipment and accessories are to be in accordance with the manufacturer's requirements. Any loss or damage to the equipment through negligence on the Contractor's part will be for his account.

[13]	BATTERIES AND CHARGERS	YES	NO	CELL NO	Volts	Specific Gravity (SG)	YES	NO
A	CLEAN BATTERY / CONTAINER / STAND AND TERMINALS WITH LUKE WARM WATER AND DRY OUT			1				
B	NEUTRALISE CORROSION WITH BICARBONATE OF SODA SOLUTION			2				
C	TOP UP ALL CELLS WITH DISTILLED WATER			3				
D	CHECK SPECIFIC GRAVITY OF ELECTROLYTE IN EACH CELL WITH HYDROMETER			4				
E	CLEAN ALL BATTERY TERMINALS AND SPRAY WITH RED AND GREEN TERMINAL PROTECTOR SPRAY			5				
F	CHECK FOR LOOSE CONNECTIONS AND TERMINALS, TIGHTEN WHERE NECESSARY			6				
G	Ensure that battery charger is set on trickle charge			7				
H	15 AMP / VOLTMETER ON CHARGER OPERATIONAL			8				
I	IS TEST BUTTON ON CHARGER OPERATIONAL?			9				
J	CHECK INDICATION LIGHTS ON CHARGER AND REPLACE IF NECESSARY. INDICATE QUANTITY REPLACED (QTY)			10				
				11				
				12				

REMARKS : If answer is "NO" on any of the previous items, state action taken by yourself or to be taken by the Department

SERVICED BY _____ PRINT NAME	MODEL & SERIAL NO OF SET _____
SIGNATURE _____	LOCATION OF SET _____
COMPANY NAME _____	RUN TIME DURING TEST _____
DATE _____	RUN HR METER READING _____ Min.

RETURNABLE SCHEDULE OF RATES

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

Where rates are not included in the Schedules of Quantities, the following rates, which shall be inclusive of, profit, supervision, administration and transport charges, shall be used to assess the value of variations to the contract.

The *Project Manager* may, if he considers that the rates below are unreasonable, request their amendment prior to acceptance of the tender.

1. DIESEL ENGINE PLANT

[illegible]

SCHEDULE OF EQUIPMENT
EMERGENCY GENERATOR SET
TO BE COMPLETED FOR EACH MAKE OF NEW PLANT
1. ENGINE

1.1.	Manufacturer's Name	:	_____
1.2.	Country of Origin	:	_____
1.3.	Model Number	:	_____
1.4.	Continuous Sea Level Rating after allowing for Ancillary Equipment	:	_____ kW
1.5.	Percentage Derating for Site Conditions in accordance with BS 5514	:	_____
	(a) For Altitude	:	_____
	(b) For Temperature	:	_____
	(c) For Humidity	:	_____
	(d) Total Derating	:	_____
1.6.	Guaranteed Nett Output on Site	:	_____ kW
1.7.	Nominal Speed	:	_____ RPM
1.8.	Number of Cylinders	:	_____
1.9.	Strokes per Working Cycle	:	_____
1.10.	Swept Volume	:	_____
1.11.	Fuel Consumption of the Complete Generating Set on Site in kg/h/kW of Alternator output at:		
	(a) Full Load	:	_____
	(b) 3/4 Load	:	_____
	(c) 1/2 Load	:	_____

NOTE: A tolerance of 5% shall be allowed above the stated values of fuel consumption.

1.12.	Method of Cooling	:	_____
1.13.	Type of Radiator if Water Cooled	:	_____
1.14.	Method of Protection against High Temperature	:	_____
1.15.	Method of Protection against Low Oil Pressure	:	_____
1.16.	Minimum Time required for Assumption of Full Load	:	_____
1.17.	Are Performance Curves attached?	:	_____
1.18.	Make of Fuel Pump	:	_____
1.19.	Make of Fuel Filters	:	_____

2. Fuel Tank (Day Tank)

2.1.	Capacity	:	_____ litres
2.2.	Overall Height of Tank	:	_____ mm

2.3. Overall Width of Tank : _____ mm
 2.4. Overall Length of Tank : _____ mm

3. Fuel Tank (Bulk Storage Tank)

3.1. Capacity (litres) : _____ N/A
 3.2. Overall Height of Tank (mm) : _____ N/A

3.3. Overall Width of Tank (mm) : _____ N/A
 3.4. Overall Length of Tank (mm) : _____ N/A

4. Alternator

4.1. Manufacturer's Name : _____
 4.2. Country of Origin : _____
 4.3. Output Power (Full Load) : _____ kVA
 4.4. Nominal Speed : _____ rpm
 4.5. Type of Enclosure : _____
 4.6. Class of Insulation : _____
 4.7. Phase-Phase Voltage : _____
 4.8. Max. Full Load Current : _____
 4.9. Efficiency at specified P.F. and
 (a) Full Load : _____
 (b) 3/4 Load : _____
 (c) 1/2 Load : _____

5. Automatic Mains Failure Panel

5.1. Manufacturer's Name : _____
 5.2. Country of Origin : _____
 5.3. Type of Board : _____
 5.4. Main Busbar Size : _____
 5.5. Make of Volt, Amp and Frequency Meters : _____
 5.6. Ratio of Current Transformers: _____
 5.7. Make of Hour Meter : _____
 5.8. Rupturing Capacity : _____

6. Dimensions of Generator Set

6.1. Overall Length : _____ mm
 6.2. Overall Width : _____ mm
 6.3. Overall Height : _____ mm
 6.4. Overall Weight : _____ mm
 6.5. Minimum Recommended Dimensions for
 Generator Room:
 Length : _____ m
 Width : _____ m

TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

Height : _____m

7. Battery

- 7.1. Maker's Name : _____
- 7.2. Type of Battery : _____
- 7.3. Voltage of Battery : _____
- 7.4. Number of Cells : _____
- 7.5. Capacity : _____

NOTE: Under no circumstances will the tenderer be permitted to deviate from the materials specified above unless agreed in writing, by the *Project Manager*, prior to award of tender.

DATE: _____

SIGNATURE OF: _____

STANDARD SPECIFICATION FOR AN UNINTERRUPTABLE POWER SUPPLY

GENERAL DESCRIPTION

The uninterruptible power supply (UPS) system will consist of the following:

- 1.1 Rectifier/charger
- 1.2 Static inverter (for single phase system)
- 1.3 Associated control logic
- 1.4 Transformers, protective devices
- 1.5 Storage battery.

The equipment may be arranged into two separate housings, i.e. the UPS module consisting of items 1.1 to 1.4 and the battery or alternatively, for smaller units, all equipment and battery may be housed together in a tower case. The equipment shall comply with Transnet and telecommunications authorities RFI Regulations with regard to Noise Suppression (EM/RFI) and to SANS 1474.

OPERATION

Primary AC power is converted by the solid state rectifier/charger to DC which is used both to charge the battery and to provide input power to the inverter. The inverter converts the DC power to AC for use by the critical load. (Double conversion true on-line UPS).

Upon failure of the primary AC power, the inverter draws power directly from the battery bank to continue to supply AC power to the critical load without interruption.

Upon reinstatement of primary AC power, the battery is recharged while AC output power continues to be supplied to the critical load without interruption.

RECTIFIER CHARGER

For UPS units above 5kVA, the rectifier/charger is to consist of a 1-phase (in the case of a 1 phase UPS), controlled SCR bridge and LC filter, supplying the DC bus. The bridge must control both the output voltage and current. For smaller units the rectifier assembly may consist of a bridge rectifier feeding a charger that will regulate the voltage and current.

The rectifier must be able to operate at full capacity at nominal input AC mains voltage plus/minus 10% and nominal frequency plus/ minus 5%.

When mains is restored after an outage, the power drawn from the mains must be phased in from 0% to 100% over a period of 15 seconds - termed the "power walk-in" period.

The rectifier/charger must have sufficient capacity to supply the maximum output power of the UPS as well as recharging the battery from a fully discharged condition to 95% charge within ten times the discharge period. After the battery is recharged the rectifier/ charger must maintain the battery at full charge.

INVERTER

The inverter is to consist of solid state switching devices (GBT's or SCR's, dependent upon the output power).

These devices are to produce pulse width modulated waveforms, which are to be passed through a matching transformer and filter network to produce a smooth and uniform sine wave.

All power semi-conductor devices must be protected against over- current and transient over-voltage. The incoming supply neutral and outgoing supply neutrals may be commoned. Should total galvanic isolation be required, such as for hospitals or where earthing could be unreliable, then a double wound isolation transformer should be provided.

The inverter must prevent the batteries discharging below 1,67 V/ cell and must switch off when this condition is reached.

The control electronics shall keep the output of the inverter in sync with the utility and during utility outages the inverter shall operate on an internal oscillator which shall keep the inverter within the specified tolerance for frequency.

The system is to be equipped with a static by-pass switch operating in parallel with a mechanical by-pass switch. Should the UPS system malfunction, the static switch is to achieve an uninterrupted transfer of the output from the inverter directly to the AC incoming mains. The mechanical switch must then be able to manually take over from the static switch.

CONTROLS, PROTECTION AND CONSTRUCTION

The UPS unit must incorporate a rectifier breaker, reserve breaker and battery isolator as well as a maintenance by-pass switch.

The UPS system is to be protected against over and under voltage mains power surges and transients and voltage surges introduced at the output terminals.

All single phase output UPS units are to be provided with a single line mimic diagram which is to be indelibly drawn on the fascia of the UPS. LED's on this diagram are to indicate the status of the various sections of the circuit.

Single line diagrams without incorporating LED displays will be required on single-phase output units. Voltage free contacts are to be available for remote indication of the status of the major components of the system.

All materials and components used in the UPS are to be new, of high quality and of current manufacture. All relays are to be in dust tight enclosures.

Terminals are to be provided for making all external cable connections. These terminals are to be of the clamp type and not of the pinch screw type.

All electronic control boards are to employ plug-in connectors to facilitate maintenance.

The UPS must be housed in a substantial enclosure constructed from sheet metal, treated and powder epoxy coated. All doors or panels are to be provided with panel key latches or have hinged doors with lockable catches.

Adequate ventilation must be provided to ensure that a safe internal temperature is maintained. Either forced or natural ventilation is to be employed, depending on the power rating of the UPS. The cooling air is to enter the cabinet via a grille. Serviceable filters which are to keep the ingress of dust and dirt to a minimum shall be provided in polluted areas.

The heat sinks for the power semi-conductors must be fitted with heat sensors, which are to initiate a shut-down if the safe working temperature is exceeded.

STORAGE BATTERY

The storage battery shall be of the lithium battery maintenance free type.

Battery cells shall be contained in a well ventilated enclosure with a corrosion-resistant drip tray.

The anticipated life of the battery cells shall be 10 years or longer.

system status panel (spp)

The SPP shall provide an electrical flow diagram on the front, which shall mimic the current operating status of the UPS. It shall provide the following controls, indicators and meters:-

Indicators

- a) Single or Three Phases of Input Voltage.
- b) Single or Three Phases of Bypass Voltage.
- c) Single or Three Phases of Maintenance Bypass Voltage.

LED Indicators For:-

- a) Inverter ON
- b) Utility ON
- c) Rectifier ON
- d) Inverter OFF
- e) Battery Charging
- f) Battery Discharging.
- g) Low Battery.
- h) ON Maintenance Bypass.
- i) ON Automatic Operation.
- j) Battery Circuit Breaker Open.
- k) Battery Circuit Breaker Closed

7.3 Analog Meters For :-

- a) Input Voltage.
- b) Output Voltage (Inverter)
- c) Output Voltage (Bypass)
- d) Output Current.
- e) DC Bus Voltage.
- f) DC Bus Current (Inverter)

Control Switches For :-

- a) Input Voltage.
- b) Output Voltage Inverter.
- c) Output Voltage Bypass.
- d) Output Current.
- e) Emergency Power Off Guarded Push-button.

UPS SPECIFICATION SHEET		
An Uninterruptable Power Supply Must Be Supplied With the Following Specification		
1	UPS INPUT	
1,1	Voltage	230 V $\pm$ 10%
1,2	Frequency	50 Hz $\pm$ 10%
1,3	Current THD (sinusoidal voltage)	10%
2	UPS OUTPUT	
2,1	Rated output at 0.7 IND PF	5 KVA
2,2	Load Power Factor Range	From 0.6 lag to unity
2,3	Rated Output Voltage (3 Phase)	230 V
2,4	Regulation no load to full load (steady state)	$\pm$ 1%
2,5	Voltage regulation with 100% load application	$\pm$ 5%
2,6	Recovery time to steady state	30 milliseconds
2,7	Overload capability	125% for 1 hour
2,8	Overload capability	200% for 30 second
2,9	Output Waveform Type	Sinusoidal
2,1	Total harmonic distortion	less than 3%
2,11	Frequency	50 Hz
3	STATIC TRANSFER SWITCH	
3,1	Transfer time	No break
3,2	O/L rating 100ms	1000%
4	GENERAL	

UPS SPECIFICATION SHEET		
An Uninterruptable Power Supply Must Be Supplied With the Following Specification		
4,1	Efficiency (Input to Output)	Better than 84%
4,2	Lightning protection	Design to with standard test impulses of 6kV and 3kV
4,3	Noise Suppression (EMI/RFI)	As per Transnet or and telecommunicaitons authority RFI regulations and SANS regulations
5	ENVIRONMENTAL	
5,1	Acoustic noise level	<50 dB(A) at 1 metre
5,2	Operating temperature	0-40 deg. C
5,3	Relative humidity (non condensing)	95%
5,4	Operating Altitude	Up to 2000m AMSL
6	BATTERY	
6,1	Run time at full load	15 minutes
6,2	Type - internal	Totally lithium ion battery maintenance free
6,3	Anticipated life	5 years
7	MONITORING	
7,1		Voltage free contacts available for remote monitoring by a remote alarm panel or building management system
7,2		RS 232

WORK REQUIRED IN THE COMMISSIONING OF PROTECTION EQUIPMENT:

The commissioning of protection equipment for MV & LV systems and electronics can be broken up into a number of broad categories.

- Panel tests and visual Inspection;
- Implementation of applicable technical instructions;
- Secondary tests;
- Primary tests;
- Review and submission of documentation;
- Energisation and on load checks;
- Sign off and handover of electrical and electronic plants for use and operation by the owner.

Each of the categories requires documentation to reflect that the test(s) required have been completed. The documentary evidence must include:

- The relevant equipment or panel name.
- The checks performed;
- The name of the person who performed the checks;
- The date on which the checks were performed;
- The signature of the person who performed the checks.

Panel Tests and Visual Inspection.

The purpose of this group of activities is to check and produce documentary evidence that:

- The panel and all contained equipment is visibly intact and mechanically sound,
- The panel and contained equipment has not been damaged in transit,
- The panel is wired according to the application drawings supplied, and that the design version between the equipment and the drawings is the same.
- The equipment contained in the panel corresponds in make, model and function to the application drawings.
- The panel and associated equipment is correctly earthed according to the SANS standards.

Implementation of Applicable Technical Instructions.

The purpose of this activity is to ensure that modifications to the protection panels required by approved technical instructions are implemented to the protection equipment prior to secondary injection. Documentation is to be in the form of the instruction with reference number, the name of the person who implemented the instruction and the date of implementation is required.

Secondary Tests

This group of activities comprises the following:

- Application of settings of all protection devices.
- Relay characteristic tests and logic functions according to settings provided and manufacturer specifications.
- End to end checks for Impedance and current differential schemes.
- Supervisory controls, alarms, indications and analogue outputs are correct to the control centre.
- To ensure that test blocks and shorting strips function correctly.

Primary Tests

All primary tests must be according to relative SANS regulation.

Normalisation of Circuits

During the primary and secondary injection tests, the trip and alarm circuits are usually rendered inoperative by the removal of isolating links, relay trip latches and so on. It is therefore essential that, when the primary and secondary injection tests have been completed, the tripping and alarm circuits be checked. Certain settings may have been altered during testing and these have to be normalized. Certain protection functions may have been deactivated in order to test other complimentary functions and these have to be reactivated as per the settings and configuration documentation.

Consolidation and Review of Test Results

The purpose of this group of activities is to consolidate the test results and;

- Ensure sure that all tests originally planned have been completed
- Ensure that all test results are consistent with reasonable Employer expectations
- Ensure that any defects have been addressed
- Ensure that the head of commissioning is satisfied that the equipment is ready to be made live and arrangements have been made with an authorized person and to clear all outstanding work permits.
- Complete the equipment test sheet that permits the equipment to be energised.
- Certificate of Compliance (CoC) must be issued will all other test results reports.

Energisation and on load checks

There are some checks and tests that cannot be performed while the equipment is de-energised. It must be stressed that the equipment cannot be considered to be completely commissioned until on-load checks have been completed and results documented.

The following checks are required:

- Correct phase rotation.
- Current measurement checks / on-load confirmation of CT ratios.
- On-load stability checks for differential schemes
- On-load directional checks for directional overcurrent and impedance relays.
- Confirmation of transducer loading if applicable.

On the successful completion of the on-load checks, a handover document / mechanism is required that indicates that the equipment has been fully commissioned.

Training**Electrical Installations**

Contractor shall train the TNPA staff on new equipment on how to operate the MV & LV panel, generator and other electrical related installations. Training shall include how to clear faults on the system once it has been attended to. Training to include all other electrical related issues that will be require by maintenance and operating TNPA staff.

ELECTRONICS AND SECURITY SYSTEM INSTALLATIONS**General**

All electronics and telecommunications equipment supplied under this contract shall be designed to perform effectively under the full range of conditions of temperature, pressure and voltage regulation prevailing.

The equipment shall also be capable of withstanding the highly corrosive effects of a moist saline atmosphere. All enclosures of equipment and outdoor equipment shall have a minimum degree of protection of IP66 / 67 / 68 and all equipment shall be able to withstand the vibrations present on the structures.

Electronic Equipment

All equipment and fittings supplied and installed under this contract, shall be in accordance with the standard and project specifications of this document. All distribution boards and kiosks shall be manufactured as per SANS 1973. All electrical panels and equipment shall be designed and manufactured in accordance with SANS 1973/60439. The equipment shall conform to SANS 60947 Parts 1 -7, unless otherwise stated, and shall be suitable for operation on supply voltages of 230/400 Volts, plus neutral and earth, 50 Hz, AC.

TECHNICAL SPECIFICATION – ELECTRONICS ENGINEERING WORKS

Closed Circuit Television (CCTV) Control Room

Video Management System (VMS) Platform in the Control Room.

Focus of Attention Interface

The Focus of Attention interface redefines the experience for monitoring live video. It helps increase operator effectiveness by providing an overview of events occurring across all cameras in the site, including analytic events, Unusual Motion Detection (UMD) events, motion events, and alarms. Operators can quickly triage the most important events at a given time by reviewing the associated live and recorded video to determine if a response is required.

Appearance Search Technology

CCTV shall be equipped with appearance Search technology which is a sophisticated artificial intelligence (AI) search engine that enables investigators to sort through hours of footage with ease and quickly locate a person or vehicle of interest across an entire site. Confirmed matches can also be used to initiate additional searches from other ACC sites. Search for a person of interest by entering their physical description, or by finding an example in recorded video. The search engine recognizes characteristics of a person's face to find matches, even if the person's clothing changes over time. Using Appearance Search technology can dramatically improve incident response time and enhance forensic investigations by allowing investigators to build robust video evidence and create a powerful narrative of events.

Self-Learning Video Analytics

The system shall have video management software that enables analytic events and alarms to be viewed and searched through an intuitive user interface. Real-time events and forensic capabilities shall detect and notify operators of scene changes and rules violations.

Unusual Motion & Activity Detection

The system shall be advanced with artificial intelligence technology that highlights the unanticipated by automatically flagging unusual motion and activity. This edge-based intelligence technology must distinguishes between typical and atypical events by continuously learning from observation of scenes over time. Unusual Motion Detection (UMD) detects atypical movement, while Unusual Activity Detection (UAD) is object-aware and detects the anomalous behavior (speed and location) of people and vehicles.

Cybersecurity & Privacy Protection

Video security measures shall include strong password enforcement, connection authentication and data encryption, as well as strict user permissions to access search functionality that uses personally, identifiable information. The system shall be equipped with blurred export to help support compliance with new data protection and privacy requirements of GDPR by allowing the user to export appearance search results in software while blurring the background of the camera view to feature only the person of interest in the video.

Video Intercom Support

This shall enables operators to monitor and control access at entry points through two-way audio communication, video certification, and the ability to send a door grant through the software.

Access Control Unification

Video Management Software (VMS) works together with the Access Control Manager (ACM) system to receive and act on ACM door events, hardware input events and access grants, enabling operators to unlock access doors directly from a camera view. Identity Verification dynamically displays ACM

credentials with video camera views. Identity Search can help find a person of interest using their ACM cardholder information.

Facial Recognition

The system shall be AI-powered facial recognition technology that helps organizations accelerate response times by identifying people of interest. People of interest are identified based on one or more secure watch lists managed by authorized users at the organization. Populate watch lists easily by either uploading images or finding a face from recorded video.

A set of configurable controls are available to support the management of the various watch lists.

The service providers' cameras shall have a license for facial recognition will seek to identify potential matches based on the watch list(s), and if a match is found, the user is alerted through the FOA interface within VMS software, helping security personnel quickly determine if further action is necessary.

Equipment Specification**Network Video Recorders (NVR)**

FIPS Series Service providers Network Video Recorders (NVR) provide secure, reliable and scalable platforms for high performance end-to-end security solutions. Service Provides network security recorders shall be pre-hardened to meet FIPS 140-2 Level 2 Security requirements and protect data-at-rest. All NVRs must be preloaded with video management software that uses FIPS-compliant cryptography for secure network video recording and video encryption. Cameras connected to the NVR's must encrypt data-in-flight using FIPS-compliant cryptography.

Enhanced Security Deployment

System must have video data encrypted at rest to FIPS 140-2 L2, secured with on-board TPM, via Windows BitLocker, OS drive encrypted to FIPS 140-2 L2, secured with TPM. Server 2016 STIG-compliant Windows OS.

Enhanced Security Deployment

Video data encrypted at rest to FIPS 140-2 L2, secured with on-board TPM, via Windows BitLocker, OS drive encrypted to FIPS 140-2 L2, secured with TPM. Server 2016 STIG-compliant Windows OS.

Risk Management Framework

Hardening guide to help customers secure their deployment and ensure all solution components meet stringent Risk Management Framework cyber requirements.

Superior Redundancy and Reliable Data Storage

NVR's must have reliable storage with RAID-configured redundancy offers a highly available and resilient system that protects your data. The suppliers shall have FIPS NVRs that include reliable hard drives with RAID 6 redundancy.

Federal Government Compliant Facility

NVR's must have built in a Federal Government compliant facility for ensuring authenticity and to help maintain strict adherence to procurement Federal Acquisition Regulations (FAR), trade agreements (TAA), and NDAA regulations

Solid-State Drive

Encrypted operating systems on a redundant array of Solid-State Drives designed for greater reliability and speed.

Embedded With Secure Video Management Software

Pre-configured with Video Management System software, optimized and provisioned to use FIPS-compliant cryptography for secure network video recording and video encryption.

Single Point of Contact for End To End Technical Support

All NVRs shall be backed by a 5-year hardware warranty with on-site part replacement service and lifetime 24/7 Service providers telephone technical support. Keep your drive warranty ensures the replaced drive remains in customer custody.

Network Video Recorder Specification

A. Throughput: NVR system must be capable of managing a combined 1,150 Mbps of total Through-put with handling for simultaneous recording, playback and live streaming.

- Recording: 700 Mbps.
- Playback: 450 Mbps.

B. Search Capacity: Provide products capable of supporting the following:

- Events search such as motion, digital input, classified object, arbitrary events and tampering across all feature enabled cameras connected to the system.
- Object similarity search up to 200 cameras simultaneously. When combined with facial recognition the system must be capable of supporting up to 100 cameras using object similarity and up to 50 cameras using facial recognition features.

System Design:

- Operating System: Microsoft Windows Server 2016.
- Operating System: Microsoft Windows 10 Enterprise Embedded.
- Processor: Intel Xeon.
- RAM: 16GB DDR4.
- Video Output: VGA.

Operating System Storage: Two (2) M.2 SSD drives configured with subsequent write capability, data mirroring, and redundancy, such that one (1) drive may be removed, replaced, or fail without system compromise (RAID 1).

Video Data Storage Capacity: Provide system with the following configurations:

- Default Effective Storage Capacity: 48 TB
- Maximum Drive Count: Maximum eight (8) 3.5 inch drives.
- Maximum Data Capacity: 64 TB raw (48 TB effective).

- Data Storage Virtualization: Provide drive array capable of subsequent read and write, with data mirroring, and redundancy, such that up to two (2) drives may be removed, replaced, or fail without system compromise (RAID 6).

Mounting: Standard server enclosure (rack) mounting, requiring no greater than a 2U configuration.

Network: Provide four (4) 1Gb Ethernet RJ-45 ports (1000Base-T).

Remote Access: Provide hardware-integrated support for remote access control.

Basis of Design: iDRAC 9 Express by Dell Technologies or similar

Electrical Power:

- Input: 100 to 240 V AC, 50 Hz, auto-switching.
- Power Supply: Provide single power supply. NETWORK VIDEO RECORDERS28 05 19.15-4
- Redundant Power Supply: Appliance must be configurable for dual power supplies that may be replaced without the need to power down (hot-swappable).
- Power Consumption:
 - Maximum: 750W
 - Average: 269W

Operating Range:

- Temperature: 10 to 35 degrees C.
- Relative Humidity: 10–80 percent (non-condensing).
- Altitude: 3048 meters.
- Vibration: 0.26 Grms at 5 Hz to 350 Hz.
- Shock: One pulse on each side of the system of 71 G for up to 2 ms.

ACCESSORIES

- Power Supplies: - NVR4X-750W-2NDDPS: Redundant, hot-swappable power supply for NVR4X STD.
- Connectivity:
 - NVR4X-STD-10GBE: Network Card, DP 10G-SFP+.
 - HD-NVR4-SFPPLUS-DA: SFP+ 10GbE Twinax Direct Attach Cable 3m.

-
- NVR4X-SFPPLUS-SR: SFP+ 10GBASE-short range transceiver.
 - AVA-HED1-NVR4X-STD-CONNECT
 - Software:
 - NVR4-IDRAC-ENT-UPG: iDRAC Enterprise upgrade.
 - Warranty Upgrade:
 - NVR4X-STD-WARR-5Y4HMC: 4-hour mission critical response service-level agreement upgrade.
 - Hard Drives:
 - NVR4-HDDS-HOT-8TB: Spare hard drive, 8TB, front or rear bay.
 - NVR4-HDDS-HOT-4TB: Spare hard drive, 4TB, front or rear bay.

Camera Specification

Camera Type 1 – Rugged Pan-Tilt-Zoom (PTZ) Camera

Rugged Pan-Tilt-Zoom (PTZ) Camera must performs continuously and reliably in the harshest environments and is built to last for mission-critical applications. This camera must combines high-resolution imaging, 360° views and up to a powerful 36 x zoom with an extremely robust design that's guaranteed by industry-leading protection ratings. The optional IR and white light illuminators provide ideal brightness in low-light scenes.

Appearance Search Support - Enables the sophisticated deep learning AI search engine that allows you to quickly locate a specific person or vehicle of interest in recorded video across an entire site within seconds.

Must have Built-In Wiper Wipes away rain and debris from the lens for unobstructed views; add optional water pumps for washing.

Must have extreme Shock, Vibration & Impact Tolerant Tested to MIL-STD-167-1A and 810G standards for extreme shock and vibration tolerance and rated IK10 for impact resistance facial Recognition Support. Enables our facial recognition technology to help to identify people of interest faster with secure watch list(s) and alarms.

FIPS 140-2, NDAA & TAA COMPLIANT. Can be deployed at sites requiring FIPS-compliant cryptography, NDAA and/or TAA compliance.

H.264 and H.265 HDSM Smartcoded™ Technologies - Combines our newest compression technologies to enhance bandwidth and storage savings

High Wind Resistance Resists wind speeds up to 230 kph with PTZ moving at maximum speed.

Must have Next-Generation Video Analytics - Expanded object classifications and more accurate detection in crowded scenes so you can detect faster.

Must be ONVIF® compliant Native ONVIF Profile S and T compliance allows easy integration with existing ONVIF infrastructures and Profile G compliance supports search, playback and retrieval of recordings on the edge.

Operational Reliability for Traffic Monitoring meets NEMA TS2 environmental standards for deployment in traffic monitoring applications.

Unusual Activity Detection - Uses AI to notify you of unusual speed and location of people and vehicles that might otherwise have been missed.

Water, Corrosion and Dust Protection at Rated IP67/68 and Type 4X/6P for optimal protection from water, corrosion and dust.

Wide Dynamic Range Captures details in scenes with both very bright and very dark areas.

Wide Temperature Range Operates continuously in extreme temperatures from -40°C to +65 °C

- 1 / 2.8" Progressive Scan CMOS
- Full HD1080p video @ 60FPS
- IR Illumination to a distance of 250m
- Dual video streams
- 120dB Wide Dynamic Range
- 3D Digital Noise Reduction
- Backlight Compensation
- DC12V & PoE ++
- Support H.265+
- Supports Full Duplex Audio
- Supports face detection
- 500 Presets
- Electronic Stabiliser
- IP67 weather-proof protection
- Metallic housing & bracket
- Mobile Monitoring via EZVIZ P2P or iVMS-4500
- Mobile monitoring via CC Mobile or ACC Remote client
- Conformant with ONVIF Profile S

Camera shall have a 5-Year Warranty

H.265 & HDSM Smartcodec Technology

Shall combine newest compression technologies to maximize bandwidth and storage savings.

Next-Generation Video Analytics

Expanded object classifications and more accurate detection in crowded scenes so you can detect and act faster.

Focus of Attention

Leverages AI and video analytics technologies to determine what information is important and should be presented to security operators.

Supported Analytics Events

Objects in Area - The event is triggered when the selected object type moves into the region of interest.

Object Loitering - The event is triggered when the selected object type moves into the region of interest and then stays for an extended amount of time.

Objects Crossing Beam - The event is triggered when the specified number of objects have crossed the directional beam that is configured over the camera's field of view. The beam can be unidirectional or bidirectional.

Object Appears or Enters Area - The event is triggered by each object that enters the region of interest. This event can be used to count objects.

Object Not Present in Area - The event is triggered when no objects are present in the region of interest.

Objects Enter Area - The event is triggered when the specified number of objects have entered the region of interest.

Objects Leave Area - The event is triggered when the specified number of objects have left the region of interest.

Object Stops in Area - The event is triggered when an object moves into a region of interest and then stops moving for the specified threshold time.

Direction Violated - The event is triggered when an object moves in the prohibited direction of travel.

Tamper Detection - The event is triggered when the scene unexpectedly changes.

Object Types of Classification - Vehicle, sub-types: Car, Truck, Bicycle, Motorcycle, Bus, and Person

Teach By Example Technology

Camera Type 2 – 4MP Bullet Camera

Appearance Search Support - Enables our sophisticated deep learning AI search engine that allows you to quickly locate a specific person or vehicle of interest in recorded video across an entire site within seconds.

Built-In Wiper - Wipes away rain, snow and debris from the lens for unobstructed views; add optional water pumps for washing

Extreme Shock, Vibration & Impact Tolerant - Tested to MIL-STD-167-1A and 810G standards for extreme shock and vibration tolerance and rated IK10 for impact resistance

FACIAL RECOGNITION SUPPORT*Enables our facial recognition technology to help you identify people of interest faster with secure watch list(s) and alarms

FIPS 140-2, NDAA & TAA Compliant - Can be deployed at sites requiring FIPS-compliant cryptography, NDAA and/or TAA compliance

H.264 and H.265 HDSM Smartcoded™ Technologies - Combines our newest compression technologies to enhance bandwidth and storage savings.

High Wind Resistance - Resists wind speeds up to 230 kph with PTZ moving at maximum speed.

Must have Next-Generation Video Analytics - Expanded object classifications and more accurate detection in crowded scenes so you can detect faster.

Must be ONVIF® COMPLIANT Native ONVIF Profile S and T compliance allows easy integration with existing ONVIF infrastructures and Profile G compliance supports search, playback and retrieval of recordings on the edge.

Operational Reliability for Traffic Monitoring Meets NEMA TS2 environmental standards for deployment in traffic monitoring applications.

Unusual Activity Detection - Uses AI to notify you of unusual speed and location of people and vehicles that might otherwise have been missed.

Water, Corrosion and Dust Protection Rated IP67/68 and Type 4X/6P for optimal protection from water, corrosion and dust

Wide Dynamic Range - Captures details in scenes with both very bright and very dark areas.

Wide Temperature Range - Operates continuously in extreme temperatures from -40 °C to +65 °C.

- 1 / 2.8" Progressive Scan CMOS
- Full HD1080p video
- Dual video streams
- 3 - 9mm vari-Focal lens
- 120dB Wide Dynamic Range
- 3D Digital Noise Reduction
- Backlight Compensation
- DC12V & PoE (ePoE capabilities)
- Support H.265+/H.264+
- Up to 30m IR range
- 3-axis adjustment
- IP67, IK10 protection

- Metallic housing & bracket
- Mobile Monitoring via EZVIZ P2P or iVMS-4500
- Mobile monitoring via CC Mobile or ACC Remote client
- Conformant with ONVIF Profile S

Camera shall have a 5-Year Warranty

H.265 & HDSM Smart codec Technology

Shall combine newest compression technologies to maximize bandwidth and storage savings.

Next-Generation Video Analytics

Expanded object classifications and more accurate detection in crowded scenes so you can detect and act faster.

Focus of Attention

Leverages AI and video analytics technologies to determine what information is important and should be presented to security operators.

Supported Analytics Events

Objects in Area - The event is triggered when the selected object type moves into the region of interest.

Object Loitering - The event is triggered when the selected object type moves into the region of interest and then stays for an extended amount of time.

Objects Crossing Beam - The event is triggered when the specified number of objects have crossed the directional beam that is configured over the camera's field of view. The beam can be unidirectional or bidirectional.

Object Appears or Enters Area - The event is triggered by each object that enters the region of interest. This event can be used to count objects.

Object Not Present in Area - The event is triggered when no objects are present in the region of interest.

Objects Enter Area - The event is triggered when the specified number of objects have entered the region of interest.

Objects Leave Area - The event is triggered when the specified number of objects have left the region of interest.

Object Stops in Area - The event is triggered when an object moves into a region of interest and then stops moving for the specified threshold time.

Direction Violated - The event is triggered when an object moves in the prohibited direction of travel.

Tamper Detection - The event is triggered when the scene unexpectedly changes.

Object Types of Classification - Vehicle, sub-types: Car, Truck, Bicycle, Motorcycle, Bus, and Person. Teach By Example Technology.

Camera Type 3 – 4MP Bullet Camera

The bullet camera / Fisheye camera is a cost-effective and easy-to-install solution that must provides 360° panoramic views of large areas from a single vantage point and bring superior situational awareness without any blind spots. The camera must have high-resolution video to monitor processes

and optimize operational efficiencies, along with its analytics and AI capabilities to proactively detect critical events and enhance the productivity of security teams.

Must have adaptive IR and to provides optimal brightness in scenes with low-light for high-resolution image detail.

Appearance Search™ Support – must be enables a sophisticated deep learning AI search engine that enables you to quickly locate a specific person of interest across an entire site.

COVID-19 Response Technology Supports occupancy counting to help keep facilities and people safe. Must be FIPS 140-2 Compliant Enables the camera to be deployed at sites requiring FIPS-compliant cryptography.

H.264 and H.265 HDSM Smartcoded™ Technologies - Combines our newest compression technologies to enhance bandwidth and storage savings.

Next-Generation Video Analytics* - Enhanced and more accurate detection of people, even in crowded scenes so you can detect faster. *Analytics support will require ACC 7.12.4 or later.

Must be ONVIF® Compliant Native ONVIF Profile S, T and G compliance allows easy integration with existing ONVIF infrastructures.

Unusual Activity Detection - Uses AI to notify you of unusual speed and location of people and vehicles that might otherwise have been missed.

Water & Impact Rated - IP66/67 weather ratings for water resistance and IK10 impact rating for vandal resistance.

Wide Dynamic Range Captures details in scenes with both very bright and very dark areas

- 1/1.8"progressivescanCMOS
- Active Pixels 2048 X 2048
- Dual video streams
- Fixed 360 view
- 120dB Wide Dynamic Range
- 3D Digital Noise Reduction
- Backlight Compensation
- DC12V & PoE (ePoE capabilities)
- Support H.265+/H.264+
- Up to 10m IR range
- IP67, IK10 protection
- Metallic housing & bracket

- Mobile Monitoring via EZVIZ P2P or iVMS-4500
- Mobile monitoring via CC Mobile or ACC Remote client
- Conformant with ONVIF Profile S

Camera shall have a 5-Year Warranty

H.265 & HDSM Smartcodec Technology

Combines our newest compression technologies to maximize bandwidth and storage savings.

Focus of Attention

Leverages AI and video analytics technologies to determine what information is important and should be presented to security operators.

Teach By Example Technology.

Camera Type 2 – 4MP Internal Dome Camera

Appearance Search Support - must enables a sophisticated deep learning AI search engine that allows you to quickly locate a specific person or vehicle of interest in recorded video across an entire site within seconds.

Must have a Built-In Wiper Wipes away rain, snow and debris from the lens for unobstructed views; add optional water pumps for washing.

Extreme Shock, Vibration & Impact Tolerant Tested to MIL-STD-167-1A and 810G standards for extreme shock and vibration tolerance and rated IK10 for impact resistance.

Facial Recognition Support – must enables a facial recognition technology to help you identify people of interest faster with secure watch list(s) and alarms.

FIPS 140-2, NDAA & TAA Compliant - Can be deployed at sites requiring FIPS-compliant cryptography, NDAA and/or TAA compliance.

H.264 and H.265 HDSM Smartcoded™ Technologies - must combines newest compression technologies to enhance bandwidth and storage savings.

High Wind Resistance - Resists wind speeds up to 230 kph with PTZ moving at maximum speed.

Must have Next-Generation Video Analytics - Expanded object classifications and more accurate detection in crowded scenes so you can detect faster.

Must be ONVIF® Compliant Native ONVIF Profile S and T compliance allows easy integration with existing ONVIF infrastructures and Profile G compliance supports search, playback and retrieval of recordings on the edge.

Operational Reliability for Traffic Monitoring Meets NEMA TS2 environmental standards for deployment in traffic monitoring applications.

Unusual Activity Detection - Uses AI to notify you of unusual speed and location of people and vehicles that might otherwise have been missed.

Water, Corrosion and Dust Protection - Rated IP67/68 and Type 4X/6P for optimal protection from water, corrosion and dust.

Wide Dynamic Range - Captures details in scenes with both very bright and very dark areas.

Wide Temperature Range - Operates continuously in extreme temperatures from -40 °C to +65 °C.

- 1 / 2.8" Progressive Scan CMOS
- Full HD1080p video
- Dual video streams
- 3 - 9mm vari-Focal lens
- 120dB Wide Dynamic Range
- 3D Digital Noise Reduction
- Backlight Compensation
- DC12V & PoE (ePoE capabilities)
- Support H.265+/H.264+
- Up to 30m IR range
- 3-axis adjustment
- IP67, IK10 protection
- Metallic housing & bracket
- Mobile Monitoring via EZVIZ P2P or iVMS-4500
- Mobile monitoring via CC Mobile or ACC Remote client
- Conformant with ONVIF Profile S

Camera shall have a 5-Year Warranty.

H.265 & HDSM Smart codec Technology

Shall combine newest compression technologies to maximize bandwidth and storage savings.

Next-Generation Video Analytics

Expanded object classifications and more accurate detection in crowded scenes so you can detect and act faster.

Focus of Attention

Leverages AI and video analytics technologies to determine what information is important and should be presented to security operators.

Supported Analytics Events

Objects in Area - The event is triggered when the selected object type moves into the region of interest.

Object Loitering - The event is triggered when the selected object type moves into the region of interest and then stays for an extended amount of time.

Objects Crossing Beam - The event is triggered when the specified number of objects have crossed the directional beam that is configured over the camera's field of view. The beam can be unidirectional or bidirectional.

Object Appears or Enters Area - The event is triggered by each object that enters the region of interest. This event can be used to count objects.

Object Not Present in Area - The event is triggered when no objects are present in the region of interest.

Objects Enter Area - The event is triggered when the specified number of objects have entered the region of interest.

Objects Leave Area - The event is triggered when the specified number of objects have left the region of interest.

Object Stops in Area - The event is triggered when an object moves into a region of interest and then stops moving for the specified threshold time.

Direction Violated - The event is triggered when an object moves in the prohibited direction of travel.

Tamper Detection - The event is triggered when the scene unexpectedly changes.

Object Types of Classification - Vehicle, sub-types: Car, Truck, Bicycle, Motorcycle, Bus, and Person.

Teach By Example Technology

ACCESS CONTROL

The surface mounted biometric face recognition and card scanner (with an option of fingerprint / palm reader for later activation) must be suitable and linked with Babylon system. The recorded personnel shall use the system to open the doors / access and exit to the building. Unit shall be rate IP65. The system must be capable of integrating with other system.



2.13 Specification – Quality Management

2.13.1 Definitions

TERM, ABBREVIATION	MEANING
Data	All drawings/documents/information required to be supplied under the Contract
Data Pack (DP)	A compilation of manufacturing data, certification, inspection and testing records prepared by the Supplier/Contractor to verify compliance with the Contractual requirements.
Employer	For the purposes of this document, the term Employer has the same meaning as applied to the term Employer.
Field Inspection Test (FIT)	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.
Inspection Release Report (IRR)	A document issued to the Supplier/Contractor by the Employer advising release of the Materials for shipment. This does not relieve the Supplier/Contractor of its obligations in accordance with the Terms and Conditions of the Contract.
Inspection Waiver Report (IWR)	A document issued to the Supplier/Contractor by Employer advising that the Employer has waived final inspection for the materials listed in this document. The issue of this Report does not preclude further inspection by Employer, is issued without prejudice and does not relieve the Supplier/ Contractor from the guarantees and obligations included in the Contract
Project Quality Plan (PQP)	A document that outlines the Supplier/Contractor's 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 Contract, drawings, codes and standards.
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 (TQ)	This refers to a document used by the Supplier/Contractor to formally clarify a Technical Query related to the scope of supply. This should not be used where a non-conformance has already been initiated.

2.13.2 Applicable Documents

2.13.2.1 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.

2.13.2.2 Statutory Regulations

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

2.14 General Obligations of Contractor

The Contractors obligations as contained in this document shall be deemed to cover the following items:

- The project scope shall include the erection of all Plant and Materials as required for completing the Works. The Contractor shall supply all necessary manpower, labour, supervision, materials, services and testing devices for all aspects of this project as indicated hereunder and the Contractors quoted amount for the Works shall be deemed to cover all cost and expense thereof;
- Project Management of the complete scope of work including planning, scheduling and reporting verbally to the Supervisor on a daily basis. Weekly written progress reports shall be issued to the Supervisor for approval;
- Implementation of an appropriate quality system including stringent quality control for all Plant and Materials stipulated in this document;
- Submission of a quality control plan (in accordance with ISO 9000) and conforming to requirements as contained in this document;
- Submission of an detailed erection programme for all Plant and Materials to be supplied by Others;
- The Contractor shall allow for any relevant information gathering exercises e.g. sample extraction and testing, dimensions, layouts, access routes, review surrounding structures, identify rigging points, checking, etc., to ensure that all Plant and Materials shall be erected in accordance with all the TNPA specifications and requirements;

-
- Selection of appropriate codes of practice, standards and specifications applicable to the Works;
 - Remove, replace, modify, reinstall and make good all existing equipment, Plant and Materials as required to facilitate the Erection of all new Plant and Materials;
 - Supply, installation, statutory compliance to relevant Codes and Standards and safe storage of all Plant, Equipment and Materials required to completely negate the detrimental effects to construction progress resulting directly or indirectly from loss of electrical power on site;
 - Mechanical fitting and alignment of all motors, gearboxes, couplings, pulleys, brakes, belts, sprockets, chains, bearings, seals, base plates, etc.;
 - Installation of all chemical anchors, bolts, fasteners, washers, nuts, clamps, brackets, fixing and securing elements as required;
 - All specialized equipment, tools, brackets, supports, packers, shims, etc., necessary to complete the Works in accordance with manufacturer's specifications, appropriate codes and the Project Standards;
 - Supply of all construction lighting and associated support structures, access platforms, etc. as required for the successful Erection of all Plant and Materials;
 - The Contractor shall engage the services of a certified (by relevant South African statutory organisation) welding inspection organisation for the execution and performance of all NDT, dye pen, Ultrasonic, X-ray and any other testing as required on all remediation work installations as is required by the appropriate codes, standards and the Project Standards.
 - The Contractor shall plan, in detail, the installation and erection sequence of the Plant and Materials to allow for accessibility for rigging purposes and the availability of respective pieces of Plant and Materials based on their delivery to site
 - Within the Site, removal and disposal of all scrap and rubble generated by the Contractor to the TNPA designated scrap lay-down or dumping area;
 - Site safety supervision, personal protection and safety equipment;
 - Supply of all equipment and personnel required to comply with the Occupational Health and Safety Act, 1993. The Contractor shall take special note of the requirements of the latest editions of Construction Regulations;

- Comply with the Employers Environmental Management Plan;
- Complete all documentation to the satisfaction of the Supervisor in order for the Taking Over Certificates as appropriate to be signed off by the Employer;
- Assistance during Test on Completion (Pre-Commissioning and Commissioning) which shall be co-ordinated and directed by the Supervisor;
- The Contractor shall attend to all punch list items (Punch list A, B and C) as outlined by the Supervisor upon the completion of the installation and during Tests on Completion (Pre-commissioning and Commissioning).
- Supply of all Contractors Documents, designs, drawings including all “As Built” drawings for Plant and Materials, specifications and details, NDT and hydraulic testing procedures and results.

2.15 Document Submission

1.1. The following documentation shall form part off the Contractor`s submission obligations to the Employer:

- Safe working area plan
- Emergency plan
- Safety File
- Environmental File
- Lifting/rigging studies
- Qualification documentation (all those resources involved with fabrication, quality, supervisory and HSE)
- Approved or evidence of approved welding procedures relevant to this Project scope of works
- Insurance cover
- Detailed Method statements and Risk Assessments for the individual Works

- Supervision and site management plan
- Detailed Quality control plans
- Detailed Work instruction/procedures
- Quality control dossier
- Compilation of “Completion Certificates” certified by the Employer

2.16 Pre-preparation for Works execution

The Contractor shall fully inspect the site and ensure that the site is in an acceptable condition to commence with the Works. Any deviation from the Contractors expectations as it pertains to existing infrastructure damage, site access etc shall immediately be raised with the Supervisor

The Contractor shall take all precautions necessary to prevent any damage to components especially to electronic components installed on structures (if any) which could be affected by the welding work if applicable.

2.17 General requirements for the Works

Surface preparation and painting is done in accordance with the established corrosion protection supplies`s guarenteed 60 month marine grade specification as well as the Transnet specification **EEAM-Q-008**.

It shall be noted by the Contractor that all corroded areas are to be prepared to bare metal. Welding works over primed metal has to be approved by the Supervisor.

Should members or plates be found below acceptable thickness based on the original size these members/areas shall be replaced or repaired to the Supervisors acceptance. All connecting flanges and ‘fish plates’ on existing structures shall be inspected and checked for corrosion.

All welds shall be checked for cracks. NDT or any other required weld testing procedure is carried out on at least 10% of all welds. Any cracks found are repaired. A welding procedure specification for the repairs of the cracks is provided by the Contractor to the Supervisors’ acceptance. All welding consumable specifications stipulated herein shall be strictly adhered to. All weld runs to be continuous.

Should the Contractor deviate from the project requirements, TNPA reserves the right to stop the Works with the Contractor to rectifying the areas of concern.

The Contractor shall provide a detailed method statement stipulating how the Works are to be carried out in a safe manner.

2.18 Procedure for submission and acceptance of Contractor's design

The Contractor shall address the following procedures:

- the Contractor shall be responsible for preparing detail drawings as required and material lists for checking by the Project Manager

2.19 Review and Acceptance of Contractor Documentation

The Project Manager comments on the proposals and forwards the comments electronically to the Contractor.

(One) paper copy of the approved drawings is stamped 'Approved by Employer' and returned to the Contractor.

The approval of the any drawings and documentation by the Supervisor is done in principle only and does not mean the approval of the details contained therein.

2.20 As-built drawings, operating manuals and maintenance schedules

- a. As-built drawings are due 14 days before the Works completion
- b. All submissions are in triplicate, hard copy and on a CD
- c. By submitting drawings, the Contractor represents that he has determined and verified all site measurements, site instruction criteria, materials, catalogue numbers and similar data, or will do so, and that he has checked and co-ordinated each of his drawings with the requirements of the Works and the contract documents, taking into account drawings of all other relevant disciplines
- d. At the time of submission, the Contractor informs the Supervisor in writing of any deviation between the approved drawings packs and the requirements of the contract documents
- e. The Supervisor will review and approve drawings with reasonable promptness (so as not to cause a delay) only for conformance with the design concept and the contract requirements

- f. The Supervisor may, at his discretion and depending on the number of discrepancies, require amendment and resubmission prior to approval. Drawings are resubmitted until approved prior to any portion of the Works related to the drawings being commenced
- g. Should the Contractor during drawing amendment, alter any portion of his drawings not specifically required by the Supervisor; he points this out in writing when resubmitting the drawing
- h. Approval of the Contractor's drawings is in no way indemnifies him from being responsible for the correctness of the drawings and satisfactory operation of the installation

3 CONSTRUCTION

3.1 Temporary Works, Site services & construction constraints

- a. The Contractor complies with the Employer's Site entry and security control, permits, Site regulations and induction.
- b. The Employer provides coded ID cards to all Contractors' employees for access / egress of personnel (and Equipment) within the Site boundaries.

3.2 Employer's Site entry and security control, permits, and Site regulations

- a. The Contractor shall comply with the Employer's Site entry and security control, permits, and Site regulations.
- b. The Employer shall provide coded ID cards to all Contractors' employees for access / egress of personnel (Equipment, Plant and Material) within the Site boundaries. This shall only be done when the contractor's staff undergoes full safety and site induction

3.3 Restrictions to access on Site, roads, walkways and barricades:

- a. The Contractor shall be specifically excluded from entering the Employer's operational areas which are adjacent to the Site and Working Areas. The Contractor shall plan and organise his work in such a manner so as to cause the least possible disruption to the Employer's operations.
- b. The Contractor shall ensure the safe passage of Contractor's traffic to and around the Site and Working Areas at all times that includes providing flagmen, protective barriers, signage, etc. for protection, direction and control of traffic.
- c. The Contractor shall ensure that any of his staff, labour and Equipment moving outside of his allocated Site and Working Areas does not obstruct the Employer's operations. To this end access routes are allocated and coordinated by the Project Manager.
- d. The Contractor shall ensure that all his construction staff, labour, and Equipment remains within his allocated and fenced off construction area.
- e. All Contractor's staff and labour shall comply with the Employer's operational safety requirements and shall be equipped with all necessary PPE.

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

- a. The Contractor shall keep daily records of his people engaged on the Site and working areas (including Subcontractors) with access to such daily records available for inspection by the Project Manager at all reasonable times.

2.

3.5 Title to Materials from demolition and excavation

- a. The Contractor shall have no title to all materials arising from excavation and demolition in the performance of the works with title to such materials remaining with the Employer.
- b. 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 the construction contract.

3.6 Cooperating with and obtaining acceptance of others

- a. The Employer (including the agents of the Employer) shall operate on Site during the entire duration of the contract period.

3.7 Publicity and progress photographs

- a. The Contractor shall 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.
- b. The Contractor shall obtain the permission and approval of the Project Manager before erecting any notice boards or using the details of the contract in any advertising media.
- c. The Contractor shall provide a complete digital photographic record of the progress of the construction of the works in it workshop as well as on site to the Project Manager, monthly as part of the Contractor's monthly programme narrative report.

3.8 Contractor's Equipment

- a. 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.

3.9 Equipment provided by the Employer

- a. No Equipment shall be provided by the Employer.

3.10 Site services and facilities:

- a. For the duration of the contract, the Project Manager shall provide an area, free of charge, for the Contractor to establish his offices, lay down areas, stores, workshops, and other Contractor's Equipment.
- b. The Contractor shall provide the following connections to services within the Site for the Contractor's use:

- c. Transnet will make available, free of charge to the contractor during the construction period; a 400 V earthed electric power supply within 250 meters of the contractors' yard. The contractor is to fully specify his power requirements prior to site establishment. The contractor will provide his own distribution cables and equipment that will be fitted with suitable leakage protection devices. The complete distribution arrangement will be approved by Transnet prior to being energized. All arrangements for providing adequate electrical power supplies to meet his requirements will be made by the contractor himself.
- d. The responsibility for maintaining adequate and continuous power supplied will rest solely with the contractor and inadequate or interrupted power supplies will not be accepted by Transnet as a valid reason for delay in completing the contract.
- e. The Contractor shall install its own meter for water and record its consumption. The contractor is responsible for the costs of the temporary connections to the site. Water will be provided free of charge.

3.11 Giving notice of work to be covered up

- a. The Contractor notifies the Supervisor in writing of any elements of the works which are to be covered up.

3.12 Connections to existing Works or Services

- b. The Contractor shall obtain written permission from the Supervisor prior to installing any connections, modifications or removal of existing works.

3.13 Services

- a. For the duration of the Contract, the Project Manager provides an area, free of charge, for the Contractor to establish his offices, lay down areas, stores, Workshops, and other Contractor's Equipment.
- b. The Employer provides the following connections to services within the Site for Contractor's use:
 - i. 25mm Isolation valve for construction Potable Water.

- ii. Circuit breaker for construction power at 380 Volts, 3-Phase and Neutral, 50 Hz.
- c. The Contractor provides a connection to the Employer's water borne sewage network. Where no suitable connection to a sewerage system is feasible, portable chemical type toilets may be used.

3.14 Contractor's Facilities

- a. The Contractor ensures that this site establishment area is compliant with the relevant health, safety and environmental regulations and restrictions, is clearly sign posted, and has a suitable security fence, lighting and the necessary access control gates.
- b. All costs for preparation of the site establishment area are for the Contractor's account.
- c. The Contractor submits details of the layout of his site establishment to the Project Manager for his acceptance.
- d. The Contractor is responsible for his own connection to the Employer's services and for the reticulation of his services from the connection point. The cost of meters, connections, reticulation and all other usage costs associated with the provision of services are for the Contractor's account.
- e. The Contractor provides the Project Manager with a "Certificate of Compliance" (COC), by an "Accredited" Person as defined by the OHS Act, in respect of his construction power electrical installation. The Project Manager only makes construction power available upon receipt of the COC.
- f. The Supervisor (or his nominated representative) conducts routine inspections of the Contractor's construction power reticulation and power tools. If found to be un-safe and / or non-compliant with statutory requirements, the electrical power supply is disconnected until the Contractor rectifies all defaults.
- g. The Contractor provides, at his cost, a sufficient number of toilets and maintains them in a clean and sanitary working condition.
- h. The Contractor provides temporary lighting and fencing around every section occupied by him during the construction of the Works.

- i. Such fencing demarcates and secures the construction area. The fencing is erected before any work starts and is removed only upon completion of the work in that area.
- j. The Contractor includes for all costs for such lighting and fencing, including access control into and out of these restricted areas.
- k. Wherever the Contractor provides facilities (either his own or for the Project Manager and/or Supervisor) and all items of Equipment, involving, inter alia, offices, accommodation, laboratories, Materials storage, etc., within the Working Areas, then the Contractor makes good and provides full reinstatement to the land (including all apparatus of the Employer and Others in, on or under the land) and surrounding areas to its original standard, upon dismantling of such facilities and items of Equipment.
- l. Upon completion, and within one month of the date of acceptance of the Works, the Contractor completely removes from the Site and Working Areas all his Equipment, including the foundations of any structures, stores, office accommodation or any other asset belonging to him, and leaves the Site and Working Areas in a tidy condition to the satisfaction of the Project Manager.
- m. No excess or discarded materials or Equipment may be buried or dumped within the port boundary.
- n. Demolition of all permanent and temporary structures, surfaces etc. shall be first approved by the Project Manager prior to the work being carried out.
- o. The Employer does not provide any security for the Site and Working Areas. The Contractor provides same and indemnifies and holds indemnified the Project Manager and Employer against any claims and actions that may arise out of Site and Working Area security.
- p. No housing is available for the Contractor's employees. The Contractor makes his own arrangements to house his employees and transports them to site in a closed vehicle specifically designed for passenger transport (bus or similar) which is in a roadworthy condition.
- q. Wherever the Employer provides facilities for the Contractor's use and the Contractor adapts such facilities for use, then the Contractor makes good and provides full reinstatement to the land (including all apparatus of the Employer and Others in, on or under the land) and surrounding areas to its original standard upon dismantling of such facilities and hand-back to the Employer.

3.15 Survey control and setting out of the Works.

- a. The Contractor is responsible for all setting out works and all surveys required that are additional to those provided to the Contractor by the Employer

3.16 Excavations and associated water control

- a. Probability of Asbestos Contamination in Excavations:
 - ii. The Contractor ensures his staff and labour are equipped with the necessary PPE and are trained to recognise asbestos contamination
 - iii. On encountering asbestos contamination, the Contractor immediately stops all work in the affected area, he summonses the Supervisor and secures the area.
 - iv. The Supervisor arranges for a specialist waste disposal Contractor to collect, bag, remove and dispose the contaminated material from the excavation or bulk earth Works.
 - v. The Contractor continues with the excavation or bulk earth Works on receipt of a written instruction from the Supervisor.

3.17 Underground services, other existing services, cable and pipe trenches and covers

- a. As a guide only, the Project Manager provides the Contractor with drawing(s) showing various known existing underground services for his information. The position of these services is approximate and it is possible that other services exist which are not reflected, and which may affect the Works.
- b. The Contractor establishes the location of the various existing services situated within the Site and Working Areas, and records all such information on "marked-up" drawing(s) which remain available for reference at all times.

- c. The Contractor exercises due care and attention in carrying out any excavation work to avoid damage or disruption to existing services. The Contractor accordingly consults the Project Manager prior to undertaking any excavation work.
- d. 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 excavation.

3.18 Control of noise, dust, water and waste

2.1.1. Before moving Equipment onto the Site, Working Areas and commencing operations, 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.

2.1.2.

3.19 Giving notice of work to be covered up

2.1.3. The Contractor notifies the Supervisor in writing of any elements of the Works which are to be covered up. This notification is given not less than 24 (twenty four) hours prior to the proposed covering up.

2.1.4.

3.20 Restrictions to access on Site, roads, walkways and barricades

- a. The Contractor is specifically excluded from entering the Employer's Operational Areas which are adjacent to the Site and Working Areas. The Contractor plans and organises his work in such a manner so as to cause the least possible disruption to the Employer's operations.
- b. The Contractor ensures the safe passage of Contractor's traffic to and around the Site and Working Areas at all times that includes providing flagmen, protective barriers, signage, etc. for protection, direction and control of traffic as detailed in the project specifications
- c. The Contractor ensures that any of his staff, labour and Equipment moving outside of his allocated Site and Working Areas does not obstruct the operations of the Port. To this end access routes are allocated and coordinated by the Project Manager.

- d. The Contractor ensures that all his construction staff, labour, and Equipment remains within his allocated and fenced off construction area.
- e. All Contractor's staff and labour working within Port's boundary complies with Transnet National Ports Authority's (TNPA) operational safety requirements and are equipped with all necessary personnel protective equipment (PPE).

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

- a. The Contractor keeps daily records of his people engaged on the Site and Working Areas (including Sub-Contractors) with access to such daily records available for inspection by the Project Manager at all reasonable times.
- b. The Contractor has access to the site from 07h00 to 17h00 daily on all working days Monday to Friday. The Contractor will be required to obtain permission from the Project Manager to Conduct Works out of the hours stipulated. Basic conditions of employment will be adhered to – a 45 hour week will apply, with a maximum of 10 hours overtime.

3.22 Completion, Testing, Commissioning and Correction of Defects

2.1.5. On or before the Completion Date, the Contractor completes everything required to Provide the Works including the work listed below which is to be done before the Completion Date and in any event 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 as specified in the Works Information	Within 14 days prior to Completion.
Performance testing of the <i>Works</i>	To be conducted as the Works progress in order to satisfy the requirements of the Technical Specifications.

The work to be done by the Completion Date:

- a. On or before the Completion Date the Contractor shall have done everything required to complete the Works. The Project Manager cannot certify Completion until all the work 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.

3.23 Materials, facilities and samples for tests and inspections

- a. The Contractor shall supply concrete mix designs to Transnet specifications, concrete cube tests, compaction results, steelwork shop detail drawings for approval, steelwork material certificates, if required.

3.24 Commissioning

- a. Access given by the Employer for correction of Defects
- b. The Contractor complies with the following constraints and procedures of the Employer where the Project Manager arranges access for the Contractor after Completion:
 - The Site Entry and Security Control requirements of the TNPA
 - Provision of barricading around the area where the defect is to be corrected.
 - The requirements of the Health and Safety Standard HAS-STD-0001
 - The Contractor is permitted to carry out the following Works after Completion
 - Defects during maintenance period.

3.24.1 Use of the Works required before Completion has been certified

2.1.6. None.

2.1.7.

3.24.2 Access given by the Employer for correction of Defects

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

- a. Safety, access control and work procedures as determined by the Ports Manager.
- b. These may be the same as communicated elsewhere within this Works Information as at the starting date / access date, or as the Works are now in use by the Employer's occupation of the Site, the same may be incrementally or substantially changed post Completion.

4 PLANT AND MATERIALS STANDARDS AND WORKMANSHIP

2.1.9.

4.1 Investigation, Survey and Site Clearance

2.1.10. The Contractor carries out the following investigations at the Site:

2.1.11.

- Conducts an investigation to determine all the existing services on the site. Marks and records all these services.
- Maintains a concise record of the conditions of all existing site infrastructure and services

4.2 National Standards

2.1.12.

2.1.13. The latest editions and/or amendments of the following Standards and Codes shall be considered a minimum requirement. In the event of differing requirements, the most stringent Code or Standard shall apply:

- a) Occupational Health and Safety (OHS) Act No. 85 of 1993;
- b) South African National Standards;

- c) DIN or British Standard Specifications. / DIN, EN and ASME Standard Specifications;
- d) N.O.S.A. Safety Guidelines;

4.3 Building works

- 4.3.1 Where the Association of South African Quantity Surveyors Model Preamble for Trades 1999 are used within the Works Information, the following interpretations and meanings shall apply:
- 4.3.2 In case of any conflict in interpretation, ambiguity or discrepancy between any Model Preamble for Trades 1999 (whether standard or written as a particular project specification) contained in the Works Information and the conditions of contract, the conditions of contract take precedence within the ECC Contract.
- 4.3.3 In case of any conflict in interpretation, ambiguity or discrepancy between any Model Preamble for Trades 1999 (whether standard or written as a particular project specification) contained in this paragraph 4.2 of C3.1 Employer's Works Information and specific statements contained elsewhere in C3.1 Employer's Works Information, the specific statements contained elsewhere shall prevail, without prejudice to the Project Manager's express duty to resolve any ambiguity or inconsistency in the Works Information under ECC Clause 17.1.
- 4.3.4 Within the Model Preambles for Trades 1999, the following amendments and interpretations shall apply:
- 4.3.5 Where the word or expression "Contractor" is used, read "Contractor".
- 4.3.6 Where the Model Preambles for Trades 1999 mention "rates" for measured work and any contractual statements relating to payment, all such statements shall be discounted, with the ECC conditions of contract taking precedence.
- 4.3.7 Within the Model Preambles for Trades 1999, A. GENERAL, the following amendments and interpretations shall apply:
- 4.3.8 Where the word or expression "bills of quantities" is used, this shall be discounted for the purposes of the Works Information. The ECC Contract Data - Part One states the main option to apply within the ECC Contract between the Parties.



- 4.3.9 Within the Model Preambles for Trades 1999, B. ALTERATIONS, B.2 MATERIALS FROM THE ALTERATIONS, CREDIT, ETC and C. EARTHWORKS, C1.4 Materials from demolitions shall not apply. C3.1 Employer's Works Information paragraph 3.1.6 states details of the Contractor's title (if any) to Materials arising from excavations and/or demolitions and how such Materials are either to be disposed of or re-used in the works.
- 4.3.10 Within the Model Preamble for Trades 1999 Q. PLUMBING AND DRAINAGE, Q.24 TESTS shall be deemed to be included within paragraph 3.2.1 of C3.1 Employer's Works Information.
- 4.3.11 Within the Model Preamble for Trades 1999 U. EXTERNAL WORKS, U.3.8 Process control tests shall be deemed to be included within paragraph 3.2.1 of C3.1 Employer's Works Information.
- 4.3.12 The principles, meanings and interpretation stated and established within paragraphs 6.2.1 to 6.2.8 with respect to the Model Preambles for Trades 1999 equally apply to the other Model Preambles for Trades 1999 references used within this paragraph 4.2 of C3.1 Employer's Works Information.
- 4.3.13 Building modifications are required for the purposes of this contract. They form an integral part of the civil and structural work, and are described under section 2.4 of the Works Information.

4.4 Civil Engineering and Structural Works

- 4.4.1 Where the SANS 1200 series of Specifications are used within the Works Information, the following interpretations and meanings shall apply:
- 4.4.2 In case of any conflict in interpretation, ambiguity or discrepancy between any SANS 1200 Specification (whether standard or written as a particular project specification) contained in the Works Information and the conditions of contract, the conditions of contract take precedence within the ECC contract.
- 4.4.3 In case of any conflict in interpretation, ambiguity or discrepancy between any SANS 1200 Specification (whether standard or written as a particular project specification) contained in this paragraph 4.3 of the Employer's Works Information and specific statements contained elsewhere in C3.1 Employer's Works Information, the specific statements

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

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

4.4.5 Where the word or expression "Employer" is used, read "Employer";

4.4.6 Where the word or expression "Contractor" is used, read "Contractor";

4.4.7 Where the word or expression "Supervisor" is used, read "Project Manager" or "Supervisor" as the context requires;

4.4.8 Where the word or expression "schedule of quantities" is used, this is deleted in entirety. Assessment and payment is in accordance with the conditions of contract (and the ECC main and secondary options stated therein);

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

4.4.10 "Acceptable. Approved (Approval)" is interpreted as either a Project Manager or a Supervisor communication or instruction in relation to Works Information compliance, consistent with the conditions of contract as the context requires;

4.4.11 "Adequate" is deleted. The Project Manager notifies the Contractor where the Contractor has not complied with the Works Information;

4.4.12 "Measurement and payment" and the further definitions contained within 6.3 c) are deleted. Assessment and payment is in accordance with the conditions of contract (and the ECC main and secondary options stated therein);

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

4.4.14 "Approval" by either the Project Manager and/or the Supervisor is without prejudice to ECC Clause 14.1 and, inter alia, ECC Clauses 13.1, 14.3 and 27.1.

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

4.4.16 SANS 1200 A: GENERAL 3.2 STRUCTURES AND NATURAL MATERIAL ON SITE, does apply.

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

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

4.4.19 SANS 1200 A: GENERAL 7.2 CONTRACTOR’S OFFICES, STORES AND SERVICES, applies but the Project Manager resolves any inconsistency with statements included within paragraph 3.1.12 of C3.1 Employer’s Works Information.

4.4.20 SANS 1200 A: GENERAL 5.1 SURVEY, does apply.

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

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

4.4.23 SANS 1200 A: GENERAL 3.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES applies only to the extent that it is consistent with the specific statements made elsewhere in C3.1 Employer’s Works Information and in any case and at all times consistent with the conditions of contract.

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

4.4.25 Where the word or expression “Supervisor” is used, read “Supervisor”.

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

4.4.27 The principles, meanings and interpretation stated and established within paragraphs 6.3.1 to 6.3.15 with respect to SANS 1200 series and to SANS 1200 A: GENERAL equally apply to the other SANS 1200 specification reference parts G (concrete) and H (structural steelwork)

4.4.28 Code of Practice for Steel Construction
The relevant sections of this document shall conform to the requirements of the SANS 1200 H Series of Standards.

4.4.29 Rolled Steel
All structural steelwork, except where otherwise stated, shall be of rolled steel and shall comply in every respect with SANS 1431 for evadable structural steel. Structural steelwork shall be designed in accordance with SANS 10162.

**4.4.30 Steel Castings**

Steel castings shall be sound, clean and free from all defects and distortion of any kind and should, except where otherwise specified, conform with the conditions and tests specified in SANS 407 : 2000 for the particular purpose according to service. They shall be thoroughly annealed and all working parts and bearing surfaces shall be machined and turned accurately with correct finish.

4.4.31 Steel Forgings

All steel forgings shall be free from flaws and surface defects of any kind and be accurately finished to the prescribed dimensions. They should conform to the conditions and tests specified in BS. No. 24, Part 4.

4.4.32 Workmanship and Finish to Steelwork

The workmanship and finish shall be of the best quality throughout with every individual part accurately made to size and form so as to fit exactly on erection.

Generally the workmanship on any steelwork shall be in accordance with the recommendations of SANS 1200H series & SANS 2001: CSI. Cutting of steelwork may be affected by shearing, cropping or sawing. Sheared or cropped edges shall be dressed to a neat and workmanlike finish and shall be free from any distortion.

All holes for turned and fitted bolts shall be accurately drilled or reamed and the diameter of the hole shall not exceed the finished diameter of the bolt by more than 0, 25 mm.

All steelwork which has been partially heated shall be properly annealed except in applications of minor detail.

4.4.33 Galvanising of Steelwork

This shall be in accordance with SANS 121: 2000 latest revision and the relevant Project Standards

Note: on National Standards: Where given, these are a minimum requirement, and not limited. Equivalent Standards are acceptable, but must be specified.

4.5 Electrical – Small Power**DISTRIBUTION BOARDS****General**

Distribution board shall comply with the requirements of the standard specifications of these documents or shown on the drawings. All distribution boards must be dustproof with an IP65 rating and 1,6mm 3RC12 and/or as per drawings specification. They must have a proxy finish.



Distribution boards are to be manufactured by an approved switchboard manufacture and to have a SABS approved manufacturer circuit breakers and/or isolators (as per drawing) and lightning/surge arrestor. All DB's to have surge arrestors as per drawings. A thirty percent (30%) space must be included on all DB's.

Drawings of all distribution by the manufacturer shall be submitted by the Contractor to the Supervisor for approval before commencement of manufacture of distribution boards. After construction all DB must be inspected by the Supervisor before installation.

Installation of Distribution Boards

Distribution boards shall be installed in the positions as shown on the respective drawings. The Contractor shall ensure that the distribution boards with the necessary conduits, sleeves, and channels as required are placed in position and mounted when required, and he shall ensure that all equipment is installed in the correct positions. It must be emphasised that no chasing will be allowed in walls built with face-bricks on the side in which distribution boards and ancillary equipment are installed. In all such cases the electrical Contractor shall place his equipment in its proper place for the building contractor to build.

The costs of any additional work caused by late, incorrect or defective positioning of equipment and/or material by the electrical Contractor, shall be recovered from him.

The electrical Contractor shall, while material and/or equipment forming part of the electrical installation are/is being built in, and have a competent representative present to ensure that no unnecessary stress is placed on the material that will influence subsequent installation of equipment. Care shall be taken that all equipment of the board fit properly in their respective position without distortion which can lead to a poor installation and appearance. All bolts, clamps and fasteners shall be examined and properly tightened.

The electrical Contractor shall ensure that all circuit breakers and other equipment can be changed and replaced if and when required.

All support props and struts, packing pieces and material used by the board manufacturer to prevent damage during transit, shall be removed by the electrical Contractor. The Contractor shall examine all boards and ensure that all equipment shown on the appropriate relevant drawings has been supplied and fitted.

Any conspicuous damage like scratches or chafe marks to paint work, shall be touched up with the same colour paint as supplied by the board supplier.

The mounting height of all distribution and meter boards, measured to the top of the edge of the board shall be 2 000 mm above finished floor level, unless otherwise specified or the position and circumstances dictate differently. The electrical Contractor shall ensure that cables sleeves and provision for the entry of cables to distribution boards as shown on drawings are done properly and neatly.

Exposed cables above or below the surface distribution board must be covered with a metal cover of the same colour as the DB.

Earthing

Earthing shall be done in accordance with the requirements of the standard specifications and those of the Supply Authority.

Earth system neutral and all non-current carrying metal parts of electrical equipment, conduit, cable racks, etc.

Earth metal parts of distribution boards, switch boxes, conduit, wash-hand basins, working surfaces, cable armouring and electrical equipment.

A separate isolated earth-bar shall be fitted in each distribution board for the dedicated computer socket outlets. These earth-bars shall be earthed with an insulated earth conductor to a separate earth spike from the main earth. The computer earth spike shall be inter-linked outside the building to an earth conductor, to the main earth spike of the building.

Additional equipment.

Install three phase lightning arrestor in the Distribution board as per drawing.

Labels

All distribution boards shall be marked as follows:

- a) Name and number of distribution board and Fault level rating of distribution board, example "DB - A, 5kA";
- b) Origin of supply, and size of all cables, example "Supply from main DB - 25 mm² x 4c
- c) All circuit breakers shall have its current rating clearly indicated on the handle, or on the panel adjacent to the switchgear;
- d) All circuit breakers shall be properly labelled as to its service, as indicated on the drawings.

Colour Coding And Labelling Of The Distribution Board

The distribution board must be white in colour, with the following specification:

Non-essential DB colour to be white with white colour face plate. The label will have black engraved letters on white ivorene label. Ivorene label super-glue or pop riveted to face plate or frame. Distribution board number as per drawing, e.g. DB-A. Content of internal label on face plate – DB number indication of a feeder source, size of a feeder cable, fault level rating of a distribution board and phase rotation direction. The label of a DB will be 6 mm label on face plate to be 3 mm. labelling of cables – all incoming and outgoing cables shall be labelled with ivorene labels indicating the size of the cable.

Essential - DB colour to be white with red colour face plate. The label will have white engraved letters on red ivorene label. Ivorene label super-glue or pop riveted to face plate



or frame. Distribution board number as per drawing, e.g. DB-AE. Content of internal label on face plate – DB number indication of a feeder source, size of a feeder cable, fault level rating of a distribution board and phase rotation direction. The label of a DB will be 6 mm label on face plate to be 3 mm. labelling of cables – all incoming and outgoing cables shall be labelled with ivorene labels indicating the size of the cable.

Uninterrupted Power Supply - DB colour to be white with blue colour face plate. The label will have black engraved letters on white ivorene label. Ivorene label super-glue or pop riveted to face plate or frame. Distribution board number as per drawing, e.g. DB-AU. Content of internal label on face plate – DB number indication of a feeder source, size of a feeder cable, fault level rating of a distribution board and phase rotation direction. The label of a DB will be 6 mm label on face plate to be 3 mm. labelling of cables – all incoming and outgoing cables shall be labelled with ivorene labels indicating the size of the cable.

Balancing of Load and Phases

In multiphase distribution boards, all single phase circuits shall be equally distributed over all three phases so as to balance the electrical load as far as possible.
Each type of sub-circuit shall separately be balanced over all three phases as far as possible.

Provision for Future Equipment

Where space is required for future switchgear, the panel shall be correctly punched for such future switchgear.
Approved blank-covers must be provided.

EARTHING

Earthing shall be done in accordance with the requirements of these documents and those of the Supply Authority.

Earth system neutral and all non-current carrying metal parts of electrical equipment, conduit, cable racks, etc.

Earth metal parts of distribution boards, switch covers, conduit, wash-hand basins, working surfaces, cable armouring and electrical equipment.

The current carrying capacity of earth conductors shall in general be not less than 50 % of that of the largest conductor which is protected, except that earth conductors smaller than 2,5 mm squared may not be used.

All luminaires shall be earthed to an earth conductor.

A specialist and approved lightning & earthing protection contractor will be appointed by the electrical subcontractor. A provisional amount for this work has been allowed for in the tender summary. The lightning protection system shall comply with the latest relevant requirements of the specification:

SANS 10313: Protection of structures against lightning.

CONDUIT AND FITTINGS

Flush In Walls, Floors and Concealed In Roof Spaces

Conduit fittings and their installation shall comply with these documents. All conduits shall be concealed by laying in concrete, chasing in walls or running in ceiling/roof spaces. All chase work and making good thereof shall form part of this contract.

Surface Mounted In Visible / Exposed Areas

Conduit fittings and their installation shall comply with these documents and shall be hot-dipped galvanised flat-ended steel conduit and accessories and shall be fixed with suitable steel spacer saddles.

Contractor is to install PVC conduits in all electrical installation. Conduits jointing to be done with couplings or approved jointing accessories for conduit jointing and contractor is to use glue to make sure that the jointing or connection of conduits is permanently fixed. All conduit shall be painted and match the wall after installation.

WIRING

Wiring shall generally be done as described in these documents and shown on the drawings on condition that:

Where no mention is made of conduit, the requirements shall also apply to other wireways such as skirting and ducting where relevant, except that these wireways contain more than one circuit.

All circuits in these wireways shall, however, be strapped and marked as described in the documents. Where "clean lines", i.e. separate circuits from the distribution board, are taken to dedicated socket outlets, more than one circuit may be taken through one conduit. These cases are, however, expressly shown on the drawings, if relevant. All wiring shall be new.

MOUNTING HEIGHTS AND POSITIONS

Mounting heights and positions of all equipment and fittings shall be as given in these documents and/or as given on the drawings.

All cases where doubt may exist shall be referred to the Supervisor for a decision.

COVERPLATES

Cover plates shall comply with the requirements of these documents. Where switched socket outlets are mounted in power skirting, the cover plates shall form an integral part of the equipment in which the switch socket outlets are mounted.

Where switched socket outlets and switches are mounted in wall outlet boxes and for blank cover plates they shall be WHITE enamel on steel.

All cover plates shall be PVC and white in colour with 3mm engraved lettering indicating distribution board and circuit number.

Colour coding is to be done as per SANS standard, namely:-

Normal /Non-essential Supply: white,

Emergency/Essential Supply: signal red – SANS 1091 code A11 and

UPS supply: blue – SANS 1091 code F01)

CABLE SLEEVES

Cable Sleeves and Bends Inside Building Complex

All cable sleeves and bends inside the building complex and on the site across roads and under hardened surfaces shall be supplied and installed by the electrical subcontractor and shall form part of his contract.

Cable sleeves shall be made from PVC and shall be at least Class 34, unless otherwise specified and shall be installed at all entrances to building, road and street crossings and such other entrances to building, road and street crossings and such other places as may be specified elsewhere in these documents or shown on the drawings. Sleeves used at entrances to building shall be sealed at both ends after the cable has been installed. During installation and until final sealing is done, the sleeves shall be kept clean of debris and blockage by temporary plugs. Final sealing shall be done with a weak cement mixture. Sleeves for future use shall be likewise sealed.

Cable sleeves to the distribution boards shall be installed with slow bends.

The sizes and number of cable sleeves are indicated on the drawings.

Where the diameter of cable sleeves are such that it cannot be hidden behind a plastered slot in the wall, an acceptable and suitable cover shall be provided and screwed over the cable slot.

Where cable sleeve are installed by the principal contractor, the electrical subcontractor shall ensure that the correct sizes, number and length of sleeves are supplied and installed by the main contractor so that the cables can be pulled-through and installed.

ARRANGEMENT OF CIRCUITS

The arrangements of the various circuits are indicated on the drawings, together with the required protection (switchgear), control and the type and number of wiring (conductor or cable) of each circuit.

All protection shall be done with moulded case circuit breakers (MCCB's) from a SABS approved manufacturer.

No mixing of different types, ratings and manufacture of switchgear shall be allowed.

The electrical subcontractor shall check and make sure that the conductors as given for the various circuits, comply with the requirements of the standard specifications of these documents, as well as those of the SANS Code of Practice, SANS 10142-1 as amended.

The electrical subcontractor shall ensure that all circuits are connected such that the load is equally balanced over all three phases.

ISOLATORS, CIRCUIT BREAKERS, EARTH LEAKAGE RELAYS AND SURGE ARRESTOR

Isolating switches, circuit breakers and earth leakage relays shall comply with the relevant requirements given in the standard specifications of these documents and shall be of the SABS approved manufacture (commercial/industrial circuit breakers and switch disconnectors), or as may be specified elsewhere in these documents or shown on the drawings. The circuit breakers must be hydraulic magnet type.

The let through current of isolating switches and the rupturing capacity of circuit breakers shall be not less than that specified on the respective distribution board diagrams and kiosk.

SWITCHED SOCKET OUTLETS

Switched socket outlets (s.s.o) shall be 250V 16A 3 round pin in the positions as shown on the drawings and shall comply with the requirements of the Standard Specifications of these documents and shall be of approved manufacture and shall bear a SABS mark, white. The position of the sockets out will be 300 mm above floor finishing level (AFFL) or/and as per drawing. Sockets outlets with waterproof housing must be provided and must be installed as shown on the drawings be the same height of 300mm AFFL, or as specified on the drawing.

All switch socket outlet shall be surface mounted and switch must be metal galvanised steel.

Labelling on the cover plate is to be engraved with black letters. Content on label shall be the distribution board number and circuit number feeding socket outlet, e.g. DBA/PD1/1. Each socket outlet on a circuit shall be labelled.

LIGHT SWITCHES

Switches shall comply with the requirements of these documents, shall have a rating of not less than 16 A 240V and shall be suitable to break the load which is typical of fluorescent tube/LED luminaries. Light switches shall be of approved manufacture and shall bear a SABS mark. The position of the light switch must be 1 400 mm above floor finishing level (AFFL) or/and as per drawing. Light switches with waterproof housing must be provided and must be installed as shown on the drawings.

Light switch cover plates are to be provided with an engraved label with black letters. Content on label shall be the distribution board number and circuit number feeding light switch, e.g. DBA/L1/1. Each light switch on a circuit shall be labelled. All switch covers must be metal steel.

WELDING ISOLATORS

All welding Isolators shall be 5 pin, 400V,3-phase, neutral, earth and shall be weatherproof to IP65 standards. Colour to be Electric orange.

All final connections shall comply with the requirements of SANS 10142-1.

Isolators shall IP65 weatherproof surface mounted isolators wall-mounted at $\pm 1\ 500\text{ m}$ AFFL or as indicated on the drawing.

DESIGN DRAWINGS

The design drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power points, switches and light points that may be influenced by built-in furniture must be established on site, prior to these items being built in.

LOW VOLTAGE CABLE

The sizes and routes of low voltage cables are indicated on the drawings and in these documents.

Low voltage cables shall be PVC/SWA/PVC ECC type with copper conductors which shall comply with the requirements of SANS 1507 in those of the standard specifications, in all respects.

Cables shall bear the SABS mark. The supply, installation, termination and jointing of cables shall comply with SANS 10198 and with the requirements of these documents. No jointing will be allowed in cables unless authorised by the Supervisor.

Earth Conductors

Earthing shall comply with the requirements of the Supply Authority and SANS 10142-1 as amended.

Marking

The electrical sub contract shall mark & label of all substation equipment. Supply and install laminated single line schematic diagram of the MV/LV reticulation and state the feeder. Labelling with ID codes of all MV, LV & control cable ends at substation. Supply and install new OHS Act signage & fire & resuscitation notices on MV and metering/LV rooms of substation.

Cables shall be labelled at all terminations with suitable and approved labels (stainless steel Dymo-tape or Irvone white ivorene label written in black) indicating:

- i) Origin and Destination; (e.g. from Meter room to DB - C)
- ii) Cable size and no. of cores; (e.g. 16 mm² 4-core)
- iii) Conductor type. (e.g. PVC/SWA/PVC Copper ECC cable)

Cable Routes

The final cable routes shall be determined on site before installation commences.

Cable Glands

All cable glands shall be of the SABS approved IP 65 rated and shall conform to SANS 1213.

Cable Trays and Racks

Cable wire ways, trays, rack in

All cable wireways, channels, trucking and trays shall be SABS manufacture and shall be hard galvanised steel finish.

All cable wireways, trucking, channels, trays, etc. shall be neatly and properly fixed, suspended, clamped or supported with galvanised steel finish mechanical support accessories specially Supervisored and manufactured as per detail specifications of the manufacturer.

All cable trays/racks/ladders exposed to view shall be provided with galvanised steel finish galvanised steel in-fill plates to prevent cables being visible from the bottom.

The Contractor shall note the minimum mounting height requirements of all ducting and wire ways.

Contractor is to clean all redundant PVC conduits, sleeves cables and PVC conductors at the roof and make neat.

LUMINAIRES

General

Luminaires which comply with the requirements of the standard and detail specifications of these documents shall be supplied and installed in accordance with these documents and/or drawings. The tender rates shall be for the type specified and if alternatives are offered it shall be under a covering letter submitted with the tender documents. The onus will be on the Electrical sub-contractor to prove that the alternatives are in all respects equal or better to the types specified by means of a supplying SABS approved photometric data.

Luminaire positions indicated on drawings are diagrammatic, and all positions, spacing, etc. must be determined in accordance with drawing.

Lamps

All luminaires shall be supplied complete with lamps complying with the requirements of the standard specifications of these documents and, where applicable, shall bear the SANS mark. The colour of all fluorescent tube lamps as specified in the luminaire schedule where applicable.

Fixing Of Luminaires

Luminaires shall be installed in the position(s) indicated on the drawings. Final positions shall be determined by the Supervisor when in doubt.

Supply and Installation of Luminaires

The contractor shall allow for ordering, receiving, packing out, storing, mounting/fixing and final connections, of all the luminaires indicated on the drawings, in his tender sum. No luminaires shall be ordered prior to the Supervisor's official written approval.

Damage to Luminaires

All luminaires damaged by the contractor or his staff before first delivery shall be replaced with new luminaires at his own cost.

SANS Specification

Luminaires shall comply with the relevant SANS specification where such specification exists and shall carry the SANS mark of approval.

Where a SANS specification does not exist for complete luminaires, the accessories and control gear shall be SANS approved and carry the SANS mark of approval.

Photo-Electric Daylight Sensitive Switch

Exterior lighting shall be controlled by a photo-electric cell mounted against the exterior of the building with the unit positioned so that the extraneous light shall not affect its operation.

The unit shall comprise a photocell, thermal actuator and change-over switch, rated at not less than ten ampere (20A). The cover of the unit shall be manufactured from a tough, destruction resistant material for protection against tampering. The cover shall have good weather proofing properties, be ultra violet resistant and shall not deteriorate when exposed to sunlight for prolonged periods. Switch contacts shall be silver plated and shall be capable of breaking the load associated with fluorescent lamp luminaires. Contact rating shall be not less than 10 A.

The operational level shall be factory preset for "ON" at a light level of approximately 54 LUX and "OFF" at approximately 108 LUX. Voltage variations shall not materially affect the operational levels.

A time delay of not less than 30 seconds shall be provided to prevent the unit from functioning due to lightning or other short period changes in illumination.

The unit shall be effectively safeguarded against surges by means of a suitable surge protector which shall preferably form an integral part of the unit.

Bypass switches shall be provided for exterior lights controlled via photocells so that testing and maintenance can be done at any time.

External lighting shall be controlled via a photo-cell mounted on a wall.

4.6 Mechanical Engineering Works

4.6.1 Code of Practice for the design of shipyards and sea locks

The relevant sections of this document shall conform to the requirements of BS 6349-3:2013 Maritime Works.

4.7 Materials, fabrication and finishing

All materials, where applicable, shall conform in respect to quality, manufacture, tests and performance, to the Project Standards, South African National Standards/the International Electro technical Commission, or where no such Standard exists, the appropriate British Standard. Materials not specifically stipulated shall be of the best commercial quality.

All welding activities performed by the Contractor shall be in accordance with appropriate codes, standards and the Project Standards and shall also include the following:

- 4.7.1 All welds shall be laid smooth and external welds strip polished;
- 4.7.2 All stainless steel and 3Cr12 welds shall be pickled and passivated.

4.8 Ease of Operation and Maintenance

All Plant and Materials supplied by the Contractor shall be designed and constructed for ease of operation and maintenance to ensure that the availability, reliability requirements and operating time efficiencies stated in the Specifications are achieved and maintained throughout the life span of the Plant and Materials.

The Following shall also be noted:

- 4.8.1 All operational, maintenance and inspection points shall be safely accessible;
- 4.8.2 All working platforms shall be wide enough for safe and easy passage

The Contractor shall provide a specification and procedure that shall suggest the safest and most efficient operation to carry out the cleaning and maintenance of all Plant and Materials to be supplied by the Contractor as well as outline and supply all specialist tools required for these operations.

4.9 Safety equipment and name plates

The Contractor shall secure all safety equipment, guards, notices and nameplates associated with all Plant and Materials erected by the Contractor. This will include but is not limited to the following items:

4.9.1 Hot surface guards

4.9.2 Railings and chains

4.9.3 Signage and notices

4.9.4 Name plates

4.10 Scaffolding

The Contractor shall contract with a certified scaffolding contractor who will supply and erect all scaffolding. The Contractor shall manage their activities to ensure the timely and safe supply and erection of all scaffolding needed for the Erection of all work under this Contract as defined in the Scope of Work. The Contractor shall give the scaffolding contractor 48 (forty eight) hours' notice of scaffolding required. No standing time or extension of time shall be claimed by the Contractor due to unavailability of scaffolding if 48 (forty-eight) hours' notice was not given.

4.11 Erection Planning

The Contractor shall develop and submit to the Supervisor a detailed erection plan for the erection of all Plant and Materials, 10 (ten) days after the award date. The erection plan shall outline the following as a minimum:

4.11.1 Critical Path definitions

4.11.2 Installation start Dates

4.11.3 All site progress meeting dates

4.11.4 Installation milestone dates

4.11.5 Installation and Erection completion dates

4.12 Rigging

Before undertaking heavy lifting and rigging, the Contractor must undertake a rigging study and all rigging activities must have the following in place:

- 4.12.1 The rigging study must be reviewed by the Supervisor and the Employers Safety Officer prior to any heavy lifting and rigging activities being undertaken by the Contractor;
- 4.12.2 The rigging study must be co-ordinated with the overall site planning and activities schedule.

The Contractor shall supply all qualified and experienced personal required to effectively and efficiently position, align, install and erect all Plant and Materials supplied (by others) in a timely manner. This shall also include the installation of all rigging equipment fixed and mobile, such as crawl beams, crawls, "A" frame, gantries, hoists, etc. as required to lift, suspend, position and align, etc.; all Plant and Materials in their respective positions and in accordance with the manufacturer's specifications and the Project Standards.

4.13 Workmanship

The Contractor shall only employ competent staff to execute the Works and submit a competency and compliance certificate of each employee (e.g. welding certifications or certificates, fitter qualifications, etc.) to the Employer for approval.

The Contract shall be executed in accordance with good Engineering practice and the relevant standards, codes, statutory requirements and the Project Standards applicable to the satisfaction of the Employer.

Should any material or workmanship supplied and performed by the Contractor not be to the satisfaction of the Supervisor/Employer; it shall be rectified at the cost of the Contractor and all rejected material removed from Site. The Contractor shall be responsible for the correct and complete installation of all Plant and Materials supplied by others.

Inspections by the Supervisor shall not release the Contractor from his responsibilities within the Contract unless covered by a formal Take Over Certificate.

4.14 Painting and Corrosion Protection

The Contractor shall carry out all preparation, priming, protection coating, painting and finishing activities as required in accordance with both the Project Standard Technical Specification for Corrosion Protection as supplied by TNPA.

The final coat of paint or touch ups on Plant and Materials supplied by others shall be done by the Contractor.

Touch ups shall be limited to any damages, scratches, scraps etc. which occurred during the offloading, storage, retrieval, assembly, positioning, alignment, installation, erection and securing of all Plant and Material or unless approved by the Employer. All painting activities shall be undertaken by competent personnel supplied by the Contractor.

4.15 Lubrication

The Contractor shall ensure that all initial fluids, lubrication oils and greases, associated mechanisms and equipment required by all Plant and Materials and supplied by others are installed correctly and in accordance with the manufacturer's specifications. This shall also include consumables such as oil filters and chemicals, etc.

The Contractor shall ensure that all Plant and Materials installed, modified, removed and reinstalled by the Contractor are correctly lubricated prior to Commissioning.

4.16 Health, Safety and Environmental requirements

The Contractor shall comply with all applicable health, safety and environmental regulations and requirements for all persons entitled to be on the Site.

The Contractor shall be responsible for the precautions and measures to ensure the health and safety of all individuals on the Site and temporary areas (if applicable) outside of the Site, but utilised by the Contractor, with the prior approval of the Employer.

This shall also include any areas that may adjoin those areas or otherwise be affected or potentially endangered by the Works. The Contractor shall be responsible for the adequacy, stability and safety of all Site and Temporary Areas operations, methods of construction, all Contractor's Equipment, Temporary Works and structures.

The Contractor shall provide and/or install for all necessary safety protection equipment (e.g. rotating parts guards, hot surface insulation/guards, railings) and necessary Contractor's Personnel, in accordance with the applicable legislation in South Africa, including the Occupational Health and Safety Act (1993) of South Africa. The Contractor shall take special note of the requirements of the Construction Regulations, 2003.

The Contractor shall comply with the Employer's Environmental Management Plan Requirements. The Plant's noise level shall be less than 85 dBA when measured at any point further than three metres from the source(s) of the noise.

4.17 Quality Control Plan

The QCP shall be approved by the Supervisor and shall conform to the requirements of ISO 9001 (2000) and shall incorporate the following as a minimum:

- 4.17.1 A detailed organisation chart;
- 4.17.2 A list of Subcontractors;
- 4.17.3 A list of the applicable quality assurance procedures;
- 4.17.4 A list of applicable Codes and Standards for design, construction, inspection and tests;
- 4.17.5 The Contractor's inspection plans;
- 4.17.6 Any Subcontractor's inspection plans;
- 4.17.7 Provisional programmes for expediting Works to be executed by Subcontractors;
- 4.17.8 Procedures to manage the non-conformance of Plant and Materials
- 4.17.9 An audit schedule for Contractor/Subcontractor activities.

The QCP shall indicate Hold Points and Witness Points proposed by the Contractor. The Supervisor will determine, in consultation with the Contractor and the Employer, and notify the Contractor, the Hold Points and Witness Points to be witnessed by the Supervisor and/or the Employer.

The Taking-Over Certificate shall not be issued to the Contractor until all the Hold Points on the QCP have been witnessed and approved by the Supervisor and/or Employer as required.

The Contractor shall be responsible for updating the QCP regularly throughout the Contract. The QCP shall be required to demonstrate compliance with the requirements of the Contract.

The Supervisor shall be entitled to audit any aspect of the QCP and details of all procedures and compliance documents shall be submitted to the Supervisor for information, before each design and execution stage is commenced. When any document of a technical nature is issued to the Supervisor, evidence of the prior approval by the Contractor itself shall be apparent on the document itself.

The Contractor shall maintain the Contractor's Data Book for the Works at all times, and the Contractor's Data Book for the Works shall be made available to the Employer at all times during the Contract for review and approval by a Third Party Inspector.

4.18 Storage of existing Plant and Materials

Plant and Material to be stored for future use by the Employer shall be transported by the Contractor to a storage area to be advised by the Employer. All Plant and Materials shall as far a practically possible, be stored above the ground on wood block, palettes, etc.

4.19 Welders Certification

All welders employed by the Contractor shall be subjected to a welding test prior to carrying out any work on Site by an Approved Inspection Authority employed by the Contractor. These tests shall be co-ordinated and supervised by the Contractor. The testing process shall consist of each welder performing a series of test welds which shall be inspected by the Approved Inspection Authority to be supplied by the Contractor. The Inspection Authority shall provide the Supervisor's Third Party Inspection Authority and the Site Manager with full certification for all welders tested. The Contractor shall be responsible for the supply all test materials, welding rods, welding machines and any other material and equipment required to carry out the above tests.

4.20 Weld maps, weld inspection and weld failures

The Contractor shall allocate each welder a unique hard stamp number prior to starting any work on Site. These numbers shall be used by the Contractor to outline on each drawing the welds to be carried out by the relevant welders. These drawings shall serve as a weld map to be used by the Supervisors Third Party Inspection Authority's inspector during testing. In addition each welder shall hard stamp their own unique number next to each weld produced by them on Site. All hard stamps and hard stamp equipment and materials shall be provided by the Contractor.

The Supervisors Third Party Inspector shall identify the welds to be tested by the Contractor. These shall include all NDT, X-ray; die pen or any other test as required by the

relevant codes, standards and the Project Standards. For every weld failure, 2(two) additional equivalent tests shall be conducted for welds carried out by that same welder. Should these tests uncover further weld failures, testing of 100% of all that particular welder's welds may be conducted by the Contractor under the supervision of the Supervisors Third Party Inspector. In the event that 10% of all welds produced by a particular welder fail the tests carried out during the 100% testing period, that particular welder shall be immediately be removed from Site The cost of all the additional testing, all rectification work and the removal of unsuitable welders shall be for the Contractors account.

5 LIST OF DRAWINGS

5.1 Drawings issued by the Employer shall be as per the drawing register issued with the tender pack of drawings. The Contractor will be issued with the construction drawing after award

SECTION 2

6 MANAGEMENT AND START UP

6.1 Management meetings

- a. It is the Employer's specific intention that the Parties and their agents use the techniques of partnering to manage the contract by holding meetings designed to pro-actively and jointly manage the administration of the contract with the objective of minimising the adverse effects of risks and surprises for both Parties.
- b. The Contractor attends management meetings at the Project Manager's request. These meetings are to be held fortnightly or as regularly as maybe determined by the Project Manager. At these meetings the Contractor presents all relevant data including safety, health and environmental issues, progress, quality plans, subContractor management, as may be required.
- c. Meetings of a specialist nature may be convened as specified elsewhere in this Works Information, or if not so specified, be convened by persons at times and locations to suit the Parties, the nature and the progress of the *Works*. Within five days of the meeting the person convening the meeting shall submit records of the meeting to the Project Manager.
- d. All meetings shall be recorded in a register, using minutes prepared and circulated by the person who convened the meeting. Such minutes (or register) shall not be used for

the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

6.2 Documentation Control

All documentation shall conform to the latest revisions of the following, i.e.:

- a. SANS 10111 - Code of Practice for Engineering Drawings, or
- b. ISO 9001:2000 - Quality Management Systems Requirements.

6.3 Safety risk management

The *Contractor* shall comply with the health and safety requirements contained in this *Works* Information.

6.4 Environmental constraints and management

The *Contractor* performs the *Works* and all construction activities within the Site and Working Areas in accordance with the provisions of the specification Standard Environmental Specification (SES), Project Environmental Specifications (PES) and specification Construction Environmental Management Plan (CEMP)

The *Contractor* ensures that its *SubContractors* comply with the requirements of the CEMP.

The CSHEO submits daily, weekly and monthly checklists as required by the CEMP to the Project Manager.

The CEMP is:

- a. Contractor's Declaration of Understanding.
- b. Environmental method statements for construction operations.
- c. Materials handling, use and storage.

- d. Environmental closure certificate.
- e. Environmental inspections and audits.
- f. Environmental alignment meetings.

The roles and responsibilities of the various personnel acting on behalf of the Project Manager and who communicate directly with the *Contractor* and his key persons with respect to the CEMP and environmental issues are:

- a. The Construction Manager (CM) is responsible for environmental management on the Site and Working Areas and reports to the Project Manager with specific tasks to:
 - b. Implementing the Employer's CEMP.
 - c. Monitor *Contractor's* compliance to the CEMP.

The Project Environmental Manager (ProjEM) is responsible for ensuring that the *Contractor* complies with the CEMP and acts on behalf of the Project Manager.

The Project Environmental Officer (ProjEO) reports to the PSSM and ProjEM, conducts the day-to-day tasks to ensure that the *Contractor* complies with the CEMP and acts on behalf of the Project Manager.

6.5 Quality assurance requirements

The Contractor shall ensure that all contractual deliverables required to be executed and completed are given due consideration to meet the client's Technical Specifications, Drawings and General Quality Requirements for Contractors and Suppliers (TNPA-QUAL-REQ-014.1).

The Contractor's Quality Management System (QMS) shall conform with the requirements of ISO 9001:2015 to ensure and demonstrate that material, workmanship, procedures, and services conform to the specified requirements.



The Contractor submits his Quality documents to the Employer as part of his programme under ECC Clause 31.2 to include details of:

4. **Project Quality Plan (PQP)** detailing at least **three** requirements of how the Contractor's Quality System will be applied to successfully execute the Scope of Work and be aligned to **Section 4.5, 4.6 & 5** of the General Quality Requirements for Contractors and Suppliers - **TNPA-QUAL-REQ-14.1 (Annexure E** of the Scope of Work).
5. **Experience of Quality Assurance Officer** - The Quality Officer **MUST** have a minimum of **three** years' quality experience in Marine construction projects submitted in a Curriculum Vitae. The CV must detail the duties carried out on the Quality Officer role.
6. **Qualifications of Quality Assurance Officer**– a minimum of a Programme in Quality **OR** Diploma in Quality **OR** Technical Diploma. In addition to the minimum qualification submitted, a tenderer must submit a 5-days ISO 9001:2015 Quality Management System (QMS) training certificates (QMS Implementation **AND/OR** QMS Auditing). Proof of these qualifications and certificates must be attached.
7. **Quality Control Plans**- A minimum of any **three** (QCPs) shall be in line with the scope of works detailing the Engineering works(**Civil, Structural, Painting and corrosion protection, Mechanical, Electrical**) These QCP's shall identify all inspections as detailed in the scope of works together with other tests and verifications required to demonstrate that the works comply with the scope of works, specifications, and drawings.

6.5.1 Project Quality Plan

The Project Quality Plan (PQP) shall outline the quality strategy, methodology, quality resource allocation, Quality Assurance and Quality Control co-ordination activities to ensure that the scope meet the standards stated in the Scope Information.

The Contractor's PQP shall provide a description of how documents provided by the Employer to the Contractor are to be managed. The Contractor develops and maintains a comprehensive register of documents that will be generated throughout the contract including all quality related documents as part of its Quality Plan.

The Employer indicates those documents required to be submitted for 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 Employer 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.

6.5.2 Quality Manual

A copy of the Contractor's Quality Manual will be requested for review by the Employer followed, by a Quality Management Systems (QMS) audit at the Contractor's Head Office to obtain evidence that a satisfactory quality management system is being maintained.

6.5.3 Quality Data Book Index

The Contractor shall submit a project specific quality data book index that lists all the project deliverables as per the contract requirements.

6.5.4 Quality Officer

The Contractor shall nominate a suitably experienced quality representative as referenced on number 6.5(2,3) above. The Quality representative is responsible to ensure that the PQP requirements are implemented accordingly on site. The Contractor shall submit the CV and qualifications / certificates of his nominated quality representative for the Project Manager's review and approval.

6.6 Subcontractor

The Contractor shall also ensure that all Sub-contractors are suitably qualified and experienced to carry out the work for which they have been sub-contracted.

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.

The Contractor shall accept full responsibility for the quality of his sub-contractor(s) work and of materials used, irrespective of any quality surveillance that may be carried out by the Employer or his representative.

6.7 Programming constraints

6.7.1 Tender Program

A summary program, hereinafter referred to as the "Tender Program" for the duration of the contract are submitted by the Contractor, reflecting all Milestone deliverables and Events.

The level of this program must at least be "compatible" to the Price Schedule columns and or the breakdown of sections in the bills of quantities as applicable. The incidence of Payment Schedules or Cash Flow Forecast, submitted with the Contractor's program must be based on this program.

The Contractor's Programs are evaluated by the Project Manager to assess the Contractor's ability to plan his portion of the project to the extent necessary for the high degree of mutual co-ordination demanded by the Project.

Non-compliance with this specification may lead to the disqualification of the tenderer. At the Project Manager's discretion, the Contractor may be requested to prepare and submit a new Contract Program.

6.7.2 Initial Program, Contract Program and Subsequent Revisions

- a. The Contractor submits a program within 1 weeks of the date on which he was notified of having been awarded the contract / order.
- b. Any program submitted which does not supply all the required documentation set out in this document or does not comply with the requirements of this document shall be deemed to be rejected, whether or not the Project manager does so in writing.
- c. This Initial Contract Program, hereinafter referred to as the "Initial Program", is be drawn up at the level of detail necessary in the opinion of the Project Manager to ensure effective control over the work, usually to Level 4 detail.
- d. A "Summary" or "ham-mocked" program is submitted with the Initial Program. The summarized activities are inserted in such a way that the Milestone Dates as well as major interfaces of services and/or other contracts logically required for the completion of the contract are clearly shown. The start and finish of the summarized or ham-mocked activities are clearly indicated on the detailed network.
- e. Unless stated to the contrary, the Project Manager will examine and comment on the Initial Program within 2 weeks of submission and the Contractor amends and submits

this program, hereinafter referred to as the "Contract Programme" for approval within a further period of 5 days.

- f. The Project Manager may not in every instance be able to provide all information or working drawings, where applicable, of every aspect of the Works but such non-availability will not be deemed to be an excuse for non-presentation of programs. In such instances the relevant part of the program should be based on the Contractor's best estimate with a statement on which assumptions or drawings it is based.
- g. Should the Project Manager so require, or should problems occur during the execution of the contract, the Project Manager might request that portions of the program be expanded to enable closer control to be exercised e.g. site construction and commissioning programs. In such cases the more detailed netWorks fit exactly into the logic and time span of the Contract Program, but may be presented as separate programs.
- h. Minor revisions to the Contract Program may be introduced from time to time by mutual agreement. Should the Project Manager require a major revision to the Contract Program, such revision will be specified to the Contractor in writing.
- i. The Project Manager specifies the date by which the Contractor is required to submit the revision in question. This date is not, unless otherwise agreed, be less than 2 weeks from the date of notice.
- j. Revised Payment Schedules are required based on the revised Contract Program. These revisions are made when changes occur in this program and must be updated every month to include actual payments.
- k. Should the Contractor require a major revision affecting the logic or dates of the program, such revision will be specified to the Project Manager in writing for approval before the revision is performed.
- l. A revision to the program does not invalidate the "Date of Completion" in terms of the General Conditions of Contract and as given in the appropriate schedules. Changes to these dates can only be effected through a contract amendment.
- m. Progress is monitored against the latest revised program and payments controlled by the latest revised Payment Schedule accepted by the Project Manager.

6.7.3 Progress Reporting

- a. The Contractor updates the program and supplies the progress reports to show actual and expected progress compared to the latest agreed Contract Program. Progress information may be verified by the Project Manager at any stage.
- b. Progress reports on design, manufacturing, shipping, transport and site progress are submitted separately as per Table 1: Progress Reporting Requirements.
- c. The methodology to define work content in the progress curves needs to be agreed to between the Contractor and Employer within 5 days of Contract Award and may include parameters such as man-hours, m³ concrete, tons of steel, length of cable and cable rack to be installed, number of terminations, etc.
- d. The work content needs to be specifically designed to suit the type of work and to effectively indicate actual progress against planned progress.
- e. Progress reports are submitted in line with the requirements as specified in the table below.

TABLE 1: PROGRESS REPORTING REQUIREMENTS

ITEM	DESCRIPTION	FREQUENCY
1.	General Planning Report and revised network if logic has changed since the previous report.	Weekly
2.	Critical Activities Report. (Look ahead)	2 Weekly
3.	Milestone Report.	2 Weekly
4.	Updated Bar Charts.	Weekly
5.	Updated Program Graphs.	Monthly
7.	Progress S-Curves.	2 Weekly
8.	Expediting Report	2 Weekly

9.	Milestones of Deliverables	2 Weekly

- f. The Contractor uses Microsoft Projects 2010 or later version for his programme submissions or a similar programme software package equivalent to Microsoft Projects 2010 or later version subject to and with the prior written notification and acceptance by the Project Manager.

6.7.4 Reporting and monitoring

The Contractor submits programme narrative report to the Project Manager at weekly intervals in addition to the intervals for submission of revised programmes stated under Contract Data Part One. Contractor submits monthly programme narrative report to the Project Manager.

The Contractor completes an assessment of all activities in progress and to completion to determine percentage complete, forecast completion dates, deviations from the Accepted Programme and proposes remedial actions to rectify deviations.

The Contractor shows on each revised programme he submits to the Project Manager a resource histogram showing planned progress versus actual, deviations from the Accepted Programme and any remedial actions proposed by the Contractor.

- a. The Contractor submits the programme narrative report detailing the status and performance of operations on the Site and Working Areas; status and performance of operations outside the Working Areas; manpower histograms; plant and equipment histograms; S-curve of overall progress; and critical action items (top 10). Report indicates “progress this period” and “progress to date”.
- b. The Contractor’s weekly programme narrative report, updated and issued weekly, includes:
 - i. 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.

-
- ii. 3-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 Basleined Programme.
 - iii. Manpower Histogram – reflecting actual, forecast and planned activities
 - iv. Plant and Equipment Histogram – reflecting actual, forecast and planned activities
 - v. S-curves – reflecting the actual percentage complete versus the planned percentage for the overall contract utilising the earned values.
- c. The Contractor's monthly programme narrative report is submitted a week before the last Friday of each month, or as required by the Project Manager. The report indicates "progress this period" and "progress to date" and include, but is not limited to, the following:
- i. Summary of progress achieved during the reporting period.
 - ii. Latest Accepted Programme.

6.8 Contractor's management, supervision and key people

The Contractor provides an Organogram and Curriculum Vitae's of all his Key people (both as required by the Employer and as independently stated by the Contractor under Contract Data Part Two) and shows how such Key people communicate with the Project Manager, the Supervisor and their delegates.

The Contractor employs a CSHEO, based on the Site, as a key person under ECC3 Clause 24.1.

The CSHEO reports to the PSSM in respect of issues relating to safety risk management. The CSHEO submits the CHSMP to the Project Manager for approval and ensures that the Contractor implements the CHSMP.

The CSHEO reports to the ProjEM on the Site in respect of issues relating to environmental management. The CSHEO submits the CEMP to the Project Manager for approval and ensures that the Contractor implements the CEMP.

The CSHEO tasks include but are not limited to:

- a. Reports a safety incident to the Project Manager;
- b. Reports a safety incident to the Project Manager;
- c. Attends all SHE meetings, toolbox talks, induction programmes and monitors compliance with the CHSMP;
- d. Submits daily, weekly and monthly reports and data as required by the CHSMP to the PSSM;
- e. Reports an environmental incident to the Project Manager;
- f. Undertakes daily, weekly and monthly inspections of the Site and Working Areas as required by the CEMP and submits reports to the ProjEM;
- g. Monitors compliance with the CEMP and the environmental method statements submitted to the Project Manager; and
- h. Ensures the Contractor clears litter from the Site and Working Areas.

The Contractor employs a QA/QC Manager (CQA/QCM), based on the Site, as a key person under ECC3 Clause 24.1.

The CQA/QCM reports to the Supervisor. The CQA submits the PQP to the Project Manager for approval and ensures that the Works meet the standards stated in the Works Information.

The CQA/QCM tasks include but are not limited to:

- a. Maintains the comprehensive register of documents required by the PQP;
- b. Undertakes all inspections and testing required by the PQP;
- c. Prepares and regularly updates the CDR, and

- d. The Contractor employs a Contractor's Industrial Relations Practitioner (CIRP), based on the Site, as a key person under ECC3 Clause 24.1.
- e. The CIRP ensures that all reports and Industrial Relation requests are submitted accurately and in a timely manner to the Project Manager.

The CIRP tasks include but are not limited to:

- i. Dedicated to human resources, industrial relations and any other Contractor employee related function; Resolve all human resources and industrial relations matters arising from the Contractor's employees;
 - ii. The Contractor employs the Contractor's Planner (CP), based on site, as a key person under ECC3 Clause 24.1.
 - iii. The CP is based on the Site and is responsible for all construction programming, planning and reporting as stated under paragraph 2.6 of this Works Information.
- f. The CP tasks include but are not limited to:
- i. Undertakes the planning and scheduling of all activities comprising the Works.
 - ii. Ensures the Contractor submits the first and all subsequently revised programmes accurately and in a timely manner to the Project Manager.
 - iii. Ensures the Contractor submits programme narrative report to the Project Manager at weekly intervals.

6.9 Training Workshops and technology transfer

The Contractor facilitates the following requirements for training Workshops:

- a. The slipway management staff, operational staff, maintenance staff and project team from the TNPA shall be trained by the Contractor during the construction, assembly, commissioning and handover.

- b. A safety pre-mobilisation Workshop.
- c. Contractor employee safety training programme.
- d. The Contractor utilises local people for staffing up some of his requirements and ensures that there is adequate skills transfer taking place.

6.10 Insurance provided by the Employer

The insurance that will be provided by the Employer is as per the procedure manual contained in Part C1.

The procedure manual further details the cover to be arranged by the Contractor and subContractors as well as exclusions and deductibles.

The Contractor liaises with the Employer and the Project Manager at the Contract Date to declare the ECC3 contract details to the Employer's insurance brokers.

Where the Works involve the assembly, erection and installation of Plant, the Contractor declares the full replacement value and not the value included in the ECC3 contract.

The Contractor liaises with the Employer and the Project Manager when a claim is made and assists in completing the Claims Advice Forms that are provided.

6.11 Contract change management

At the Contract kick off meeting, the Contractor will be provided with the format of the standard forms to be used for communication of Contract change management (ECC3 Clause 60).

6.12 Provision of bonds and guarantees

The form in which a bond or guarantee required by the conditions of contract (if any) is to be provided by the Contractor is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The Contractor provides a bond or guarantee as required by the conditions of contract concurrently with the execution by the Parties of the form of agreement for the ECC3 contract.

C3.2 SCOPE OK WORK ANNEXURES

Annexure Reference	Title	No of pages
	This cover page	
D	Health And Safety Specifications	87
E	TNPA-QUAL-REQ-014.1 General Quality Requirements for Contractors and Suppliers	16
F	TNPA-SHEQ PD-QUAL-SPEC-008 Corrosion Protection	11
G	Contractor Environmental and Sustainable Specifications (TRN-IMS-GRP-GDL-014)	47
H	New TIMS Policy Commitment Statement	
I	Construction Management Plan - Upgrade of Ship Repair Facilities MSB - REV 3 (002)	2
J	Standard Operating Procedure for Construction Environmental Management - Version 1.0 Signed	35
		38
	Total number of pages	229

TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

ANNEXURE D: HEALTH AND SAFETY SPECIFICATIONS

Document Reference	Title	No of page
	This cover page	1
	Health And Safety Specifications	86
	Total number of pages	87

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

ANNEXURE E: Annexure F -TNPA-QUAL-REQ-014.1 General Quality Requirements for Contractors and Suppliers

Document Reference	Title	No of pages
	This cover page	1
	TNPA-QUAL-REQ-014.1 General Quality Requirements for Contractors and Suppliers	15
	Total number of pages	16

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

ANNEXURE F: TNPA-SHEQ PD-QUAL-SPEC-008 Corrosion Protection

Document Reference	Title	No of pages
	This cover page	1
	TNPA-SHEQ PD-QUAL-SPEC-008 Corrosion Protection	10
	Total number of pages	11

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

ANNEXURE G: CONTRACTOR ENVIRONMENTAL AND SUSTAINABLE SPECIFICATIONS (TRN-IMS-GRP-GDL-014.

Document Reference	Title	No of pages
	This cover page	1
	Contractor Environmental and Sustainable Specifications (TRN-IMS-GRP-GDL-014)	46
	Total number of pages	47

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

ANNEXURE H: NEW TIMS POLICY COMMITMENT STATEMENT

Document Reference	Title	No of pages
	This cover page	1
	New TIMS Policy Commitment Statement	1
	Total number of pages	2

TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

**ANNEXURE I: CONSTRUCTION MANAGEMENT PLAN - UPGRADE OF SHIP REPAIR FACILITIES MSB
- REV 3 (002)**

Document Reference	Title	No of pages
	This cover page	1
	Construction Management Plan	34
	Total number of pages	35

TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

ANNEXURE J: STANDARD OPERATING PROCEDURE FOR CONSTRUCTION ENVIRONMENTAL MANAGEMENT

Document Reference	Title	No of pages
	This cover page	1
	Standard Operating Procedure for Construction Environmental Management - version 1.0	37
	Total number of pages	38

TRANSNET NATIONAL PORTS AUTHORITY

CONTRACT NUMBER: TNPA/2024/11/0006/82453/RFP

DESCRIPTION OF THE WORKS: REHABILITATION OF THE SHIP REPAIR FACILITY IN THE PORT OF MOSSEL BAY FOR A PERIOD OF TWENTY-FOUR (24) MONTHS.

PART C4: SITE INFORMATION

Document reference	Title	No of pages
C4.1	This cover page	1
	Site Information	5
	Total number of pages	6

1. Description of the Site and its surroundings

1.1 General description

The proposed development is in the town of Mossel Bay which is 50 km southwest of George, and halfway between Cape Town and Port Elizabeth, both approximately 400km away. The site is the Slipway Facility in the Port of Mossel Bay. The Port is located in the south-east area of Mossel Bay Municipality, within Ward 8. The site is bound by Church Street to the East, Bland Street to the South, Kloof Street to the east, and the Indian Ocean to the north, refer Figure 25: Port of Mossel Bay: Scope Area bound in Red and Figure 26: Slipway at the Port of Mossel Bay below.



Figure 25: Port of Mossel Bay: Scope Area bound in Red

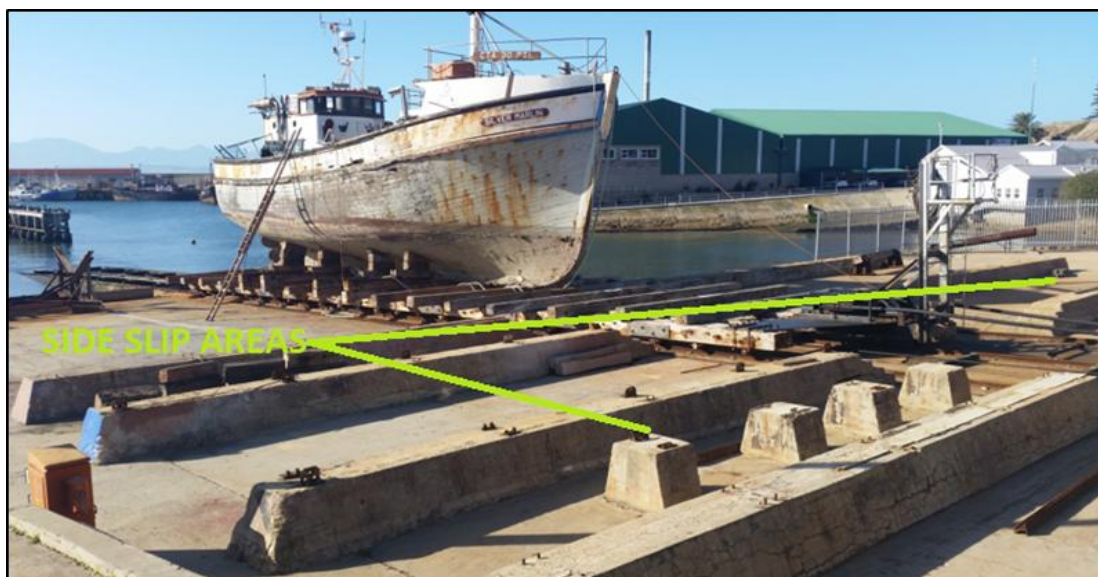


Figure 26: Slipway at the Port of Mossel Bay

The Port of Mossel Bay has an approximately 85year old end haul type slipway currently installed, the original design capacity of the slipway being 500Ton (long). The existing cradle is made from wood and is supported by a 3-way system. The cradle was originally constructed as a 42m long structure but had a section cut-off around 10years ago, reducing its effective length to 35m. The timber cradle, when fully extended into the water, straddles two wooden lead-in jetties on either side of it. Both jetties are approximately 62m long and supported on wooden piles.



Figure 27: View from land to water showing slipway and jetties



The slipway was originally designed for accommodating side slipping, where vessels are brought to land on the main cradle and then shifted off the main cradle to either side of it. Some of the side slipping infrastructure, like the upstand concrete beams that used to support the side slip rails, are still present at the site. Side slipping has however not been practiced at the slipway for the last 50 years at least. The Port of Mossel Bay has clarified that it intends to undertake side slipping activities in future.

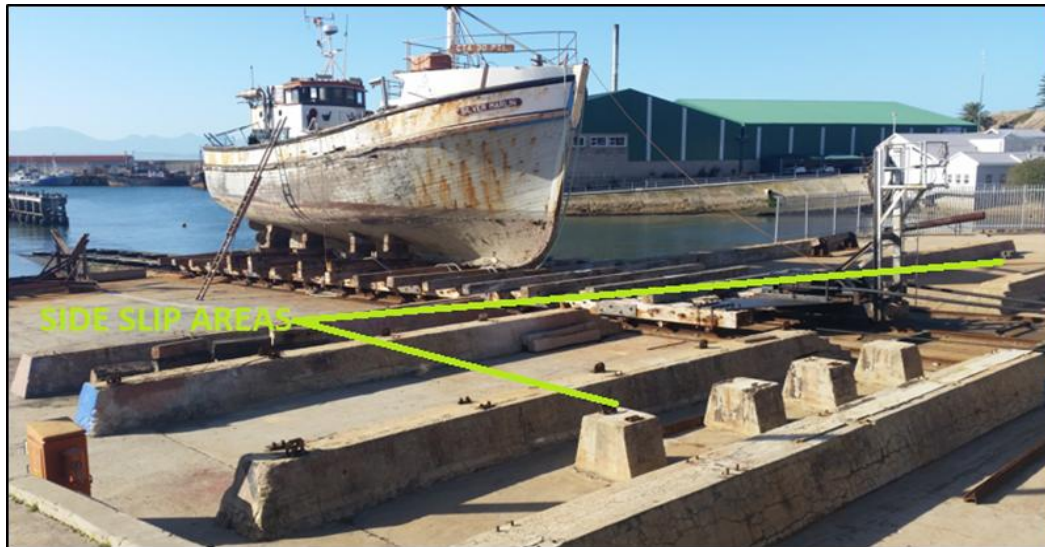


Figure 28: Side Slips either side of the main cradle

Due to poor condition of the slipway, the vessel handling capacity was downgraded to the current 200Ton (metric). The lead-in jetties are also in a poor condition, with major deterioration of both the pile supports and superstructure. There is particular concern that any impact by vessels could result in a catastrophic structural failure of the jetties. There is also an operations building on the site that was constructed at the same time as the slipway. The building is old, of outdated construction and does not meet the Port's future operational requirements.



Figure 29: Slipway operations building

The Chart Datum for Mossel Bay is 0.233m below Mean Sea Level. The approximate coordinates of the slipway are S-34°10'59.05" and E22°08'45.78".

1.2 Site conditions

Site Conditions are generally as follows:

- Altitude: At sea level
- Ambient temperature: 15-22 °C
- Relative humidity: Frequently 100%
- Air pollution heavily saline; industrial and locomotive fumes;
- General wind velocities: Up to 60 km/h
- Storm wind velocities: Up to 180 km/h

1.3 Access to the Works

Access to the works is from existing public road networks and roads internal to the Port of Mossel Bay. Access will be subject to Transnet National Ports Authority security and safety requirements and regulations

Due allowance must be made for any potential delays arising from vehicular congestion due to the large number of trucks entering the Port facilities.

The Contractor, its employees and its sub-contractors shall be required to complete a full induction from TNPA before being allowed on the site.