

Transnet Port Terminals

an Operating Division **TRANSNET SOC LTD**

[Registration Number 1990/000900/30]

REQUEST FOR PROPOSAL (RFP)

FOR THE: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

RFP NUMBER	: ICLM HQ 782 TPT- TPT/2024/01/0086/55121/RFP
ISSUE DATE	: 07 February 2024
COMPULSORY BRIEFING	: 14,19,20,21,22,23 February 2024
CLOSING DATE	: 07 March 2024
CLOSING TIME	: 12h00pm
TENDER VALIDITY PERIOD	: 12 weeks from closing date

- 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

- ELIGIBILITY IN TERMS OF THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD :

- 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 **8ME or higher** class of construction work, are eligible to have their tenders evaluated.

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T1.1 TENDER NOTICE AND INVITATION TO TENDER

SECTION 1: NOTICE TO TENDERERS

1. INVITATION TO TENDER

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

DESCRIPTION	DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT").
TENDER DOWNLOADING	This Tender may be downloaded directly from the National Treasury e-Tender 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	The Compulsory Tender Clarification Meetings will be conducted in the following locations as follows at: An initial Compulsory Tender Clarification Meeting will be conducted via Microsoft Teams on Wednesday the 14th of February 2024, at 11:00am [11 O'clock] for a period of ± 2 (two) hours. The initial Compulsory Tender Clarification Meeting will start punctually, and information will not be repeated for the benefit of individuals arriving late. Should the Tenderers wish to participate in the initial tender compulsory briefing session, the Tenderers may access the Compulsory Briefing Session using the links below: <u>Microsoft Teams meeting</u> Join on your computer, mobile app or room device Click here to join the meeting MeetingID:394669476745 Passcode: D7gTje <u>Or call in (audio only)</u> +27 21 835 5059,567264846# South Africa, Cape Town Phone Conference ID: 567 264 846# Find a local number Reset PIN http://intranet.inter.transnet.local/Videos/General/Transnet%20Recovery%20Plan/VID-20231214-WA0000?Web=1

**Join with a video conferencing device**

648388511@t.plcm.vc

Video Conference ID: 127 312 564 4

[Alternate VTC instructions](#)

Subsequent compulsory tender briefing sessions would be held in Cape Town, Saldanha, Eastern Cape and KwaZulu Natal as per the details on the tables below:

Cape Town

Location	Date & Time
Cape Town Container Terminal, 1 Container Rd, Foreshore, Cape Town, 7441	19 February 2024 – 09h00 (AM)
Cape Town Container Terminal, 1 Container Rd, Foreshore, Cape Town, 7441	19 February 2024 – 12h00 (PM)
Saldanha Port Terminals, Saldanha Bay Road, West Coast Peninsula	20 February 2024 – 08h00 (AM)

Eastern Cape

Location	Date & Time
East London Port - Hely Hutchinson Rd, Quigney, East London, 5211	20 February 2024 – 16h00 (PM)
– Ngqura Container Terminal - Neptune road, Port of Ngqura, Gqeberha, 6100	21 February 2024 – 12h00 (PM)
Gqeberha Terminal – TNPA ADMIN – Port Elizaberth, Gqeberha, 6001	21 February 2024 – 15h00 (PM)

KwaZulu Natal

Location	Date & Time
Durban Container Terminals (DCT) Pier 2	22 February 2024 – 08h00 (AM)
Durban Container Terminals (DCT) Pier 1	22 February 2024 – 10h00 (AM)
Transnet Port Terminals - Maydon Wharf Terminal - Shed 7A Corner Crofts & Johnstone Rd, Johnstone Road, Durban, 4057	22 February 2024 – 12h00 (PM)
Transnet - Queen's Warehouse - 237 Mahatma Gandhi Rd, Point, Durban, 4001	22 February 2024 – 14h00 (PM)
Transnet Richards Bay Terminals	23 February 2024 – 12h00 (PM)

for a period of ± 2 (two) hours. [Tenderers to provide own transportation and accommodation].

The Compulsory Tender Clarification Meetings 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 T2.2-02** hereto must be completed and submitted with your Tender as proof of attendance is required for a **compulsory** site meeting and/or tender briefing.

Tenderers are required to bring this Returnable Schedule T2.2-02 to the Compulsory Tender Clarification Meeting to be signed by the *Employer's Representative*.



	Tenderers failing to attend the compulsory tender briefing will be disqualified.
CLOSING DATE	12:00pm on (07 March 2024) Tenderers must ensure that tenders are uploaded timeously onto the system. If a tender is late, it will not be accepted for consideration.

2. TENDER SUBMISSION

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

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

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

- Click on "ADVERTISED TENDERS" to view advertised tenders;
- Click on "SIGN IN/REGISTER – for bidder to register their information (must fill in all mandatory information);
- Click on "SIGN IN/REGISTER" - to sign in if already registered;
- Toggle (click to switch) the "Log an Intent" button to submit a bid;
- Submit bid documents by uploading them into the system against each tender selected.
- **Tenderers are required to ensure that electronic bid submissions are done at least a day before the closing date to prevent issues which they may encounter due to their internet speed, bandwidth or the size of the number of uploads they are submitting. Transnet will not be held liable for any challenges experienced by bidders as a result of the technical challenges. Please do not wait for the last hour to submit. A Tenderer can upload 30mb per upload and multiple uploads are permitted.**

b) The tender offers to this tender will be opened as soon as possible after the closing date and time. Transnet shall not, at the opening of tenders, disclose to any other company any confidential details pertaining to the Tender Offers / information received, i.e. pricing,



delivery, etc. The names and locations of the Tenderers will be divulged to other Tenderers upon request.

- c) Submissions must not contain documents relating to any Tender other than that shown on the submission.

3. CONFIDENTIALITY

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

4. DISCLAIMERS

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

- 4.1. Award the business to the highest scoring Tenderer/s unless objective criteria justify the award to another tenderer.
- 4.2. Not necessarily accept the lowest priced tender or an alternative Tender;
- 4.3. Go to the open market if the quoted rates (for award of work) are deemed unreasonable;
- 4.4. Should the Tenderers be awarded business on strength of information furnished by the Tenderer, which after conclusion of the contract is proved to have been incorrect, Transnet reserves the right to terminate the contract;
- 4.5. Request audited financial statements or other documentation for the purposes of a due diligence exercise;
- 4.6. Not accept any changes or purported changes by the Tenderer to the tender rates after the closing date;
- 4.7. Verify any information supplied by a Tenderer by submitting a tender, the Tenderer/s hereby irrevocably grant the necessary consent to the Transnet to do so;



- 4.8. Conduct the evaluation process in parallel. The evaluation of Tenderers at any given stage must therefore not be interpreted to mean that Tenderers have necessarily passed any previous stage(s);
- 4.9. Unless otherwise expressly stated, each tender lodged in response to the invitation to tender shall be deemed to be an offer by the Tenderer. The Employer has the right in its sole and unfettered discretion not to accept any offer.
- 4.10. Not be held liable if tenderers do not provide the correct contact details during the clarification session and do not receive the latest information regarding this RFP with the possible consequence of being disadvantaged or disqualified as a result thereof.
- 4.11. Transnet reserves the right to exclude any Tenderers from the tender process who has been convicted of a serious breach of law during the preceding 5 [five] years including but not limited to breaches of the Competition Act 89 of 1998, as amended. Tenderers are required to indicate in tender returnable on T2.2-24], **[Breach of Law]** whether or not they have been found guilty of a serious breach of law during the past 5 [five] years.
- 4.12. Transnet reserves the right to perform a risk analysis on the preferred tenderer to ascertain if any of the following might present an unacceptable commercial risk to the employer:
- *unduly high or unduly low tendered rates or amounts in the tender offer;*
 - *contract data of contract provided by the tenderer; or*
 - *the contents of the tender returnables which are to be included in the contract.*

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

6. NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE

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

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



TRANSNET PORT TERMINALS

TENDER NUMBER: ICLM HQ 782 TPT-TPT/2024/01/0086/55121/RFP

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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

T1.2 TENDER DATA

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

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

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

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

Clause	Data
C.1.1 The <i>Employer</i> is	Transnet SOC Ltd (Reg No. 1990/000900/30)
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 Activity Schedule



Transnet Port Terminals

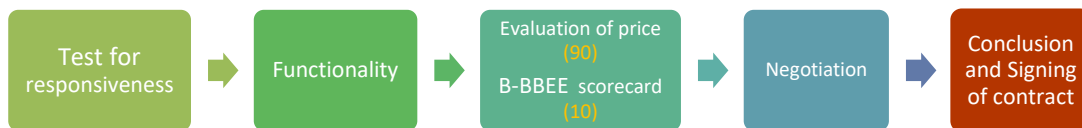
TENDER NUMBER: ICLM HQ 782 TPT- TPT/2024/01/0086/55121/RFP

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

	Part C3: Scope of work	C3.1 Works Information
	Part C4: Site information	C4.1 Site information
C.1.4	The Employer's agent is:	Procurement Officer
	Name:	Wiseman Xaba
	Address:	Transnet Port Terminals 2nd Floor, 202 Anton Lembede Street, Durban Central Durban 4001
	E – mail	Wiseman.Xaba2@transnet.net

C.2.1 EVALUATION METHODOLOGY

Transnet will utilise the following methodology and criteria in selecting a preferred Supplier/Service provider:



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

1. Stage One - 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. Stage Two - 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 **SME or higher** class of construction work, are eligible to have their tenders evaluated.

b) Joint Venture (JV)

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



1. every member of the joint venture is registered with the CIDB;
2. the lead partner has a contractor grading designation of not lower than one level below the required class of construction works under consideration and possesses the required recognition status; and
3. the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a **8ME or higher** 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 certified copy of its signed joint venture agreement

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

3. Stage Three - Test for Administrative Responsiveness:

The test for administrative responsiveness will include the following:

Administrative responsiveness check	RFP Reference
Whether the Bid has been lodged on time	<i>T.1.1 Section1 / E-tender Management System</i>
Whether all Returnable Documents and/or schedules [where applicable] were completed and returned by the closing date and time	<i>Part T2</i>
Verify the validity of all returnable documents	<i>All Sections</i>
Verify if the Bid document has been duly signed by the authorised respondent	<i>All sections</i>

The test for administrative responsiveness [Stage Three] must be passed for a Respondent's Proposal to progress to Stage Four for further Evaluations.



4. Stage Four - Test for Substantive Responsiveness to RFP:

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

Check for substantive responsiveness	RFP Reference
Whether any general and legislation qualification criteria (excluding preferential procurement) set by Transnet, have been met	<i>All sections</i>
Whether the Bid contains a priced offer as prescribed in the pricing and delivery schedule	Part. C2.2 / C1.1
Whether the Bid materially complies with the scope and/or specification given	<i>All Sections</i>
Entity's financial stability	<i>T2.2-31 Three (3) years audited financial statements</i>

The test for substantive responsiveness [Stage Four] must be passed for a Respondent's proposal to progress to Stage Five for further evaluation.

5. Stage Five - Functionality:

Only those tenderers who obtain the minimum qualifying score for functionality will be evaluated further in terms of price and the applicable preference point system. The minimum qualifying for score for functionality is 80 points.

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

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

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

Tenderers are also **required to bring their RFP document to the briefing session and have their returnable document T2.2-02 certificate of attendance** signed off by the Employer's authorised representative.

- C.2.12 No alternative tender offers will be considered.



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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: (insert company name)
- Contact person and details: (insert details)
- The Tender Number: ICLM HQ 782 TPT- TPT/2024/01/0086/55121/RFP
- The Tender Description: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

Documents must be marked for the attention of:

Employer's Agent:

Wiseman Xaba

Wiseman.Xaba2@transnet.net

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: **12:00pm** on the **07 March 2024**

Location: The Transnet e-Tender Submission Portal:

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

NO LATE TENDERS WILL BE ACCEPTED

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

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

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

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

2. A **valid B-BBEE Certificate** from a Verification Agency accredited by the South African Accreditation System [SANAS], or a **sworn affidavit** confirming annual turnover and level of black ownership in case of all EMEs and QSEs with 51% black

ownership or more 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.

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

C.3.11 The minimum number of evaluation points for functionality is: **80**

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:

(Please see CIDB Compiler guidance note T1.2 – Tender Data).

TECHNICAL EVALUATION						
DESCRIPTION OF THE WORKS: Design, Refurbish, Supply, Delivery, Installation, Testing and Commissioning of Fuel Facilities for Transnet SOC Ltd (Reg. No. 1990/000900/30) Operating as Transnet Port Terminals, (Hereinafter Referred to as "TPT") at various Port Terminals (National).						
Evaluation Criteria	Description	Supporting Documents	Scoring Principal	Returnable Schedule	Criteria	Weighting
Eligibility Criteria	CIDB 8 ME	Attach supporting documents	Yes or No	T2.2-04	Attach Certificate	N/A
	A level 2 Inspector –registered with Southern African Institute of Welding (SAIW) in welding and fabrication.	Attach supporting documents	Yes or No			
	An American Petroleum Institute (API) 653 Tank Inspector	Attach supporting documents	Yes or No			
	An Approved Inspection Authority (AIA) inspector	Attach supporting documents	Yes or No			
	An International Organization of Standardization (ISO) 3834 Part 2 certificate	Attach supporting documents	Yes or No			
	An International Organization of Standardization (ISO) 9001 -2015	Attach supporting documents	Yes or No			
	Description	Scoring Principal	Score			
Engineerin	Profession	Qualifications	Points	T2.2-05	CV	15
	Organogram	A comprehensive and detailed organogram that shows the structure and composition of their management structure involved in the works, inclusive of the key staff/professionals, identified in the Contract Data Part two.	2,5			
	Project Manager	Project Manager should have a minimum of a Btech/B.Eng. or similar in Engineering or Built Environment. Post Grad Diploma in project management certificate or PMP certification. With preferably 10 years petrochemical experience. Must have NEC 3 experience.	5			



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g & CVs	Health and Safety Officer	Health and Safety Officer should have SAMTRAC, NEBOSH and Modern SHEQ Risk Management (MSRM) training course with accredited health and safety service provider as a minimum qualification and registered as a Health and Safety Officer with SACPCMP. At least 5 years' experience as a Safety, Health and Environmental Officer on construction projects. The SHE must also have undergone Environmental awareness and short courses.	7.5			
	Environmental Officer	Minimum 3 yrs. petrochemical/construction experience.				
	Construction Manager	Construction Manager should have minimum of 10 years petrochemical experience.				
	Project Planner	ND: Engineering and minimum 5 years' experience in planning, accompanied by Primavera or Microsoft Project certificate				
Health and Safety	Project Specific Safety Plan	Documented Health and Safety Plan in accordance with Transnet Project Health and Safety Specifications.	2	T2.2-06	Health and Safety	10
	Safety Policy (State points allocated)	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.	1			
	Roles & Responsibilities	S16.2 CEO, 8.1 Construction manager, 8.2 Assistant Construction manager, 8.5 Safety officer Registered with the SACPCMP, 8.7 Construction Supervisor, 8.8 Construction assistant supervisor, 9.1 Risk Assessor, 17.1 SHE Reps, etc. as per the Occupational health and safety Act 85 of 1993	1			
	Training Matrix	List of job categories for project and competencies required per category and develop a training Matrix for all employees who will be working on the project. This matrix must include Management and highlight training planned dates.	1			
	Overview of the Baseline	Indicating major activities of the project namely: Isolate, discharge, drain and bleed the underground tank and lines to zero energy state, Blank off from the inlet and outlet then perform pressure test on an tank, vessel entry, re-fueling of tanks Soil Testing to determine. Perform Non Destructive Test (NDT) to determine corrosion factors within the internals/externals, material thickness and cracks within the internal/external.	2			
	One year synopsis	SHE incidents, description, type and action taken to prevent re-occurrence.	1			
	Safety Questionnaire	Complete and return with tender documentation the Contractor with required supporting documentation included as an Annexure.	1			
	Cost Breakdown Sheet	Submission of completed cost breakdown sheet.	1			
Quality Management	Project Quality Plan	Project Quality Plan specifically produced for this scope of works as per project specification STD-QAL-0001 (Please refer to Annexure C for specification).	2	T2.2-07	Quality Management	10
		Index of procedures (Quality and relevant construction) to be used during the contract.	2			
		Project Specific Quality Control Plans.	2			
		Quality Data book index MUST cover all disciplines of the project scope including relevant tests and certifications to be provided	2			
		Order and timing of the audits, inspection and design milestones that will take place in order to provide the Works.	2			
Security Management	A detailed Security Management Plan is required must include as a minimum should cover but not limited:	1. Physical Security Layout 2. Consultation, Communication and Coordination 3. Stakeholder's communication and consultation 4. Employees and Contractors 5. Execution of the Plan and control measures 6. Security compliance	5	T2.2-08	Security Management	5
Environmental Management	Environmental method statements which describe relevant roles and responsibilities and how the tenderer intends to manage and mitigate potential environmental impacts including the monitoring and recording.	Environmental policy signed by Senior Management	2.5	T2.2-09	Environmental Management	5
		Environmental method statements which describe relevant roles and responsibilities and how the tenderer intends to manage and mitigate potential environmental impacts including the monitoring and recording. These include, but are not limited to, the following where applicable: •Site establishment and demarcation •Hazardous and non-hazardous waste management •Prevention of marine pollution •Environmental awareness training •Emergency procedures for environmental incident •Rehabilitation	2.5			



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DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

Previous Experience	Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience	Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience showing but not limited •Construction of similar works as detailed in the Works Information with reference to Petrochemical Mechanical Works as related to the Works Information; and •Electrical Works as related to the Works Information •Civils Woks Works as related to the Works Informatio	5	T2.2-10	Previous Experience	5
Programme	The tenderer shall provide the proposed programme, at a minimum Level 3	Ability to provide the services in terms of the Employer's requirements within the required timeframe as stated in the Works Information and Tender Data by indicating, in a logical sequence, the order, the timing, and the duration of the works that will take place in order to Provide the Works.	10	T2.2-11	Programme	20
		The Contractor clearly indicates in the schedule all milestones, activities & information related to the following – 1. Float, 2. Time Risk Allowances, 3. Health and safety requirements, 4. Procedures set out in this contract, 5. Work by the Employer and Others, 6. Access to a part of the site if later than its access date, 7. Acceptances, 8. Plant & Materials and other things to be provided by the employer, 9. Information by Others, 10. starting date, access dates, Key Dates and Completion Date 1. planned Completion for each Key Date for each option and the complete works 2. Shows how each activity on the Activity Schedule relates to the operations on each programme	5			
		The Programme must clearly support and demonstrate full alignment to the Approach Paper as contained under T.2.2-12	5			
Method Statement	The Tenderer must sufficiently demonstrate the approach/methodology that he/she will employ to cover the scope of the project in a method statement	• Machinal work, new installation including piping and tank	5	T2.2-12	Method Statement	30
		• Demolition Work;	5			
		• Electrical and Instrumentation Work;	5			
		• Civil works;	5			
		• Fire fighting works	5			
		• Design Work, whether process is internal or external (clearly state interface procedure if design work is given to a third party);	5			
TOTAL RATING						100
Technical Qualification Threshold = 80%						
Compiled and Recommended by		Recommend by		Approved by		
Lead Execution Project Manager		Executive Manager: Head of Equipment Engineering		Executive Manager: Head of Infrastructure Engineering		
Signature		Signature		Signature		

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

T2.2-03	Evaluation Schedule: Eligibility Criteria
T2.2-04	Evaluation Schedule: Management & CV's of Key Personnel
T2.2-05	Evaluation Schedule: Health and Safety Plan
T2.2-06	Evaluation Schedule: Quality Management



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T2.2-07	Evaluation Schedule: Security Management Plan
T2.2-08	Evaluation Schedule: Environmental Management
T2.2-09	Evaluation Schedule: Previous Experience
T2.2-10	Evaluation Schedule: Programme
T2.2-11	Evaluation Schedule: Method Statement

Each evaluation criteria will be assessed in terms of scores of 0, 20, 40, 60, 80 or 100 (linear scale, more suitable for NEC3, ECC (construction related procurement)).

The formular:

Score

$$Points = \frac{Score}{100} \times \text{Weight (Points)\%}$$

The above formular will be used to convert the scores into points.

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.



6. Stage Six: Evaluation and Final Weighted Scoring

- C.3.12 Only tenders that achieve the minimum qualifying score for functionality will be evaluated further in accordance with the 90/10 preference points systems as described in Preferential Procurement Regulations.

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

Thresholds	Minimum Threshold
Technical / functionality	80%

Evaluation Criteria	Final Weighted Scores
Price and Total Cost of Ownership	90
Specific goals - Scorecard	10
TOTAL SCORE:	100

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

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

Selected Specific Goal	Number of points allocated (90/10)
B-BBEE Level of contributor (1 and 2)	2.5
51% Black Owned Entities (51% BO)	2.5
Subcontracting 30% of the value of the contract to EME's and QSE's who are 51% black owned.	2.5
Local Content and Local Production	2.5
TOTAL SCORE	10



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

Specific Goals	Acceptable Evidence
B-BBEE	B-BBEE Certificate / Sworn-Affidavit B-BBEE Certificate (in case of JV, a consolidate scorecard will be accept) as per DTIC guidelines
Entities that are 51 % Black Owned	B-BBEE Certificate / Sworn-Affidavit B-BBEE Certificate (in case of JV, a consolidate scorecard will be accept) as per DTIC guidelines
Local Content and Local Production	Returnable Local Content and production Annexures
The promotion of supplier development through sub-contracting or JV for a minimum of 30% of the value of a contract to South African Companies which are: EMEs and/or QSEs who are 51% black-owned	Sub-contracting agreements and Declaration / Joint Venture Agreement. Certified copy of ID Documents of the Owners and B-BBEE Certificate / Affidavit (in case of JV, a consolidate scorecard will be accept) of the sub-contracted entities.

The maximum points for this bid are allocated as follows:

DISCRIPTION	POINTS
PRICE	90
B-BBEE LEVEL OF CONTRIBUTOR (1 AND 2). 51% BLACK OWNED ENTITIES (51% BO) SUBCONTRACTING 30% OF THE VALUE OF THE CONTRACT TO EME`s AND QSE`s WHO ARE 51% BLACK OWNED. LOCAL CONTENT AND LOCAL PRODUCTION	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 tenderers scorecard components at any stage from the date of close of the tenders until completion of the contract.

7. Stage Seven Post Tender Negotiations (if applicable)

Transnet reserves the right to negotiate market-related price with the tenderer scoring the highest points or cancel the tender; if the tenderer does not agree to a market related price, negotiate a market related price with the tenderer scoring the second highest points or cancel the tender; if the tenderer scoring the second highest points does not agree to a market related price, negotiate a market related price with the tenderer scoring the third highest points or cancel the tender. If the market related price is not agreed as envisaged in this paragraph Transnet will cancel the tender.

C.3.13 Tender offers will only be accepted if:

1. The tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;
 2. the tenderer does not appear on Transnet's list for restricted tenderers and National Treasury's list of Tender Defaulters;
 3. the tenderer has fully and properly completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process and persons in the employ of the state.
 4. Transnet reserves the right to award the tender to the tenderer who scores the highest number of points overall, unless there are **objective criteria** which will justify the award of the tender to another tenderer. Objective criteria include but are not limited to the outcome of a due diligence exercise to be conducted. The due diligence exercise may take the following factors into account inter alia;

the tenderer:

 - a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
-



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

T2.1 List of Returnable Documents

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

- T2.2-01 **Stage Three as per CIDB: Eligibility Criteria Schedule** - CIDB Registration
- T2.2-02 **Stage Four as per CIDB: Eligibility Criteria Schedule** - Certificate of attendance at Compulsory Tender Clarification Meeting

2.1.2 Stage Five as per CIDB: these schedules will be utilised for evaluation purposes:

- T2.2-03 **Evaluation Schedule:** Eligibility Criteria
- T2.2-04 **Evaluation Schedule:** Management & CV's of Key Personnel
- T2.2-05 **Evaluation Schedule:** Health and Safety Plan
- T2.2-06 **Evaluation Schedule:** Quality Management
- T2.2-07 **Evaluation Schedule:** Security Management Plan
- T2.2-08 **Evaluation Schedule:** Environmental Management
- T2.2-09 **Evaluation Schedule:** Previous Experience
- T2.2-10 **Evaluation Schedule:** Programme
- T2.2-11 **Evaluation Schedule:** Method Statement

2.1.3 Returnable Schedules:

General:

- T2.2-12 Health and Safety Management Cost Breakdown
- T2.2-13 Health and Safety Questionnaire
- T2.2-14: Authority to submit a Tender
- T2.2-15 Record of addenda to tender documents
- T2.2-16 Letter of Good Standing
- T2.2-17 Risk Elements
- T2.2-18 Availability of equipment and other resources
- T2.2-19 Schedule of proposed Subcontractors (if subcontract in terms of TPPP is not eligibility)
- T2.2-20 Site Establishment requirements
- T2.2-20a SBD1 Form

Agreement and Commitment by Tenderer:

- T2.2-21: CIDB SFU ANNEX G Compulsory Enterprise Questionnaire
- T2.2-22 Non-Disclosure Agreement
- T2.2-23 RFP Declaration Form

- T2.2-24 RFP – Breach of Law
- T2.2-25 Certificate of Acquaintance with Tender Document
- T2.2-26 Service Provider Integrity Pact
- T2.2-27 Supplier Code of Conduct

1.3.2 Bonds/Guarantees/Financial/Insurance:

- T2.2-28 Insurance provided by the Contractor
- T2.2-29 Form of Intent to provide a Performance Guarantee
- T2.2-30 Forecast Rate of Invoicing
- T2.2-31 Three (3) years audited financial statements

1.3.3 Local Content:

- T2.2-32 Annexure A Guidance Document for the Calculation of Local Content
- T2.2-33 Annexure B Declaration Certificate Local Production and Content SBD 6.2 CPM 2020 Rev 02
- T2.2-34 ANNEXURE -C - Local Content Declaration Summary Schedule
- T2.2-35-ANNEXURE D - Imported Content Declaration - Supporting Schedule to Annex C
- T2.2-36-ANNEXURE E - Local Content Declaration - Supporting Schedule to Annex C

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

2.3 C1.2 Contract Data

2.4 C1.3 Forms of Securities

2.5 C2.1 Pricing Instructions (Activity Schedule)

2.6 C2.2 Activity Schedule

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

Note to tenderers:

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

CRS Number	Status	Grading	Expiry Date

- Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a **8ME** class of construction work, are eligible to have their tenders evaluated.

2. Joint Venture (JV)

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

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

T2.2-02: 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



TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

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T2.2-04: Evaluation Schedule – Eligibility - Certification

The Tenderer must be able to demonstrate that it has the following certification within its organization

Submit the following documents as a minimum with your tender document:

1. A level 2 Inspector –registered with Southern African Institute of Welding (SAIW) in welding and fabrication.
2. An American Petroleum Institute (API) 653 Tank inspector
3. An Approved Inspection Authority (AIA) inspector
4. An International Organization of Standardization (ISO) 3834 Part 2 certificate
5. An International Organization of Standardization (ISO) 9001 -2015

List of certifications required

No.	Certification	Certification attached (Yes/No)
1	CIDB 8ME – CIDB Certificate	
2	Inspector level 2 - SAIW welding and fabricating	
3	API 653 Tank Inspector Certificate	
4	AIA Inspector Certificate	
5	ISO 3834 Part 2 Certificate	
6	ISO 9001 - 2015 Certificate	

Failure to submit eligibility documents will automatically disqualify the tenderer from further evaluation

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COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT



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Index of documentation attached to this schedule:

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Signed

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Date

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Name

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Position

.....

Tenderer

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T2.2-04: Evaluation Schedule - Management & CV's of Key Personnel

The Tenderer must be able to demonstrate that the project personnel have sufficient knowledge, qualifications and experience to provide the required service.

Submit the following documents as a minimum with your tender document:

1. A comprehensive and detailed **organogram** that shows the structure and composition of their management structure involved in the *works*, inclusive of the key staff/professionals, identified in the Contract Data Part two.
2. CV's for the key personnel for all identified posts should include as a minimum but not limited to:

Project Manager

Project Manager should have a minimum of a Btech/B.Eng. or similar in Engineering or Built Environment. Post Grad Diploma in project management certificate or PMP certification. With preferably 10 years petrochemical experience. Must have NEC 3 experience.

Construction Manager

Construction Manager should have minimum of 10 years petrochemical experience.

Project Planner

ND: Engineering and minimum 5 years' experience in planning, accompanied by Primavera or Microsoft Project certificate

Environmental Officer

with minimum 3 yrs. petrochemical/construction experience

CV's should include, as a minimum:

- i. Personal particulars
 - a. Name
 - b. Date and place of birth
 - c. Place (s) of tertiary education and dates associated therewith
 - d. Professional awards
- ii. Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations)
- iii. Name of current employer and position in enterprise
- iv. Overview of post graduate experience (year, organization and position)
- v. Outline of recent assignments / experience that has a bearing on the scope of work

Health and Safety Officer

Health and Safety Officer should have SAMTRAC, NEBOSH and Modern SHEQ Risk Management (MSRM) training course with accredited health and safety service provider as a minimum qualification and registered as a Health and Safety Officer with SACPCMP. At least

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5 years' experience as a Safety, Health and Environmental Officer on construction projects.

The SHE must also have undergone Environmental awareness and short courses.

List of Key Persons assigned to the above disciplines

No.	Key Persons	Name and Surname	CV attached (Yes/No)
1	Project Manager		
2	Construction Manager		
3	Project Planner		
4	Environmental Officer		
5	Health and Safety Officer		

The experience of assigned key persons in relation to the scope of work will be evaluated from three different points of view, namely:

- i. General experience (total duration of construction activity) and positions held of each discipline specific team member.
- ii. The education, training and skills of the assigned staff in the specific sector, field, subject, etc. which is directly linked to the scope of work. Proof of education and training must be attached to the C.V.
- iii. The key staff members' / experts' knowledge of issues which the tenderer considers pertinent to the project e.g. local conditions, affected communities, legislation, techniques etc.

The scoring of the Management & CV's of Key Persons will be as follows:

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SCORE	EVALUATION CRITERIA		
	A comprehensive and detailed organogram that shows the structure and composition of their management structure involved in the works, inclusive of the key staff/professionals, identified in the Contract Data Part two	Project Manager with a minimum Btech/B.Eng. or similar: Engineering & Built Environment with a Post Grad Diploma in project management certificate or PMP certification. With preferably 10 years petrochemical experience. Must have NEC3 ECC experience	1.Construction Manager: Supervisor/Foreman's: minimum 10 years of petrochemical experience 2. Project Planner - ND: Engineering and minimum 5 years' experience in planning, accompanied by Primavera or Microsoft Project certificate 3. Environmental Officer with minimum 3 yrs. petrochemical/construction experience. 4. Health and Safety Officer should have SAMTRAC, NEBOSH and Modern SHEQ Risk Management (MSRM) training course with accredited health and safety service provider as a minimum qualification and registered as a Health and Safety Officer with SACPCMP. At least 5 years' experience as a Safety, Health and Environmental Officer on construction projects. The SHE must also have undergone Environmental awareness and short courses.
Total Score 20	2.5	5	7.5
Score 0	No Information submitted for evaluation	No Information submitted for evaluation	No Information submitted for evaluation
Score 20	The organization chart and staffing plan do not address project requirements. There is overlapping/misallocation of tasks and responsibilities.	The Project Manager have shown one (1) to two (2) years relevant experience and does not have education.	All four CV's Submitted
Score 40	The organization chart does not show all the key personnel within the project and their reporting lines, the staffing plan is weak in important areas. There is no clarity in allocation of tasks and responsibilities.	The Project Manager have shown three (3) to four (4) years relevant experience with N6 qualification and no knowledge of NEC3 ECC.	All four CV's Submitted with only two (2) CV failing to meet the minimum requirement mentioned
Score 60	The organization chart is complete and detailed, the technical level and composition of the staffing arrangements are adequate (includes the on and off site management).	The Project Manager have shown three (3) to five (5) years relevant experience and National Diploma in Engineering or Built Environment and has Post Graduate Project management Diploma or is registered with <i>PMI</i> for <i>PMP</i> . The project manager has shown a reasonable knowledge of working with NEC3 ECC.	All four CV's Submitted with only one (1) CV failing to meet the minimum requirement mentioned
Score 80	Besides meeting the 60 rating, the chart includes key people as per contract data Part 2 and staff are well balanced i.e. they show good co-ordination, complimentary skills, clear and defined duties and responsibilities.	The Project Manager have shown five (5) to ten (10) years relevant experience and Btech/B.Eng. in Engineering or Built Environment and has Post Graduate Project management Diploma or is registered with <i>PMI</i> for <i>PMP</i> . The project manager has shown a reasonable knowledge of working with NEC3 ECC.	All four CV's Submitted and meet the minimum requirement mentioned
Score 100	Besides meeting the 80 rating, the proposed team is well integrated and identifies legal appointments	The Project Manager have shown ten (10) or more years relevant experience and Btech/B.Eng. in Engineering or Built Environment and has Post Graduate Project management Diploma or is registered with <i>PMI</i> for <i>PMP</i> . The project manager has shown a reasonable knowledge of working with NEC3 ECC.	All four CV's Submitted and exceed the minimum requirement mentioned by two (2) years



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Index of documentation attached to this schedule:

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Signed _____ Date _____

Name _____ Position _____

Tenderer _____



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T2.2-05: Evaluation Schedule - Health and Safety Plan

Submit the following documents as a minimum with your tender:

1. The Tenderer must provide their Contract specific health and safety plan addressing the requirements of TRANSNET health and safety specification and include the following documents:
 - Health and Safety Company Policy signed by the accounting officer and dated (OHS Act, 16.2 appointee)
2. Roles and responsibilities of legal appointees
 - a) In terms of OHSA 85 of 1993 and its Regulations.
 - I. S16.1 CEO,
 - II. S16.2 Assistant to CEO,
 - III. CR8.1 Construction manager,
 - IV. CR8.2 Assistant Construction manager,
 - V. CR8.5 Construction Health & Safety officer,
 - VI. CR8.7 Construction Supervisor,
 - VII. CR8.8 Construction assistant supervisor,
 - VIII. CR9.1 Risk Assessor
 - b) In terms of Project and Construction Management Professional Act 48 of 2000
 - I. Construction Manager
3. List of job categories for project and competencies required per category and develop a training Matrix for all employees who will be working on the project. This matrix must include Management and highlight training planned dates.
4. Overview of the tenderer's Risk Assessment methodology, and submission of project specific risk assessments indicating major activities of the project to be undertaken.
5. One year synopsis of SHE incidents, description, type and action taken to prevent re-occurrence
6. Submission of completed cost breakdown sheet
7. Complete and return with tender documentation the Contractor Safety Questionnaire with supporting documentation included as an Annexure.

Attached submissions to this schedule:

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SCORE	EVALUATION CRITERIA						
	Health and Safety Company Policy signed by the accounting officer and dated (OHS Act, 16.2 appointee) that addressed the following 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.	Roles & Responsibilities, such as S16.1 CEO; S16.2 Assistant CEO; 8.1 Competent Construction manager ; 8.2 Ass Construction Manager; 8.5 Safety officer CV and proof registration with SACPCMP, 8.7 Construction Supervisor, 8.8 Construction assistant supervisor, 9.1 Risk Assessor, etc. as per the Occupational health and safety Act 85 of 1993	List of job categories for project and competencies required per category and develop a training Matrix for all employees who will be working on the project. This matrix must include Management and highlight training planned dates	Overview of the tenderer's Risk Assessment methodology, and submission of project specific risk assessments indicating major activities of the project to be undertaken.	One year synopsis of SHE incidents, description, type and action taken to prevent re-occurrence.	Submission of completed cost breakdown sheet.	Complete and return with tender documentation the Contractor Safety Questionnaire with required supporting documentation included as an Annexure.
total score 10	1	2	1	2	2	1	1
Score 0	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation
Score 20	1 of the 5 key policy components are recognized and meet the Employer's requirement.	Roles and responsibilities do not meet the Occupational health and safety Act as per construction regulations and Transnet health and safety specification.	Key responsible persons are not included on training matrix as per proposed organogram structure.	Information supplied is totally insignificant/inadequate to achieve the required standard of service.	Information supplied is totally insignificant/inadequate to achieve the required standard of service.	Health and safety Budget submitted is totally insignificant/inadequate to achieve the required standard of service, 0,1 to 1% allocated.	20% of the Health and Safety Questionnaire completed
Score 40	2 of the 5 key policy components are recognized and meet the Employer's requirement.	Roles and responsibilities are unlikely to ensure compliance as per the Works information and not in line with OHS Act and TRANSNET health and safety specification	Not all key responsible persons are included in the training matrix. Trainings matrix submitted does not cover all SHE training listed on Health and Safety specification. Training matrix not signed by responsible personnel.	Poor response/answer/solution lacks convincing evidence, medium risk that stated <i>employer's</i> requirements will not be met.	Poor response/answer/solution lacks convincing evidence, medium risk that stated <i>Employer's</i> requirements will not be met.	Health and safety Budget submitted is insignificant/inadequate /answer/solution to the returnable, Employer's health and safety requirements will not be met, 1 – 2% allocated.	40% of the Health and Safety Questionnaire completed
Score 60	3 of the 5 key policy components are recognized and meet the Employer's requirement.	Satisfactory response on roles and responsibilities as per Employer's requirements.	Satisfactory response on the list of job categories and trainings as per proposed project organogram structure. Training matrix covers most of the trainings listed on TRANSNET Health and safety specification.	Satisfactory response/answer/solution to the particular aspect of the requirement, evidence given that the stated <i>Employer's</i> requirements will be met.	Satisfactory response/answer/solution to the particular aspect of the requirement, evidence given that the stated <i>Employer's</i> requirements will be met.	Health and safety Budget submitted is Satisfactory response/answer/solution to the returnable, Employer's health and safety requirements will be met, 2 – 3% allocated.	60% of the Health and Safety Questionnaire completed
Score 80	4 of the 5 key policy components are recognized and meet the Employer's requirement.	Roles and responsibilities are likely to ensure compliance as per Works Information, OHS Act and TRANSNET health and safety specification.	Most of key persons listed on the training matrix as per proposed project organogram structure. Trainings specified on the matrix are in line with TRANSNET health and safety specification.	Good response/answer/solution which demonstrates real understanding and evidence of ability to meet stated <i>Employer's</i> requirements.	Good response/answer/solution which demonstrates real understanding and evidence of ability to meet stated <i>Employer's</i> requirements.	Health and safety Budget submitted is Good response/answer/solution to the returnable, Employer's health and safety requirements will be met, 3 – 4% - above allocated.	80% of the Health and Safety Questionnaire completed
Score 100	All 5 key policy components are recognized and meets the Employer's requirements	Roles and Responsibilities most likely to ensure compliance as per requirements of OHS Act and TRANSNET Health and Safety Management Specification	Training matrix include Management and all employees /personnel in the project. Training matrix had been signed by responsible personnel.	Very good response/answer/solution gives real confidence that the tenderer is most likely to ensure compliance with stated <i>Employer's</i> requirements.	Very good response/answer/solution gives real confidence that the tenderer is most likely to ensure compliance with stated <i>Employer's</i> requirements	Health and safety Budget submitted is Very good response/answer/solution to the returnable, Employer's health and safety requirements will be met, 4% - above allocated.	100% of the Health and Safety Questionnaire completed





Transnet Port Terminals

Tender Number: ICLM HQ 782 TPT - TPT/2024/01/0086/55121/RFP

Description of the Works: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

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

Signed

Date

Name

Position

Tenderer

T2.2-06: Quality Management

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

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

1. Project Quality Plan MUST cover project scope and be aligned to ISO 10005:2018 requirements.
2. Index or list of QMS procedures including list of method statements and forms to be used during the contract as per ISO 9001:2015
3. Audit schedule during the contract
4. Quality Control Plan MUST cover all disciplines of the project scope
5. Quality Data book index MUST cover all disciplines of the project scope including relevant tests and certifications to be provided.
6. Valid ISO 9001:2015 certificate



SCORE	EVALUATION CRITERIA					
	Project Quality Plan for the contract.	Audit Schedule during the contract.	Index or list of QMS procedures including method statements to be used.	Project specific Quality Control Plan.	Valid ISO 9001 certificate	Project specific Quality Data Book Index.
Total Score 10	2	1	2	2	1	2
Score (0)	No PQP submitted.	No audit schedule submitted	No list of QMS procedures and method statement (MS) submitted	No QCPs submitted	Not Applicable	No Quality Data book index submitted
Score (20)	PQP does not meet ISO 10005:2018 requirements nor covers the project scope	Audit Schedule does not cover quality audit requirements of the project scope.	Index / list of QMS procedures and method statement is not project specific as per ISO 9001:2015	QCPs do not cover project scope.	Not Applicable	Quality Data book index is does not cover project scope
Score (40)	PQP covers the project scope and partially meets ISO 10005:2018 Project Quality Plan requirements	The Audit Schedule is inadequate to cover most of the quality audit (Not all disciplines and covered).	Index / list of QMS procedures and method statements is inadequate to cover project scope as per ISO 9001:2015. MS list covers Only one (1) discipline.	QCPs are project specific but inadequate to cover project scope. Only one (1) discipline covered	Not Applicable	Quality Data book index is project specific but inadequate to cover project scope. Only one (1) discipline covered
Score (60)	PQP meets ISO 10005:2018 requirements and covers the project scope	The Audit Schedule has adequate audits to cover most audit quality requirements for the project scope.	Index / list of QMS procedures and method statements partially covers project scope requirements as per ISO 9001:2015. MS list covers Only two (2) disciplines	QCP's shows adequate understanding of project quality requirements. Only two (2) disciplines covered	ISO 9001:2015 certificate has expired	Data book index shows adequate understanding of project quality requirements. Only two (2) disciplines covered
Score (80)	PQP is fully meets ISO 10005:2018 Project Quality Plan requirements.	The Audit Schedule covers all the required audit requirements for the project scope. All clauses of ISO 9001 are covered. All disciplines covered	Index / list of QMS procedures and method statements fully covers all project scope requirements as per ISO 9001:2015. MS list covers all disciplines	QCP's shows above average understanding of the project quality requirements, All disciplines covered.	Not Applicable	Data book index shows above average understanding of the project quality requirements. All disciplines covered.
Score (100)	PQP fully meets ISO 10005:2018 Project Quality Plan requirements and makes references all relevant QMS specifications and standards.	The Audit Schedule exceeds the required quality audit requirements of the scope. All clauses of ISO 9001 are covered. All disciplines covered	Index / list of procedures and method statements covers all project scope requirements as per ISO 9001:2015. MS list covers all disciplines as well as list relevant check sheets / forms.	QCP's covers all disciplines and intervention points with reference to standards, specifications, drawings, etc.	ISO 9001:2015 certificate is valid / ISO 9001:2015 acknowledgment letter for certification.	The Data book index covers all disciplines including all relevant tests and certifications to be provided.

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Attached submissions to this schedule:

Signed	_____	Date	_____
Name	_____	Position	_____
Tenderer	_____		



T2.2-07: Evaluation Schedule: Security Management Plan

Note to tenderers:

Security Management Plan - The tenderers must submit a Security management Plan which responds to the scope of work and outlines proposed approach / methodology including that relating but not limited to programme, method statement, technical approach and an understanding of the project objective.

The Security Management Plan should articulate how the Tenderer will fully secure the site and employees while ensuring safety of both all employee and equipment on site.

The Tenderer must as such explain his / her understanding of the security requirements of the works and the Employer's stated and implied requirements, highlight areas of importance.

The Security Management Plan as a minimum should cover but not limited:

1. **Physical Security Layout**
2. **Consultation, Communication and Coordination**
3. **Stakeholder's communication and consultation**
4. **Employees and Contractors**
5. **Execution of the Plan and control measures**
6. **Security Compliance**

(the contractor must refer to the works information for a full description of the scope of the works):

Please note: Tenderers are required to provide detailed method statements for the categories as listed above. Each sub-category as listed will be scored based on the linear scale below and will be averaged and weighed to provide a final score. Tenderers to note that they will not achieve an "acceptable" score should they not provide the information as required in this Returnable.

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

SCORE	EVALUATION CRITERIA
	A detailed Security Management Plan is required must include as a minimum should cover but not limited: 1. Physical Security Layout 2. Consultation, Communication and Coordination 3. Stakeholder’s communication and consultation 4. Employees and Contractors 5. Execution of the Plan and control measures 6. Security compliance
Total Score 5	5
Score 0	No information submitted for evaluation
Score 20	The methodology/approach and work alignment to project schedule is poorly presented, generic and not tailored to address the specific project objectives and methodology.
Score 40	The Security Management Plan is generic and not tailored to address the specific project works information. The Security Management Plan does not adequately deal with the critical characteristics of the project.
Score 60	Satisfactory response/solution to the particular aspect of the requirement where 3 of 6 of the requirements are addressed and are tailored to the scope of works.
Score 80	The Security Management Plan is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. 5 of 6 of the requirements are met
Score 100	Security Management Plan requirements are fully met meaning 6 of 6 requirement are fully detailed and tailored to the works information for the project.



TRANSNET PORT TERMINALS

ICLM HQ 782 TPT - TPT/2024/01/0086/55121/RFP

Description of the Works: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

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

Signed

Date

Name

Position

Tenderer



Transnet Port Terminals

Tender Number: ICLM HQ 782 TPT - TPT/2024/01/0086/55121/RFP

Description of the Works: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

T2.2.08: Evaluation Schedule: Environmental Management

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

- Transnet SOC Limited – Transnet Integrated Management System (TIMS) Policy Commitment Statement - IMS-GRP-GDL-002-1 (**Annexure A**)
 - Project Environmental Specification (PES) which comprises of the following as a minimum:
 - Contractor Environmental and Sustainable Specifications TRN-IMS-GRP-GDL-014.4 (**Annexure B**)
 - Standard Operating Procedure- Construction Environmental Management - 009-TCC-CLO-SUS-11386 (**Annexure C**)
1. The tenderer must provide an environmental policy signed by Top Management which, as a minimum:
 - Is appropriate given the purpose and context of the tenderer's business;
 - Includes a commitment to fulfil the tenderer's environmental compliance (legal) obligations;
 - Includes a commitment to the protection of the environment, including prevention of pollution;
 - Provides framework for setting environmental objectives; and
 - Includes a commitment to continual improvement of their EMS.
 2. The tenderer must provide environmental method statements which describe relevant roles and responsibilities; the when, where, what, who and how the Tenderer intends to manage and mitigate potential environmental impacts including the monitoring and recording. These include, but are not limited to, the following where applicable:
 - Site establishment and demarcation
 - Hazardous and non-hazardous waste management
 - Prevention of marine pollution
 - Environmental awareness training
 - Rehabilitation

Attached submissions to this schedule:

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

	Environmental Policy	Environmental method statements
Points	2,5	2,5
(Score 0)	Tenderer has not submitted the signed policy and cannot be rated.	Tenderer has not submitted the required information/ cannot be rated.
(Score 20)	Tenderer has provided a signed environmental policy and addressed one (1) key key policy component.	Tenderer has provided generic method statements.
(Score 40)	Tenderer has provided a signed environmental policy and addressed two (2) key policy components.	Two (2) of the environmental method statements listed above have been provided and the when, where, what, who and how is covered.
(Score 60)	Tenderer has provided a signed environmental policy and addressed three (3) key policy components.	Three (3) of the environmental method statements listed above have been provided and the when, where, what, who and how is covered.
(Score 80)	Tenderer has provided a signed environmental policy and addressed four (4) key policy components.	Four (4) of the environmental method statements listed above have been provided and the when, where, what, who and how is covered.
(Score 100)	Tenderer has provided a signed environmental policy and addressed all five (5) key policy components.	All the environmental method statements listed above have been provided and the when, where, what, who and how is covered.

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

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

T2.2-09: Evaluation Schedule: Previous Experience

Tenderers are required to demonstrate their overall experience in the delivery of similar works, and to this end shall supply a sufficiently detailed reference list with contact details of existing customers and also demonstrate their relevant experience with regards to the Engineering Design and Works Information. Organization's overall experience in the engineering, with focus on:

- Construction of similar works as detailed in the Works Information with reference to Petrochemical Mechanical Works as related to the Works Information; and
- Electrical Works as related to the Works Information
- Civils Works as related to the Works Information

Sufficient references to substantiate experience indicated (Client name and contact details, project description, duration and contract value)

[illegible]

SCORE	EVALUATION CRITERIA
	Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience showing but not limited • Construction of similar works as detailed in the Works Information with reference to Petrochemical Mechanical Works as related to the Works Information; and • Electrical Works as related to the Works Information • Civils Works as related to the Works Information
Total Score 5	5
Score 0	No information submitted for evaluation
Score 20	Evidence provided shows the competency in a single experience criteria category with less than one years’ experience for either Mechanical, Civil or Electrical work
Score 40	Evidence provided shows the competency in a single category with 1 to 3 years’ experience.
Score 60	Evidence provided shows the competency in 2 experience criteria categories with at least 5 years’ experience.
Score 80	Evidence provided shows the competency in 3 experience criteria categories including at least 5 years’ experience.
Score 100	Evidence provided shows the competency in 3 experience criteria categories including more than 5 years’ experience.

Signed

Date

Name

Position

Tenderer

T2.2-10: Evaluation Schedule: Programme = 20 Points

Note to tenderers:

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

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

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

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

- **Meet the required timeframes:**

Ability to provide the services in terms of the *Employer's* requirements within the required timeframe as stated in the Works Information and Tender Data by indicating, in a logical sequence, the order, the timing, and the duration of the works that will take place in order to Provide the Works.

- **Programme Information:**

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

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

Alignment between programme and of Method statement

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

The scoring of the programme will be as follows:

	Meet the required timeframes (10)	Programme Information (5)	Alignment between programme and of Method statement (5)
Score 0	The tenderer has submitted no information or inadequate information to determine a score.	The tenderer has submitted no information or inadequate information to determine a score.	The tenderer has submitted no information or inadequate information to determine a score.
Score 20	The programme does not meet any of the required timeframes, key dates and sectional completion dates	The tenderer has addressed some but not all data requirements as listed in this returnable (4 or less of 12 addressed)	The tenderer has addressed some but there is no alignment between programme and Method Statement
Score 40	The programme does not meet all (less than 40%) of the required timeframes, key dates and sectional completion dates	The tenderer has addressed some but not all data requirements as listed in this returnable (6 of 12 addressed)	The tenderer has addressed some but there's critical errors and or omissions in alignment between programme and Method statement
Score 60	The programme does not meet all (more than 40%, but less than or equal to 60%) of the required timeframes, key dates and sectional completion dates	The tenderer has addressed most but not all data requirements as listed in this returnable (8 of 12 addressed)	The tenderer has addressed most but there are minor errors and or omissions in alignment between programme and method statement
Score 80	The programme does meet all (more than 60%, but less than or equal to 99%) of the required timeframes, key dates and sectional completion dates	The tenderer has addressed most but not all data requirements as listed in this returnable (10 of 12 addressed)	The tenderer has addressed most but not all the Programme and method statement requirements and are aligned, and submission contains no critical errors or omissions.
Score 100	The programme does meet All of the required timeframes, key dates and sectional completion dates	The tenderer has addressed all data requirements as listed in this returnable (12 of 12 addressed)	The tenderer has addressed all the Programme and method statement are fully aligned and submission contains no critical errors or omissions.

Reference to attached submissions to this schedule:

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

Signed	_____	Date	_____
Name	_____	Position	_____
Tenderer	_____		



T2.2-11: Evaluation Schedule: Method Statement

Note to tenderers:

Method statement - The tenderers must submit a Method Statement which responds to the scope of work and outlines proposed approach / methodology including that relating but not limited to programme, method statement, technical approach and an understanding of the project objective.

The Method Statement should articulate what the Tenderer will provide in achieving the stated objectives for the project and demonstrate alignment to Programme as contained under T2.2-11. Tenderers to also exhibit a clear understanding of the project and has shown a concise method statement for all activities incorporating best practice.

The Tenderer must as such explain his / her understanding of the objectives of the works and the Employer's stated and implied requirements, highlight the issues of importance, and explain the technical approach they would adopt to address them. The Method Statement should explain the methodologies which are to be adopted and demonstrate its compatibility. The approach should also include and outline processes, procedures and associated resources, to meet the requirements and indicate how risks will be managed.

The Method Statement should cover:

- Outline of proposed approach
- Narrative related to the programme
- Detailed method statement, technical approach and construction sequencing in terms of the Works Information (design philosophy)
- Demonstrate an understanding of the project objectives
- Detailed list of equipment and number thereof to execute the works, and areas it will be utilised

The Tenderer must attach his / her Method Statement to this page.

The Method Statement shall include as a minimum but not limited to the following (the contractor must refer to the works information for a full description of the scope of the works):

A detailed method statement is required must include procedures for:

- Machinal work, new installation including piping and tank;
- Demolition Work;
- Civil works
- Electrical and Instrumentation Work;
- Fire Fighting works
- Design Work, whether process is internal or external (clearly state interface procedure if design work is given to a third party);



Transnet Port Terminals

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Please note: Tenderers are required to provide detailed method statements for the categories as listed above. Each sub-category as listed will be scored based on the linear scale below and will be averaged and weighed to provide a final score. Tenderers to note that they will not achieve an "acceptable" score should they not provide the information as required in this Returnable.

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



CORE	EVALUATION CRITERIA					
	A detailed method statement is required must include Machinal work, new installation including piping and tank.	A detailed method statement is required must include procedures for Demolition Work.	A detailed method statement is required must include procedures for Electrical and Instrumentation Work.	A detailed method statement is required must include procedures for Design Work, whether process is internal or external (clearly state interface procedure if design work is given to a third party).	A detailed method statement is required must include procedures for Firefighting Works	A detailed method statement is required must include procedures for Civil Works
otal core 30	5	5	5	5	5	5
core 0	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation	No information submitted for evaluation
core 20	The methodology/approach and work alignment to project schedule is poorly presented, generic and not tailored to address the specific project objectives and methodology.	The methodology/approach and work alignment to project schedule is poorly presented, generic and not tailored to address the specific project objectives and methodology.	The methodology/approach and work alignment to project schedule is poorly presented, generic and not tailored to address the specific project objectives and methodology.	The methodology/approach and work alignment to project schedule is poorly presented, generic and not tailored to address the specific project objectives and methodology.	The methodology/approach and work alignment to project schedule is poorly presented, generic and not tailored to address the specific project objectives and methodology.	The methodology/approach and work alignment to project schedule is poorly presented, generic and not tailored to address the specific project objectives and methodology.
core 40	The methodology/approach is generic and not tailored to address the specific project objectives and methodology. The methodology approach does not adequately deal with the critical characteristics of the project.	The methodology/approach is generic and not tailored to address the specific project objectives and methodology. The methodology approach does not adequately deal with the critical characteristics of the project.	The methodology/approach is generic and not tailored to address the specific project objectives and methodology. The methodology approach does not adequately deal with the critical characteristics of the project.	The methodology/approach is generic and not tailored to address the specific project objectives and methodology. The methodology approach does not adequately deal with the critical characteristics of the project.	The methodology/approach is generic and not tailored to address the specific project objectives and methodology. The methodology approach does not adequately deal with the critical characteristics of the project.	The methodology/approach is generic and not tailored to address the specific project objectives and methodology. The methodology approach does not adequately deal with the critical characteristics of the project.
core 60	Satisfactory response/solution to the particular aspect of the requirement and evidence given that the stated employer's requirements will be met.	Satisfactory response/solution to the particular aspect of the requirement and evidence given that the stated employer's requirements will be met.	Satisfactory response/solution to the particular aspect of the requirement and evidence given that the stated employer's requirements will be met. All four (4) Construction Phases covered.	Satisfactory response/solution to the particular aspect of the requirement and evidence given that the stated employer's requirements will be met.	Satisfactory response/solution to the particular aspect of the requirement and evidence given that the stated employer's requirements will be met.	Satisfactory response/solution to the particular aspect of the requirement and evidence given that the stated employer's requirements will be met.
core 80	The methodology/approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The methodology/approach to manage activities is specifically tailored to the critical path of the project.	The methodology/approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The methodology/approach to manage activities is specifically tailored to the critical path of the project.	The methodology/approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The methodology/approach to manage activities is specifically tailored to the critical path of the project. All four (4) Construction Phases covered.	The methodology/approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The methodology/approach to manage activities is specifically tailored to the critical path of the project.	The methodology/approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The methodology/approach to manage activities is specifically tailored to the critical path of the project.	The methodology/approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The methodology/approach to manage activities is specifically tailored to the critical path of the project.
core 100	Besides meeting the "80" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the-art approaches i.e. suggests working in parallel rather than in series. The methodology approach details ways to improve the project outcomes and the quality of the outputs.	Besides meeting the "80" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the-art approaches i.e. suggests working in parallel rather than in series. The methodology approach details ways to improve the project outcomes and the quality of the outputs.	Besides meeting the "80" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the-art approaches i.e. suggests working in parallel rather than in series. The methodology approach details ways to improve the project outcomes and the quality of the outputs.	Besides meeting the "80" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the-art approaches i.e. suggests working in parallel rather than in series. The methodology approach details ways to improve the project outcomes and the quality of the outputs.	Besides meeting the "80" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the-art approaches i.e. suggests working in parallel rather than in series. The methodology approach details ways to improve the project outcomes and the quality of the outputs.	Besides meeting the "80" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the-art approaches i.e. suggests working in parallel rather than in series. The methodology approach details ways to improve the project outcomes and the quality of the outputs.



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

Signed

Date

Name

Position

Tenderer

Transnet Port Terminals

Tender Number: ICLM HQ 782 TPT - TPT/2024/01/0086/55121/RFP

Description of the Works: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

T2.2-12 Health and Safety Cost Breakdown

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

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

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



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T2.2-13: Health and Safety Questionnaire

Health, Safety Questionnaire

1. SAFE WORK PERFORMANCE													
1A. Injury Experience / Historical Performance - Alberta													
Use the previous three years injury and illness records to complete the following:													
Year													
Number of medical treatment cases													
Number of restricted work day cases													
Number of lost time injury cases													
Number of fatal injuries													
Total recordable frequency													
Lost time injury frequency													
Number of worker manhours													
<table border="1"> <tr> <td>1 - Medical Treatment Case</td> <td>Any occupational injury or illness requiring treatment provided by a physician or treatment provided under the direction of a physician</td> </tr> <tr> <td>2 - Restricted Work Day Case</td> <td>Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties</td> </tr> <tr> <td>3 - Lost Time injury Cases</td> <td>Any occupational injury that prevents the worker from performing any work for at least one day</td> </tr> <tr> <td>4 - Total Recordable Frequency</td> <td>Total number of Medical Treatment, Restricted Work and Lost Time Injury cases multiplied by 200,000 then divided by total manhours</td> </tr> <tr> <td>5- Lost Time Injury Frequency</td> <td>Total number of Lost Time Injury cases multiplied by 200,000 then divide by total manhours</td> </tr> </table>				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 Work Day 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
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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													
% Discount or Surcharge													
Is your Workers' Compensation account in good standing? (Please provide letter of confirmation)		☐ 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? ☐ Yes ☐ No If yes, provide details:												
2B.	Has your company been cited, charged or prosecuted under the above Legislation in another Country, Region or State? ☐ Yes ☐ No If yes, provide details:												



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3. CERTIFICATE OF RECOGNITION	
Does your company have a Certificate of Recognition? ☐ Yes ☐ No If Yes, what is the Certificate No. _____ Issue Date _____	

4. SAFETY PROGRAM					
Do you have a written safety program manual?				☐ Yes ☐ No	
If Yes, provide a copy for review					
Do you have a pocket safety booklet for field distribution?				☐ Yes ☐ No	
If Yes, provide a copy for review					
Does your safety program contain the following elements:					
	YES	NO		YES	NO
CORPORATE SAFETY POLICY	☐	☐	EQUIPMENT MAINTENANCE	☐	☐
INCIDENT NOTIFICATION POLICY	☐	☐	EMERGENCY RESPONSE	☐	☐
RECORDKEEPING & STATISTICS	☐	☐	HAZARD ASSESSMENT	☐	☐
REFERENCE TO LEGISLATION	☐	☐	SAFE WORK PRACTICES	☐	☐
GENERAL RULES & REGULATIONS	☐	☐	SAFE WORK PROCEDURES	☐	☐
PROGRESSIVE DISCIPLINE POLICY	☐	☐	WORKPLACE INSPECTIONS	☐	☐
RESPONSIBILITIES	☐	☐	INVESTIGATION PROCESS	☐	☐
PPE STANDARDS	☐	☐	TRAINING POLICY & PROGRAM	☐	☐
ENVIRONMENTAL STANDARDS	☐	☐	COMMUNICATION PROCESSES	☐	☐
MODIFIED WORK PROGRAM	☐	☐			
5. TRAINING PROGRAM					
5A. Do you have an orientation program for new hire employees?				☐ Yes ☐ No	
If Yes, include a course outline. Does it include any of the following:					
	YES	NO		YES	NO
GENERAL RULES & REGULATIONS	☐	☐	CONFINED SPACE ENTRY	☐	☐
EMERGENCY REPORTING	☐	☐	TRENCHING & EXCAVATION	☐	☐
INJURY REPORTING	☐	☐	SIGNS & BARRICADES	☐	☐
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	☐	☐



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5B. Do you have a program for training newly hired or promoted supervisors? ☐ Yes ☐ No

(If Yes, submit an outline for evaluation. Does it include instruction on the following:

	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

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?

Do you hold site safety meetings for field employees? If Yes, how often?

Yes No Daily Weekly Biweekly
☐ ☐ ☐ ☐ ☐

Do you hold site meetings where safety is addressed with management and field supervisors?

Yes No Weekly Biweekly Monthly
☐ ☐ ☐ ☐ ☐

Is pre-job safety instruction provided before to each new task? ☐ Yes ☐ No

Is the process documented? ☐ Yes ☐ No

Who leads the discussion?

Do you have a hazard assessment process? ☐ Yes ☐ No

- Are hazard assessments documented? If yes, how are hazard assessments communicated and implemented on each project? Who is responsible for leading the hazard assessment process?

Does your company have policies and procedures for environmental protection, spill clean-up, reporting, waste disposal, and recycling as part of the Health & Safety Program?

☐ Yes ☐ No

How does your company measure its H&S success?

- Attach separate sheet to explain



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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	☐	☐	☐	☐	☐
Managing Director	☐	☐	☐	☐	☐
Safety Director/Manager	☐	☐	☐	☐	☐
/Chief Executive Officer	☐	☐	☐	☐	☐

7B How are incident records and summaries kept? How often are they reported internally?

	Yes	No	Monthly	Quarterly	Annually
Incidents totaled for the entire company	☐	☐	☐	☐	☐
Incidents totaled by project	☐	☐	☐	☐	☐
• Subtotaled by superintendent	☐	☐	☐	☐	☐
• Subtotaled by foreman	☐	☐	☐	☐	☐

7C How are the costs of individual incidents kept? How often are they reported internally?

	Yes	No	Monthly	Quarterly	Annually
Costs totaled for the entire company	☐	☐	☐	☐	☐
Costs totaled by project	☐	☐	☐	☐	☐
• Subtotaled by superintendent	☐	☐	☐	☐	☐
• Subtotaled 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.

Name	Position/Title	Designation

Supply name, address and phone number of your company's corporate health and safety representative. Does this individual have responsibilities other than health, safety and environment?

Name	Address	Telephone Number

Other responsibilities:

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	Phone Number

T2.2-14: Authority to submit a Tender

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

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

A. Certificate for Company

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

Signed

Date

Name

Position

Chairman of the Board of Directors

B. Certificate for Partnership

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

_____ hereby authorise Mr/Ms _____

acting in the capacity of _____, to sign all documents in

connection with the tender offer for Contract _____ and any

contract resulting from it on our behalf.

Name	Address	Signature	Date

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

C. Certificate for Joint Venture

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

Mr/Ms _____, an authorised signatory of the company

_____, acting in the capacity of lead partner, to sign all documents in connection with the tender offer for Contract _____

_____ and any contract resulting from it on our behalf.

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

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

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

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

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T2.2-15: 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		

T2.2-16 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:

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

T2.2-19: Schedule of Proposed Subcontractors

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

Note to tenderers:

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

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

Provide information of the Sub-contractors below:

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

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

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

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

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

Tenderers to indicate their Site establishment area requirements:

This image shows a single sheet of white paper with horizontal 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.

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T2.2-20a: SBD1 Form

SBD1 FORM

PART A

INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR THE BELOW REQUIREMENTS:

BID NUMBER:	ICLMHQ782TPT-TPT/2024/01/0086/55121/RFP	CLOSING DATE:	07 th March 2024	CLOSING TIME:	12h00pm

DESCRIPTION	DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

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

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

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

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

CONTACT PERSON	Wiseman Xaba	CONTACT PERSON	Nonduduzo Mahlaba
TELEPHONE NUMBER	081 864 7514	TELEPHONE NUMBER	061 494 8531
FACSIMILE NUMBER	N/A	FACSIMILE NUMBER	N/A
E-MAIL ADDRESS	wiseman.xaba2@transnet.net	E-MAIL ADDRESS	nonduduzo.mahlaba@transnet.net

LAST DAY OF SENDING IN TENDER CLARIFICATION QUESTIONS	23rd February 2024	CLOSING TIME: 16:00pm

SUPPLIER INFORMATION

NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		OR	CENTRAL SUPPLIER DATABASE No:	UNIQUE REGISTRATION REFERENCE NUMBER:

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				MAAA:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX]		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	[TICK APPLICABLE BOX]	
	☐ Yes ☐ No			☐ Yes ☐ No	

[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	☐ Yes ☐ No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS

IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? ☐ YES ☐ NO

DOES THE ENTITY HAVE A BRANCH IN THE RSA? ☐ 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? ☐ YES ☐ NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 1.3 BELOW.

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PART B

TERMS AND CONDITIONS FOR BIDDING

1. TAX COMPLIANCE REQUIREMENTS

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

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

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:

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

DATE:

T2.2-21: ANNEX G Compulsory Enterprise Questionnaire

The following particulars hereunder must be furnished.

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

Section 1: Name of enterprise: _____

Section 2: VAT registration number, if any: _____

Section 3: CIDB registration number, if any: _____

Section 4: CSD number: _____

Section 5: Particulars of sole proprietors and partners in partnerships

Name	Identity number	Personal income tax number

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

Section 6: Particulars of companies and close corporations

Company registration number _____

Close corporation number _____

Tax reference number: _____

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

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

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

SBD 6.1**PREFERENCE POINTS CLAIM FORM**

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

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The value of this bid is estimated to 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 bid to determine the applicable preference point system in a situation where all received acceptable bids are received outside the stated preference point system.

1.3 Preference points for this bid shall be awarded for:

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

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

	POINTS
PRICE	90
B-BBEE LEVEL OF CONTRIBUTOR (1 AND 2). 51% BLACK OWNED ENTITIES (51% BO) SUBCONTRACTING 30% OF THE VALUE OF THE CONTRACT TO EME`s AND QSE`s WHO ARE 51% BLACK OWNED. LOCAL CONTENT AND LOCAL PRODUCTION	10
Total points for Price and B-BBEE must not exceed	100

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

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

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

2. DEFINITIONS

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

preference in allocation of procurement contracts in line with section 2(1) of the PPPFA.

3. POINTS AWARDED FOR PRICE

3.1 THE 90/10 PREFERENCE POINT SYSTEMS

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

90/10

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

Where

P_s = Points scored for comparative price of bid under consideration

P_t = Comparative price of bid under consideration

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

4. EVIDENCE REQUIRED FOR CLAIMING SPECIFIC GOALS

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

Specific Goals	Acceptable Evidence
B-BBEE Status contributor	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Entities that are 51 % Black Owned	CI B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Local Content and Local Production	Returnable Local Content and production Annexures
The promotion of supplier development through sub-contracting or JV for a minimum of 30% of the value of a contract to South African Companies which are: EMEs and/or QSEs who are 51% black-owned	Sub-contracting agreements and Declaration / Joint Venture Agreement and CIPC – B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate as per DTIC guideline

- 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 bid.
- 4.4 Tertiary Institutions and Public Entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.
- 4.5 A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a bidder intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a bidder qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.
- 4.6 A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.
- 4.7 Bidders are to note that the rules pertaining to B-BBEE verification and other B-BBEE requirements may be changed from time to time by regulatory bodies such as National

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.

Part T2: Returnable Schedules
T2.2-21: Compulsory Questionnaire

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

8.2 VAT registration number:.....

8.3 Company registration number:.....

8.4 TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional Supplier/Service provider
- ☐ Other Suppliers/Service providers, e.g. transporter, etc.

[TICK APPLICABLE BOX]

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

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

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- iv) If a bidder submitted false information regarding its B-BBEE status level of contributor,, which will affect or has affected the evaluation of a bid, or where a bidder has failed to declare any subcontracting arrangements or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have
 - (a) disqualify the person from the bidding process;

- (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
- (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
- (d) if the successful bidder subcontracted a portion of the bid to another person without disclosing it, Transnet reserves the right to penalise the bidder up to 10 percent of the value of the contract;
- (e) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the audi alteram partem (hear the other side) rule has been applied; and
- (f) forward the matter for criminal prosecution.

WITNESSES

1.
2.

.....

SIGNATURE(S) OF BIDDERS(S)

DATE:

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

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

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

2. Bidder's declaration

- 2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners

or any person having a controlling interest² in the enterprise, employed by the state?

YES/NO

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

Full Name	Identity Number	Name of institution	State

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

- 2.2.1 If so, furnish particulars:

.....

- 2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

- 2.3.1 If so, furnish particulars:

.....

3 DECLARATION

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.

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

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
- 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.
- 3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

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

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

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.

FALSE.

.....	
Signature	Date
.....	
Position	Name of bidder

T2.2-22 NON-DISCLOSURE AGREEMENT

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

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

TRANSNET SOC LTD

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

and

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

WHEREAS

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

IT IS HEREBY AGREED

1. INTERPRETATION

In this Agreement:

- 1.1 **Agents** mean directors, officers, employees, agents, professional advisers, contractors or sub-contractors, or any Group member;
- 1.2 **Bid or Bid Document** (hereinafter Tender) means Transnet's Request for Proposal [**RFP**] as the case may be;
- 1.3 **Confidential Information** means any information or other data relating to one party [the **Disclosing Party**] and/or the business carried on or proposed or intended to be carried on by that party and which is made available for the purposes of the Bid to the other party [the **Receiving Party**] or its Agents by the Disclosing Party or its Agents or recorded in agreed minutes following oral disclosure and any other information otherwise made available by the Disclosing Party or its Agents to the Receiving Party or its Agents, whether before, on or after the date of this Agreement, and whether in writing or otherwise, including any information, analysis or specifications derived from, containing or reflecting such information but excluding information which:

- 1.3.1 is publicly available at the time of its disclosure or becomes publicly available [other than as a result of disclosure by the Receiving Party or any of its Agents contrary to the terms of this Agreement]; or
- 1.3.2 was lawfully in the possession of the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] free of any restriction as to its use or disclosure prior to its being so disclosed; or
- 1.3.3 following such disclosure, becomes available to the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] from a source other than the Disclosing Party or its Agents, which source is not bound by any duty of confidentiality owed, directly or indirectly, to the Disclosing Party in relation to such information;
- 1.4 **Group** means any subsidiary, any holding company and any subsidiary of any holding company of either party; and
- 1.5 **Information** means all information in whatever form including, without limitation, any information relating to systems, operations, plans, intentions, market opportunities, know-how, trade secrets and business affairs whether in writing, conveyed orally or by machine-readable medium.

2. CONFIDENTIAL INFORMATION

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

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

3. RECORDS AND RETURN OF INFORMATION

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

4. ANNOUNCEMENTS

- 4.1 Neither party will make or permit to be made any announcement or disclosure of its prospective interest in the Tender without the prior written consent of the other party.
- 4.2 Neither party shall make use of the other party's name or any information acquired through its dealings with the other party for publicity or marketing purposes without the prior written consent of the other party.

5. DURATION

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

6. PRINCIPAL

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

7. ADEQUACY OF DAMAGES

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

8. PRIVACY AND DATA PROTECTION

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

9. GENERAL

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

Signed

Date

Name

Position

Tenderer

T2.2-23: RFP DECLARATION FORM

NAME OF COMPANY: _____

We _____ do hereby certify that:

1. Transnet has supplied and we have received appropriate tender offers to any/all questions (as applicable) which were submitted by ourselves for tender clarification purposes;
2. we have received all information we deemed necessary for the completion of this Tender;
3. at no stage have we received additional information relating to the subject matter of this tender from Transnet sources, other than information formally received from the designated Transnet contact(s) as nominated in the tender documents;
4. we are satisfied, insofar as our company is concerned, that the processes and procedures adopted by Transnet in issuing this tender and the requirements requested from tenderers in responding to this tender have been conducted in a fair and transparent manner; and
5. furthermore, we acknowledge that a direct relationship exists between a family member and/or an owner / member / director / partner / shareholder (unlisted companies) of our company and an employee or board member of the Transnet Group as indicated below:

[Respondent to indicate if this section is not applicable]

FULL NAME OF OWNER/MEMBER/DIRECTOR/

PARTNER/SHAREHOLDER:

ADDRESS:

Indicate nature of relationship with Transnet:

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

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

6. We accept that any dispute pertaining to this tender will be resolved through the Ombudsman process and will be subject to the Terms of Reference of the Ombudsman. The Ombudsman process must first be exhausted before judicial review of a decision is sought. (Refer "Important Notice to respondents" below).
7. We further accept that Transnet reserves the right to reverse a tender award or decision based on the recommendations of the Ombudsman without having to follow a formal court process to have such award or decision set aside.
8. We have acquainted ourselves and agree with the content of T2.2-26 "Service Provider Integrity Pact".

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

IMPORTANT NOTICE TO TENDERERS

- Transnet has appointed a Procurement Ombudsman to investigate any material complaint in respect of tenders exceeding R5,000,000.00 (five million S.A. Rand) in value. Should a Tenderer have any material concern regarding an tender process which meets this value threshold, a complaint may be lodged with Transnet's Procurement Ombudsman for further investigation.
- It is incumbent on the Tenderer to familiarise himself/herself with the Terms of Reference for the Transnet Procurement Ombudsman, details of which are available for review at Transnet's website www.transnet.net.



Transnet Port Terminals

Tender Number: ICLM HQ 782 TPT- TPT/2024/01/0086/55121/RFP

Description of the Works: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

-
- An official complaint form may be downloaded from this website and submitted, together with any supporting documentation, within the prescribed period, to procurement.ombud@transnet.net
 - For transactions below the R5,000,000.00 (five million S.A. Rand) threshold, a complaint may be lodged with the Chief Procurement Officer of the relevant Transnet Operating Division.
 - All Tenderers should note that a complaint must be made in good faith. If a complaint is made in bad faith, Transnet reserves the right to place such a tenderer on its List of Excluded Bidders.

T2.2-24: 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

T2.2-25 Certificate of Acquaintance with Tender Documents

NAME OF TENDERING ENTITY:

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

-
- 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

Transnet Port Terminals

Tender Number: ICLM HQ 782 TPT - TPT/2024/01/0086/55121/RFP

Description of The Works: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

T2.2-26 Service Provider Integrity Pact

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

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

INTEGRITY PACT

Between

TRANSNET SOC LTD

Registration Number: 1990/000900/30

("Transnet")

and

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

PREAMBLE

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

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

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

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

1 OBJECTIVES

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

2 COMMITMENTS OF TRANSNET

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

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

gift, reward, favour or any material or immaterial benefit or any other advantage from the Tenderer, either for themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the tendering process, Tender evaluation, contracting or implementation process related to any contract.

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

3 OBLIGATIONS OF THE TENDERER / SERVICE PROVIDER

- 3.1 Transnet has a '**Zero Gifts**' Policy. No employee is allowed to accept gifts, favours or benefits.
 - a) Transnet officials and employees **shall not** solicit, give or accept, or from agreeing to solicit, give, accept or receive directly or indirectly, any gift, gratuity, favour, entertainment, loan, or anything of monetary value, from any person or juridical entities in the course of official duties or in connection with any operation being managed by, or any transaction which may be affected by the functions of their office.
 - b) Transnet officials and employees **shall not** solicit or accept gifts of any kind, from vendors, suppliers, customers, potential employees, potential vendors, and suppliers, or any other individual or organisation irrespective of the value.
 - c) Under **no circumstances** should gifts, business courtesies or hospitality packages be accepted from or given to prospective suppliers participating in a tender process at the respective employee's Operating Division, regardless of retail value.

- d) Gratuities, bribes or kickbacks of any kind must never be solicited, accepted or offered, either directly or indirectly. This includes money, loans, equity, special privileges, personal favours, benefit or services. Such favours will be considered to constitute corruption.
- 3.2 The Tenderer/Service Provider/Contractor commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its Tender or during any ensuing contract stage in order to secure the contract or in furtherance to secure it and in particular the Tenderer/Service Provider/Contractor commits to the following:
- a) The Tenderer/Service Provider/Contractor will not, directly or through any other person or firm, offer, promise or give to Transnet or to any of Transnet's employees involved in the tendering process or to any third person any material or other benefit or payment, in order to obtain in exchange an advantage during the tendering process; and
 - b) The Tenderer/Service Provider/Contractor will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any employee of Transnet, connected directly or indirectly with the tendering process, or to any person, organisation or third party related to the contract in exchange for any advantage in the tendering, evaluation, contracting and implementation of the contract.
- 3.3 The Tenderer/Service Provider/Contractor will not collude with other parties interested in the contract to preclude a competitive Tender price, impair the transparency, fairness and progress of the tendering process, Tender evaluation, contracting and implementation of the contract. The Tenderer / Service Provider further commits itself to delivering against all agreed upon conditions as stipulated within the contract.
- 3.4 The Tenderer/Service Provider/Contractor will not enter into any illegal or dishonest agreement or understanding, whether formal or informal with other Tenderers/Service Providers/Contractors. This applies in particular to certifications, submissions or non-submission of documents or actions that are restrictive or to introduce cartels into the tendering process.
- 3.5 The Tenderer/Service Provider/Contractor will not commit any criminal offence under the relevant anti-corruption laws of South Africa or any other country. Furthermore, the Tenderer/Service Provider/Contractor will not use for illegitimate purposes or for restrictive purposes or personal gain, or pass on to others, any information provided by Transnet as part of the business relationship,

regarding plans, technical proposals and business details, including information contained or transmitted electronically.

- 3.6 A Tenderer/Service Provider/Contractor of foreign origin shall disclose the name and address of its agents or representatives in South Africa, if any, involved directly or indirectly in the registration or tendering process. Similarly, the Tenderer / Service Provider / Contractor of South African nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the registration or tendering process.
- 3.7 The Tenderer/Service Provider/Contractor will not misrepresent facts or furnish false or forged documents or information in order to influence the tendering process to the advantage of the Tenderer/Service Provider/Contractor or detriment of Transnet or other competitors.
- 3.8 Transnet may require the Tenderer/Service Provider/Contractor to furnish Transnet with a copy of its code of conduct. Such code of conduct must address the compliance programme for the implementation of the code of conduct and reject the use of bribes and other dishonest and unethical conduct.
- 3.9 The Tenderer/Service Provider/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 3.10 The Tenderer/Service Provider/Contractor confirms that they will uphold the ten principles of the United Nations Global Compact (UNGC) in the fields of Human Rights, Labour, Anti-Corruption and the Environment when undertaking business with Transnet as follows:

a) Human Rights

- Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
- Principle 2: make sure that they are not complicit in human rights abuses.

b) Labour

- Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and

- Principle 6: the elimination of discrimination in respect of employment and occupation.

c) Environment

- Principle 7: Businesses should support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote greater environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

d) Anti-Corruption

- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

4 INDEPENDENT TENDERING

4.1 For the purposes of that Certificate in relation to any submitted Tender, the Tenderer declares to fully understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:

- a) has been requested to submit a Tender in response to this Tender invitation;
- b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
- c) provides the same Goods and Services as the Tenderer and/or is in the same line of business as the Tenderer.

4.2 The Tenderer has arrived at his submitted Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive tendering.

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

- a) prices;
- b) geographical area where Goods or Services will be rendered [market allocation];

- c) methods, factors or formulas used to calculate prices;
 - d) the intention or decision to submit or not to submit, a Tender;
 - e) the submission of a Tender which does not meet the specifications and conditions of the RFP; or
 - f) tendering with the intention of not winning the Tender.
- 4.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the Goods or Services to which his/her tender relates.
- 4.5 The terms of the Tender as submitted have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official Tender opening or of the awarding of the contract.
- 4.6 Tenderers are aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to Tenders and contracts, Tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and/or may be reported to the National Prosecuting Authority **[NPA]** for criminal investigation and/or may be restricted from conducting business with the public sector for a period not exceeding 10 [ten] years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.
- 4.7 Should the Tenderer find any terms or conditions stipulated in any of the relevant documents quoted in the Tender unacceptable, it should indicate which conditions are unacceptable and offer alternatives by written submission on its company letterhead, attached to its submitted Tender. Any such submission shall be subject to review by Transnet's Legal Counsel who shall determine whether the proposed alternative(s) are acceptable or otherwise, as the case may be.

5 DISQUALIFICATION FROM TENDERING PROCESS

- 5.1 If the Tenderer/Service Provider/Contractor has committed a transgression through a violation of section 3 of this Integrity Pact or in any other form such as to put its reliability or credibility as a Tenderer/Service Provider/Contractor into question, Transnet may reject the Tenderer's / Service Provider's / Contractor's application from the registration or tendering process and remove the Tenderer/Service Provider/Contractor from its database, if already registered.

- 5.2 If the Tenderer/Service Provider/Contractor has committed a transgression through a violation of section 3, or any material violation, such as to put its reliability or credibility into question. Transnet may after following due procedures and at its own discretion also exclude the Tenderer/Service Provider/Contractor from future tendering processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, which will include amongst others the number of transgressions, the position of the transgressors within the company hierarchy of the Tenderer/Service Provider/Contractor and the amount of the damage. The exclusion will be imposed for up to a maximum of 10 (ten) years. However, Transnet reserves the right to impose a longer period of exclusion, depending on the gravity of the misconduct.
- 5.3 If the Tenderer/Service Provider/Contractor can prove that it has restored the damage caused by it and has installed a suitable corruption prevention system, or taken other remedial measures as the circumstances of the case may require, Transnet may at its own discretion revoke the exclusion or suspend the imposed penalty.

6 TRANSNET'S LIST OF EXCLUDED TENDERERS (BLACKLIST)

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

the entity concerned on the Database of Restricted Suppliers published on its official website.

- 6.4 The decision to restrict is based on one of the grounds for restriction. The standard of proof to commence the restriction process is whether a "*prima facie*" (i.e. on the face of it) case has been established.
- 6.5 Depending on the seriousness of the misconduct and the strategic importance of the Goods/Services, in addition to restricting a company/person from future business, Transnet may decide to terminate some or all existing contracts with the company/person as well.
- 6.6 A Service Provider or Contractor to Transnet may not subcontract any portion of the contract to a blacklisted company.
- 6.7 Grounds for blacklisting include: If any person/Enterprise which has submitted a Tender, concluded a contract, or, in the capacity of agent or subcontractor, has been associated with such Tender or contract:
 - a) Has, in bad faith, withdrawn such Tender after the advertised closing date and time for the receipt of Tenders;
 - b) has, after being notified of the acceptance of his Tender, failed or refused to sign a contract when called upon to do so in terms of any condition forming part of the Tender documents;
 - c) has carried out any contract resulting from such Tender in an unsatisfactory manner or has breached any condition of the contract;
 - d) has offered, promised or given a bribe in relation to the obtaining or execution of the contract;
 - e) has acted in a fraudulent or improper manner or in bad faith towards Transnet or any Government Department or towards any public body, Enterprise or person;
 - f) has made any incorrect statement in a certificate or other communication with regard to the Local Content of his Goods or his B-BBEE status and is unable to prove to the satisfaction of Transnet that:
 - (i) he made the statement in good faith honestly believing it to be correct;
 - and

- (ii) before making such statement he took all reasonable steps to satisfy himself of its correctness;
 - g) caused Transnet damage, or to incur costs in order to meet the contractor's requirements and which could not be recovered from the contractor;
 - h) has litigated against Transnet in bad faith.
- 6.8 Grounds for blacklisting include a company/person recorded as being a company or person prohibited from doing business with the public sector on National Treasury's database of Restricted Service Providers or Register of Tender Defaulters.
- 6.9 Companies associated with the person/s guilty of misconduct (i.e. entities owned, controlled or managed by such persons), any companies subsequently formed by the person(s) guilty of the misconduct and/or an existing company where such person(s) acquires a controlling stake may be considered for blacklisting. The decision to extend the blacklist to associated companies will be at the sole discretion of Transnet.

7 PREVIOUS TRANSGRESSIONS

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

8 SANCTIONS FOR VIOLATIONS

- 8.1 Transnet shall also take all or any one of the following actions, wherever required to:
 - a) Immediately exclude the Tenderer/Service Provider/Contractor from the tendering process or call off the pre-contract negotiations without giving any compensation

- the Tenderer/Service Provider/Contractor. However, the proceedings with the other Tenderer/ Service Provider/Contractor may continue;
- b) Immediately cancel the contract, if already awarded or signed, without giving any compensation to the Tenderer/Service Provider/Contractor;
 - c) Recover all sums already paid by Transnet;
 - d) Encash the advance bank guarantee and performance bond or warranty bond, if furnished by the Tenderer/Service Provider/Contractor, in order to recover the payments, already made by Transnet, along with interest;
 - e) Cancel all or any other contracts with the Tenderer/Service Provider/Contractor; and
 - f) Exclude the Tenderer/ Service Provider/Contractor from entering into any Tender with Transnet in future.

9 CONFLICTS OF INTEREST

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

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

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

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

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

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

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

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

10 DISPUTE RESOLUTION

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

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

11 GENERAL

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

11.2 The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the law relating to any civil or criminal proceedings.

11.3 The validity of this Integrity Pact shall cover all the tendering processes and will be valid for an indefinite period unless cancelled by either Party.

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

11.5 Should a Tenderer/Service Provider/Contractor be confronted with dishonest, fraudulent or corruptive behaviour of one or more Transnet employees, Transnet expects its Tenderer/Service Provider/Contractor to report this behaviour directly to a senior Transnet official/employee or alternatively by using Transnet's "Tip-Off Anonymous" hotline number 0800 003 056, whereby your confidentiality is guaranteed.

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

T2.2-27 : Supplier Code of Conduct

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

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

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

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

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

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

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

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

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

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

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

- Generally, suppliers have their own business standards and regulations. Although Transnet cannot control the actions of our suppliers, we will not tolerate any illegal activities. These include, but are not limited to:
 - Misrepresentation of their product (origin of manufacture, specifications, intellectual property rights, etc);
 - Collusion;
 - Failure to disclose accurate information required during the sourcing activity (ownership, financial situation, BBBEE status, etc.);
 - Corrupt activities listed above; and
 - Harassment, intimidation or other aggressive actions towards Transnet employees.
- Suppliers must be evaluated and approved before any materials, components, products or services are purchased from them. Rigorous due diligence is conducted and the supplier is expected to participate in an honest and straight forward manner.

-
- Suppliers must record and report facts accurately, honestly and objectively.
Financial records must be accurate in all material respects.

Conflicts of Interest

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

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

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

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

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

Signed this on day _____ at

Signature

T2.2-28: Insurance provided by the *Contractor*

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

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

Insurance against (See clause 84.2 of the ECC)	Name of Insurance Company	Cover	Premium
Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract			
Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R5 000 000.			
Insurance in respect of loss of or damage to own property and equipment.			
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 20,000,000			
(Other)			

T2.2-29: Form of Intent to Provide a Performance Guarantee

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

Name of Guarantor

(Bank/Insurer)

Address

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

Signed

Name

Capacity

On behalf of (name of tenderer)

Date

Confirmed by Guarantor's Authorised Representative

Signature(s)

Name (print)

Capacity

On behalf of Guarantor
(Bank/insurer)

Date

T2.2-30: Forecast Rate of Invoicing

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

Index of documentation attached to this schedule:

T2.2-31: 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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T2.2-28: Insurance provided by the *Contractor*

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

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

Insurance against (See clause 84.2 of the ECC)	Name of Insurance Company	Cover	Premium
Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract			
Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R5 000 000.			
Insurance in respect of loss of or damage to own property and equipment.			
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 20,000,000			
(Other)			

T2.2-29: Form of Intent to Provide a Performance Guarantee

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

Name of Guarantor

(Bank/Insurer)

Address

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

Signed

Name

Capacity

On behalf of (name of tenderer)

Date

Confirmed by Guarantor's Authorised Representative

Signature(s)

Name (print)

Capacity

On behalf of Guarantor
(Bank/insurer)

Date

T2.2-30: Forecast Rate of Invoicing

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

Index of documentation attached to this schedule:

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

T2.2-31: 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:

.....

.....

.....

.....

.....

.....

.....

Guidance Document for the Calculation of Local Content

1. DEFINITIONS

Unless explicitly provided in this guideline, the definitions given in SATS 1286:2011 apply.

2. GENERAL

2.1. Introduction

This guideline provides tenderers with a detailed description of how to calculate local content of products (goods, services and works) by components/material/services and enables them to keep an updated record for verification requirements as per the SATS 1286:2011 Annexure A and B.

The guideline consists of two parts, namely:

- a written guideline; and
- three declarations that must be completed:
 - Declaration C: “Local Content Declaration – Summary Schedule” (see Annexure C);
 - Declaration D: “Imported Content Declaration – Supporting Schedule to Annex C” (see Annexure D); and
 - Declaration E: “Local Content Declaration – Supporting Schedule to Annex C” (see Annexure E).

The guidelines and declarations should be used by tenderers when preparing a tender. A tenderer must complete Declarations D and E, and consolidate the information on Declaration C.

Annexure C must be submitted with the tender by the closing date and time as determined by the Tender Authority. The Tender Authority reserves the right to request that Declarations D and E also be submitted.

If the tender is successful, the tenderer must continuously update Declarations C, D and E with actual values for the duration of the contract.

NOTE:

Annexure A is a note to the purchaser in SATS 1286:2011; and
Annexure B is the Local Content Declaration IN SATS 1286:2011.

2.2. What is local content?

According to SATS 1286:2011, the local content of a product is the tender price less the value of imported content, expressed as a percentage. It is, therefore, necessary to first compute the imported value of a product to determine the local content of a product.

2.3. Categories: Imported and Local Content

The tenderer must differentiate between imported content and local content.

Imported content of a product by components/material/services is separated into two categories, namely:

- products imported directly by the tenderer; and
- products imported by a third party and supplied to the tenderer.

2.3.1. Imported Content

Identify the imported content, if any, by value for products by component/material/services. In the case of components/materials/services sourced from a South African manufacturer, agent, supplier or subcontractor (i.e. third party), obtain that information and Declaration D from the third party.

Calculate the imported content of components/materials/services to be used in the manufacture of the total quantity of the products for which the tender is to be submitted.

As stated in clause 3.2.4 of SATS 1286:2011: "If information on the origin of components, parts or materials is not available, it will be deemed to be imported content."

2.3.1.1. Imported directly by the tenderer:

When the tenderer import products directly, the onus is on the tenderer to provide evidence of any components/materials/services that were procured from a non-domestic source. The evidence should be verifiable and pertain to the tender as a whole. Typical evidence will include commercial invoices, bills of entry, etc.

When the tenderer procures imported services such as project management, design, testing, marketing, etc and makes royalty and lease payments, such payments relating to the tender must be included when calculating imported content.

2.3.1.2. Imported by a third party and supplied to the tenderer:

When the tenderer supplies components/material/services that are imported by any third party (for example, a domestic manufacturer, agent, supplier or subcontractor in the supply chain), the onus is on the tenderer to obtain verifiable evidence from the third party.

The tenderer must obtain Declaration D from all third parties for the related tender. The third party must be requested by the tenderer to continuously update Declaration D. Typical evidence of imported content will include commercial invoices, bills of entry etc.

When a third party procures imported services such as project management, design, testing, marketing etc. and makes royalty and lease payments, such payments relating to the tender must be included when calculating imported content.

2.3.1.3. Exempt Imported Content:

Exemptions, if any, are granted by the Department of Trade and Industry (**the dti**). Evidence of the exemptions must be provided and included in Annexure D.

2.3.2. Local Content

Identify and calculate the local content, by value for products by components/materials/services to be used in the manufacture of the total quantity of the products.

3. ANNEXURE C

3.1. Guidelines for completing Annexure C: Local Content Declaration – Summary Schedule

Note: The paragraph numbers correspond to the numbers in Annexure C.

C1. Tender Number

Supply the tender number that is specified on the specific tender documentation.

C2. Tender description

Supply the tender description that is specified on the specific tender documentation.

C3. Designated products

Supply the details of the products that are designated in terms of this tender (i.e. buses).

C4. Tender Authority

Supply the name of the tender authority.

C5. Tendering Entity name

Provide the tendering entity name (for example, Unibody Bus Builders (Pty) Ltd).

C6. Tender Exchange Rate

Provide the exchange rate used for this tender, as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

C7. Specified local content %

Provide the specified minimum local content requirement for the tender (i.e. 80%), as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MDB) 6.2.

C8. Tender item number

Provide the tender item number(s) of the products that have a local content requirement as per the tender specification.

C9. List of items

Provide a list of the item(s) corresponding with the tender item number.
This may be a short description or a brand name.

Calculation of local content

C10. Tender price

Provide the unit tender price of each item excluding VAT.

C11. Exempted imported content

Provide the ZAR value of the exempted imported content for each item, if applicable. These value(s) must correspond with the value(s) of column D16 on Annexure D.

C12. Tender value net of exempted imported content

Provide the net tender value of the item, if applicable, by deducting the exempted imported content (C11) from the tender price (C10).

C13. Imported value

Provide the ZAR value of the items' imported content.

C14. Local value

Provide the local value of the item by deducting the Imported value (C13) from the net tender value (C12).

C15. Local content percentage (per item)

Provide the local content percentage of the item(s) by dividing the local value (C14) by the net tender value (C12) as per the local content formula in SATS 1286.

Tender Summary

C16. Tender quantity

Provide the tender quantity for each item number as per the tender specification.

C17. Total tender value

Provide the total tender value by multiplying the tender quantity (C16) by the tender price (C10).

C18. Total exempted imported content

Provide the total exempted imported content by multiplying the tender quantity (C16) by the exempted imported content (C11). These values must correspond with the values of column D18 on Annexure D.

C19. Total imported content

Provide the total imported content of each item by multiplying the tender quantity (C16) by the imported value (C13).

C20. Total tender value

Total tender value is the sum of the values in column C17.

C21. Total exempted imported content

Total exempted imported content is the sum of the values in column C18. This value must correspond with the value of D19 on Annexure D.

C22. Total tender value net of exempted imported content

The total tender value net of exempt imported content is the total tender value (C20) less the total exempted imported content (C21).

C23. Total imported content

Total imported content is the sum of the values in column C19. This value must correspond with the value of D53 on Annexure D.

C24. Total local content

Total local content is the total tender value net of exempted imported content (C22) less the total imported content (C23). This value must correspond with the value of E13 on Annexure E.

C25. Average local content percentage of tender

The average local content percentage of tender is calculated by dividing total local content (C24) by the total tender value net of exempted imported content (C22).

4. ANNEXURE D

4.1. Guidelines for completing Annexure D: “Imported Content Declaration – Supporting Schedule to Annexure C”

Note: The paragraph numbers correspond to the numbers in Annexure D.

D1. Tender number

Supply the tender number that is specified on the specific tender documentation.

D2. Tender description

Supply the tender description that is specified on the specific tender documentation.

D3. Designated products

Supply the details of the products that are designated in terms of this tender (i.e. buses).

D4. Tender authority

Supply the name of the tender authority.

D5. Tendering entity name

Provide the tendering entity name (i.e. Unibody Bus Builders (Pty) Ltd).

D6. Tender exchange rate

Provide the exchange rate used for this tender, as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

Table A. Exempted Imported Content

D7. Tender item number

Provide the tender item number(s) of the product(s) that have imported content.

D8. Description of imported content

Provide a list of the exempted imported product(s), if any, as specified in the tender.

D9. Local supplier

Provide the name of the local supplier(s) supplying the imported product(s).

D10. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the exempted imported product(s).

D11. Imported value as per commercial invoice

Provide the foreign currency value of the exempted imported product(s) disclosed in the commercial invoice accepted by the South African Revenue Service (SARS).

D12. Tender exchange rate

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D13. Local value of imports

Convert the value of the exempted imported content as per commercial invoice (D11) into the ZAR value by using the tender exchange rate (D12) disclosed in the tender documentation.

D14. Freight costs to port of entry

Provide the freight costs to the South African Port of the exempted imported item.

D15. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the exempted imported product(s) as stipulated in the SATS 1286:2011.

D16. Total landed costs excl VAT

Provide the total landed costs (excluding VAT) for each item imported by adding the corresponding item values in columns D13, D14 and D15. These values must be transferred to column C11 on Annexure C.

D17. Tender quantity

Provide the tender quantity of the exempted imported products as per the tender specification.

D18. Exempted imported value

Provide the imported value for each of the exempted imported product(s) by multiplying the total landed cost (excl. VAT) (D16) by the

tender quantity (D17). The values in column D18 must correspond with the values of column C18 of Annexure C.

D19. Total exempted imported value

The total exempted imported value is the sum of the values in column D18. This total must correspond with the value of C21 on Annexure C.

Table B. Imported Directly By Tenderer

D20. Tender item numbers

Provide the tender item number(s) of the product(s) that have imported content.

D21. Description of imported content:

Provide a list of the product(s) imported directly by tender as specified in the tender documentation.

D22. Unit of measure

Provide the unit of measure for the product(s) imported directly by the tenderer.

D23. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the imported product(s).

D24. Imported value as per commercial Invoice

Provide the foreign currency value of the product(s) imported directly by tenderer disclosed in the commercial invoice accepted by the South African Revenue Service (SARS).

D25. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D26. Local value of imports

Convert the value of the product(s) imported directly by the tenderer as per commercial invoice (D24) into the ZAR value by using the tender exchange rate (D25) disclosed in the tender documentation.

D27. Freight costs to port of entry

Provide the freight costs to the South African Port of the product(s) imported directly by the tenderer.

D28. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the product(s) imported directly by the tenderer as stipulated in the SATS 1286:2011.

D29. Total landed costs excl VAT

Provide the total landed costs (excluding VAT) for each item imported directly by the tenderer by adding the corresponding item values in columns D26, D27 and D28.

D30. Tender quantity

Provide the tender quantity of the product(s) imported directly by the tenderer as per the tender specification.

D31. Total imported value

Provide the total imported value for each of the product(s) imported directly by the tenderer by multiplying the total landed cost (excl. VAT) (D29) by the tender quantity (D30).

D32. Total imported value by tenderer

The total value of imports by the tenderer is the sum of the values in column D31.

Table C. Imported by Third Party and Supplied to the Tenderer

D33. Description of imported content

Provide a list of the product(s) imported by the third party and supplied to the tenderer as specified in the tender documentation.

D34. Unit of measure

Provide the unit of measure for the product(s) imported by the third party and supplied to tenderer as disclosed in the commercial invoice.

D35. Local supplier

Provide the name of the local supplier(s) supplying the imported product(s).

D36. Overseas supplier

Provide the name(s) of the overseas supplier(s) supplying the imported products.

D37. Imported value as per commercial invoice

Provide the foreign currency value of the product(s) imported by the third party and supplied to the tenderer disclosed in the commercial invoice accepted by SARS.

D38. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D39. Local value of imports

Convert the value of the product(s) imported by the third party as per commercial invoice (D37) into the ZAR value by using the tender exchange rate (D38) disclosed in the tender documentation.

D40. Freight costs to port of entry

Provide the freight costs to the South African Port of the product(s) imported by third party and supplied to the tenderer.

D41. All locally incurred landing costs and duties

Provide all landing costs including customs and excise duty for the product(s) imported by third party and supplied to the tenderer as stipulated in the SATS 1286:2011.

D42. Total landed costs excluding VAT

Provide the total landed costs (excluding VAT) for each product imported by third party and supplied to the tenderer by adding the corresponding item values in columns D39, D40 and D41.

D43. Quantity imported

Provide the quantity of each product(s) imported by third party and supplied to the tenderer for the tender.

D44. Total imported value

Provide the total imported value of the product(s) imported by third party and supplied to the tenderer by multiplying the total landed cost (D42) by the quantity imported (D43).

D45. Total imported value by third party

The total imported value from the third party is the sum of the values in column D44.

Table D. Other Foreign Currency Payments

D46. Type of payment

Provide the type of foreign currency payment. (i.e. royalty payment for use of patent, annual licence fee, etc).

D47. Local supplier making the payment

Provide the name of the local supplier making the payment.

D48. Overseas beneficiary

Provide the name of the overseas beneficiary.

D49. Foreign currency value paid

Provide the value of the listed payment(s) in their foreign currency.

D50. Tender rate of exchange

Provide the exchange rate used for this tender as per the Standard Bidding Document (SBD) and Municipal Bidding Document (MBD) 6.2.

D51. Local value of payments

Provide the local value of each payment by multiplying the foreign currency value paid (D49) by the tender rate of exchange (D50).

D52. Total of foreign currency payments declared by tenderer and/or third party

The total of foreign currency payments declared by tenderer and/or a third party is the sum of the values in column D51.

D53. Total of imported content and foreign currency payment

The total imported content and foreign currency payment is the sum of the values in column D32, D45 and D52. This value must correspond with the value of C23 on Annexure C.

5. ANNEXURE E

5.1. Guidelines to completing Annexure E: “Local Content Declaration-Supporting Schedule to Annexure C”

The paragraph numbers correspond to the numbers in Annexure E

E1. Tender number

Supply the tender number that is specified on the specific tender documentation.

E2. Tender description

Supply the tender description that is specified on the specific tender documentation.

E3. Designated products

Supply the details of the products that are designated in terms of this tender (for example, buses/canned vegetables).

E4. Tender authority

Supply the name of the tender authority.

E5. Tendering entity name

Provide the tendering entity name (for example, Unibody Bus Builders (Pty) Ltd) Ltd).

Local Goods, Services and Works

E6. Description of items purchased

Provide a description of the items purchased locally in the space provided.

E7. Local supplier

Provide the name of the local supplier that corresponds to the item listed in column E6.

E8. Value

Provide the total value of the item purchased in column E6.

E9. Total local products (Goods, Services and Works)

Total local products (goods, services and works) is the sum of the values in E8.

E10. Manpower costs:

Provide the total of all the labour costs accruing only to the tenderer (i.e. not the suppliers to tenderer).

E11. Factory overheads:

Provide the total of all the factory overheads including rental, depreciation and amortisation for local and imported capital goods, utility costs and consumables. (Consumables are goods used by individuals and businesses that must be replaced regularly because they wear out or are used up. Consumables can also be defined as the components of an end product that are used up or permanently altered in the process of manufacturing, such as basic chemicals.)

E12. Administration overheads and mark-up:

Provide the total of all the administration overheads, including marketing, insurance, financing, interest and mark-up costs.

E13. Total local content:

The total local content is the sum of the values of E9, E10, E11 and E12. This total must correspond with C24 of Annexure C.

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SATS 1286:2011

Edition 1

SABS STANDARDS DIVISION

Technical specification

Local goods, services and works — Measurement and verification of local content

This document does not have the status of a South African National Standard.

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SATS 1286:2011
Edition 1

Table of changes

Change No.	Date	Scope

Foreword

This South African technical specification was approved by National Committee SABS TC 180, *Conformity assessment (CASCO)*, in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement.

This SATS was published in November 2011.

This document is being issued as a South African technical specification because there is a need for clarity and the ability to measure and validate the local content of goods, works and services in order to implement a procurement system that takes the local content into account.

This document will in future be revised and issued as a national standard.

Reference is made in 1.1 and 2.6 to the "relevant national legislation". In South Africa, this means the Preferential Procurement Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

Reference is made in the note to 2.10 to a "national accreditation body". In South Africa, this means the South African National Accreditation System (SANAS).

Reference is made in 5.1(a) to an "accredited verification body". In South Africa, this means a body accredited by the South African National Accreditation System (SANAS).

Reference is made in 5.1(b) to an "independent registered auditor". In South Africa, this means a registered auditor approved by the Independent Regulatory Board for Auditors (IRBA) in terms of the Auditing Profession Act, 2005 (Act No. 26 of 2005).

Annexes A and B form an integral part of this document.

Introduction

Preferential procurement policies and their associated regulations, such as local content requirements, are mechanisms used by the government and organs of state in the adjudication of tenders, to give consideration to procuring locally manufactured products that comply with specified requirements. Governments may identify specific industries which are deemed to be of critical importance to the economic sustainability and industrial development of their country.

In order to calculate and verify local content, a standardized approach is essential, and this document specifies the approach used in South Africa.

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Local goods, services and works — Measurement and verification of local content

1 Scope

1.1 This technical specification specifies requirements and procedures to define, measure, declare and verify the local content of goods, services and works when required for procurement and other purposes, in terms of the relevant national legislation (see foreword):

NOTE The product should contain no less than the level of local content as determined by the relevant national legislation (see foreword) and other procurement requirements.

1.2 This technical specification does not specify the required safety, quality or other properties of the product.

The responsibility to include the above requirements rests with the procurement authority.

2 Definitions

For the purposes of this document, the following definitions apply.

2.1

component

elementary part (element or portion) of a product

2.2

imported content

that portion of the tender price represented by

a) the cost of imported components, and

b) the cost of parts or materials which have been or are still to be imported (whether by the suppliers or the suppliers' subcontractors or any other third party) the costs of which are inclusive of the costs abroad,

plus freight and other direct importation costs, such as landing cost, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry excluding value added tax (VAT)

2.3

local content

that portion of the tender price that is not included in the imported content, provided that local manufacturing takes place and is calculated in accordance with the local content formula (see 3.1)

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2.4

manufacture

any kind of working or processing, including assembly or specific operations

2.5

material

ingredient, raw material, component or part used in the manufacture of a product

2.6

products

produced goods, services or works, or manufactured goods as defined in the relevant national legislation (see foreword)

2.7

tender price

price offered by the tenderer, excluding value added tax (VAT)

2.8

tenderer

person or organization that submits a tender offer

[ISO 10845-1:2010]

2.9

verification

confirmation through the provision of objective evidence that the specified requirements have been fulfilled.

2.10

verification body

body that provides assurance of the claims of local content made by the supplier

NOTE In order to provide assurance as to the competence of the verification body, the user may require that the verification body be accredited to perform these functions by a national accreditation body (see foreword).

3 Local content measurement

3.1 Calculation of local content

The local content percentage of the product shall be as specified (see annex A). The local content, LC, expressed as a percentage of the tender price, shall be calculated as follows:

$$LC = (1 - x/y) * 100$$

where

x is the imported content (see 2.2), in Rand (ZAR);

y is the tender price (see 2.7), in Rand (ZAR).

Prices referred to in the determination of x shall all be converted to Rand (ZAR) by using the exchange rate as specified (see annex A).

3.2 Documentation required for the calculation of local content

3.2.1 Documentation used for the purposes of measuring local content shall include, but is not limited to, details of all imported components, parts or materials indicating origin, manufacturer, freight cost and other direct importation costs, such as landing cost, dock duties, and import duty and sales duty, i.e. landed cost.

3.2.2 Documentary proof used for calculating x in the measurement of local content and proof of the tender price y shall be kept accessible for a period of no less than five years.

3.2.3 The tenderer shall be responsible for the accuracy of the information, including the imported content in the supply chain.

3.2.4 If information on the origin of components, parts or materials is not available, it will be deemed to be imported content.

3.3 Control of documents and records by the tenderer

Documents and records to provide evidence of compliance with the requirements of this technical specification shall be controlled.

A documented procedure to define the controls needed for the identification, storage, protection, retrieval, retention and disposition of records shall be established.

Records shall remain legible, readily identifiable and retrievable.

4 Declaration

The tenderer shall attach the declaration in annex B signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member/person with management responsibility (close corporation, partnership or individual) to the purchaser stating the local content percentage of the product, calculated in accordance with 3.1, and confirming the final tender price.

5 Verification

5.1 The procurement authority may require that the measurement of local content be verified. The verification shall be conducted by:

- a) an accredited verification body (see foreword); or
- b) an independent registered auditor (see foreword).

5.2 Those conducting the verification shall have defined and documented procedures for the verification activities.

Annex A
(normative)

Notes to purchasers

In addition to data clearly describing the product ordered, the following requirements shall be specified in tender invitations and in each order or contract:

- a) the local content percentage requirements (see 3.1), and
- b) the exchange rate requirements (see 3.1).

Annex B
(normative)

Local content declaration

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF TENDER No.
ISSUED BY: (Procurement Authority):

NB The obligation to complete and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the tenderer.

I, the undersigned, ... (full names),
do hereby declare, in my capacity as
of(name of tendering entity),
the following:

- (a) The facts herein contained are within my own personal knowledge.
- (b) I have satisfied myself that the goods/services to be delivered in terms of the above-specified tender comply with the minimum local content requirements as specified in the tender, and as measured in terms of SATS 1286.
- (c) The local content has been calculated using the formula given in clause 3 of SATS 1286 and the following figures:

	Rand (ZAR)
Tender price, excluding VAT	
Less imported content, as calculated in terms of SATS 1286	
Local content	
Local content %	

If the tender is for more than one product, a schedule of the local content by product shall be attached.

- (d) I accept that the Procurement Authority has the right to request that the local content be verified in terms of the requirements of SATS 1286.
- (e) I understand that the awarding of the tender is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286, may result in the procurement authority imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations promulgated under the Policy Framework Act (PPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____

DATE: _____

WITNESS No. 1 _____

DATE: _____

WITNESS No. 2 _____

DATE: _____

Bibliography

ISO 10845:2010, *Construction procurement – Part 1: Processes, methods and procedures.*

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SABS – Standards Division

The objective of the SABS Standards Division is to develop, promote and maintain South African National Standards. This objective is incorporated in the Standards Act, 2008 (Act No. 8 of 2008).

Amendments and Revisions

South African National Standards are updated by amendment or revision. Users of South African National Standards should ensure that they possess the latest amendments or editions.

The SABS continuously strives to improve the quality of its products and services and would therefore be grateful if anyone finding an inaccuracy or ambiguity while using this standard would inform the secretary of the technical committee responsible, the identity of which can be found in the foreword.

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Information on Standards

The Standards Information Centre provides a wide range of standards-related information on both national and international standards, and is the official WTO/TBT enquiry point for South Africa. The Centre also offers an individual updating service called INFOPLUS, which ensures that subscribers automatically receive notification regarding amendments to, and revisions of, international standards.

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Mandatory Returnable

SBD 6.2

T2.2-33: Annexure B-Declaration of Certificate for Local Production and Content for Designated Sectors

This Standard Bidding Document (SBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017, the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1) and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)].

1. General Conditions

- 1.1. Preferential Procurement Regulations, 2017 (Regulation 8) makes provision for the promotion of local production and content.
- 1.2. Regulation 8.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.
- 1.3. Where necessary, for bids referred to in paragraph 1.2 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.
- 1.4. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 1.5. The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:

$$LC = [1 - x / y] * 100$$

Where

x is the imported content in Rand

y is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by South African Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid as indicated in paragraph 4.1 below.

The SABS approved technical specification number SATS 1286:2011 is accessible on <http://www.thedti.gov.za/industrial development/ip.jsp> at no cost.

- 1.6. A bid may be disqualified if this Declaration Certificate and the Annex C (Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation;

2. Definitions

- 2.1. **"bid"** includes written price quotations, advertised competitive bids or proposals;
- 2.2. **"bid price"** price offered by the bidder, excluding value added tax (VAT);

Transnet Port Terminals

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Description of the Works: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

- 2.3. **"contract"** means the agreement that results from the acceptance of a bid by an organ of state;
- 2.4. **"designated sector"** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;
- 2.5. **"duly sign"** means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility(close corporation, partnership or individual).
- 2.6. **"imported content"** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad (this includes labour or intellectual property costs), plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;
- 2.7. **"local content"** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;
- 2.8. **"stipulated minimum threshold"** means that portion of local production and content as determined by the Department of Trade and Industry; and
- 2.9. **"sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.
3. **The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid is/are as follows:**

<u>Description of services, works or goods</u>	<u>Stipulated minimum threshold</u>
• Conveyor System Equipment	85%
• Conveyor Idlers	70%
• Pumps MV Motors and Associated Accessories	70%
• Valves Products and Actuators	70%

4. Does any portion of the services, works or goods offered have any imported content?

(**Tick applicable box**)

YES		NO	

- 4.1. If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.5 of the general conditions must be the rate(s) published by SARB for the specific currency at 12:00 on the date of advertisement of the bid.

The relevant rates of exchange information is accessible on www.reservebank.co.za

Indicate the rate(s) of exchange against the appropriate currency in the table below (refer to Annex A of SATS 1286:2011):

Currency	Rates of exchange
US Dollar	

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Pound Sterling	
Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

- Where, after the award of a bid, challenges are experienced in meeting the stipulated minimum threshold for local content the dti must be informed accordingly in order for the dti to verify and in consultation with the AO/AA provide directives in this regard.



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LOCAL CONTENT DECLARATION
(REFER TO ANNEX B OF SATS 1286:2011)

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID NO. TPT/2023/07/0088/35446/RFP

ISSUED BY: TRANSNET PORT TERMINALS ON BEHALF OF TRANSNET SOC LTD

NB

- 1 The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.
- 2 Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on http://www.thdti.gov.za/industrial_development/ip.jsp. Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. **Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph (c) below.** Declarations D and E should be kept by the bidders for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

I, the undersigned, ... (full names), do hereby declare, in my capacity as of (name of bidder entity), the following:

- (a) The facts contained herein are within my own personal knowledge.
- (b) I have satisfied myself that:
 - (i) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and
- (c) The local content percentage (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C

Conveyor System Equipment - 85%

Price of the Designated commodity	Ex VAT	R
Imported content (x), as calculated in terms of SATS 1286:2011		R
Stipulated minimum threshold for local content (paragraph 3 above)		85%
Local content %, as calculated in terms of SATS 1286:2011		

Conveyor Idlers -70%

Price of the Designated commodity	Ex Vat	R
Imported content (x), as calculated in terms of SATS 1286:2011		R
Stipulated minimum threshold for local content (paragraph 3 above)		70%
Local content %, as calculated in terms of SATS 1286:2011		

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Pumps MV Motors and Associated Accessories -70%

Price of the Designated commodity	Ex Vat	R
Imported content (x), as calculated in terms of SATS 1286:2011		R
Stipulated minimum threshold for local content (paragraph 3 above)		70%
Local content %, as calculated in terms of SATS 1286:2011		

Valves Products and Actuators -70%

Price of the Designated commodity	Ex Vat	R
Imported content (x), as calculated in terms of SATS 1286:2011		R
Stipulated minimum threshold for local content (paragraph 3 above)		70%
Local content %, as calculated in terms of SATS 1286:2011		

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above. The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 above and the information contained in Declaration D and E.

- (d) I accept that the Procurement Authority / Institution has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.
- (e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Institution imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____

DATE: _____

WITNESS No. 1 _____

DATE: _____

WITNESS No. 2 _____

DATE: _____

NOTE TO TENDERERS: Failure to fully complete, declare, sign & date this SBD6.2 Declaration as well as the accompanying Annexure C "local content declaration - summary schedule" may result in the tender submission being non-responsive and disqualified from any further evaluation.

Schedule A – Non-compliance for Local Content

Non-compliance Penalties for Local Content:

- a) If for any reason the *Contractor* is unable to achieve the local content undertaking, the *Contractor* must approach the Department of Trade and Industry ("DTI") to obtain exemption in order to supply the goods at a lower local content threshold. The *Contractor* is obliged to



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approach DTI for exemption within 10 (ten) days of determining that it is unable to achieve any milestone target or local content threshold.

- b) Should the DTI provide exemption, the *Contractor* shall be entitled to provide the goods at the lower local content threshold set by DTI. In such event, the Parties shall in good faith renegotiate the milestone targets or local content undertaking to ensure that the lowered local content thresholds are achieved.
- c) Should DTI not provide the necessary exemption, the *Contractor* shall be obliged to meet each milestone target as stated in the Local Content Plan or the local content undertaking.
- d) Should the *Contractor* fail to meet any milestone target or the local content undertaking, the following remedies shall apply without limiting any of the *Employer's* other rights in law:
 - i. The *Employer* shall afford the *Contractor* a period of thirty (30) days to remedy its non-compliance.
 - ii. Should the *Contractor* fail to meet its obligations within the further 30 day period, the *Contractor* shall pay a Non-Compliance penalty ("Non-compliance Penalty") to the *Employer* in respect of such Non-compliance as set out in clause iv below. The penalties shall be imposed per milestone measurement for non-delivery of committed values in the case of a Local Content Plan or shall be imposed against the non-delivery of committed values where local content undertakings must be met immediately.
 - iii. To the extent that the Actual Local Content Spend¹ is lower than the Required Local Content Spend² (or the Adjusted Required Local Content Spend³, as the case may be), the *Contractor* shall be liable for Penalties which is the difference in value between the Actual Local Content Spend and the Required Local Content Spend (or the Adjusted Required Local Content Spend, as the case may be) plus an additional percentage of such difference. Such Non-compliance Penalties shall be calculated and levied at the relevant milestones as stipulated in the Local Content Plan or shall be imposed against the non-delivery of committed values where local content undertakings must be met immediately, in accordance with clause iv below.
 - iv. Non-compliance penalties shall apply at the following rate: the difference in value between the Required Local Content Spend and the Actual Local Content Spend, plus 5% of such difference.
 - v. In order to guarantee that the *Contractor* meets its obligations in terms of the Local Content Plan or its committed local content undertaking, the *Employer* shall be entitled to retain a Non-compliance Penalty at the rate of 1% of every monthly payment due by the *Employer* to the *Contractor* over the contract period ("the Local Content Retention Amount"). The Local Content Retention Amount shall be set off against any penalties payable by the *Contractor* at any milestone assessment.
- e) Should no penalties be imposed during the duration of the contract, the *Employer* shall refund the full value of the Local Content Retention Amount to the *Contractor* at the end of the contract period.
- f) Should any unpaid penalties remain at the end of the contract period, then without limiting other rights that the *Employer* may have in law, the *Contractor* shall forfeit the Local Content Retention Amount and shall have no further claim against the *Employer* for the repayment of such amount.

Non-compliance Penalty Certificate:

- a) If any Non-compliance Penalty arises, the *Employer* shall issue a Non-compliance Penalty Certificate on the last day of each month during such Non-compliance indicating the Non-compliance Penalties which have accrued during that period.
- b) A Non-compliance Penalty Certificate shall be prima facie proof of the matters to which it relates. If the *Contractor* disputes any of the amounts set out in a Non-compliance Penalty Certificate:
 - the dispute shall be resolved in accordance with the provisions of the Contract; and
 - if pursuant to that referral, it is determined that the *Contractor* owes any amount to the *Employer* pursuant to the Non-compliance Penalty Certificate, then the *Contractor* shall pay such amount to the *Employer* within 10 (ten) Business Days of the determination made pursuant to such determination and an accompanying valid Tax Invoice.

¹ Actual Local Content Spend means the monetary value of local content initiatives actually delivered by the Supplier during the period under review.

² Required Local Content Spend means the monetary value of local content obligations that the Supplier has agreed to deliver during the period under review.

³ Adjusted Required Local Content Spend means any adjustment to the Required Local Content Spend as prescribed by DTI through the process of exemption referred to in clause c) above and as agreed to between the parties, reduced to writing and signed by the parties.



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Payment of Non-compliance Penalties:

- a) Subject to Clause i) above, the *Contractor* shall pay the Non-compliance Penalty indicated in the Non-compliance Penalty Certificate within 10 (ten) Business Days of the *Employer* issuing a valid Tax Invoice to the *Contractor* for the amount set out in that certificate. If the *Employer* does not issue a valid Tax Invoice to the *Contractor* for Non-compliance Penalties accrued during any relevant period, those Non-compliance Penalties shall be carried forward to the next period.
- b) The *Contractor* shall pay the amount due within 10 (ten) days after receipt of a valid Tax Invoice from the *Employer*, failing which Transnet shall, without prejudice to any other rights of the *Employer* under this Agreement, be entitled to call for payment which may be in any form the *Employer* deems reasonable and appropriate.
- c) It is agreed that the *Employer*, the DTI, the South African Bureau of Standards and/or any of their appointed agents shall be entitled to monitor, evaluate and audit the *Contractor's* compliance with its obligations under the Local Content Plan. To this end, the *Contractor* shall provide its full cooperation to the respective bodies referred to in this clause to ensure that effective monitoring, evaluation and auditing takes place.

The Non Compliance Penalties set forth in this Clause are stated exclusive of VAT. Any VAT payable on Non Compliance Penalties will be for the account of the *Contractor*.

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SATS 1286.2011

Annexture C

Local Content Declaration - Summary Schedule

- (C1) **Tender No.** ICLM HQ 782 TPT - TPT/2024/01/0086/55121/RFP
- (C2) **Tender description:** DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).
- (C3) **Designated product(s)**
- (C4) **Tender Authority:** Transnet Port Terminals
- (C5) **Tendering Entity name:**
- (C6) **Tender Exchange Rate:** Pula EU GBP
- (C7) **Specified local content %**

Note: VAT to be excluded from all calculations

		Calculation of local content						Tender summary			
Tender item no's	List of items	Tender price - each (excl VAT)	Exempted imported value	Tender value net of exempted imported content	Imported value	Local value	Local content % (per item)	Tender Qty	Total Tender value	Total exempted imported content	Total Imported content
(C8)	(C9)	(C10)	(C11)	(C12)	(C13)	(C14)	(C15)	(C16)	(C17)	(C18)	(C19)
1	Conveyor System Equipment -85%										
2	Conveyor Idlers -70%										
3	Pumps MV Motors and Associated Accessories- 70%										
4	Valves Products and Actuators -70%										

Signature of tenderer from Annex B

Date: _____

(C20) Total tender value

(C21) Total Exempt imported content

(C22) Total Tender value net of exempt imported content

(C23) Total Imported content

(C24) Total local content

(C25) Average local content % of tender

Annex D

ESSENTIAL RETURNABLE DOCUMENT:
FAILURE TO FULLY COMPLETE, DECLARE, SIGN & DATE THIS ANNEXURE C WILL RESULT IN NO POINTS BEING SCORED

Imported Content Declaration - Supporting Schedule to Annex C

(D1) Tender No.

ICLM HQ 782 TPT - TPT/2024/01/0086/55121/RFP

(D2) Tender description:

DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND
COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO
1990/000900/30) OPERATING AS
TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT
VARIOUS PORT TERMINALS (NATIONAL).

Note: VAT to be excluded from
all calculations

(D3) Designated Products:

(D4) Tender Authority:

(D5) Tendering Entity name:

(D6) Tender Exchange Rate:

Pula

EU

GBP

A. Exempted imported content

				Calculation of imported content						Summary	
Tender item no's	Description of imported content	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Exchange Rate	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Exempted imported value
(D7)	(D8)	(D9)	(D10)	(D11)	(D12)	(D13)	(D14)	(D15)	(D16)	(D17)	(D18)
(D19) Total exempt imported value										R	0
This total must correspond with Annex C - C 21											

B. Imported directly by the Tenderer

				Calculation of imported content						Summary	
Tender item no's	Description of imported content	Unit of measure	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Tender Qty	Total imported value
(D20)	(D21)	(D22)	(D23)	(D24)	(D25)	(D26)	(D27)	(D28)	(D29)	(D30)	(D31)
(D32) Total imported value by tenderer										R	0

C. Imported by a 3rd party and supplied to the Tenderer

				Calculation of imported content						Summary	
Description of imported content	Unit of measure	Local supplier	Overseas Supplier	Foreign currency value as per Commercial Invoice	Tender Rate of Exchange	Local value of imports	Freight costs to port of entry	All locally incurred landing costs & duties	Total landed cost excl VAT	Quantity imported	Total imported value
(D33)	(D34)	(D35)	(D36)	(D37)	(D38)	(D39)	(D40)	(D41)	(D42)	(D43)	(D44)
(D45) Total imported value by 3rd party										R	0

D. Other foreign currency payments

			Calculation of foreign currency payments		Summary of payments	
Type of payment	Local supplier making the payment	Overseas beneficiary	Foreign currency value paid	Tender Rate of Exchange	Local value of payments	
(D46)	(D47)	(D48)	(D49)	(D50)	(D51)	
(D52) Total of foreign currency payments declared by tenderer and/or 3rd party						
(D53) Total of imported content & foreign currency payments - (D32), (D45) & (D52) above					R	0
This total must correspond with Annex C - C 23						

Signature of tenderer from Annex B

Date:

TENDER NUMBER: ICLM HQ 782 TPT - TPT/2024/01/0086/55121/RFP
DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

Annex E

Local Content Declaration - Supporting Schedule to Annex C

(E10)	Manpower costs	(Tenderer's manpower cost)		R 0
(E11)	Factory overheads	(Rental, depreciation & amortisation, utility costs, consumables etc.)		R 0
(E12)	Administration overheads and mark-up	(Marketing, insurance, financing, interest etc.)		R 0
			(E13) Total local content	R 0
This total must correspond with Annex C - C24				

Date: _____

TRANSNET PORT TERMINALS

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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:

DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

The tenderer, identified in the Offer signature block, has

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

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

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

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

Signature(s)

Name(s)

Capacity

**For the
tenderer:**

(Insert name and address of organisation)

Date

TRANSNET PORT TERMINALS

TENDER NUMBER: ICLM HQ 782 TPT -TPT/2024/01/0086/55121/RFP

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)..

Name &

signature of

witness

Tenderer's CIDB registration number:

TRANSNET PORT TERMINALS

TENDER NUMBER: ICLM HQ 782 TPT -TPT/2024/01/0086/55121/RFP

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)..

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).

TRANSNET PORT TERMINALS

TENDER NUMBER: ICLM HQ 782 TPT -TPT/2024/01/0086/55121/RFP

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)..

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

Signature(s)

Name(s)

Capacity

**for the
Employer**

Transnet SOC Ltd

*(Insert name and address of organisation)*Name &
signature of
witness

Date

TRANSNET PORT TERMINALS

TENDER NUMBER: ICLM HQ 782 TPT -TPT/2024/01/0086/55121/RFP

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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		

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	<i>(Insert name and address of organisation)</i>	Transnet SOC Ltd
Name & signature of witness		
Date		



NEC3 ECC Contract

entered into by and between

Transnet SOC Ltd

Registration Number 1990/000900/30

(hereinafter referred to as the "*Employer*")

and

.....

Registration Number

(hereinafter referred to as the "*Contractor*")

Contract Number **ICLM HQ 782 TPT -TPT/2024/01/0086/55121/RFP**

Start Date

Completion Date

CONTRACT DOCUMENTS

Form of Offer and Acceptance

Contract Data

Part One – Data provided by the *Employer*.

Part Two – Data provided by the *Contractor*.

Form of Guarantee

Pricing Data

Scope of works

Technical Evaluation Score Card

Annexures/Specifications

Engineering

High Level Commissioning Plan

TPD-001-EL&P SPEC

TPD-002-DBSPEC (2)

TPD-003-CABLESPEC

TPD-004-EARTHINGSPEC

TPD-005-FIRESPEC

TPD-007-MVSWITCHSPEC

Environmental constraints and management

Annexure A- TIMS Policy Commitment Statement

Annexure B - Contractor Environmental and Sustainability Spe

Annexure C - Construction Environmental Management

Annexure D - Declaration of Understanding

Annexure E - Environmental Method Statement Template

Annexure F - Environmental Closure Certificate

Health and Safety

Project Health and Safety Specification - PHSS001

Quality

QAL-STD-0001 Rev0__General Quality Requirements for Contractors and Suppliers signed

BBB-EE Improvement Plan

Annexure A - BBB-EE Improvement Plan

Site Information

- 1) Part C4 Site Information - Cape Town Container Terminal MPT
- 2) Part C4 Site Information - Cape Town Container Terminal
- 3) Part C4 Site Information - DBN Point
- 4) Part C4 Site Information - DCT Pier 1
- 5) Part C4 Site Information - DCT Pier 2
- 6) Part C4 Site Information - East London MPT
- 7) Part C4 Site Information - Maydon Wharf
- 8) Part C4 Site Information – NCT
- 9) Part C4 Site Information - Port Elizabeth Container Terminal
- 10) Part C4 Site Information - Richards Bay
- 11) Part C4 Site Information - Saldanha Terminal MPT

TRANSNET PORT TERMINALS

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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:

DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

The tenderer, identified in the Offer signature block, has

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

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

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

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

Signature(s)

Name(s)

Capacity

**For the
tenderer:**

(Insert name and address of organisation)

Date

TRANSNET PORT TERMINALS

TENDER NUMBER: ICLM HQ 782 TPT -TPT/2024/01/0086/55121/RFP

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)..

Name &

signature of

witness

Tenderer's CIDB registration number:

TRANSNET PORT TERMINALS

TENDER NUMBER: ICLM HQ 782 TPT -TPT/2024/01/0086/55121/RFP

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)..

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The terms of the contract, are contained in:

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

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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.

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

Signature(s)

Name(s)

Capacity

**for the
Employer**

Transnet SOC Ltd

(Insert name and address of organisation)

Name &
signature of
witness

Date

TRANSNET PORT TERMINALS

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Schedule of Deviations

Note:

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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.

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2		
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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	<i>(Insert name and address of organisation)</i>	Transnet SOC Ltd
Name & signature of witness		
Date		

C1.2 Contract Data

Part one - Data provided by the *Employer*

(Compilers) Please read the relevant clauses in the conditions of contract before you enter data. The number of the principal clause is shown for each statement however other clauses may also use the same data.

Completion of this data in full including Z Clauses, according to the Options chosen, is essential to create a complete contract. (Please delete all the above highlighted sentences).

Clause	Statement	Data
1	General	
	The <i>conditions of contract</i> are the core clauses and the clauses for main Option	
		A: Priced contract with activity schedule
	dispute resolution Option	W1: Dispute resolution procedure
	and secondary Options	
		X1: Price adjustment for inflation
		X2 Changes in the law
		X3: Multiple currencies
		X4: Parent company guarantee
		X5: Sectional Completion
		X7: Delay damages
		X13: Performance Bond
		X16: Retention
		X18: Limitation of liability
		X20: Key performance indicators
		Z: <i>Additional conditions of contract</i>



Transnet Port Terminals

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of the NEC3 Engineering and Construction Contract June 2005 (amended June 2006 and April 2013)

10.1	The <i>Employer</i> is: Address Having elected its Contractual Address for the purposes of this contract as:	Transnet SOC Ltd (Registration No. 1990/000900/30) Registered address: Transnet Corporate Centre 138 Eloff Street Braamfontein Johannesburg 2000 Transnet Port Terminals 202 Anton Lembede Street Durban 4000
10.1	The <i>Project Manager</i> is: (Name) Address Tel e-mail	TBC
10.1	The <i>Supervisor</i> is: (Name) Address Tel No. e-mail	
11.2(13)	The <i>works</i> are	DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).
11.2(14)	The following matters will be included in the Risk Register	



Transnet Port Terminals

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11.2(15)	The <i>boundaries of the site</i> are	As stated in Part C4 "Description of the Site and it surroundings"	
11.2(16)	The Site Information is in	Part C4	
11.2(19)	The Works Information is in	Part C3	
12.2	The <i>law of the contract</i> is the law of	the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.	
13.1	The <i>language of this contract</i> is	English	
13.3	The <i>period for reply</i> is	2 weeks	
2	The <i>Contractor's</i> main responsibilities	No additional data is required for this section of the <i>conditions of contract</i>.	
3	Time		
11.2(3)	The <i>completion date</i> for the whole of the <i>works</i> is	TBC	
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	
30.1	The <i>access dates</i> are	Part of the Site	Date
		1	
31.1	The <i>Contractor</i> is to submit a first programme for acceptance within	2 weeks of the Contract Date.	
31.2	The <i>starting date</i> is	TBC	
32.2	The <i>Contractor</i> submits revised programmes at intervals no longer than	2 weeks.	
35.1	The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date.		
4	Testing and Defects		
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	



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5	Payment	
50.1	The <i>assessment interval</i> is	25th (twenty fifth) 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 Standard Bank of South Africa.
6	Compensation events	
60.1(13)	The <i>weather measurements</i> to be recorded for each calendar month are,	the cumulative rainfall (mm) the number of days with rainfall more than 10 mm the number of days with minimum air temperature less than 0 degrees Celsius the number of days with snow lying at 08:00 hours South African Time and these measurements: The place where weather is to be recorded (on the Site) is: The <i>Contractor's</i> Site establishment area The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at: Part C4 Site Locations and which are available from: South African Weather Service 012 367 6023 or info3@weathersa.co.za.
7	Title	No additional data is required for this section of the <i>conditions of contract</i>.
8	Risks and insurance	



Transnet Port Terminals

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



Transnet Port Terminals

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	Cover / indemnity	Cover / indemnity is to the extent provided by the SASRIA coupon
	The deductibles are	The deductibles are, in respect of each and every theft claim, 0,1% of the contract value subject to a minimum of R2,500 and a maximum of R25,000.
	Note:	The deductibles for the insurance as stated above are listed in the document titled "Certificate of Insurance: Transnet (SOC) Limited Principal Controlled Insurance."
84.1	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract for any one event is The <i>Contractor</i> provides these additional Insurances	The <i>Contractor</i> must comply at a minimum with the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended. 1 Where the contract requires that the design of any part of the <i>works</i> shall be provided by the <i>Contractor</i> the <i>Contractor</i> shall satisfy the <i>Employer</i> that professional indemnity insurance cover in connection therewith has been affected 2 Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the <i>works</i> at premises other than the site, the <i>Contractor</i> shall satisfy the <i>Employer</i> that such plant & materials, components or other goods for incorporation in the <i>works</i> are adequately insured during manufacture and/or fabrication and transportation to the site. 3 Should the <i>Employer</i> have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the <i>Contractor's</i> policies of insurance as well as those of any sub-contractor

- 4 Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000/R10 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 *Employer*. The *Contractor* shall arrange with the insurer to submit to the *Project Manager* the original and the duplicate original of the policy or policies of insurance and the receipts for payment of current premiums, together with a certificate from the insurer or insurance broker concerned, confirming that the policy or policies provide the full coverage as required. The original policy will be returned to the *Contractor*.**

84.2 The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the *Contractor*) caused by activity in connection with this contract for any one event is

Whatever the *Contractor* requires in addition to the amount of insurance taken out by the *Employer* for the same risk.

84.2	The insurance against loss of or damage to the works, Plant and Materials as stated in the insurance policy for contract works and public liability selected from:	Principal Controlled Insurance policy for Contract OR Project Specific Insurance for the 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	
A	Priced contract with Activity Schedule	No additional data is required for this Option.
11	Data for Option W1	
W1.1	The <i>Adjudicator</i> is	Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the <i>Adjudicator</i>, the Chairman of the Association of Arbitrators will appoint an <i>Adjudicator</i>.
W1.2(3)	The <i>Adjudicator nominating body</i> is: If no <i>Adjudicator nominating body</i> is entered, it is:	The Chairman of the Association of Arbitrators (Southern Africa) the Association of Arbitrators (Southern Africa)
W1.4(2)	The <i>tribunal</i> is:	Arbitration
W1.4(5)	The <i>arbitration procedure</i> is	The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)
	The place where arbitration is to be held is	South Africa
	The person or organisation who will choose an arbitrator	
	- if the Parties cannot agree a choice or	The Chairman of the Association of Arbitrators (Southern Africa)
	- if the arbitration procedure does not state who selects an arbitrator, is	



Transnet Port Terminals

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12	Data for secondary Option clauses			
X1	Price adjustment for inflation			
X1.1(a)	The <i>base date</i> for indices is	05 February 2024.		
X1.1(c)	The proportions used to calculate the Price Adjustment Factor are:	Pro-portion	linked to index for	Index prepared by
		0.30	Labour (People)	The Consumer Price Index (CPI) for "All Items" in Table 1 (Consumer price indices for the total country) of the Statistical Release P0141 "Consumer Price Index - Additional Tables" published by Statistics South Africa. (Link- http://www.statssa.gov.za/?page_id=1854&PPN=P0141)



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



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0.36	Material (Electrical)	The "Electrical Engineering" index in Table 5 (Mechanical and Electrical Engineering Input Price Indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa.
0.03	Material (Mechanical)	The "Mechanical Engineering" index in Table 5 (Mechanical and Electrical Engineering Input Price Indices) of the Statistical Release P0151.1 "Construction Materials Price Indices" published by Statistics South Africa.



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		0.01	Fuel	The "Diesel" index in Table 1 (PPI for final manufactured goods) of the Statistical Release P0142.1 "Producer Price Index" published by Statistics South Africa. (Link - http://www.statssa.gov.za/?page_id=1854&PPN=P0142.1)
		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 A)			
X4	Parent company guarantee	No additional data is required for this Option		
X7	Delay damages (but not if Option X5 is also used)			
X7.1	Delay damages for Completion of the whole of the <i>works</i> are	will be 0.1% of the total contract value per day capped at 7.5% of the total contract value.		
X13	Performance bond			
X13.1	The amount of the performance bond is	20% of the total of the Prices		
X16	Retention			
X16.1	The retention free amount is	Nil		
	The retention percentage is	N/A.		



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X18	Limitation of liability	
X18.1	The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:	Nil (this is the default position depending on a risk assessment, therefore this can go up to Total of the Prices)
X18.2	For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:	The deductible of the relevant insurance policy
X18.3	The <i>Contractor's</i> liability for Defects due to his design which are not listed on the Defects Certificate is limited to:	The cost of correcting the Defect
X18.4	The <i>Contractor's</i> total liability to the <i>Employer</i> for all matters arising under or in connection with this contract, other than excluded matters, is limited to:	The Total of the Prices
X18.5	The <i>end of liability date</i> is	5 years after Completion of the whole of the works
Z	<i>Additional conditions of contract are:</i>	
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 <i>Employer</i> by a financial institution reasonably acceptable to the <i>Employer</i>.



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)



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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."
Z5	Right Reserved by the <i>Employer</i> to Conduct Vetting through SSA	
Z5.1		The <i>Employer</i> reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any <i>Contractor</i> who has access to National Key Points for the following without limitations: 1. Confidential – this clearance is based on any information which may be used by malicious, opposing or hostile elements to harm the objectives and functions of an organ of state. 2. Secret – clearance is based on any information which may be used by malicious, opposing or hostile elements to disrupt the objectives and functions of an organ of state. 3. Top Secret – this clearance is based on information which may be used by malicious, opposing or hostile elements to neutralise the objectives and functions of an organ of state.

Z6	Additional Clause Relating to Collusion in the Construction Industry	
Z6.1		The contract award is made without prejudice to any rights the <i>Employer</i> may have to take appropriate action later with regard to any declared tender rigging including blacklisting.
Z7	Protection of Personal Information Act	
Z7.1		The <i>Employer</i> and the <i>Contractor</i> are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act.
Z8	BBBEE Clauses	
Z8.1		Insert additional clause 27.7. 27.7.1. The <i>Employer</i> encourages its <i>Contractors</i> to constantly strive to improve their B-BBEE Contributor Status Levels. To this end, the <i>Contractor</i> is to maintain and/or improve its B-BBEE Improvement Plan over the Contract period as per Returnable Schedule Annexure A - BBB-EE Improvement Plan 27.2.2. The <i>Contractor</i> shall, for the duration of the Works, comply with the B-BBEE Improvement Plan. The accepted <i>Contractor's</i> B-BBEE Improvement Plan, constitutes an offer to perform all its B-BBEE commitments and will constitute a binding agreement. 27.7.3. Breach of B-BBEE Improvement Plan commitments provide the <i>Employer</i> cause to terminate the contract.



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27.7.6. The performance of the *Contractor* as compared to with the accepted B-BBEE Improvement Plan, shall be measured on an annual basis within 60 (sixty) days after the Anniversary Date for the duration of the Contract Period. To this end, the *Contractor* shall grant the *Employer* a right of access and provide the underlying data supporting the achievement by the *Contractor* of the targets specified in the accepted B-BBEE Improvement Plan, which underlying data shall be auditable.

27.7.7. The *Contractor* shall ensure that it has the relevant internal mechanisms and procedures in place to allow the *Employer* to measure and verify the *Contractor's* compliance with the accepted B-BBEE Improvement Plan. Without limiting the generality of the foregoing, the *Contractor* shall be obliged to provide the *Employer* with written quarterly status reports specifying the progress made by the *Contractor* in relation to the accepted B-BBEE Improvement Plan.



27.7.10. To the extent of that the *Contractor* has not complied with the accepted B-BBEE Improvement Plan, the *Employer* shall be entitled to levy penalties which shall be determined with reference to the actual aggregate amounts paid by the *Employer* to the *Contractor* in respect of the preceding 12 (twelve) calendar month intervals, such interval period shall commence from the Contract Date as follows:

Interval One	
Interval Two	
Interval Three	
Interval Four	Refer to paragraph 27.7.10 – 27.7.12 below

27.7.11. Penalties will be levied based on the failure of the *Contractor* to achieve the targets specified in the accepted B-BBEE Improvement Plan rather than the failure of any constituent of the *Contractor* to contribute to the achievement of the targets in the accepted B-BBEE improvement plan;

27.7.12. In order to guarantee that the *Contractor* meet its obligations in terms of the accepted B-BBEE Improvement Plan and specifically during interval the *Employer* shall be entitled to retain 5% (five percent) of every payment due by the *Employer* to the *Contractor* ("B-BBEE Retention Amount").

27.7.13. The B-BBEE Retention amount shall be retained by the *Employer* as guarantee for the remaining obligations of the *Contractor* in terms of the accepted B-BBEE Improvement Plan;



27.7.14 The B-BBEE Retention Amount shall be deducted as part of the Retention in X16.1. The Retention in X16.1 shall be reduced to accommodate the B-BBEE Retention Amount. As such total Retention for the *works* shall not exceed 10%;

27.7.15. Should the *Contractor's* obligations:

- be met in terms of the accepted B-BBEE Improvement Plan, the B-BBEE Retention amount shall be released within 30 (thirty) days of the date of verification of compliance by the *Contractor* of its obligations in terms of the accepted B-BBEE Improvement Plan, at which time the monies shall be paid over to the *Contractor*;
- not be met, unless such failure is an attributable occurrence of an event which:
 - stops the *Contractor* Providing the *works* or
 - stops the *Contractor* Providing the *works* by the date shown on the Accepted Programme
 and which
 - neither Party could prevent and
 - an experienced *Contractor* would have judged at the Contract to have such a small chance of occurring that it would have been unreasonable for him to have allowed for it

the *Contractor* shall forfeit the B-BBEE Retention Amount and shall have no further claim against the *Employer* for the repayment of such amount.

27.7.16. Should the contract be extended the same provisions as applicable in the last interval shall continue to apply until Completion Date.



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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:	
	1 Name:	
	Job:	
	Responsibilities:	
	Qualifications:	
	Experience:	
	2 Name:	
	Job	
	Responsibilities:	
	Qualifications:	
	Experience:	



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		CV's (and further key persons data including CVs) are appended to Tender Schedule entitled .		
11.2(14)	The following matters will be included in the Risk Register			
31.1	The programme identified in the Contract Data is			
A	Priced contract with activity schedule			
11.2(20)	The <i>activity schedule</i> is in			
11.2(30)	The tendered total of the Prices is	(in figures) (in words), excluding VAT		
A	Priced contract with activity schedule	Data for the Shorter Schedule of Cost Components		
41 in SSCC	The percentage for people overheads is:	%		
21 in SSCC	The published list of Equipment is the last edition of the list published by			
	The percentage for adjustment for Equipment in the published list is	% (state plus or minus)		
22 in SSCC	The rates of other Equipment are:	Equipment	Size or capacity	Rate
61 in SSCC	The hourly rates for Defined Cost of design outside the Working Areas are	Category of employee		Hourly rate

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62 SSCC	in	The percentage for design overheads is	%
63 SSCC	in	The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:	

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PART 2: PRICING DATA

Document reference	Title	No of pages
	This cover page	1
C2.1	Pricing instructions: Option A	2
C2.2	Activity Schedule	11

C2.1 Pricing instructions: Option A

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 (amended June 2006 and April 2013) (ECC) Option A states:

Identified and defined 11 terms

- 11.2 (20) The Activity Schedule is the *activity schedule* unless later changed in accordance with this contract.
- (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.
- (27) The Price for Work Done to Date is the total of the Prices for
- each group of completed activities and
 - each completed activity which is not in a group
- A completed activity is one which is without Defects which would either delay or be covered by immediately following work.
- (30) The Prices are the lump sums for each of the activities on the Activity Schedule unless later changed in accordance with this contract.

1.2. Measurement and Payment

- 1.2.1 The Activity Schedule provides the basis of all valuations of the Price for Work Done to Date, price adjustments for inflation and general progress monitoring.
- 1.2.2 The amount due at each assessment date is based on **completed activities** as indicated on the Activity Schedule.

- 1.2.3 The Activity Schedule work breakdown structure provided by the *Contractor* is based on the Activity Schedule provided by the *Employer*. The activities listed by the *Employer* are the minimum activities acceptable and identify the specific activities which are required to achieve Completion. The activity schedule work breakdown structure is compiled to the satisfaction of the *Project Manager* with any additions and/or amendments deemed necessary.
- 1.2.4 The *Contractor's* detailed Activity Schedule summates back to the Activity Schedule provided by the *Employer* and is in sufficient detail to monitor completion of activities related to the Accepted Programme in order that payment of completed activities may be assessed.
- 1.2.5 The short descriptions in the Activity Schedule are for identification purposes only. All work described in the Works Information is deemed included in the activities.
- 1.2.6 The Activity Schedule is integrated with the Accepted Programme and where required the forecast rate of payment schedule.

1.2.6.1 General Assumptions:

- The Activity Schedule is for guidance purpose only and will be used as a method for calculating interim payments due to the *Contractor* on completion of the relevant Activities as noted in the Activity Schedule.
- The *Contractor* to make provision for all waste allowances when pricing the *works* and will use all available information in the tender document to ensure that the full scope of work is covered when pricing for the *works*.
- The lump sum prices stated for each item in the Activity Schedule 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.
- Where this contract requires detailed drawings, designs, or other information to be provided, and no prices are included in the Activity Schedule specifically for such matters, the *Contractor* is deemed to have allowed for all costs associated with such requirements within the tendered Price.
- An Activity against which no lump sum price is entered will be treated as covered by other lump sum prices in the Activity Schedule. If a number of items are grouped together for pricing purposes, this will be treated as a single lump sum price.
- The short descriptions of the items of payment given in the Activity Schedule 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.
- An activity (where applicable) will be regarded as complete when all data packs have been submitted and accepted by The *Employer*

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C2.2 Activity Schedule

The Tenderer details his Activity Schedule below or makes reference to his Activity Schedule and attaches it to this schedule.

The details given in the Activity Schedule attached serve as guidelines only

REFER TO ATTACHMENT

C2.2 Activity Schedule

Mandatory Returnable

Item	Activity Description	Unit	Qty	Total cost
	<u>SECTION 1: PRELIMINARIES AND GENERAL</u>			
	<u>SECTION NO.1</u>			
	<u>PREAMBLES</u>			
1	<u>Project Initiation</u>			
1.1	Participation at Kick-off and Construction interface meetings	Sum	1	
1.2	Participation at Technical Kick-off meeting	Sum	1	
1.3	Baselining of programme	Sum	1	
1.4	Mobilisation of Contractor Project Team	Sum	1	
	<u>SECTION NO.2</u>			
	<u>KwaZulu - NATAL</u>			
2	<u>RICHARDS BAY</u>			
2.1	Site mobilization	Sum	1	
2.2	Site establishment including all inductions	Sum	1	
2.3	SHEQ and Security documentation approval	Sum	1	
2.4	Geotechnical investigation for old tanks	Sum	1	
2.5	Geotechnical investigation for new fuel facility	Sum	1	
2.6	Detection of underground services, remove and redirect where necessary for old tanks	Sum	1	
2.7	Detection of underground services, remove and redirect where necessary for new facility	Sum	1	
2.8	Rig out old tank and make good existing tank	Sum	1	
2.9	Approval of engineering designs of new tank	Sum	1	

2.10	Prepare existing tank for vessel entry	Sum	1	
2.11	Submit comprehensive inspection report of entire Fuel Facility	Sum	1	
2.12	Approval of engineering designs based on inspection recommendations	Sum	1	
2.13	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	
2.14	Completion of all Civil Works	Sum	1	
2.15	Completion of all Electrical & Instrumentation Works	Sum	1	
2.16	Completion of all Structural Works	Sum	1	
2.17	Miscellaneous items	Sum	1	
2.18	Cold Commissioning	Sum	1	
2.19	Final Inspection sign off	Sum	1	
2.20	Hot Commissioning	Sum	1	
2.21	Handover to Employer	Sum	1	
2.22	Site - De-establishment and Rehabilitate	Sum	1	
	<u>DURBAN POINT TERMINAL</u>			
2.23	Site mobilization	Sum	1	
2.24	Site establishment including all inductions	Sum	1	
2.25	SHEQ and Security documentation approval	Sum	1	
2.26	Detection of underground services	Sum	1	
2.27	Prepare existing tank for vessel entry	Sum	1	
2.28	Submit comprehensive inspection report of entire Fuel Facility	Sum	1	
2.29	Approval of engineering designs based on inspection recommendations	Sum	1	
2.30	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	
2.31	Completion of all Civil Works	Sum	1	
2.32	Completion of all Electrical & Instrumentation Works	Sum	1	
2.33	Completion of all Structural Works	Sum	1	
2.34	Miscellaneous items	Sum	1	
2.35	Cold Commissioning	Sum	1	

2.36	Final Inspection sign off	Sum	1	
2.37	Hot Commissioning	Sum	1	
2.38	Handover to Employer	Sum	1	
2.39	Site - De-establishment and Rehabilitate	Sum	1	
	<u>DURBAN Maydon Wharf</u>			
	Site mobilization	Sum	1	
	Site establishment including all inductions	Sum	1	
2.40	SHEQ and Security documentation approval	Sum	1	
2.41	Detection of underground services	Sum	1	
2.42	Prepare existing tank for vessel entry	Sum	1	
2.43	Submit comprehensive inspection report of entire Fuel Facility	Sum	1	
2.44	Approval of engineering designs based on inspection recommendations	Sum	1	
2.45	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	
2.46	Completion of all Civil Works	Sum	1	
2.47	Completion of all Electrical & Instrumentation Works	Sum	1	
2.48	Completion of all Structural Works	Sum	1	
2.49	Miscellaneous items	Sum	1	
2.50	Cold Commissioning	Sum	1	
2.51	Final Inspection sign off	Sum	1	
2.52	Hot Commissioning	Sum	1	
2.53	Handover to Employer	Sum	1	
2.54	Site - De-establishment and Rehabilitate	Sum	1	
	<u>DURBAN PIER 2</u>			
2.55	Site mobilization	Sum	1	
2.56	Site establishment including all inductions	Sum	1	
2.57	SHEQ and Security documentation approval	Sum	1	

2.58	Detection of underground services	Sum	1	
2.59	Prepare existing tank for vessel entry	Sum	1	
2.60	Submit comprehensive inspection report of entire Fuel Facility (Tank 1)	Sum	1	
2.61	Approval of engineering designs based on inspection recommendations	Sum	1	
	Completion of all Mechanical Works (Piping, valves pumps, etc)	Sum	1	
2.62	Submit comprehensive inspection report of entire Fuel Facility (Tank 2)	Sum	1	
2.63	Approval of engineering designs based on inspection recommendations	Sum	1	
2.64	Completion of all Mechanical Works (Piping, valves pumps, etc)	Sum	1	
2.65	Submit comprehensive inspection report of entire Fuel Facility (Tank 3)	Sum	1	
2.66	Approval of engineering designs based on inspection recommendations	Sum	1	
2.67	Completion of all Mechanical Works (Piping, valves pumps, etc)	Sum	1	
2.68	Submit comprehensive inspection report of entire Fuel Facility (Tank 4)	Sum	1	
2.69	Approval of engineering designs based on inspection recommendations	Sum	1	
2.70	Completion of all Mechanical Works (Piping, valves pumps, etc)	Sum	1	
2.71	Completion of Fire System	Sum	1	
2.72	Completion of all Civil Works	Sum	1	
2.73	Completion of all Electrical & Instrumentation Works	Sum	1	
2.74	Completion of all Structural Works	Sum	1	
2.75	Miscellaneous items	Sum	1	
2.76	Cold Commissioning	Sum	1	
2.77	Final Inspection sign off	Sum	1	
2.78	Hot Commissioning	Sum	1	
2.79	Handover to Employer	Sum	1	
2.80	Site - De-establishment and Rehabilitate	Sum	1	
	<u>DURBAN PIER 1</u>			
2.81	Site mobilization	Sum	1	

2.82	Site establishment including all inductions	Sum	1	
2.83	SHEQ and Security documentation approval	Sum	1	
2.84	Geotechnical investigation for old tanks	Sum	1	
	Geotechnical investigation for new fuel facility	Sum	1	
2.85	Detection of underground services, remove and redirect where necessary for old tanks	Sum	1	
2.86	Detection of underground services, remove and redirect where necessary for new facility	Sum	1	
2.87	Excavate, Rig out old tanks and Rehabilitate	Sum	1	
2.88	Approval of engineering designs of new Fuel Facility	Sum	1	
2.89	Prepare existing tank for vessel entry	Sum	1	
2.90	Submit comprehensive inspection report of entire Fuel Facility	Sum	1	
2.91	Approval of engineering designs based on inspection recommendations	Sum	1	
2.92	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	
2.93	Completion of all Civil Works	Sum	1	
2.94	Completion of all Electrical & Instrumentation Works	Sum	1	
2.95	Completion of all Structural Works	Sum	1	
2.96	Miscellaneous items	Sum	1	
2.97	Cold Commissioning	Sum	1	
2.98	Final Inspection sign off	Sum	1	
2.99	Hot Commissioning	Sum	1	
3.1	Handover to Employer	Sum	1	
3.2	Site - De-establishment and Rehabilitate	Sum	1	
	<u>Western Cape</u>			
	<u>SALDANHA</u>			
3.3	Site mobilization	Sum	1	
3.4	Site establishment including all inductions	Sum	1	
3.5	SHEQ and Security documentation approval	Sum	1	

3.6	Detection of underground services	Sum	1	
3.7	Rig out old tank and make good	Sum	1	
3.8	Approval of engineering designs of new Fuel Facility	Sum	1	
3.9	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	
3.10	Completion of all Civil Works	Sum	1	
3.11	Completion of all Electrical & Instrumentation Works	Sum	1	
3.12	Completion of all Structural Works	Sum	1	
3.13	Miscellaneous items	Sum	1	
3.14	Cold Commissioning	Sum	1	
3.15	Final Inspection sign off	Sum	1	
3.16	Hot Commissioning	Sum	1	
3.17	Handover to Employer	Sum	1	
3.18	Site - De-establishment and Rehabilitate	Sum	1	
3.19				
	<u>CAPE TOWN CONTAINER TERMINAL</u>			
3.20	Site mobilization	Sum	1	
3.21	Site establishment including all inductions	Sum	1	
3.22	SHEQ and Security documentation approval	Sum	1	
3.23	Detection of underground services	Sum	1	
3.24	Prepare existing tank for vessel entry	Sum	1	
3.25	Submit comprehensive inspection report of entire Fuel Facility	Sum	1	
3.26	Approval of engineering designs based on inspection recommendations	Sum	1	
3.27	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	
3.28	Completion of all Civil Works	Sum	1	
3.29	Completion of all Electrical & Instrumentation Works	Sum	1	
3.30	Completion of all Structural Works	Sum	1	
3.31	Miscellaneous items	Sum	1	

3.32	Cold Commissioning	Sum	1	
3.33	Final Inspection sign off	Sum	1	
3.34	Hot Commissioning	Sum	1	
3.35	Handover to Employer	Sum	1	
3.36	Site - De-establishment and Rehabilitate	Sum	1	
	<u>CAPE TOWN MULTI-PURPOSE TERMINAL</u>			
3.37	Site mobilization	Sum	1	
3.38	Site establishment including all inductions	Sum	1	
3.39	SHEQ and Security documentation approval	Sum	1	
3.40	Geotechnical investigation for new fuel facility	Sum	1	
3.41	Detection of underground services for new facility	Sum	1	
3.42	Approval of engineering designs of new Fuel Facility	Sum	1	
3.43	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	
3.44	Completion of all Civil Works	Sum	1	
3.45	Completion of all Electrical & Instrumentation Works	Sum	1	
3.46	Completion of all Structural Works	Sum	1	
3.47	Miscellaneous items	Sum	1	
3.48	Cold Commissioning	Sum	1	
3.49	Final Inspection sign off	Sum	1	
3.50	Hot Commissioning	Sum	1	
3.51	Handover to Employer	Sum	1	
3.52	Site - De-establishment and rehabilitate	Sum	1	
	<u>Eastern Cape</u>			
	<u>Gqeberha Car Terminal</u>			
3.52	Site mobilization	Sum	1	
3.53	Site establishment including all inductions	Sum	1	

3.54	SHEQ and Security documentation approval	Sum	1	
3.55	Detection of underground services	Sum	1	
3.56	Prepare existing tanks for vessel entry	Sum	1	
3.57	Submit comprehensive inspection report of entire Fuel Facility	Sum	1	
3.58	Approval of engineering designs based on inspection recommendations	Sum	1	
3.59	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	
3.60	Completion of all Civil Works	Sum	1	
3.61	Completion of all Electrical & Instrumentation Works	Sum	1	
3.62	Completion of all Structural Works	Sum	1	
3.63	Miscellaneous items	Sum	1	
3.64	Cold Commissioning	Sum	1	
3.65	Final Inspection sign off	Sum	1	
3.66	Hot Commissioning	Sum	1	
3.67	Handover to Employer	Sum	1	
3.68	Site - De-establishment and rehabilitate	Sum	1	
	<u>Nggura</u>			
3.69	Site mobilization	Sum	1	
3.70	Site establishment including all inductions	Sum	1	
3.71	SHEQ and Security documentation approval	Sum	1	
3.72	Detection of underground services	Sum	1	
3.73	Prepare existing tank for vessel entry	Sum	1	
3.74	Submit comprehensive inspection report of entire Fuel Facility (Tank 1)	Sum	1	
3.75	Approval of engineering designs based on inspection recommendations	Sum	1	
3.76	Completion of all Mechanical Works (Piping, valves pumps, etc)	Sum	1	
3.77	Submit comprehensive inspection report of entire Fuel Facility (Tank 2)	Sum	1	
3.78	Approval of engineering designs based on inspection recommendations	Sum	1	
3.79	Completion of all Mechanical Works (Piping, valves pumps, etc)	Sum	1	
3.80	Submit comprehensive inspection report of entire Fuel Facility (Tank 3)	Sum	1	

3.81	Approval of engineering designs based on inspection recommendations	Sum	1	
3.82	Completion of all Mechanical Works (Piping, valves pumps, etc)	Sum	1	
3.83	Completion of Fire System	Sum	1	
3.84	Completion of all Civil Works	Sum	1	
3.85	Completion of all Electrical & Instrumentation Works	Sum	1	
3.86	Completion of all Structural Works	Sum	1	
3.87	Miscellaneous items	Sum	1	
3.88	Cold Commissioning	Sum	1	
3.89	Final Inspection sign off	Sum	1	
3.90	Hot Commissioning	Sum	1	
3.91	Handover to Employer	Sum	1	
3.92	Site - De-establishment and Rehabilitate	Sum	1	
		Sum	1	
	<u>EAST LONDON CAR TERMINAL</u>			
3.93	Site mobilization	Sum	1	
3.94	Site establishment including all inductions	Sum	1	
3.95	SHEQ and Security documentation approval	Sum	1	
3.96	Geotechnical investigation for old tanks	Sum	1	
3.97	Geotechnical investigation for new fuel facility	Sum	1	
3.98	Detection of underground services, remove and redirect where necessary for old tanks	Sum	1	
3.99	Detection of underground services, remove and redirect where necessary for new facility	Sum	1	
4.1	Excavate, Rig out old tanks and Rehabilitate	Sum	1	
4.2	Approval of engineering designs of new Fuel Facility	Sum	1	
4.3	Prepare existing tank for vessel entry	Sum	1	
4.4	Submit comprehensive inspection report of entire Fuel Facility	Sum	1	
4.5	Approval of engineering designs based on inspection recommendations	Sum	1	
4.6	Completion of all Mechanical Works (Piping, Fire System, valves pumps, etc)	Sum	1	

Transnet Port Terminals

Tender Number: ICLM HQ 782 TPT -TPT/2024/01/0086/55121/RFP

Description of the Works: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL).

4.7	Completion of all Civil Works	Sum	1	
4.8	Completion of all Electrical & Instrumentation Works	Sum	1	
4.9	Completion of all Structural Works	Sum	1	
4.10	Miscellaneous items	Sum	1	
4.11	Final Inspection sign off	Sum	1	
4.12	Hot Commissioning	Sum	1	
4.13	Handover to Employer	Sum	1	
4.14	Site - De-establishment and rehabilitate	Sum	1	
		Sum	1	
	<u>Project Close out</u>			
4.15	Approval of as built drawings	Sum	1	
4.16	Project close out documentation	Sum	1	

Total Price (Excl. VAT) to be carried over to the Form of Offer & Acceptance C1.1

PART C3: SCOPE OF WORK

Document reference	Title	No of page
C3.1 C3.2	This cover page <i>Employer's Works Information</i> <i>Contractor's Works</i>	1
Total number of pages		53



TENDER NUMBER: ICLM HQ 782 TPT-TPT/2024/01/0086/55121/RFP

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30)

OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT").

DOCUMENTATION DISTRIBUTION, REVISION AND APPROVAL HISTORY

DOCUMENT	REV	DISTRIBUTION	PREPARED BY	APPROVED BY
Employer's Works Information	02	Owner Approval		

COMPILED BY:_____
Signature

Name: Sphamandla Mathonsi

Designation: Senior Project Manager

Date: _____

REVIEWED BY:_____
Signature

Name: McDonald Tsubella

Designation: Engineering Manager

Date: _____

REVIEWED BY:_____
Signature

Name: Amit More (TPL)

Designation: Engineering

Date: _____

RECOMMENDED BY:_____
Signature

Name: Richard Shandu

Designation: Head of Equipment

Date: _____

RECOMMENDED BY:_____
Signature

Name: Raymond Van Rooyen

Designation: Executive Manager (Sponsor)

Date: _____

APPROVED BY:_____
Signature

Name: Akil Maharaj

Designation: Head of Engineering, Energy & Sustainability

Date: _____

C3.1 EMPLOYER'S WORKS INFORMATION

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SECTION 1

1 Description of the works

1.1 Executive overview

Transnet Port Terminals currently uses diesel to support its operations, which includes dry bulk and break-bulk containers. The equipment that uses diesel includes ship loader cranes, reach stackers, rubber tyre gantries (RTG), reefers, haulers, pay loaders, dumper trucks, back actors, BOB CATS, brooms, sweepers, forklifts, transport buses, double cab vans, cars, generators etc. TPT has fuel facilities across all the terminals to service the equipment. The Fuel Facilities are now smaller compared to fleet size and the increased diesel demand, the Fuel Facilities are now old and have become non-compliant to Occupational Health & Safety Act, South African National Standards (SANS) and National Environment Management Act (NEMA).

1.2 Employer's objectives

1.2.1 The works that the *Contractor* is to perform *involve* the design, refurbish, supply, delivery, installation, testing and commissioning of fuel facilities at the various Transnet Port Terminals. The terminals are in three provinces, namely

a. Kwa Zulu Natal

- Richards Bay and
- Durban

b. Eastern Cape

- East London,
- Coega and
- Gqebera

c. Western Cape

- Cape Town and
- Saldanha

1.2.2 The major activities of the *works* for Existing Fuel Facilities, as minimum activities include but not limited to:

1.2.3 Detection of underground services for old tanks.

1.2.4 Perform condition assessment using relevant engineering tests to determine the condition of the Fuel Facility which includes i.e.

- Tank
 - Piping
 - Electrical
 - Instrumentation
 - Platforms, ladders and structural
 - Civil works
 - Firefighting system
 - Pump
 - Valves
- 1.2.5 Provide comprehensive report to TPT with recommendations that are subjected to approval.
- 1.2.6 When approval is granted, perform critical repairs, to ensure compliance to Occupational Health & Safety Act, SANS, API 653 and NEMA and get the Fuel Facilities registered with the council and energy department.
- 1.2.7 Improve the tank features i.e., installation of fuel gauges, repositioning of stepladders (ergonomics).
- 1.2.8 Issue drawings for the existing structures.
- 1.2.9 Issue maintenance manuals.
- 1.2.10 Issue flammable certificate and all relevant compliance certificates.
- 1.2.11 Register the tanks with local authorities i.e., Municipality.
- 1.2.12 The major activities of the *works* for New Fuel Facilities, as minimum activities include but not limited to:
- a. Design, supply, delivery, installation, testing and commissioning of fuel facilities.
 - b. Removal and safe disposal of old tanks.
 - c. Rehabilitation of the area once the old tank has been removed.
 - d. Perform underground detection service
 - e. Geotechnical investigation and Report.
 - f. Entire fuel facility refurbishment.
 - g. Mechanical works including Fire Fighting.
 - h. Electrical and Instrumentation works
 - i. Civil works
 - j. Inspection and Report with recommendations.
 - k. Refurbishment of fuel drainage.

- l. Commissioning of fuel facilities.
- m. Issue all relevant fuel compliance certificates

1.3 Interpretation and terminology

1.3.1 The following abbreviations are used in this Works Information:

Table 1: Abbreviations used in the document

Abbreviation	Meaning given to the abbreviation
AIA	Approved Inspection Authority
API	American Petroleum Institute
CD	Compact Disc
CDR	<i>Contractor</i> Documentation Register
CDS	<i>Contractor</i> Documentation Schedule
CRL	<i>Contractor</i> Review Label
CIRP	<i>Contractor's</i> Industrial Relations Practitioner
CM	Construction Manager
DCT	Durban Container Terminal
DTI	Department of Trade and Industry
DGN	CAD file format supported by Micro-station
DWG	Drawings
EDMS	Emissions Data Management System
EO	Environmental Officer
HAW	Hazard Assessment Workshop
HAZCON	Hazard of Construction
HAZOP	Hazard and Operability Study
HSSP	Health and Safety Surveillance Plan
INC	Independent Nominated Consultant
IP	Industrial Participation
IR	Industrial Relations
ISPS	International Ship and Port Facility Security Code
IPP	Industrial Participation Policy
IPO	Industrial Participation Obligation
IPS	Industrial Participation Secretariat
IRCC	Industrial Relations Co-ordinating Committee
JSA	Job Safety Analysis
CIRP	<i>Contractor's</i> Industrial Relations Practitioner
Native	Original electronic file format of documentation



TENDER NUMBER: ICLM HQ 782 TPT-TPT/2024/01/0086/55121/RFP

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT").

PES	Project Environmental Specifications
PHA	Preliminary Hazard Assessment
PIRM	Project Industrial Relations Manager
PIRPMP	Project Industrial Relations Policy and Management Plan
PLA	Project Labour Agreements
PIRM	Project Industrial Relations Manager
PSPM	Project Safety Program Manager
PSSM	Project Site Safety Manager
QA	Quality Assurance
R&D	Research and Development
SACPCMP	South African Council for Project and Construction Management Professionals
SANS	South African National Standards
SASRIA	South African Special Risks Insurance Association
SHEQ	Safety, Health, Environment and Quality
SHEC	Safety, Health and Environment Co-ordinator
SIP	Site Induction Programme
SMP	Safety Management Plan
CEM SOP	Transnet Construction Environmental Management Standard Operating Procedure
SSRC	Site Safety Review Committee
TNPA	Transnet National Port Authority
TPT	Transnet Port Terminals
*TPL	Transnet Pipelines
AFC	Approved for Construction
AFD	Approved for Design
ANSI	American National Standard Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
AWS	American Welding Society
BOM	Bill of Materials
CAD	Computer Aided Drawing
COC	Certificate of Compliance
DB	Distribution Board

1.4 Project Scope Overview

- 1.4.1 HSSE compliance
- 1.4.2 Regulatory compliance
- 1.4.3 The suitability and functionality of all the items provided
- 1.4.4 The warranty / guarantee of all the items provided
- 1.4.5 Supplying of all design documentation, including drawings and specifications, to the Engineer for review
- 1.4.6 all necessary regulatory and professional approvals, this includes but is not limited to Pr. Eng., Architectural and Responsible Person signoff
- 1.4.7 Quality control and assurance
- 1.4.8 Training
- 1.4.9 Documentation, including Approved for Construction (AFC) drawings, as-built drawings, and manuals
- 1.4.10 Providing and keeping to the schedule
- 1.4.11 Budgetary control
- 1.4.12 Attending all project meetings
- 1.4.13 Assisting the Engineer, Purchaser, and any third-party appointments by the Purchaser
- 1.4.14 The Engineer is responsible for:
- 1.4.15 Reviewing the Suppliers documentation – this does not remove any responsibility from the Supplier
- 1.4.16 Monitoring the Supplier's quality – this does not remove any responsibility from the Supplier
- 1.4.17 Monitoring the works and reporting on progress to the Purchaser
- 1.4.18 Facilitating project meetings
- 1.4.19 The Purchaser is responsible for:
- 1.4.20 Providing fair and reasonable access
- 1.4.21 Remunerating the Supplier as per the agreed progress schedule

2 Engineering Scope

2.1 Legal Requirements Regarding Designs

- 2.1.1 All associated equipment shall comply with the following relevant South African Acts and Regulations, and they shall apply in the order of precedence as listed below:

2.1.2 All the designs and installations must also comply with the standards, regulations, and design codes below.

2.2 Reference Documents

2.3 Regulations

Table 2: List of South African and International Codes used in the development of this document

Item	Document Number	Description
[1]	OSH ACT 85 of 1993	South African National Occupational Health and Safety Act 85 of 1993
[2]	NEMA 107 of 1998	National Environmental Management Act 107 of 1998

2.4 Standards

Table 3: List of all South African and International Standards used in the development of this document

Item	Document Number	Description
1)	SANS 10198	The selection, handling, and installation of electric power cables of rating not exceeding 33 kV Part.
2)	SANS 10108	The classification of hazardous locations and the selection of electrical apparatus for use in such locations.
3)	SANS 10114-1	Interior lighting.
4)	SANS10142-1&2	Code of practice for the wiring of premises.
5)	SANS 1019, 2014	Standard voltages, currents, and insulation levels for electricity supply.
6)	SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 to 1900/3300 V) for low voltage (LV) power cables.
7)	SANS 1339	Electric cables – cross-linked polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV for medium voltage (MV) XLPE power cables.
8)	SANS 10400	The application of the National Building Regulations.
9)	SANS 1200HC	Corrosion Protection of Steelwork.
10)	SANS 10198	The selection, handling, and installation of electric power cables of rating not exceeding 33 kV Part.
11)	SANS 15589-1:2009	Cathodic Protection of Buried and Submerged Structures
12)	SANS 10129	Plastic tape wrapping of Steel Pipelines
13)	NACE RP 01-69	Control of External Corrosion on Underground or Submerged Metallic Piping Systems
14)	NACE RP 05-77	Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems



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OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT").

15)	NACE RP 05-72	Design, Installation, Operation of Impressed Current Deep Ground beds
16)	NACE RP 16-32	Cathodic Protection of Underground Storage tanks and Piping Systems
17)	SANS 10108	The classification of hazardous locations and the selection of electrical apparatus for use in such locations.
18)	SANS 10114-1	Interior lighting.
19)	SANS10142-1&2	Code of practice for the wiring of premises.
20)	SANS 1019, 2014	Standard voltages, currents, and insulation levels for electricity supply.
21)	SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 to 1900/3300 V) for low voltage (LV) power cables.
22)	SANS 1339	Electric cables – cross-linked polyethylene (XLPE) insulated cables for rated voltages 3,8/6,6 kV to 19/33 kV for medium voltage (MV) XLPE power cables.
23)	SANS 10400	The application of the National Building Regulations.
24)	SANS 1200HC	Corrosion Protection of Steelwork.
25)	SANS 347	Categorization and conformity assessment criteria for all pressure equipment
26)	SANS 0089	The petroleum industry Part 1, Part 2, and Part 3: Storage and distribution of petroleum products
27)	SANS 10227	Criteria for Operation of Inspection Authorities Performing Inspections in Terms of Pressure Equipment Regulations
28)	SANS 17020	Conformity Assessment – Requirements for the Operation of Various Types of bodies Performing Inspection,
29)	SANS 17021	Conformity Assessment – Requirements for bodies Providing Audit and Certification of Management Systems,
30)	SANS 10112	National Norms and Standards for Domestic Water and Sanitation Services
31)	SANS 10400 – T	Fire protection
32)	SANS 10400 – W	Fire Installations
33)	SANS 10131 – Part 1	Storage and distribution of petroleum products in above-ground bulk installations
34)	SANS 10089 – Part 2	Electrical and other installations in the distribution marketing sector
35)	SANS 10089 – Part 3	The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.
36)	SANS 10089	The petroleum industry Part 1, Part 2, and Part 3: Storage and distribution of petroleum products.
37)	SANS 10131	Above Ground storage tanks for petroleum products
38)	UL 142	Steel Aboveground Tanks for Flammable and Combustible Liquids
39)	UL 58	Safety Steel Underground Tanks for Flammable and Combustible Liquids,
40)	API 510	Pressure Vessel Inspection Code

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41)	API 570	Inspection, Repair, alteration, and Rerating of In-Service Piping Systems
42)	API RP 574	Inspection Practices for Piping system Components
43)	API 650	Tank Inspection, Repair, Alteration and Reconstruction Code
44)	API 653	Tank Inspection, Repair, Alteration and Reconstruction Code
45)	ANSI/NB-23	National Board Inspection Code
46)	NFPA 20	Standard for the installation of Stationary Pumps for Fire Protection
47)	NFPA 11	Standard for Low, Medium, and High Expansion foam
48)	NFPA 10	Standard for Portable fire Extinguishers
49)	API 2000	Venting Atmospheric and Low-pressure Storage Tanks
50)	API 520	Sizing, Selection, and Installation of Pressure-relieving Devices
51)	SANS 1200	Standardised specification for Civil Engineering
52)	SANS 2100	Construction Works-Concrete Works
53)	SANS 10100-2	Structural Use of concrete
54)	SANS 10089	Storage and distribution of petroleum products in above ground bulk installations
55)	SANS 2100-CS1	Structural Steelwork
56)	SANS 10100-1	Structural use of concrete
57)	SANS 10162-1	The Structural use of steel
58)	SANS 10089-3	The installation, modification, and decommissioning of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations
59)	The S.A. National Building Regulations and Building Standards Act. (Act 103 of 1977)	
60)	The Automatic Sprinkler Inspection Bureau (ASIB) 12 th edition rules (or latest update)	

2.5 Specifications

Table 4: List of all Transnet Specifications used in the development of this document

Item	Document Number	Description
[1]	TPD-002-DBSPEC	Specification for low voltage distribution boards
[2]	TPD-003-CABLESPEC	Specification for the supply and installation of medium voltage and low voltage electrical cables
[3]	TPD-004-EARTHINGSPEC	Specification for earthing and the protection of buildings and structures against lightning.
[4]	TPD-007-MVSWITCHSPEC	Technical specification for indoor medium/high voltage (1kV to 33kV) alternating current switchgear and control gear.
[5]	TPD-001-EL&PSPEC	Technical specification for electrical installations to building other than dwelling houses.
[6]	TPD-010B-HIGHMASTSPEC	Technical specification for the maintenance and upgrade of high mast lighting structure.

[7]	TPD-008-MINISUBSPEC	Specification for the design, supply, delivery, and installation of Mini-Substations.
[8]	EEAM-Q-008	Corrosion Protection
[9]	EEAM-Q-009	Quality Management
[10]	TIMS SHEQ Contractor Specifications Guidelines	

2.6 Other Specifications

Table 5: List of other Specifications used in the development of this document

Item	Document Number	Description
[1]	TPD-002-DBSPEC	The Local Municipal by laws and any special requirements of the Supply Activities of the area or district concerned.

2.7 Project Scope Overview

The high-level scope of the project is to evaluate the status of the existing equipment, infrastructure, facilities, utilities, systems and associated current designs that forms part of the TPT Fuel Facilities Project (National), in its varying state of completion, review and on-boarding of the existing designs (if available), carry out additional/ complete designs, execute the project as per the updated designs, and finally commission and handover the assets to the Employer for operational use. This includes the EPCM Scope of services as well as other work packages.

All new designs as well as the construction of the plant needs to be compliant to the OSH Act per regulations. The EPCM Contractor needs to develop a strategy to accommodate this requirement

2.8 Engineering Scope

Transnet the Employer requires an EPC EPCM Contractor who has experience in petrochemical industry to co-ordinate the works in Fuel Facility conditional assessment across all Terminals, prepare a Scope for work for repairing as per Table 5. EPC EPCM shall Design, Manufacture, Construct, Testing and Commissioning of the new Fuel facility including Structural, Electrical, Instrumentation, Civils, Firefighting, Security compliances etc. as per Table 5.

The EPC EPCM Contractor must appoint an Authorized Inspection Authority (AIA) for inspection of fuel facility integrity inspection in accordance with API 653 Standard is a statutory requirement. These standard covers steel storage tanks built to API 650 Standard and its predecessor API 12C. The Inspector shall be qualified and certified in accordance with the applicable post construction Codes (latest).

Non-destructive examination personnel responsible for data used in a Fitness-For-Service assessment shall be certified to Level II in accordance with industry standards such as the

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American Society for Non-destructive Testing (ANST) SNT-TC-1A, CP-189, ACCP, or equivalent. The Inspector shall have experience in the inspection, examination, or both, of the type of equipment and associated process that is the subject of the Fitness-For-Service assessment. The appointed EPC EPCM Contractor shall be responsible for all site work, supervision and management aspects of the API 653 Inspection and SANS 10089 (parts 1-3) Codes for the petrochemical industry.

The following table illustrates a high-level view of the project and compares the original design scope with that of the revised scope, and the proposed new scope:

Table 6: Existing and Proposed New Scope

No	Area/Location	Original/Existing Design Scope	Proposed New Scope
1.	Maydon Wharf, Durban	- Aboveground Horizontal Tank - Capacity = 23 000 Litres - Diameter = 2 200 mm - Length = 5 500 mm - Quantity = 1	- Inspection & Testing, Recommendation, and Implement Recommendations - EPC EPCM to propose Transnet options either Repair the Existing Fuel Facility or Construct New Fuel facility.
2.	Pier 2, Durban	- Aboveground Vertical Tanks - Capacity = 83 000 Litres - Diameter = 915 mm - Height = 12 600 mm - Quantity = 3	- Inspection, Recommendation, Implement Recommendations - Recommendations could be Repair the Existing Fuel Facility
3.	Pier 1, Durban	Underground Tanks Details not available	- Dismantle, Demolish and Dispose the existing tanks including accessories, attachments, and Civil works. - Detection and removal of underground services. - Soil Testing to determine if the fuel has contaminated the soil. Rehabilitate the existing soil if any contamination found. Import suitable soil to fill the pits after removal of the Tanks. - Geotechnical Investigations to be conducted. - Design, Manufacture, Construct, Testing and Commissioning of the new Fuel facility including Structural, Electrical, Instrumentation, Civils, Firefighting, Security compliances, including 2 New Tanks with Capacity 78 m³ (78 000 Litres).



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4.	Point Road, Durban	- Aboveground Horizontal Tank - Capacity = 23 000 Litres - Diameter = 2 200 mm - Height = 5 500 mm - Quantity = 1	- Inspection & Testing, Recommendation, and Implement Recommendations - EPC EPCM to propose Transnet with options either Repair the Existing Fuel Facility or Construct New Fuel facility.
5.	Richards Bay	- Aboveground Horizontal Tank - Capacity = 60 000 Litres - Diameter = 2 900 mm - Height = 9 000 mm - Quantity = 1	- Inspection & Testing, Recommendation, and Implement Recommendations. - EPC EPCM to propose Transnet with options either Repair the Existing Fuel Facility or Construct New Fuel facility.
6.	Richards Bay	- Aboveground Horizontal Petrol Tank - Capacity = 14 000 Litres - Quantity = 1	- Dismantle, Demolish and Dispose the existing tanks including accessories, attachments, and Civil works. - Detection and removal of underground services. - Soil Testing to determine if the fuel has contaminated the soil. Rehabilitate the existing soil if any contamination found. Import suitable soil to fill the pits after removal of the Tanks. - Geotechnical Investigations to be conducted. - Design, Manufacture, Construct, Testing and Commissioning of the new Fuel facility including Structural, Electrical, Instrumentation, Civils, Firefighting, Security compliances, including 1 New Tanks with Capacity 20 m³ (20 000 Litres).
7.	East London	- Underground Tanks - Capacity = 23 000 Litres - Quantity = 2	- Dismantle, Demolish and Dispose the existing tanks including accessories, attachments, and Civil works. - Detection and removal of underground services. - Soil Testing to determine if the fuel has contaminated the soil. Rehabilitate the existing soil if any contamination found. Import suitable soil to fill the pits after removal of the Tanks. - Geotechnical Investigations to be conducted. - Design, Manufacture, Construct,



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			Testing and Commissioning of the new Fuel facility including Structural, Electrical, Instrumentation, Civils, Firefighting, Security compliances, including 2 New Tanks with Capacity 70 m ³ (70 000 Litres).
8.	Saldanha	- Aboveground Horizontal Tank - Capacity = 23 000 Litres - Diameter = 2 300 mm - Height = 5 400 mm - Quantity = 1	- Dismantle, Demolish and Dispose the existing tanks including accessories, attachments, and Civil works. - Detection and removal of underground services. - Soil Testing to determine if the fuel has contaminated the soil. Rehabilitate the existing soil if any contamination found. Import suitable soil to fill the pits after removal of the Tanks. - Geotechnical Investigations to be conducted. Design, Construct, Testing and Commissioning of the new Fuel facility including Structural, Electrical, Instrumentation, Civils, Firefighting, Security compliances, including 2 New Tanks with Capacity 70 m³ (70 000 Litres).
9.	Cape Town Container Terminal	- Aboveground Vertical Tank - Capacity = 39 000 Litres - Diameter = 2 820 mm - Height = 6000 mm - Quantity = 2	- Inspection & Testing, Recommendation, and Implement Recommendations. - EPC EPCM to propose Transnet options either Repair the Existing Fuel Facility or Construct New Fuel facility.
10.	Cape Town Multipurpose Terminal	New site with no existing Fuel Facility	- Detection and removal of underground services. - Soil Testing to determine if the fuel has contaminated the soil. Rehabilitate the existing soil if any contamination found. Import suitable soil to fill the pits after removal of the Tanks. - Geotechnical Investigations to be conducted. - Design, Construct, Testing and Commissioning of the new Fuel facility including Structural, Electrical, Instrumentation, Civils, Firefighting, Security compliances, including 2 New Tanks with Capacity 70 m³ (70 000 Litres).



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11.	Port Elizabeth/ Gqebera	• Aboveground Horizontal Tank • Capacity = 23 000 Litres • Diameter = 2 300 mm • Height = 5 400 mm • Quantity = 2	• Inspection & Testing, Recommendation, and Implement Recommendations. • EPC EPCM to propose Transnet options either Repair the Existing Fuel Facility or Construct New Fuel facility.
12.	Ngqura Container Terminal (NCT)	• Aboveground Vertical Tank • Capacity = 63 000 Litres • Diameter: 2800 mm • Height = 10230 mm • Quantity = 4	• Inspection & Testing, Recommendation, and Implement Recommendations. • EPC EPCM to propose Transnet options either Repair the Existing Fuel Facility or Construct New Fuel facility.

The scope for the EPCM Contractor shall include but not be limited to the following:

- a. Conduct gap analysis and risk assessment to determine existing risk, issue recommendation for immediate implementation.
- b. Undertake a site investigation and detailed condition assessment of all structural, civil, electrical, instrumentation and firefighting components; this must include the performing of relevant testing if required/where necessary.
- c. Before testing could be carried out, it should agree with Transnet on the methodology.
- d. Produce an independent assessment report including remedial measures and costing for the repairs and/or modifications required.
- e. Design, supply, and construct work, in accordance with Transnet's Specifications, deliverables and processes, industry best practices, latest statutory codes, regulations and standards.
- f. All remedial works to be signed by the Professional Registered Engineer (ECSA).
- g. All method statements, designs, drawings, and maintenance plans to be provided in native and hard signed copy.
- h. The remedial methodology to ensure there is minimum disruption to the operations of Transnet Port Terminals.
- i. The fire protection system shall be integrated into the main control system for the port wherever possible, such that any alert will be sent to a control center for a quicker response to the fire.
- j. The fire protection system shall be designed with the following in mind, including but not limited to an appropriate fire alarm system at the correct volume and tone shall be installed as per regulations and appropriate symbolic safety signs that comply with the requirements of SANS 1186-1 shall be mounted.
- k. The fuel storage facility must also be registered with local municipality in line with SANS10400 and Municipal bylaws. Be issued with Flammable store registration certificate.

- l. Develop or ensure any other legal registration is conducted or compliant with, example Environmental regulation requirements.
- m. Designs needs to be informed by the Hazardous Installation Risk Assessment (which is different from a HAZOP)
- n. Undertake complete HAZOP workshop for all designed elements and prepare HAZOP Report
- o. Complete Fire Risk Assessment report
- p. Operational Readiness Plan.
- q. As built drawings.
- r. Development of Business Continuity Plan in relation to how the business needs to be kept going while construction is taking place, including handover section by section plans.

2.9 Outputs

- a. Complete inspection checklist for entire fuel facility.
- b. Preliminary field report & final report.
- c. Provide the inspection report with recommendations & prepare a scope of work for fuel facility repairs based on the inspection findings.
- d. Post fuel facility repairs: conduct repairs verification inspection & provide a report or build a new facility as required.
- e. Remaining life of fuel facility including tanks, piping, and structure.
- f. Settlement cosine graph and inspection intervals.
- g. Issue general arrangement and detail drawings of the complete fuel facility including structural and piping in two (2) set of hard copies, PDF format as well as AUTO-CAD format.
- h. All intelligent property to belong to Transnet at completion

3 Construction

3.1 Temporary works, Site services & construction constraints

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

- a. The *Contractor* complies with the *Employer's* Site entry and security control, permits, and Site regulations.
- b. The *Employer* arranges for ID cards to all *Contractors'* employees for access/egress of personnel (and Equipment) within the Site boundaries.
- c. In some Sites, a TNPA permit will be required together with a TPT permit, depending on the access requirements for the specific Site

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

- a. All *Contractor* staff entering the Transnet Port Terminals facility will be subjected to an alcohol breathalyser test on a daily basis, or to be conducted by the contractor.

- b. All relevant PPE must be worn by Site personnel when entering the Port.
- c. All vehicle permits must be obtained prior to site access
- d. All relevant personnel inductions must be done prior to site in line with TIMS SHEQ Contractor Specification Guidelines.

3.1.3 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 Area. The *Contractor* plans and organises his work in such a manner to cause the least possible disruption to the *Employer's* operations.
- b. The *Contractor* ensures the safe passage of *Contractor's* traffic to and from the Site and Working Areas at all times that includes providing flagmen, protective barriers, signage, etc. for the protection, direction and control of traffic.
- c. The *Contractor* ensures that none of his personnel and Equipment will be allowed to move outside of his allocated Site and Working Areas. To this end, access routes are allocated and co-ordinated by the *Project Manager*.
- d. The *Contractor* ensures that all his construction personnel and Equipment remains within his allocated and fenced off construction area.
- e. The *Contractor's* personnel working within Transnet Port Terminals complies and are equipped with all necessary PPE, high visibility apparel.

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

- a. Access/egress permissions and restrictions for all personnel and equipment will apply
- b. All personnel to remain within the site boundary at all times

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

3.1.6 Health and safety facilities on Site to comply with the OSH ACT 85 of 1993.

3.1.7 The *Contractor* provides a notice board in terms of Transnet requirements at a location to be approved by the *Project Manager* on site.

3.1.8 The *Contractor* provides progress photographs at weekly intervals in electronic format to the *Project Manager*.

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

3.1.10 Site services and facilities:

- a. For the duration of the Contract, the *Project Manager* will provide an area, free of charge, of the *Contractor* to establish his offices, lay down areas, stores, workshops, and other *Contractor's* Equipment when needed.
- b. The *Project Manager* provides the *Contractor* with a connection to the *Employer's* water-borne sewerage network. Where no suitable connection to a sewerage system is feasible, portable chemical type toilets may be used at contractors' cost.
- c. All costs for preparation of the site establishment area are for the *Contractor's* account.
- 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 temporary lighting (if required) and fencing around every section occupied by him during the construction of the works which will not interfere with landside and waterside operations.
- f. 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 the area. The fencing should be at least 1,8m high and be constructed of material that will prevent any pilferage of material through the fence. Gates should be of the same quality and be able to be locked when the contractor is not on site. A suitable guard hut must be placed at the entrance to the site for protection of the guard(s) deployed.
- g. The *Contractor* includes for all costs for such lighting and fencing, including access control into and out of these restricted areas.
- h. Wherever the *Contractor* provides facilities (either his own or for the *Project Manager* and/or *Supervisor*) and all items of Equipment, involving, *inter alia*, offices, accommodation, laboratories, Materials storage, compound areas etc, within the Working Areas, then the *Contractor* makes good and provides full reinstatement to the land (including all apparatus of the *Employer* and Others in, on or under the land) and surrounding areas to its original standard, upon dismantling of such facilities and items of Equipment.
- i. Upon completion, and within one month of the date of acceptance of the works, the *Contractor* completely removes from the Site and Working Area 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*.

- j. No excess or discarded materials or Equipment may be buried or dumped within the port boundary.
 - k. All waste removal will be for the contractors account and waste shall not be placed in TPT waste receptacles.
 - l. Demolition of all temporary structures, surfaces, etc., shall be first approved by the *Project Manager* prior to the work being carried out.
 - m. The *Employer* does not provide any security for the Site and Working Areas. The *Contractor* provides same and indemnifies and hold indemnified the *Project Manager* and *Employer* against any claims and actions that may arise out of Site and Working Areas security.
 - n. Security service providers employed must comply to the prescripts of the Private Security Industry Regulatory Authority (PSIRA). This applies to both the security company and its employees. The rates payable will be as per the Sectoral Determination for the security industry as published in the Government Gazette by the Minister of Labour and Employment.
 - o. 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), accepted by the *Project Manager*.
 - p. The *Contractor* shall provide everything else necessary for Providing the Works.
- 3.1.11 Wherever the *Employer* provides facilities (including, *inter alia*, temporary power, water, waste disposal, telecommunications etc) for the *Contractor's* use within the Working Areas and the *Contractor* adapts such facilities for use, then the *Contractor* makes good and provides full reinstatement to the land (including all apparatus of the *Employer* and Others in, on or under the land) and surrounding areas to its original standard upon dismantling of such facilities and hand-back to the *Employer*.
- 3.1.12 Facilities provided by the *Contractor*:
- The *Contractor* ensures that this site establishment area is compliant with the relevant safety regulations and restrictions, is clearly sign posted, and has a suitable security fence, lighting and the necessary access control gates.
- 3.1.13 Unless expressly stated as a responsibility of the *Employer* as stated under 3.1.10 Site services and facilities, all residual requirements for the provision of facilities and all items of Equipment necessary for the *Contractor* to Provide the *Works* remains the responsibility of the *Contractor*.
- 3.1.14 Underground services, other existing services, cable and pipe trenches and covers

- a) The *Contractor* establishes the location of the various existing services situated within the Site and Working Areas and records all such information on a "marked-up" drawing(s) which remains available for reference at all times.
- b) The *Contractor* exercises due care and attention in carrying out any excavation work to avoid damage or disruption to existing services. The *Contractor* according consults the *Project Manager* prior to undertaking any excavation work.
- c) 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.

3.1.15 Where the *Contractor* encounters existing underground services / existing services cables / pipe trenches, the *Contractor* undertakes the following: Notify the *Project Supervisor* immediately and await further instructions

3.1.16 Control of noise, dust, water and waste

Before moving Equipment onto the Site and 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 and noise for acceptance by the *Project Manager*.

3.1.17 Giving notice of work to be covered up:

This notification is given not less than 24 (twenty-four) hours prior to the proposed covering up.

3.2 Completion, testing, commissioning, and correction of Defects

3.2.1 The *work* to be done by the Sectional Completion Dates;

On or before the Sectional Completion Date the *Contractor* shall have done everything required to Provide the Works including the work listed below which is to be done before the Sectional Completion Date and in any case before the dates stated.

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

No.	Item of work	To be completed by
1.	Richards Bay Terminal - Refurbishment of Fuel Facility with Compliance certification	24 Mar 2025
2.	Durban Roro Port Terminal - Refurbishment of Fuel Facility with Compliance certification	23 Oct 2025
3.	Durban Maydon Wharf Port Terminal - Refurbishment of Fuel Facility with Compliance certification	15 Jul 2025
4.	Durban Container Port Terminal Pier 1 – New Fuel Facility with Compliance certification	16 Oct 2025

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5.	Durban Container Port Terminal Pier 2 – Refurbishment of Fuel Facility with Compliance certification	11 Feb 2025
6.	Cape Town Multi-Purpose Terminal– New Fuel Facility with Compliance certification	12 May 2026
7.	Cape Town Container Terminal – Refurbishment of Fuel Facility with Compliance certification	07 Oct 2025
8.	Saldanha Multi-Purpose Terminal– Refurbishment of Fuel Facility with Compliance certification	27 Jun 2025
9.	East London Multi-Purpose Terminal – Refurbishment of Fuel Facility with Compliance certification	16 Feb 2026
10.	Gqebera Multi-Purpose Terminal – Refurbishment of Fuel Facility with Compliance certification	18 May 2025
11.	Ngqura Multi-Purpose Terminal – Refurbishment of Fuel Facility with Compliance certification	10 Jul 2025
12.	Defects Period	09 Jun 2026
13.	Completion Date	09 Jun 2026
	As built drawings	Within 7 days of each Sectional Completion.
	Testing of all works in use as specified in this Works Information.	Within 14 days before of each Sectional Completion

3.2.2 Use of the *works* before Completion has been certified (Clause 35 of the NEC3 ECC to be included in Part C1: Contract Data).

3.2.3 The *Employer* to take over a *section* of the works listed above before Completion of the whole of the works. Each of the *sections* should be identified in the Contract Data part one, with the requirements for the work to be done by *completion date* of each stated in the Works Information. Once Completion of a *section* is achieved the *Employer* take over the *section*. (Secondary Option X5 of the NEC3 ECC to be included in Part C1: Contract Data)

3.2.4 The *Contractor* ensures that the *Project Manager* has a full and accurate dossier of As-built documents that represent the contractors Mechanical, Electrical, Civil and General Construction Works and Layouts status of the completed *works* (to include Plant within the *works*) to present to the *Employer*.

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

4 List Of Drawings

4.1 Drawings issued by the *Employer*

4.1.1 There are no drawings that will be issued by the *Employer* at or before the Contract Date and which apply to this contract.

SECTION 2

5 Management and start up

5.1.1 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.

5.1.2 Depending on the size and complexities of the Works, it is probably beneficial for the Employer to hold a bi-weekly risk register meeting (Clause 16.2). This could be used to discuss safety, environmental, compensation events, subcontracting, overall co-ordination, and other matters of a general nature. Separate meetings for specialist activities such as programming, engineering, and design management, may also be warranted.

5.2 Management meetings

5.2.1 Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Risk register and compensation events	Weekly on (or at shorter intervals if required)	On site / Virtual	<i>Project Manager, Supervisor, Contractor,</i> and appropriate key persons
Overall contract progress and feedback	Every two weeks	On site / Virtual	<i>Employer, Project Manager, Supervisor, Contractor,</i> and appropriate key persons
Technical Meetings	Every two weeks	On site / Virtual	<i>Project Manager, Supervisor, Contractor,</i> and appropriate key persons
Planning Meetings	Weekly	On site / Virtual	<i>Employer, Project Manager, Supervisor, Contractor,</i> and appropriate key persons

5.2.2 Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature, and the progress of the *works*. Records of these meetings are to be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

5.2.3 All meetings are to be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register are not to be used for

the purpose of confirming actions or instructions under the contract as these are to be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

5.3 Documentation Control

- 5.3.1 In undertaking the 'Works' all documentation requirements for The Works shall be dealt with in accordance with document DOC-STD-0001 – Rev03 (Contractor Documentation Submittal Requirements). The control, maintenance and handling of these documents and drawings, using a suitable document control system, remain the sole responsibility of the Contractor.
- 5.3.2 TPT's Project Document Controller will take the responsibility for the management of all technical and non-technical documentation throughout the life cycle of the Project. All documentation produced for and on behalf of the project will be registered with document control and its management thereof. This will include the registration, classification, managing, scanning, tracking, filing, storing, distribution and filing of all hardcopy and electronic documentation generated for and on behalf of the project.
- 5.3.3 All documentation and data created for the Project shall be numbered and named according to the TPT Codification Procedure. Such numbering is only available from the Project's Document Control Group
- 5.3.4 All contract correspondence is issued through document control. All communication to be submitted electronically and is to be addressed to the Project Manager and Transnet Port Terminals doc Control mailbox at all times email: DBNDocControl@transnet.net
- 5.3.5 Each supplier of documentation and data to the Project is responsible for ensuring that all documentation and data submitted conforms to the Project Standards and data Quality requirements in terms of numbering, uniqueness, quality, accuracy, format, completeness, and currency of information. Data not meeting the Project Standards and data Quality requirements will be cause for rejection and returned to the Contractor for corrective action and re-submission.
- 5.3.6 Should any change be made to documentation or data, which has already been submitted to the Project, then new or revised documentation or data shall be issued to Doc Control DBNDocControl@transnet.net to replace the outdated information.
- 5.3.7 It is the responsibility of all Project participants undertaking work on the Project to ensure they obtain and comply with the relevant requirements to suit their deliverables and Scope of Work.
- 5.3.8 The Contractor is to ensure that the latest version of the required application software and a suitable 'IT' Infrastructure is in place to support the electronic transmission of documentation.

- 5.3.9 The Contractor shall be responsible for the supply of all Sub-Supplier/Contractor/Manufacturer, etc. documentation and data related to their package of work and shall ensure that these Sub-Suppliers have the capability to supply the necessary documentation and data in the required timeframe and quality as outlined in the specified standards prior to awarding sub-orders.
- 5.3.10 The required number of copies shall as a minimum be three (3) (1x original + 2 x hard copies), with the corresponding PDF and 'Native' file formats upon final submission.
- 5.3.11 The Contractor shall apply "wet signatures" to the original Documentation before scanning the signed original and prior to formal submission to the Project.
- 5.3.12 Final issues of all documentation shall be supplied to the Project in "wet signature" format along with the associated corresponding electronic 'native files and PDF renditions.
- 5.3.13 The Contractor shall ensure adequate resources are available to manage and execute the Document Control function as per the requirements of the Project. (The Contractor shall ensure that a dedicated Document Controller is available for the Project).

5.4 Safety risk

5.4.1 Health and Safety Standard

The Contractor must comply with the requirements of the TIMS H&S Contractor Specification Guideline TRN-IMS-GRP-GDL-014.3, site specific health and safety specification and OHS Act No. 85 of 1993 and its applicable Regulations.

5.4.2 Contractor's General Requirements for Health and Safety

The *Contractor* is solely responsible for carrying out the work under the Contract having the highest regard for the health and safety of its employees, Transnet's employees and persons at or in the vicinity of the Site, the *works*, temporary work, materials, the property of third parties and any purpose relating to the *Contractor* carrying out its obligations under this Contract.

The *Contractor* must initiate and maintain safety precautions and programs to conform to all applicable Health and Safety laws or other requirements, including requirements of any applicable government instrumentality and client corporate, business unit and site requirements. The *Contractor* must, at its own cost, erect and maintain safeguards for the protection of workers and the public. The *Contractor* must manage all reasonably foreseeable hazards created by performance of the work. The *Contractor* must:

- a) Provide all things and take all measures necessary for maintaining proper personal hygiene, ensuring safety of persons and property and protecting the environment at or near the Site.
- b) Avoid unnecessary interference with the passage of people and property at or near the Site.



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DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT").

- c) Prevent nuisance and excessive noises and unreasonable disturbances in performing the Services.
- d) Be responsible for the adequacy, stability and safety of all of its site operations, of all its methods of design, construction and work and be responsible for all of the work, irrespective of any acceptance, recommendation, or consent by TPT, its *Contractors*, employees, agents and invitees, or any Government Body.

Costs for the above are borne by the *Contractor*.

The Contractor must ensure that it is well equipped and competent to prevent and handle emergencies in a project of this nature. The contractor must compile an emergency preparedness response plan detailing the arrangements made to provide effective emergency response for the duration of the project. The contractor must ensure that there is vessel entry procedure and that the oxygen levels are tested before anyone goes inside the tank. The contractor must ensure there is always a competent safety and fire watcher to monitor and respond in case of an emergency. The safety watcher must also be able to identify the hazard and be able to sound the alarm should the need arise.

The contractor must ensure that they appoint a competent construction manager, construction supervisor and a safety officer who will be on site at all times.

The *Contractor* must comply and is responsible for ensuring that all of its Sub-*Contractors* comply with the relevant legislation(s) and statutory regulations for health and safety, the Transnet Health and Safety requirements included in the Contract and other document pertaining to health & safety contained in the Programme Health & Safety Management System and include standards, policies, procedures, guidelines and safe work instructions.

5.4.3 **Contractor's Health and Safety Management**

The *Contractor* must prepare, implement and maintain a project-specific Health and Safety Management Plan as per the TIMS H&S Contractor Specification Guideline TRN-IMS-GRP-GDL-014.3 and site-specific health and safety specification. The plan must be based on the requirements set out in this Project Health and Safety specification as well as all applicable legislation. It must cover all activities that will be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning.

The plan must demonstrate the *Contractor's* commitment to health and safety and must, as a minimum, include the following:

- a. A copy of the *Contractor's* Health and Safety Policy; in terms of the OHS Act section 7;
- b. Procedures concerning Hazard Identification and Risk Assessment, including both Baseline and Task-Based Risk Assessments;

- c. Arrangements concerning the identification of applicable Legal and Other Requirements, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel;
- d. Details concerning Health and Safety Objectives – a process must be in place for setting objectives (and developing associated action plans) to drive continual improvement;
- e. Details concerning Resources, Accountabilities and Responsibilities – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a *Project Manager*, Health and Safety Officers, *Supervisors*, Health and Safety Representatives, and First Aiders;
- f. Details concerning Competence, Training and Awareness – a system must be in place to ensure that each employee is suitably trained and competent, and procedures must be in place for identifying training needs and providing the necessary training;
- g. Communication, Participation and Consultation arrangements concerning health and safety, including Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards;
- h. Documentation and Document Control – project-specific documentation required for the effective management of health and safety on the project must be developed and maintained, and processes must be in place for the control of these documents;
- i. Processes and procedures for maintaining Operational Control, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment and light vehicles, lifting operations, hazardous chemical substances, etc.;
- j. Emergency Preparedness and Response procedures;
- k. Management of Change – a process must be in place to ensure that health and safety risks are considered before changes are implemented;
- l. Sub-*Contractor* Alignment procedures – a process must be in place for the assessment of sub-*Contractors* and suppliers with regard to health and safety requirements and performance (before any contract or purchase order is awarded);
- m. Measuring and Monitoring plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. noise, dust, etc.) in order to determine the effectiveness of control measures;
- n. Incident Reporting and Investigation procedures describing the protocols to be followed with regard to incident reporting, recording, investigation and analysis in accordance with TIMS Procedure- TRN-IMS-GRP-FRM-013.36;

- o. Non-conformance and Action Management procedures concerning the management of corrective actions in accordance with TIMS Procedure- TRN-IMS-GRP-FRM-013.43;
- p. Performance Assessment and Auditing procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and
- q. Details concerning the Management Review process followed to assess the effectiveness of health and safety management efforts. Site Supervision
- r. The *Contractor* shall comply with OH&S Act – Section 8, 9, 13 and 16 and the Construction Regulations 2014.
- s. The *Contractor* must nominate and appoint a responsible person on site to whom the *Project Manager* may refer in connection with the *works*. Persons are nominated for all shifts worked or whilst any activity relating to the Contract is being performed on site, and must have the authority to bind the *Contractor* with respect to the Contract. (OH&S Act - 16 Section (2)).
- t. The *Contractor* must ensure that the performance of all specified *works* is supervised throughout by a sufficient number of qualified and competent appointed representatives of the *Contractor*, who have experience in the type of work specified. (OH&S Act – Construction Reg. 8 (1) and 8 (2).)
- u. Note: No work may commence and or continue without *Supervisory* Appointees present on site. The *Contractor's* Site *Supervisor* must be equipped with a mobile telephone with message bank and/or pager or an equivalent communication device so that communication throughout the Contract can be maintained at all times.
- v. The *Contractor's* Site *Supervisor* must provide a list of names and contact telephone numbers of all *Contractors* and Sub-*Contractor's* contact persons on Site. This list is updated as a new *Contractor* or Sub-*Contractor* employee commences on Site.
- w. The *Contractor's* Site *Supervisor* must keep a record of all employees, including date of induction, relevant skills and licenses, and be able to produce this list at the request of the *Supervisor* in accordance to TIMS Employee Personal Dossiers TRN-IMS-GRP-TMP 014.13
- x. The *Contractor's* Site *Supervisor* must complete manning sheets describing the day's activities, labour numbers and classifications and issue these to the *Supervisor* prior to 9.00 am daily.
- y. The *Project Manager's* Site Safety Representative is notified of any new starter with evidence of induction and site-specific induction prior to commencement of work.

5.4.4 **Contractor's Safety Officer**

- a. The *Contractor* must appoint a full-time Health and Safety Officer for the duration of the contract who is registered with the SACPCMP (The South African Council for Project Construction Management Professions). If more than 100 employees are

deployed on the project site(s) (directly or through sub-*Contractors*), at least two full-time Health and Safety Officers must be appointed, with an additional Health and Safety Officer appointed for every 100 additional employees thereafter.

- b. The Health and Safety Officer must be on site when work commences at the start of the day and must remain on site until all activities for that day (including the activities of sub-*Contractors*) have been completed. A Health and Safety Officer must be present during all shifts, so if work is carried out over more than one shift per day, the *Contractor* must make provision for an additional Health and Safety Officer.

Each *Contractor* Health and Safety Officer shall be responsible for:

- a. Reviewing all applicable legal and project health and safety requirements and providing guidance to *Contractor* and sub-*Contractor* personnel (particularly the *Contractor's Project Manager*) to help ensure compliance at all times;
- b. Assisting with the implementation of effective hazard identification and risk management processes for all work to be carried out by the *Contractor*;
- c. Participating in the Baseline Risk Assessment for the *Contractor's* scope of work (prior to site establishment) and ensuring that identified control measures are implemented;
- d. Participating in all Task-Based Risk Assessments conducted for the work to be carried out by the *Contractor* and ensuring that identified control measures are implemented;
- e. Conducting *Contractor* health and safety induction training for all *Contractor* and sub-*Contractor* personnel;
- f. Compiling and maintaining all health and safety related documents and records required of the *Contractor*;
- g. Communicating relevant health and safety information to *Contractor* and sub-*Contractor* personnel (e.g. incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.);
- h. Carrying out Safety Observations and Coaching (one per day);
- i. Evaluating (on a daily basis) the content of the Daily Safe Task Instructions (DSTI's) conducted by the *Contractor's* appointed *Supervisors*, and attending at least one DSTI each day;
- j. Attending monthly *Contractor* and Site Health and Safety Meetings;
- k. Assisting with the implementation of the *Contractor's* Health and Safety Management Plan and associated Safe Work Procedures;
- l. Carrying out Planned Task Observations on an ad hoc basis;
- m. Assisting with the implementation, testing and maintenance of an effective Emergency Response Plan for all *Contractor* and sub-*Contractor* activities;
- n. Responding to workplace incidents (as appropriate);

- o. Participating in incident investigations;
- p. Maintaining accurate health and safety statistics (for the *Contractor* and all sub-*Contractors*), and compiling health and safety performance reports as required;
- q. Auditing the health and safety management system and workplace activities of the *Contractor* and each sub-*Contractor* monthly to assess compliance with the project health and safety requirements; and
- r. Tracking and reporting on the implementation of corrective actions (arising from incident investigations, audits, inspections, etc.).
- s. The *Contractor* must ensure that they have made adequate provision of safety officers as per the *Works Information*. The *Contractor* must ensure that the Health and Safety Officer is adequately equipped to enable him to perform his duties effectively. Each Health and Safety Officer must be in provision with the following:
 - Health and safety auditing experience and training;
 - A valid First Aid certificate of competency;
 - Fire prevention and protection training; and
 - A valid Driving License (light motor vehicle).
 - Registered as a Health and Safety Officer with SACPCMP depending on the size of the project and on the risk.
- t. Before placing a Health and Safety Officer on the project site(s), the *Contractor* must forward a copy of the person's CV to the nominated project management representative or to TPT Health and Safety Manager for review and acceptance. A proposed candidate may be rejected should he not meet the experience and/or qualification requirements, or due to poor work performance on previous projects.

5.4.5 **Contractor's Safety Manual**

- a. The *Contractor* must provide a hard copy of its safety manual, policies and procedures to the *Project Manager* for acceptance prior to the commencement of any site work. The *Contractor* must ensure that his personnel, at all times, strictly observe and comply with the procedures set out therein. The *Project Manager* or the *Project Manager's* nominated Representative may from time to time request safety procedures applicable to the area of operations. The *Contractor* must forward to the *Project Manager* any updates or revisions to its safety manuals, policies or procedures as soon as practicable following revision or update.
- b. The *Project Manager* may require the *Contractor* from time to time to supplement its safety manual, policies and procedures with guidelines and/or operating standards provided to the *Contractor* by the *Project Manager*. The *Contractor* must comply with such requests where the request is consistent with the requirements of the Contract. The *Contractor* must give prompt written notice to the *Project Manager* of any objection to the requested supplement, including the reasons for objection. The *Project Manager's* rights under this Clause are not intended, and must not be

construed, to relieve the *Contractor* from any obligations to ensure compliance with all provisions of this Contract.

5.4.6 Performance Measurement and Reporting

a. Health and Safety Statistics

The Contractor and each of its Sub-Contractors must complete and submit Health and Safety statistics to the *Project Manager* or the *Project Manager's* nominated representative, or as amended by the *Project Manager*, before mid-day on the Friday of each week. The Contractor must submit monthly Health & Safety Statistics before mid-day on the last day of each month to the *Project Manager's* nominated representative.

b. Safety Management Records

The Contractor must submit to the *Project Manager* for acceptance a schedule of the specific Health and Safety records it intends to maintain for the Contract. As a minimum, such records are as specified by applicable legislation. Copies are provided to the *Project Manager* or the Project Manager's nominated Representative if requested.

5.4.7 Field Technical/Safety Audit by the *Project Manager*

- a. The *Project Manager* or the *Project Manager's* nominated Representative has the right to conduct audits/inspections of the Consultant, Professional Service Provider (PSP) and Contractor Safety Management Plan implementation, operations, equipment, emergency procedures, etc., at any time, and the Contractor must fully cooperate with the *Project Manager* or the *Project Manager's* nominated Representative during such audits/inspections. The *Project Manager's* rights under this clause does not, must not and will not relieve the Consultant, Professional Service Provider (PSP) and Contractor of its own obligations to conduct audits and reviews of its own Health and Safety performance.
- b. Where such audits/inspections reveal deficiencies in the Contractor procedures, drills, training or equipment, or non-conformities with the Contractor accepted project Safety Management Plan, the Contractor must investigate the cause of the nonconformity and initiate corrective and preventive action to rectify such deficiencies and non-conformities and prevent recurrence as soon as practicable as per the TIMS Occurrence and Non-conformance Management Procedure TRN-IMS-GRP-PROC-013.
- c. Where such deficiencies include an unsafe practice or a breach of the statutory or the Contract's requirements, the *Project Manager* or the *Project Manager's* nominated Representative may in accordance with the General Conditions of

Contract suspend the work associated with the unsafe practice or breach until the deficiency is rectified.

- d. The *Project Manager* or the *Project Manager's* nominated Representative will establish a schedule of regular field safety audits which will be based on an audit tool aligned to the Contractor Safety Management Plan and site operations and activities. The Contractor audit conformance will be assessed as a percentage and where conformance is better than 90% it will be considered satisfactory and the Contractor must develop and implement an action plan within 4 weeks, to be reviewed at the next regular audit. Where the Contractor level of conformance is between 80 – 90%, a corrective action plan will be required to be developed and implemented within 2 weeks, and a follow up audit will be carried out. Where the Contractor conformance is less than 80% the Contractor must stop work until an investigation of the cause/s has been completed and corrective actions have been developed and implemented by the Contractor.
- e. The Contractor must provide to the *Project Manager* or the *Project Manager's* nominated Representative, at a time to be agreed, but not to exceed monthly intervals, a regular status report on all outstanding corrective actions until they are successfully closed out.

5.4.8 Unsafe Act/Condition Auditing

The Contractor must implement a system to recognize, correct, and report unsafe acts/conditions (Unsafe Act/Condition Auditing) associated with all Site activities. All such observations must be recorded and delivered the TPT Health and Safety Manager/or as per the project's organogram

5.4.9 Involvement, Communication and Motivation

The Contractor and sub Contractor's workforce must, through their supervision, safety notice boards, toolbox meetings and daily pre-start meetings be kept aware of safety related matters.

5.4.10 Safety Meetings

The Contractor must implement and comply with OH&S Act, Section 19

The Contractor must conduct weekly safety meetings with his employees to foster safety awareness. Copies of minutes and action items arising from such Toolbox meetings is submitted or otherwise made available for review by the *Project Manager* or the *Project Manager's* nominated Representative.

Such meetings should at least address:

- Accident / safety incidents
- Hazardous conditions
- Hazardous materials / substances

- Work procedures
- Protective clothing / equipment
- Housekeeping
- General safety topics
- Job or work look-ahead issues
- Safety statistics
- Significant Safety Occurrences (SSO)

The *Contractor* must conduct at least one formal safety meeting per month and must maintain appropriate records of attendance and meeting content. Such records are made available to the *Project Manager's* Representative. In addition to Daily Safe Task Instructions, the *Contractor* must conduct at least weekly "tool box" meetings to discuss safety issues and procedures.

a. Pre-Start Safety Briefings

- The *Contractor* must hold documented Daily Safe Task Instructions with each work team before the start of each shift. Attendance records and brief topic notes is kept for auditing and record purposes. Safety Review Meetings
- The *Contractor* Site Manager and a Site Safety Representative must take part in weekly safety review meetings between the *Contractor* and the *Project Manager* or the *Project Manager's* nominated Representative.
- The *Contractor* must attend all project safety meetings as outlined in the Project Safety Management Plan.

b. Site Safety Review Committee

The *Contractor* complies with the requirements of the SSRC with respect to his own activities and others on the Site and Working Areas.

c. HAZOP Review

The *Contractor* participates in HAZOP reviews upon the instruction and direction of the *Project Manager*.

The reviews may include, but not be limited to, studies to ensure that the Plant is built and operated as designed and that personal safety, employee health and environmental protection systems conform to the *Employer's* and legislative requirements.

d. Job Safety Analysis

The *Contractor* completes a JSA prior to carrying out any operation on the Site and/or Working Area to the approval of the *Project Manager*.

e. Lines of Communication

The following personnel act on behalf of the *Project Manager* and may communicate directly with the *Contractor* and his key persons with respect to the SMP:

- Construction Manager (CM)

- Project Site Safety Manager (PSSM)

5.4.11 Roles and responsibilities

The roles and responsibilities of the various personnel acting on behalf of the *Project Manager* with respect to the SMP and health and safety issues are as stated in the paragraphs following:

Construction Manager (CM)

The CM is responsible (in the context of the SMP only) for health and safety on the Site and Working Areas and reports to the *Project Manager*.

The CM specific tasks (in the context of the SMP) are:

- Implement the safety management system
- Monitor compliance to the established safety management system
- Ensure risk is at an acceptable level
- Ensure Consultant Construction Management Team are competent

Provide for:

- Planning, organisation, leadership and control
- Particular technical competencies for critical work
- Supervision and control on each shift
- Regular monitoring and assessment
- Workplace inspections
- Project Site Safety Manager
- The PSSM is responsible for ensuring that the *Contractor* complies with the SMP. The PSSM acts on behalf of the *Project Manager*.
- The PSSM specific tasks (in the context of the SMP) are:
 - Define, in accordance with the HSSP, the: Safety program (instructions, training, meetings, inspections, incentive), Health and medical program
 - Checks that *Contractors* have issued their Health and Safety plans, PPSPS and procedures before the beginning of work
 - Organizes safety awareness campaigns
 - Promotes communication on all health and safety matters (awards, incentives, meeting/inspections/audits reports)
 - Checks conformance of equipment to technical requirements and regulations.
 - Issues and address the site EHS activities reports
 - Promotes everybody's best efforts to keep accident frequency and severity ratios at their lowest level
 - Promotes a proper and continuous housekeeping of Plant and temporary facilities in order to create the most suitable conditions for workers to work and to be encouraged to follow SHEQ requirements

- q. Conducts *Worksite* SHEQ walks with all *Contractors*, and directs appropriate corrective actions
- r. Monitors that all factors likely to improve health and safety are taken into consideration, particularly those which lead to:
- s. Promoting personnel protection as an absolute requisite
- t. Investigating, identifying and neutralizing potential hazards
- u. Close coordination with all parties involved in construction in order to avoid overcrowded areas and dangerous operations
- v. Thorough preparation of work critical phases
- w. Close contacts to local SHEQ authorities
- x. Continuous follow-up in order to correct immediately unsafe acts and situations
- y. In case of accident, he takes actions necessary to:
- z. Initiate quick interventions of the emergency means.
- aa. Check that first aid and evacuation of injured persons are properly carried out.
- bb. Obtain a clear accident report from the sub-*Contractor* concerned.
- cc. Report immediately to the Construction Manager.
- dd. Investigate to identify the root causes of all incident and near misses.

5.4.12 Commissioning Safety Study

The *Project Manager*, through his Construction Management Team, will facilitate and coordinate a formal Commissioning Safety Study and ensure that required procedures are prepared prior to the commencement of the commissioning phase. The Commissioning Safety Study will provide a final checkpoint for the completed work and is part of the process for ensuring that all necessary actions have been completed. The elements to be considered include:

- a. Electrical integrity systems are in place (e.g., equipment tests and inspections of critical equipment, quality control procedures, etc.) which will confirm that construction, equipment and materials are in accordance with design specifications
- b. Formal hazard analyses for pre-commissioning and commissioning activities have been completed, appropriately documented, and communicated, and are available to all personnel.
- c. Punch-list work has been sufficiently completed so that installations are safe to apply hazardous energy.
- d. Documentation relevant to any modifications has been created/updated.
- e. Safe operating, maintenance and emergency procedures are in place.
- f. Operating and maintenance manuals are available and training of commissioning employees has been completed.
- g. As Built drawings are available.

- h. A Commissioning Permit (to apply hazardous energy) is developed and implemented.
- i. The *Project Manager* will ensure that after commissioning there is a formal documented hand over to operations and maintenance personnel and others who will be impacted by hazards that have been identified during project activities. This will involve communication of any changes to the process hazards, procedures and operating philosophy. Safe systems of work will be established and updated throughout the Project. Safe systems of work will be subject to on-going review to ensure their effectiveness. Site-wide Permits to Work will be used as the basis of safe systems of work for specified hazardous activities.

5.4.13 Working at Nights

A site-specific health and safety management plan should be well documented and structured so that both *Employers* and employees can benefit from its use. The following are recommended components of a safety management plan for nighttime and working extended hours or weekends *Works*.

5.4.14 Site personnel responsibility

It should be determined and stated clearly in the site-specific health and safety management plan the responsibility of everyone at construction site for nighttime *Works*. *Project Manager*, Engineers, Designers, Safety Officer and Site *Supervisors* as well as workers each have their specific responsibility to make sure the highest level of priority is given towards safety and health issues.

The *Contractor* must ensure adequate provision of safety officer personnel are present whenever working at night activities are taking place.

5.4.15 Permission to work at night

The *Contractor* shall apply in writing for permission to work at night and should be obtained from the relevant authority in this case TPT *Project Manager* before construction *Works* at night is carried out. The *Contractors* should submit their application for work at night permit to TPT Client representative and it is advisable to follow all requirements enforced by the authority to executing nighttime construction *Works*. It is recommended that TPT representative should also notified TPT responsible personnel about intended night shift work.

5.4.16 Housekeeping

Accidents can occur because of poor housekeeping. Hazards at construction site are the same for both day and night shift while the risks of injury are much higher during

night *Works* because of the inherent poor illumination. It is essential that the workplace is kept clean and tidy to ensure safety and prevent accidents.

5.4.17 **Emergency Preparedness and Response (EPR)**

Contractor should develop and implement the EPR that is specifically nighttime environment and submit for approval before work at night is carried out. A well-established EPR can help both *Contractors* and employees to prepare; response and recover should a disaster occur.

5.4.18 **Public safety**

- a. When construction *Works* involves public area, it is important to make sure the safety of the public. The *Contractor* must consider the following when planning for nighttime work; identify the hazards for example construction vehicle movement or too much glare from lighting equipment and plan for vehicular movement to not interrupt peak hours and make sure adequate supervision is provided for such movement.
- b. *Contractor* must provide sufficient signage to warn the public and put barriers at a safe distance to keep the public away.
- c. Set up safe walkways where it is unavoidable to work near or in public vicinity.
- d. Arrange noisy equipment or machinery at farthest point from the public or adopt an engineering control to reduce the noise.
- e. When overhead crane is operating near the public, clear off the area and make sure adequate supervision is in place.
- f. Schedule for daily cleaning of the adjacent public road and filling up holes as well as uneven surfaces.

5.4.19 **Types of Risks and factors affecting night-time work**

To decide when to conduct nighttime work, factors (parameters) affecting nighttime work must be identified. The *Contractor* must ensure the following factors are identified:

- Risk
- Illumination
- Nuisances
- Productivity
- Cost
- Safety

The Contractor must ensure that they implement the following step in an effective risk management program as to identify possible risks. Specific concerns related to nighttime work zones include poor visibility and work quality, staffing issues, unwanted

noise, and glare, decreased worker and driver alertness, impaired drivers, higher vehicle speeds, increased labor costs, materials and traffic control, and problems in logistics and supervision. These risks are categorized broadly as safety, cost/production and schedule, quality, organizational relationships, technical, construction, economic and environmental.

5.4.20 Risk

Nighttime construction introduces numerous risks to a construction project. One clear set of examples is driver and worker fatigue and reduced visibility, which are factors that could increase safety risks. Other major factors contributing to the risks of nighttime work are human factors such as sleep, stress, work, social or domestic issues, and psychological characteristics, such as appetite and safety. Additional factors associated with the risks of nighttime construction work zones are reduced workspace for machinery and equipment movement, inadequate lighting, high speed of traffic during the night, and long working hours. Working at night does not supersede the requirements of the Project Health and Safety Specification requirements that enforces compliance during day shift.

5.4.21 Document Control

All safety documents shall comply with the Project Document Control Procedures.

5.4.22 Medicals

Pre-employment medicals, including chest X-ray examinations, specific for the Contract will be required for all employees working on the Site regardless of duration spent on Site. Exit medicals, including chest X-ray examinations will be required at the end of the Contract. A registered Occupational Health Practitioner must carry out these medical examinations.

The *Contractor* must ensure that budget provision for SHEQ requirements are in place.

5.4.23 Environmental Constraints and Management

The following documents shall be used to ensure an integrated approach to environmental management. This approach is designed to guide the appropriate allocation of human resources, assign responsibilities, develop procedures, and ensure project compliance with regulatory and best practice requirements.

- a) Transnet Integrated Management System (TIMS) Policy Commitment Statement IMS-GRP-GDL-002-1 (**Annexure A**) Contractor Environmental and Sustainable Specifications TRN-IMS-GRP-GDL-014.4 (**Annexure B**)
- b) Transnet Construction Environmental Management Standard Operating Procedure 009-TCC-CLO-SUS-11386 (**Annexure C**)

- 5.4.24 The Declaration of Understanding 009-TCC-CLO-SUS-TMP-11386 (**Annexure D**) shall be signed and submitted to the CM within 14 days after the contract date.
- 5.4.25 Where required, one of the first actions to be undertaken by the *Contractor* shall be to erect and maintain a temporary fence along the boundaries of the Site and working areas as applicable, and around any no-go areas identified on the layout plans, to the satisfaction of the *Project Manager*.
- 5.4.26 The *Contractor* must appoint a suitably qualified (Natural Science Degree) Environmental Officer (EO) to monitor compliance against the listed environmental standards and on-site environmental issues e.g., litter, spills, illegal activities, fence patrol, dust etc. This appointment, along with details of the individual being appointed and job description, must be sent to the *Project Manager* and/or Environmental Officer for approval.
- 5.4.27 During the construction period, the *Contractor* shall comply with the following:
- 5.4.28 A copy of the CEM SOP and Contractor Environmental and Sustainable Specifications shall be available on Site, and the *Contractor* shall ensure that all the personnel on Site (including *Subcontractors* and their staff) as well as suppliers are familiar with and understand the specifications contained in the documents.
- 5.4.29 Method statements that are required during construction must be submitted to the *Project Manager* for acceptance at least 20 days prior to the proposed commencement of the activity. Emergency construction activity method statements may also be required. The activities requiring method statements cannot commence if they have not been approved by the *Project Manager* and/or EO.
- 5.4.30 The method statements for Completion by the Contractor are contained within **Annexure 009-TCC-CLO-SUS-TMP-11386.14 E**.
- 5.4.31 The *Contractor* shall identify the kinds of environmental impacts that will occur because of his activities and then prepare separate method statements describing how each of those impacts will be prevented or managed so that the standards set out in this document are achieved. These method statements will be prepared in accordance with the requirements set out in the CEM SOP, Contractor Environmental and Sustainable Specifications, Environmental Baseline and Risk Assessment Reports.
- 5.4.32 The minimum method statements for Completion by the *Contractor* include, but are not limited to, the following where applicable:
- a. Site establishment
 - b. Hazardous and non-hazardous solid waste management
 - c. Storm water management
 - d. Contaminated water management
 - e. Prevention of marine pollution

- f. Hydrocarbon spills
- g. Diesel tanks and refuelling procedures
- h. Dust control
- i. Spoil dumping
- j. Sourcing, excavating, transporting, and dumping of fill material
- k. Noise and vibration control
- l. Removal of rare, endemic, or endangered species
- m. Removal and stockpiling of topsoil
- n. Rodent and pest control
- o. Environmental awareness training
- p. Emergency procedures for environmental incidents
- q. Rehabilitation

- 5.4.33 Where required, one of the first actions to be undertaken by the *Contractor* shall be to erect and maintain a temporary fence along the boundaries of the Site and Working Areas as applicable, and around any no-go areas identified on the layout plans, to the satisfaction of the *Project Manager*.
- 5.4.34 The plant search and rescue (if applicable) must be undertaken and completed prior to any Site clearance or any other construction activity that may damage the vegetation can commences on Site.
- 5.4.35 The *Contractor* shall ensure that any Materials delivery drivers are informed of all procedures and restrictions (e.g., which access roads to use, no go areas, speed limits, noise, etc.) required by the CEM SOP and Contractor Environmental and Sustainable Specifications before they arrive at Site and off load any Materials.
- 5.4.36 A copy of the CEM SOP, and the relevant PES shall be available on Site, and the *Contractor* shall ensure that all the personnel on Site (including Subcontractors and their staff) as well as suppliers are familiar with and understand the specifications contained in the CEM SOP (as amended by the PES).
- 5.4.37 The *Contractor's* EO submits daily, weekly, and monthly checklists to the *Project Manager*.
- 5.4.38 The Contractor complies with environmental inspections and audits as contained within CEM.
- 5.4.39 The *Contractor's* EO must scan environmental file monthly during construction according to the environmental file index and send the soft copy to the *Employer*. The *Contractor* must make copies of the CEM SOP and Contractor Environmental and Sustainable Specifications available at the offices of the *Contractor* on Site. The *Contractor* ensures that all personnel on Site (including Subcontractors) are familiar with and understand the

requirements of the CEM SOP, Contractor Environmental and Sustainable Specifications and Environmental Baseline and Risk Assessment Reports.

- 5.4.40 The lines of communication of the various personnel acting on behalf of the *Project Manager* who communicate to the *Contractor* and his keys persons contained with Contractor Environmental and Sustainable Specifications.
- 5.4.41 The *Contractor* shall be responsible for rehabilitating and re-vegetating all areas to the satisfaction of the *Project Manager* as detailed in the CEM SOP and PES. The *Contractor* shall clear and clean the Site and working areas and ensure that everything not forming part of the *works* is removed from the Site and working areas and that all re-instatement has taken place in accordance with the CEM SOP and Contractor Environmental and Sustainable Specifications.
- 5.4.42 A site closure audit will be conducted by the *Employer's* EO of which upon closure of all findings and observations. The *Contractor's* EO must scan the entire environmental file according to the environmental file index and send both the hard and soft copies to the *Employer*. An Environmental Closure Certificate TRN-IMS-GRP-TMP-014.23 (**Annexure F**) has been issued by the Transnet EO and signed off by the *Project Manager*.

5.5 Quality assurance requirements

- 5.5.1 The Contractor shall execute the works in accordance with the project approved specification "General Quality Requirements for Contractors and Suppliers" - **QAL-STD-0001 Rev0** included in **Annexure I** of the *Works Information*.
- 5.5.2 The Contractor shall submit his Quality Assurance (QA) proposal(s) for the contract. This proposal shall detail the Contractor's quality management system as it applies to all aspects of supply or service provision including Design, Procurement, Manufacturing, Installation/Erection and Commissioning. Additionally, the Contractor shall include for the provision of suitably qualified quality control staff to manage and carry out inspection on all Supplier/Subcontractor activities in all disciplines included within the *Works Information*.
- 5.5.3 The Quality Policy is a concise document, approved by the Contractor's executive management that defines organisational goals and objectives regarding quality, a commitment to meeting stated requirements and an undertaking to drive continuous improvement throughout the organisation's activities. It must be suitable for the organisation and provide a framework for stabilising, communicating, and monitoring performance against agreed quality objectives.
- 5.5.4 The Contractor shall submit a Project Quality Plan (PQP), which shall also contain specific proposals and details regarding Quality Control for the works. The PQP includes

Contractor's statement that outlines strategy, methodology, resources allocation and details about quality control for the works.

- 5.5.5 The PQP is generally in narrative form detailing the Project Specific QA and QC systems and controls required by the Contractor for the specific works. Where the Contractor intends to employ any third-party organisations to execute quality related activities on his behalf, such intentions shall be stipulated in the PQP.
- 5.5.6 The Contractor shall provide a full-time resident quality manager for all aspects of the works including Site activities, with a staff adequate to perform the requirements of his quality plan and quality management system.
- 5.5.7 The nominated individual shall be fully conversant with quality management on major construction projects and the maintenance of an appropriate ISO 9001 Quality Management System.
- 5.5.8 The Contractor shall submit the CV of his quality manager for the *Project Manager's* review and approval with a complete proposed organogram clearly indicating reporting levels and the number of resources dedicated to quality assurance and quality control.
- 5.5.9 The Contractor shall have, maintain, and demonstrate its use to the *Project Manager* and/or the Supervisor to satisfy the requirements, as appropriate, of the documented Quality Management System to be used in the performance of the works. The Contractor's Quality Management System shall conform to International Standard ISO 9001 (or an equivalent standard acceptable to the *Project Manager*).
- 5.5.10 The Contractor submits his Quality Management System documents to the *Project Manager* as part of his programme under ECC3 Clause 31.2 to include details of:
- Quality Policy.
 - Project Quality Plan for the contract.
 - Index of Procedures to be used; and
 - A schedule of internal and external audits during the contract
- 5.5.11 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.
- 5.5.12 The *Project Manager* indicates those documents required to be submitted either 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 *Project Manager* responding to documents submitted by the Contractor for review or acceptance within the period for reply prior to such documents being used by the Contractor.
- 5.5.13 The requirements for a PQP are detailed in the project standard **QAL-STD-0001 Rev0** and shall include but not be limited to the following:
- Include a listing of all special processes (e.g., welding, and non-destructive testing, cube testing etc.) envisaged for use, including confirmation of personnel certification as required

- b. Include a list of all proposed method statements (for Site based work activities)
 - c. Include all quality activities relevant to the works, identifying all procedures, reviews, audits, controls, and records used to control and verify compliance with the specified contractual requirements
 - d. Include a description of the Supplier/Contractor's project organization, with key positions and responsibilities identified and individuals named. The organization structure shall also indicate the resources committed to the management / coordination of QA / QC activities both within the main Contractor's organization and that of his Sub-Contractors and Suppliers
 - e. Include a listing of all pre- approved Quality Control Plans (QCP's), Quality Inspection Test Plans (QITPs) and associated Field Inspection Checklists (FIC's), as applicable
 - f. Identify in the Project Quality Plan any Sub-Supplier/Sub-Contractor work. Sub-Supplier/Sub-Contractor plans shall be approved by the Supplier/Contractor, and a copy forwarded to the *Project Manager*
 - g. Include the proposed **Authorized Inspection Authority (AIA)** (where applicable - for pressurized equipment and systems at fabrication factory and at site pre-commissioning stage)
 - h. Include a schedule of proposed quality records (Data Book Index) which will form the permanent record of conformance to requirements.
- 5.5.14 The index of procedures shall contain a list of the Contractor's quality management system procedures to be applied during the project including any relevant work instructions or 3rd tier quality system documentation. Where aspects of the works are to be subcontracted, the Contractor shall include procedures for the management of Suppliers and Sub-Contractors.
- 5.5.15 A schedule of internal and external audits during the contract means a schedule provided by the Contractor detailing the location, frequency, and extent of internal and external quality system audits to be carried out on during the contract period. The schedule shall include all locations including construction Site and supplier/service providers.

5.6 Programming constraints

- 5.6.1 The *Contractor's* construction WBS as a minimum shall include but not be limited to the following WBS Elements:
- a. Procurement and delivery of all long lead items necessary to Provide the *works* in line with the stipulations of the *Employer's* Works Information. Long lead items include but are not limited to; Plant, equipment, materials and any other resources, as required to provide both temporary and permanent *works*.
 - b. *Contractor's* design as a well as associated procedure for *Contractor's* design submission and acceptance of any portion of the *works* and/or approval of Plant

as stipulated under Sections 1 Clause 2 of the Works Information in accordance with the stipulations for submission, acceptance and approval as stipulated under the relevant section(s) of the *Employer's* Works Information; including any other additional design requirements, interfacing and or alterations in existing design which may stem from the aforementioned.

- c. Manufacturing and or Fabrication both on and off-site which may include but is not limited to; Plant, equipment, materials and any other resources, as required to provide both temporary and permanent *works*.
 - d. Preparation and Approvals of Health & Safety, Environmental and Quality Documentation.
 - e. Approval of any applicable permits, permissions and licenses, including inductions
- 5.6.2 The *Contractor's* construction programme shall correspond with the *Contractor's* Method Statements, Quality Control Plans and Risk Assessments, as drafted in line with the *Employer's* stipulations.
- 5.6.3 The *Contractor* uses Primavera Professional version 19.12 for his programme submissions, or similar approved software with the prior written consent of the *Project Manager*. In the event that the *Contractor* will be using earlier or later versions of the software, the onus is on the *Contractor* to ensure that a conversion is done in order for the XER file to be compatible with Primavera Professional version 19.12.
- 5.6.4 The *Contractor* shows on each programme he submits to the *Project Manager*, the requirements of the [CEM SOP, Contractor Environmental and Sustainable Specifications, PES and SMP] as described under the relevant sections of the Works Information, together with the associated environmental method statements.
- 5.6.5 The *Employer* (including the agents of the *Employer*) operates on *Site* during dates or timings when the *Contractor* has completed certain elements of the *works* and/or during the contract period as stipulated in this Works Information.
- 5.6.6 Others operate on *working area* during dates or timings when the *Contractor* has completed certain elements of the *works* as stipulated in this Works Information
- 5.6.7 The *Contractor's* first programme submitted for accepted shall be agreed during the pre-contract negotiation period, and no later than the period stipulated under Contract Data Part One (2 weeks after the Contract Date).
- 5.6.8 The *Contractor* complies with the *Employer's* high-level programme when he submits his first programme for acceptance.
- 5.6.9 The *Contractor* presents his first programme for acceptance and all subsequently revised programmes (see ECC Clauses 31.2 and 32.1) in hard copy and soft copy format.

- 5.6.10 The *Contractor* shows on his programme submitted for acceptance and all subsequently revised programmes, the critical path or paths and all necessary logic diagrams demonstrating sequence of operations.
- 5.6.11 The *Contractor's* programme shows duration of operations in working days as per the stipulated definition of the workdays and hours in the *Employer's Works Information*.
- 5.6.12 Each programme submitted by the *Contractor* to the *Project Manager*, is fully Cost and Resource Loaded (People, Equipment, Plant, Materials & Other Resources) with the exception of the *Contractor's* tender programme submission.
- 5.6.13 The *Contractor* shows on each programme he submits to the *Project Manager*, the requirements as listed in the NEC 3, ECC, Clause 31.2.
- 5.6.14 The *Contractor* attends, participates in and makes a meaningful contribution to, planning initiation & set-up meetings held during the pre-contract negotiation period and no later than the period stipulated under *Contract Data Part One* (2 weeks after the Contract Date); to agree and set-up including but not limited to - the first schedule for acceptance; monitoring, control and reporting requirements; proposed templates and planning/scheduling procedures to be complied with for the duration of the project.
- 5.6.15 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*, including a spread sheet identifying instances of resource over-allocation and/or conflicts, accompanied by proposed resolutions.
- 5.6.16 The *Contractor's* programme shows the following levels:
- a. 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.
 - b. Level 2 Project Schedule – summary schedules 'rolled up' from Level 3 Project Schedule described below.
 - c. Level 3 Project Schedule – detailed schedules generated to demonstrate all operations identified on the programme from the starting date to Completion. Individual operations will be assigned a code. The *Employer* notifies any subsequent layouts and corresponding filters on revised programmes.
 - d. Level 4 Project Schedule – detailed discipline/speciality level schedule decomposed to the appropriate levels of detail in order to accurately substantiate activity scope and activity duration estimates; developed and maintained by the *Contractor* relating to all operations identified on the programme representing the

daily activities by each discipline, with activities and operations adequately decomposed in order to accurately represent the effort required to execute said activity/operation and support accurate duration estimates.

- e. A narrative status report, which includes but is not limited to status and performance of operations on the *Site* and Working Areas; status and performance of operations outside the Working Areas; manpower histograms; S-curve of overall progress; critical action items (top 10) and deviations from the Accepted Programme and action plan to rectify.
- f. Basis of Programme/Schedule document detailing but not limited to the following minimum requirements:
 - Basis of latest accepted programme, including an overview of assumptions, constraints, specific and quantified resource allocations, productivity assumptions and basis of calculation, identification and justification of general scheduling provisions such as calendars and working times, lags, date constraints, activity durations longer than one reporting period, etc.
 - Description of network logic and sequencing.
 - Description of general construction approach.
 - Description of approach to allocation, use and management of all resources dedicated to the project.
 - Description of and trend analysis of critical risks as identified through schedule risk analysis and included in schedule contingency and or Time Risk Allowance provisions.
 - Discussion regarding the basis, method of calculation and validity of the critical path and near critical paths, (interrogate longest path and total float as contained in the programme).
 - Reporting on change management, i.e., identify and record any deviations/changes that have taken place within the previous reporting cycle, and their resultant impact on the remaining *works* and as identified and highlighted in the current revision of the programme for acceptance.
 - Identification critical activities, as well as top 10 near critical activities and undertake trends analysis on such activities with the aim to identify any deviations from planned performance.
 - Identification of any recovery and or mitigation action required to neutralise any deviations.

5.7 Reporting and Monitoring

- 5.7.1 The *Contractor* attends meetings as included but not limited to Section 2 Clause 5 of the *Employer's Works Information*.
- 5.7.2 The *Contractor* attends weekly planning meetings. Meeting agenda to include progress reporting as detailed under Section 2 Clause 5.10 of the *Employer's Works Information*, recovery/optimisation, contractual matters in line with NEC ECC core clauses 31, 32 and main option clause, Option B.
- 5.7.3 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*. The *Contractor* also submits fortnightly expediting report and monthly programme narrative report to *Project Manager*.
- 5.7.4 The *Contractor* completes an assessment of all activities in progress and to completion to determine physical percentage complete, forecasted completion dates, deviations from the Accepted Programme and proposes remedial action to rectify deviations.
- 5.7.5 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*.
- 5.7.6 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, man-power histograms, Plant and equipment histograms, S-curve of overall progress, and critical action items (top 10). Report shall indicate "progress this period" and "progress to date".
- 5.7.7 The *Contractor's* **weekly** project progress report (narrative report) includes but is not limited to:
- 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.
 - Progress Spreadsheet detailing actual progress achieved (target/planned quantity versus actual quantity) on current (critical) activities for the previous week, planned progress for the current week, deviations and proposed recovery for each activity in question. A 1-week Look Ahead Spreadsheet in line with the aforementioned stipulations to be included. Priority to be given to identification of critical activities, progress and any deviations from planned performance in this regard.
 - 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 Programme.

- d. Dependencies/Deliverables matrix detailing interim approvals and/or any other inputs/requirements from *Employer/Supervisor/Project Manager/Others* or any other project *Stakeholder* in line with the activities identified in the 3-week Look Ahead Schedule.
- e. Interfacing Matrix, detailing timeous identification of any requirements for providing the *works* and/or *works* to be executed by *Others* and any other *Stakeholders* party to this contract in line with the stipulations of the *Works Information*.
- f. Manpower Histogram – reflecting actual, forecasted and planned activities.
- g. Plant and Equipment Histogram – reflecting actual, forecast and planned activities.
- h. S-curves – reflecting the actual percentage complete versus the planned percentage for the overall contract.
- i. Identification critical activities, progress and any deviations from planned performance.
- j. Adherence and actual performance achieved with regards to Environmental, Health & Safety and Quality Management.

5.7.8 The *Contractor's* **fortnightly** expediting report includes but is not limited to:

- Based on the Accepted Programme/ latest programme submitted for acceptance the *Contractor* submits a cash flow forecast report that details the anticipated monthly cash flow, represented by the expected assessment of the amounts due, to the *Project Manager*. The cash flow forecast is to be extrapolated from the latest Accepted Programme through the mechanism of the cost loaded schedule or other similar methodologies with the prior approval of the *Project Manager*.
- The *Contractor* shall submit to the *Project Manager*, a bi-weekly report on progress of any off-site manufacturing activities undertaken during the previous half-month.

5.7.9 The *Contractor's* **monthly** project progress report includes but is not limited to:

- a. Monthly, the Contractor completes an assessment of all activities in progress and to completion, and accordingly revises and submits the updated programme for acceptance and cash flow forecast report detailing any variances and proposes remedial actions to rectify deviations.
- b. 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 shall indicate "progress this period" and "progress to date" and shall include, but is not limited to, the following;
 - Summary of progress achieved during the reporting period.
 - Latest Accepted Programme.

- Deviations from the current Accepted Programme and action plans to rectify.
- Project milestones table – planned versus actual and forecast.
- Status and performance of operations on the site and Working Areas.
- Status and performance of operations outside Working Areas.
- Cash flow forecast report.
- Digital photographic record of the progress of the *works*.
- Manpower histograms, including a control spread sheet detailing specific over allocation and/or conflicts in allocation of resources.
- *Contractor's* Plant and equipment histograms, including a control spread sheet detailing specific over-allocation and/or conflicts in allocation of resources.
- S-curves of overall progress.
- Critical action items list (top 10).

5.8 Contractor's management, supervision, and key people

- 5.8.1 The *Contractor* shall make an adequate, experienced, and stable project team available for the duration of the contract. Every effort must be exercised by the *Contractor* to minimise the replacement of project team members to ensure optimum contract management continuity and efficiency.
- 5.8.2 On an active site, the *Contractor* shall make sure that is always equipped with experienced site supervision to monitor and manage site work force and the works. All active sites will have at a minimum a Site Supervisor/Forman and Health, Safety and Environmental Officer and any engineering support that might be required. They will keep constant communication with the contractor's *Project manager* and Construction manager.
- 5.8.3 The *Contractors* Construction manager will be responsible for all site construction and will have to rotate between active sites.
- 5.8.4 The *Contractor* employs full time, fully qualified and experienced key persons who have been delegated sufficient authority to manage the contract efficiently on-site during completion of the *works* including and not limited to:
- a. Project Manager
 - Project Manager with a minimum Btech/B.Eng. or similar: Engineering & Built Environment with a Post Grad Diploma in project management certificate or

PMP certification. With a minimum of 10 years petrochemical experience.
Must have NEC3 ECC experience or provide supporting documents of
Contracts manager with NEC3 ECC experience.

b. Engineering Manager

- Engineering Manager should have at least have a minimum qualifications Bsc. Eng/B.Tech in Built Environment qualification/s, a minimum of 15 years' experience in construction and building sector. Demonstratable knowledge and experience in successfully managing large infrastructure projects more than R50 Million, preferable in the petrochemical sector, knowledge of the principles, practices and methods of petrochemical engineering and infrastructure design and construction. The engineering manager must be registered with Engineering Council of South Africa (ECSA).

c. Contracts Manager

- The Contracts Manager should at least have a minimum qualification of a Legal/ BSc. Eng./ B.Tech./ National Diploma of a Commercial qualification. The Contracts Manager must have experience working with the NEC3 Engineering and Construction Contract in at least 3 separate projects.

d. Construction Manager

- The Construction Manager should have technical qualification with SACPCMP registration as Pr. CM with at least 10 years of experience in Mechanical projects. The Construction Manager must have experience working with the NEC3 Engineering and Contracts.

e. Site Supervisor/Foreman

- Minimum 10 years of petrochemical experience, training in IRCON, legal liability and hazard identification and risk assessment (HIRA)

f. Planner

- The planner should at least have an Engineering Diploma and a minimum of 5 years' experience working in construction projects as planner.

g. Quality Controller Officer

- Quality Controller official should have a Diploma or Certified qualification in quality systems with relevant quality experience in construction. At least 5 years of experience in a quality systems environment and relevant experience in the following activities: (1) excavations & waste management, (2) civil engineering works, (3) tanks fabrication, transportation, preservation, and

installation works, (5) auxiliary electrical and piping construction projects is required preferably with Oil & Gas projects background.

h. Safety Officer

- Health and Safety Officer should have SAMTRAC, NEBOSH and Modern SHEQ Risk Management (MSRM) training course with accredited health and safety service provider as a minimum qualification and registered as a Health and Safety Officer with SACPCMP. At least 5 years' experience as a Safety, Health and Environmental Officer on construction projects. The SHE must also have undergone Environmental awareness and short courses.

i. Environmental Officer

- Environmental officer should have Diploma/B-tech/Degree in Environmental Management or relevant qualification and at least 3 years experience as Environmental Officer on construction projects.

j. Document Controller

- Document controller should have at least 5 years of experience working in construction and experience working with the NEC3 Engineering and Construction.

k. Security Manager

- A Security Manager should have a Diploma in Security Risk Management or relevant field, i.e. law enforcement.
- PSIRA Grade A registered and valid certificate.
- Two years' experience as a Manager and at least three years as a supervisor.
- Knowledge of the construction site/industrial security.
- Knowledge of relevant security legislation, i.e. Control of Access to Public Premises and Vehicles Act, POPI Act, Dangerous Goods Act, Firearms Control Act, etc.
- Knowledge of the Occupational Health and Safety Act.

5.8.5 The *Contractor* employs personnel listed above but not limited to those mentioned in order to perform the functions of key persons under NEC3 ECC Clause 24.1. These appointments shall have the necessary experience and be suitably qualified.

5.8.6 The *Contractor* provides an Organogram of all his key people (both as required by the *Employer* and as independently stated by the *Contractor* under Contract Data Part Two) and how such key people communicate with the *Project Manager* and the Supervisor and their delegates all as stated at paragraph 2.5 of C3.1 *Employer's Works Information*.

5.9 Training workshops and technology transfer

- 5.9.1 Contractor organises 3 times training per terminal to operate the Fuel Facility.
- 5.9.2 Contractor to provide specific manuals for training according to the Fuel Facility.
- 5.9.3 Contractor Provides Operation and Maintenance specific manual for each Fuel Facility at every terminal.
- 5.9.4 Contractor transfers Databook's, O&M Manuals Maintenance Manual and Training Manuals to the *Employer*.

5.10 The *Contractor's* Invoices

- 5.10.1 When the *Project Manager* certifies payment (see ECC Clause 51.1) following an assessment date, the *Contractor* complies with the *Employer's* procedure for invoice submission.
- 5.10.2 The invoice must correspond to the *Project Manager's* assessment of the amount due to the *Contractor* as stated in the payment certificate.
- 5.10.3 Invoices must be submitted by the 18th of the month forecasted to the 25th of the month.
- 5.10.4 The invoice states the following:
 - Invoice addressed to Transnet SOC Ltd;
 - Transnet SOC Limited's VAT No: 4720103177;
 - Invoice number;
 - Registered name of contractor
 - Address (Physical and Postal) of the Contractor,
 - The *Contractor's* VAT Number; and
 - The Contract number
- 5.10.5 The invoice contains the supporting detail
 - The amount paid to date;
 - Amount for payment (Excluding VAT);
 - VAT amount;
 - Amount for payment (Including VAT)
 - Any Retention monies to be deducted from the invoice;
 - Any Interest payable;
 - Escalation amount formula used where applicable;
 - Settlement discount;
 - Proof of ownership of Materials supplied;
 - A statement is to accompany each invoice
- 5.10.6 The invoice is presented either by post or by hand delivery.
- 5.10.7 Invoices submitted by post are addressed to:

Transnet Port Terminals
202 Anton Lembede Street
Durban
4001

The invoice is presented as an original.

- 5.10.8 The Contractor ensures that The *Employer* has his correct banking information to make the electronic payment transfer.
- 5.10.9 All payments are provisional and subject to audit. The *Contractor* preserves his records for such a period of time as legislation requires, but in any event not less than five (5) years
- 5.10.10 The Employer deducts any amount owed by the Contractor to the *Employer* from any amount payable by The *Employer* to the Contractor.

TECHNICAL EVALUATION						
DESCRIPTION OF THE WORKS: Design, Refurbish, Supply, Delivery, Installation, Testing and Commissioning of Fuel Facilities for Transnet SOC Ltd (Reg. No. 1990/000900/30) Operating as Transnet Port Terminals, (Hereinafter Referred to as "TPT") at various Port Terminals (National).						
Evaluation Criteria	Description	Supporting Documents	Scoring Principal	Returnable Schedule	Criteria	Weighting
Eligibility Criteria	CIDB 8 ME	Attach supporting documents	Yes or No	T2.2-03	Attach Certificate	N/A
	A level 2 Inspector –registered with Southern African Institute of Welding (SAIW) in welding and fabrication.	Attach supporting documents	Yes or No			
	An American Petroleum Institute (API) 653 Tank Inspector	Attach supporting documents	Yes or No			
	An Approved Inspection Authority (AIA) inspector	Attach supporting documents	Yes or No			
	An International Organization of Standardization (ISO) 3834 Part 2 certificate	Attach supporting documents	Yes or No			
	An International Organization of Standardization (ISO) 9001 -2015	Attach supporting documents	Yes or No			
Engineering & CVs	Description	Scoring Principal	Score	T2.2-05	CV	15
	Profession	Qualifications	Points			
	Organogram	A comprehensive and detailed organogram that shows the structure and composition of their management structure involved in the works, inclusive of the key staff/professionals, identified in the Contract Data Part two.	2,5			
		A comprehensive and detailed organogram that shows the structure and composition of their management structure involved in the works, inclusive of the key staff/professionals, identified in the Contract Data Part two.	3			
	Health and Safety Officer	Health and Safety Officer should have SAMTRAC, NEBOSH and Modern SHEQ Risk Management (MSRM) training course with accredited health and safety service provider as a minimum qualification and registered as a Health and Safety Officer with SACPCMP. At least 5 years' experience as a Safety, Health and Environmental Officer on construction projects. The SHE must also have undergone Environmental awareness and short courses.	7,5			
	Environmental Officer	Minimum 3 yrs. petrochemical/construction experience.				
	Document Controller	Years of experience				
Health and Safety	Project Planner	ND: Engineering and minimum 5 years' experience in planning, accompanied by Primavera or Microsoft Project certificate		T2.2-06	Health and Safety	10
	Project Specific Safety Plan	Documented Health and Safety Plan in accordance with Transnet Project Health and Safety Specifications.	2			
	Safety Policy (State points allocated)	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.	1			
	Roles & Responsibilities	S16.2 CEO, 8.1 Construction manager, 8.2 Assistant Construction manager, 8.5 Safety officer Registered with the SACPCMP, 8.7 Construction Supervisor	1			
	Training Matrix	List of job categories for project and competencies required per category and develop a training Matrix for all employees who will be working on the project. This matrix must include Management and highlight training planned dates.	1			
	Overview of the Baseline	Indicating major activities of the project namely: Isolate, discharge, drain and bleed the underground tank and lines to zero energy state, Blank off from the inlet and outlet then perform pressure test on an tank, vessel entry, re-fueling of tanks Soil Testing to determine. Perform Non Destructive Test (NDT) to determine corrosion factors within the internals/externals, material thickness and cracks within the internal/external.	2			
	One year synopsis	SHE incidents, description, type and action taken to prevent re-occurrence.	1			
	Safety Questionnaire	Complete and return with tender documentation the Contractor with required supporting documentation included as an Annexure.	1			
Quality Management	Cost Breakdown Sheet	Submission of completed cost breakdown sheet.	1	T2.2-07	Quality Management	10
	Project Quality Plan	Project Quality Plan specifically produced for this scope of works as per project specification STD-QAL-0001 (Please refer to Annexure C for specification).	2			
		Index of procedures (Quality and relevant construction) to be used during the contract.	2			
		Project Specific Quality Control Plans.	2			
		Quality Data book index MUST cover all disciplines of the project scope including relevant tests and certifications to be provided	2			
Security Management	A detailed Security management Plan is required	Order and timing of the audits, inspection and design milestones that will take place in order to provide the Works.	2	T2.2-08	Security Management	5
Environmental Management		1. Physical Security Layout	5	T2.2-09	Environmental Management	5
		Environmental policy signed by Senior Management	2,5			
	Environmental method statements which describe relevant roles and responsibilities and how the tenderer intends to manage and mitigate potential environmental impacts including the monitoring and recording.	Environmental method statements which describe relevant roles and responsibilities and how the tenderer intends to manage and mitigate potential environmental impacts including the monitoring and recording. These include, but are not limited to, the following where applicable: •Site establishment and demarcation •Hazardous and non-hazardous waste management •Prevention of marine pollution •Environmental awareness training •Emergency procedures for environmental incident •Rehabilitation	2,5			
Previous Experience				T2.2-10	Previous Experience	5
Programme	Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience	Tenderers are required to demonstrate their past experience in the delivery of similar projects, areas, conditions and circumstances in relation to the scope of work in the last 5 years indicating their previous experience showing but not limited	5	T2.2-11	Programme	20
		Ability to provide the services in terms of the Employer's requirements within the required timeframe as stated in the Works Information and Tender Data by indicating, in a logical sequence, the order, the timing, and the duration of the works that will take place in order to Provide the Works.	10			
	The tenderer shall provide the proposed programme, at a minimum Level 3	The Contractor clearly indicates in the schedule all milestones, activities & information related to the following – 1. Float, 2. Time Discrepancies	5			
Method Statement	The Tenderer must sufficiently demonstrate the approach/methodology that he/she will employ to cover the scope of the project in a method statement	The Programme must clearly support and demonstrate full alignment to the Approach Paper as contained under T.2.2-12	5	T2.2-12	Method Statement	30
		• Machinal work, new installation including piping and tank	5			
		• Demolition Work;	5			
		• Electrical and Instrumentation Work;	5			
		• Civil works;	5			
		• Fire fighting works	5			
TOTAL RATING		• Design Work, whether process is internal or external (clearly state interface procedure if design work is given to a third party);	5			100
Technical Qualification Threshold = 80%						
Compiled and Recommended by						
Lead Execution Project Manager		Recommend by	Approved by			
Sphamandla Mathonsi		Executive Manager: Head of Equipment Engineering	Executive Manager: Head of Infrastructure Engineering			
Signature		Richard Shandu	Akil Maharaj			



TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Cape Town Container Terminal (CTCT)

The site is in the Port of Cape Town, Western Cape. CTCT currently uses diesel to support its operations which includes dry bulk and break-bulk containers. The equipment that uses diesel includes ship loader cranes, reach stackers, rail truck gantries (RTG), reefers, haulers, pay loaders, dumper trucks, back actors, BOB CATS, brooms, sweepers, forklifts, transport buses, double cap vans, cars, generators etc.

Access is available through the main TNPA and TPT Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

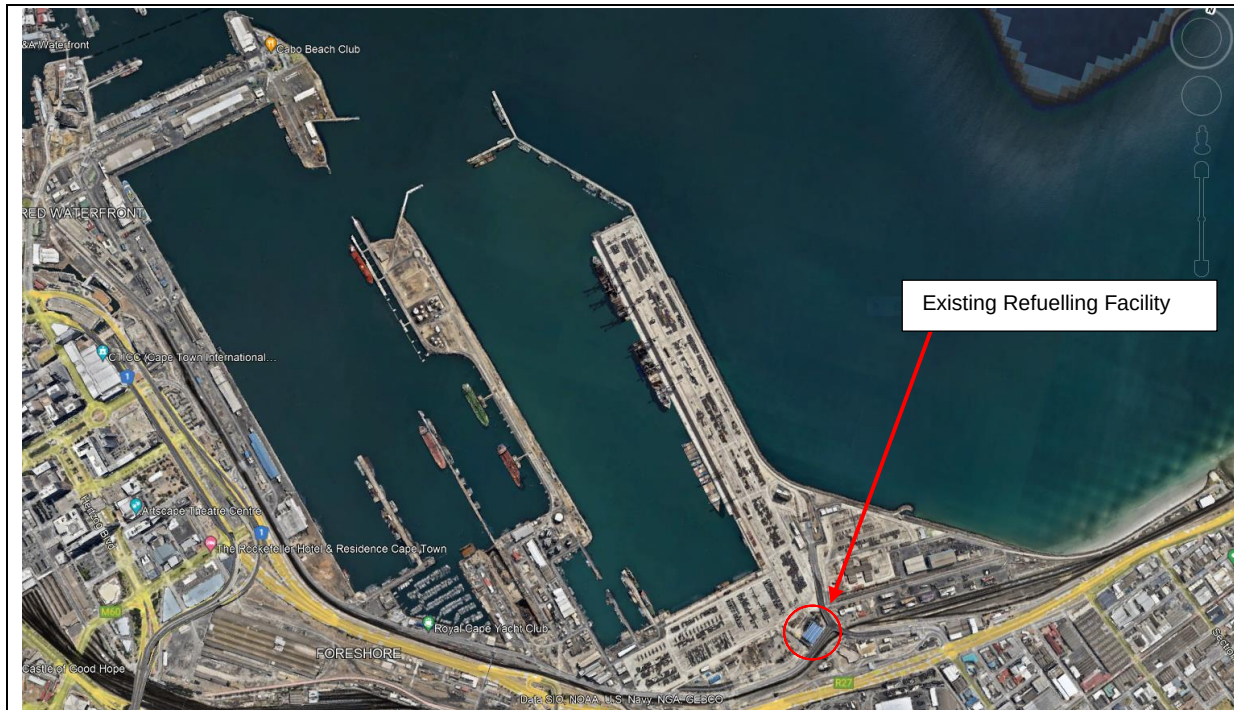
CTCT site is situated next to Workshop 17 which is used for maintaining terminal equipment. The site is located within 50m of the Sea and is used to ship containerised cargo. During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.



TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY



1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

Should there be a need to use a crane, Cape Town wind conditions make it dangerous to work at high elevation therefore when the wind speed is too high the contractor will stop work until it is safe to work.

Rain weather may also lead to delays.



TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 50m of the construction site.





TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Cape Town Multi Terminal (CTMPT)

The site is in the Port of Cape Town, Western Cape. The Terminal's core business is to import and export a large range of cargoes including bulk, break bulk, containerised and general cargo. The equipment used within this area is of a heavy port nature, including straddle carriers, haulers and trailers, 45-ton Reach Stackers and mobile harbour cranes, rail truck gantries (RTG), reefers, pay loaders, dumper trucks, forklifts, transport buses, double cap vans, cars, generators etc.

Access is available through the main TNPA and TPT Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

CTMPT site is situated next to H Shed which is used to store. The site is located within 50m of the Sea. During the construction work, CTMPT will utilise a CTCT fuel facility.



TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY



1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

Should there be a need to use a crane, Cape Town wind conditions make it dangerous to work at high elevation therefore when the wind speed is too high the contractor will stop work until it is safe to work.

Rain weather may also lead to delays.



TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 50m of the construction site.



TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Durban Point Terminal

Port of Durban Bulk, Break Bulk and Car Terminal (BBC Terminal) is made up of Point Terminal, Agri-Port Terminal, and Maydon Wharf Terminal. The Terminal's core business is to import and export a large range of cargoes including cars, containerised and general cargo.

TPT has various cargo handling equipment such as haulers, trailers, reach stackers and mobile harbour cranes, forklifts to facilitate the movement of the cargo to and from the Quayside and transfer it to sheds, warehouses, railway wagons, trucks, etc. The said equipment uses diesel to operate, however most of it does not have license to operate in the public road. TPT has fuel tank facilities across all the terminals to service their equipment.

Access is available through the main TNPA and TPT Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

The existing tank is located at Durban Point Terminal, it is surrounded by stacking areas, and moving machinery. The vicinity of the tank has a traffic flow of the cargo handling equipment, trucks as well as the employees'. Port users access to and from the surrounding area shall be always maintained in a safe manner. During the construction work, the terminal will utilise a temporal fuel facility.



TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)



Figure 1: Source: Google Earth – (1) Proposed Site for a temporal tank (2) Proposed Site Offices (3) Existing Tank

Note: TPT will clear the site for the contractor to be able to establish site offices and erect temporal tanks.

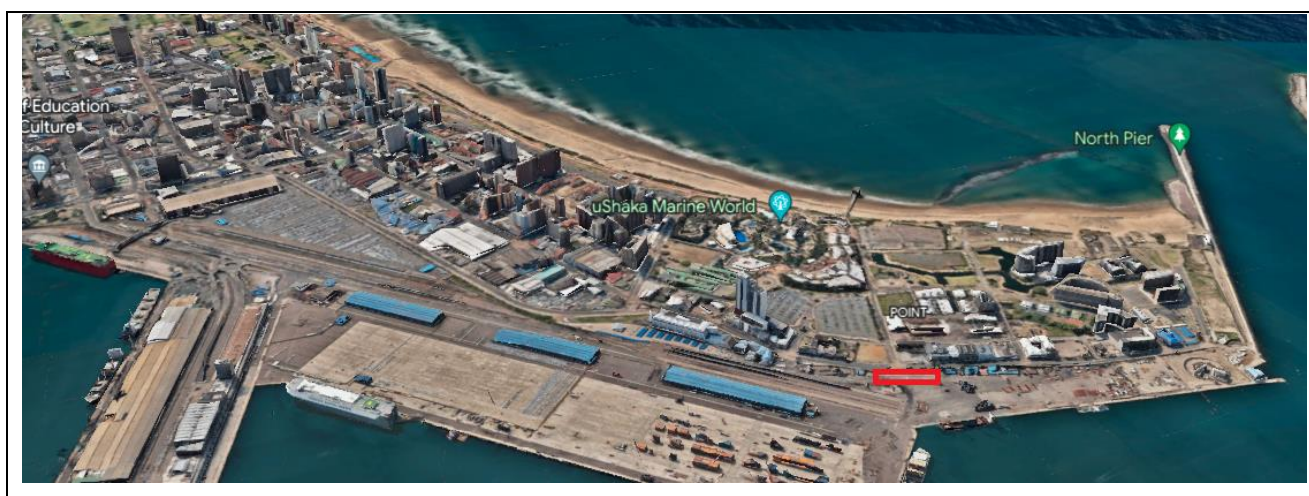


Figure 2: Source: Google Earth – Arial view for Point Terminal

1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility. Traffic management will be applicable to all sites and Client's access to and from the surrounding area shall be always maintained in safe manner.

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 50m of the construction site.

TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Durban Container Terminal (DCT, Pier 1)

The site is in the Port of Durban, KwaZulu-Natal, Durban Container Terminal / DCT, Pier 1. The container terminal plays a strategic role in the South African Economy by enabling efficient flow of imports and exports through its cargo terminal operations.

TPT has various cargo handling equipment such as forklifts, haulers, straddle carriers, rubber tyre guntrees (RTG's), empty container handlers, reach stackers to facilitate the movement of the cargo to and from the Quayside and transfer it to sheds, warehouses, railway wagons, trucks, etc. The said equipment uses diesel to operate, however most of it does not have license to operate in the public road. TPT has fuel tank facilities across all the terminals to service their equipment.

Access is available through the main TNPA and TPT Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contract.

1.2. Existing buildings, structures, and plant & machinery on the Site

DCT, Pier 1 existing site (site 1) is situated next to Pier 1 security boom gate entrance leading to Bhukulwandle Staff Facility Building and EES Offices, it is also adjacent to the main road (Bayhead Road), therefore there is a traffic flow of the cargo handling equipment, trucks as well as the employees' entering offices. The site is located within 200m from the Sea water. Client's access to and from the surrounding area shall be always maintained in a safe manner.

Site 2: Proposed site offices is next to Bhukulwandle Staff Facility Building, it is also adjacent next to the road leading to Bhukulwandle Staff Facility Building and EES Offices, therefore there is a traffic flow of the staff shuttle, employees' vehicles entering offices. The site is located within 200m from the Sea water. Client's access to and from the surrounding area shall be always maintained in a safe manner.

Site 3: Proposed site offices is next to Bhukulwandle Staff Facility Building, it is also adjacent next to the road leading to Bhukulwandle Staff Facility Building and EES Offices, therefore there is a traffic flow of the staff shuttle, employees' vehicles entering offices. The site is located within 200m from the Sea water. Client's access to and from the surrounding area shall be always maintained in a safe manner.



TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)



Figure 1: Source: Google Earth – (1) Existing Tank (2) Proposed Site Offices (3) Proposed Site for a new Installation



Figure 2: Source: Google Earth – Arial view for DCT, Pier 1

1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility. Traffic management will be applicable to all sites and Client's access to and from the surrounding area shall be always maintained in safe manner.

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 100m of the construction site.

TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Durban Container Terminal (DCT, Pier 2)

The site is in the Port of Durban, KwaZulu-Natal, Durban Container Terminal / DCT, Pier 2. The container terminal plays a strategic role in the South African Economy by enabling efficient flow of imports and exports through its cargo terminal operations.

TPT has various cargo handling equipment such as forklifts, haulers, straddle carriers, rubber tyre guntrees (RTG's), empty container handlers, reach stackers to facilitate the movement of the cargo to and from the Quayside and transfer it to sheds, warehouses, railway wagons, trucks, etc. The said equipment uses diesel to operate, however most of it does not have license to operate in the public road. TPT has fuel tank facilities across all the terminals to service their equipment.

Access is available through the main TNPA and TPT Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contract

1.2. Existing buildings, structures, and plant & machinery on the Site

DCT, Pier 2 existing site is situated next to various equipment workshops, therefore there is a traffic flow of the cargo handling equipment as the employees' entering the workshops. Port users' access to and from the surrounding area shall be always maintained in a safe manner.



TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)



Figure 1: Source: Google Earth – Existing Tanks and Proposed Site Offices

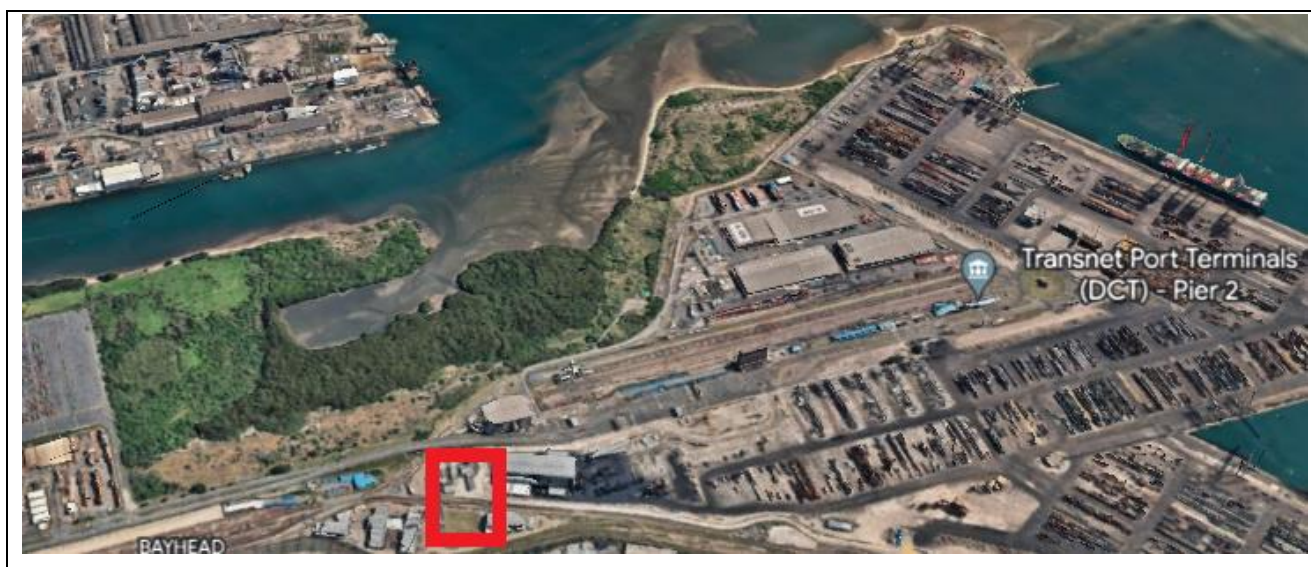


Figure 2: Source: Google Earth – Arial view for DCT, Pier 2

1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility. Traffic management will be applicable to all sites and Client's access to and from the surrounding area shall be always maintained in safe manner.

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 200m of the construction site.

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – East London Multi Purpose Terminal (EL MPT)

The site is in the Port of East London, Eastern Cape. EL MPT currently uses diesel to support its operations. The equipment that uses diesel includes Straddle Carriers, forklifts, bakkies, cars, generators etc.

Access is available through the main TNPA Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

EL MPT site is situated behind CPO building offices just opposite the gate for Livestock truck operations. During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.



TRANSNET PORT TERMINALS

TENDER NUMBER:

DESCRIPTION OF THE WORKS: FUEL STORAGE AT THE EAST LONDON MULTI PURPOSE TERMINAL OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT")

1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.

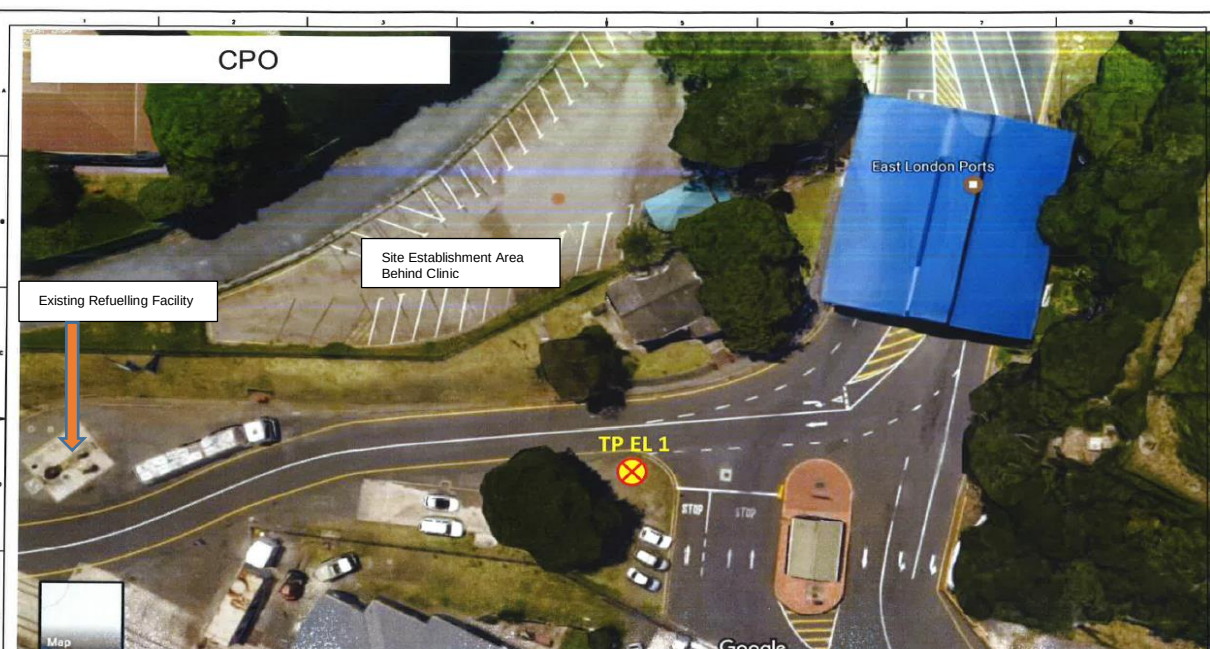
It is envisaged that the contraction site will be available to the contractor through the duration of the works.

Should there be a need to use a crane, East London wind conditions make it dangerous to work at high elevation therefore when the wind speed is too high the contractor will stop work until it is safe to work.

Rain weather may also lead to delays.

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 50m of the construction site.



TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)

PART 4: SITE INFORMATION

Core clause 11.2(16) states

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In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Maydon Wharf Terminal (Durban)

Maydon Wharf and AGRI terminal form part of Bulk, Break Bulk and Car (BBC) Terminal in Durban. Transnet Port Terminals' (TPT) Maydon Wharf and AGRI terminal are situated in the Maydon Wharf precinct in the Port of Durban. The terminal footprint is aligned to six (6) berths, namely, MW7 to MW12 with storage facilities and sheds with additional common user berths MW1 to MW14. The Agriport Terminal imports and exports agricultural products such as wheat, maize, soya beans, soya bean meal and woodchips while Maydon Wharf Terminal operates as import and export facility for neo-bulk cargo i.e., Manganese Ore, Ferro Chrome, Chrome Ore, Anthracite Ore, etc.

TPT has various cargo handling equipment such as forklifts, haulers to facilitate the movement of the cargo to and from the Quayside and transfer it to sheds, warehouses, railway wagons, trucks, etc. The said equipment uses diesel to operate, however most of it does not have license to operate in the public road. TPT has fuel tank facilities across all the terminals to service their equipment.

Access is available through the main TNPA and TPT Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

The existing tank is located at Maydon Wharf, it is surrounded by workshops, stacking areas, and moving machinery. The area is generally dusty due to the cargo that is stored in the terminal. The vicinity of the tank has a traffic flow of the cargo handling equipment, trucks as well as the employees' entering workshops. Client's access to and from the surrounding area shall be always maintained in a safe manner. During the construction work, the terminal will utilise a temporal fuel facility.



TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)



Figure 1: Source: Google Earth – (1) Proposed Site for a temporal tank (2) Proposed Site Offices (3) Existing Tank

Note: TPT will clear the site for the contractor to be able to establish site offices and erect temporal tanks.



Figure 2: Source: Google Earth – Aerial view for Maydon Wharf Terminal

TRANSNET PORT TERMINALS

NUMBER: ICLM HQ XXX/TPT

DESCRIPTION OF THE WORKS: DESIGN, REFURBISH, SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF FUEL FACILITIES FOR TRANSNET SOC LTD (REG.NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT") AT VARIOUS PORT TERMINALS (NATIONAL)

1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility. Traffic management will be applicable to all sites and Client's access to and from the surrounding area shall be always maintained in safe manner.

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 50m of the construction site.



TRANSNET PORT TERMINALS

TENDER NUMBER:

DESCRIPTION OF THE WORKS: FUEL STORAGE AT THE PORT OF NGQURA CONTAINER TERMINAL OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT")

PART 4: SITE INFORMATION

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1. Description of the Site and its surroundings

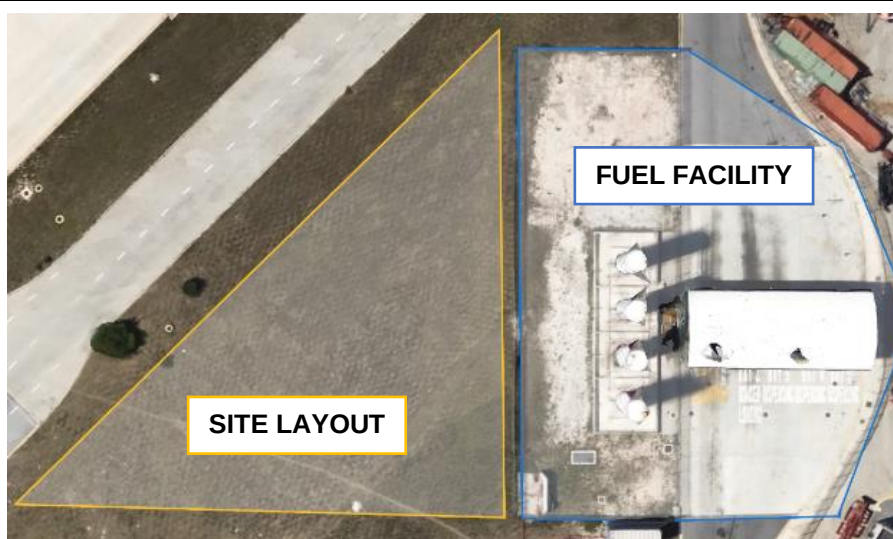
1.1. General description – Ngqura Terminal (NCT)

The site is in the Port of Ngqura, Eastern Cape. NCT currently uses diesel to support its operations. The equipment that uses diesel includes RTG'S, Haulers, Reach Stackers, Empty Container handlers, forklifts, tractors, bakkies, generators etc.

Access is available through the main TNPA Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

NCT site is situated just before the entrance to the hauler zone workshop building. Refurbishment work, will have to be conducted in sections to be able to utilise the facility to support to Terminal demand.



TRANSNET PORT TERMINALS

TENDER NUMBER:

DESCRIPTION OF THE WORKS: FUEL STORAGE AT THE PORT OF NGQURA CONTAINER TERMINAL OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT")

1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

1.5. Other reports and publicly available information

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

Should there be a need to use a crane, Ngqura wind conditions make it dangerous to work at high elevation therefore when the wind speed is too high the contractor will stop work until it is safe to work.

Rain weather may also lead to delays.

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 50m of the construction site.





TRANSNET PORT TERMINALS

TENDER NUMBER:

DESCRIPTION OF THE WORKS: FUEL STORAGE AT THE PORT OF PORT ELIZABETH CONTAINER TERMINAL OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT")

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Port of Port Elizabeth Terminal (PECT)

The site is in the Port of Port Elizabeth, Eastern Cape. PECT currently uses diesel to support its operations. The equipment that uses diesel includes Straddle Carriers, forklifts, bakkies, breakbulk, generators etc.

Access is available through the main TNPA Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

PECT site is situated behind Straddle workshop building. During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.



TRANSNET PORT TERMINALS

TENDER NUMBER:

DESCRIPTION OF THE WORKS: FUEL STORAGE AT THE PORT OF PORT ELIZABETH CONTAINER TERMINAL OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT")

1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.

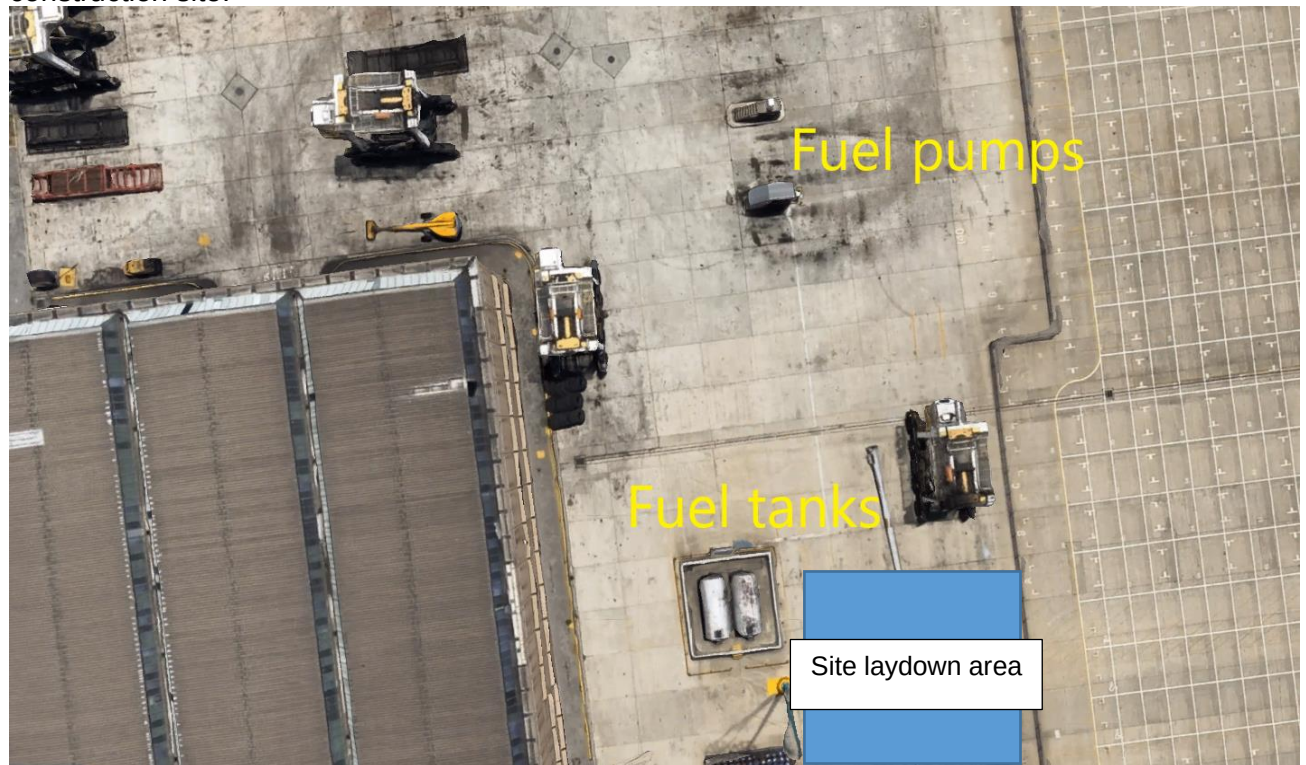
It is envisaged that the contraction site will be available to the contractor through the duration of the works.

Should there be a need to use a crane, Port Elizabeth wind conditions make it dangerous to work at high elevation therefore when the wind speed is too high the contractor will stop work until it is safe to work.

Rain weather may also lead to delays.

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within 50m of the construction site.





TRANSNET PORT TERMINALS

TENDER NUMBER:

DESCRIPTION OF THE WORKS: FUEL STORAGE AT THE PORT OF PORT ELIZABETH CONTAINER TERMINAL OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT")

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Richards Bay Terminal

The site is in the Port of Richards Bay, KwaZulu Natal. Transnet Port Terminals is a division of Transnet SOC Limited whose core business is to provide cargo handling to a wide spectrum of customers, including shipping lines freight forwarders and cargo owners. Operations are divided into five major business segments, namely containers, bulk, break bulk, automotive and agriculture. The PORB consists of a Dry Bulk Terminal (DBT), a Multi-Purpose Terminal (MPT) and other privately-operated coal terminals, wood chip export terminals and liquid bulk terminals.

Access is available through the main TNPA and TPT Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

The site is situated next to old MHA building which is used for mess and ablution for the service drivers. During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility at Umkhombe building.



TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY



1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY

Should there be a need to use a crane, Richards Bay wind conditions make it dangerous to work at high elevation therefore when the wind speed is too high the contractor will stop work until it is safe to work.

Rain weather may also lead to delays.

1.6. Site Establishment

During the constructions works, the contractor site establishment will be situated within the construction site.





TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY

PART 4: SITE INFORMATION

Core clause 11.2(16) states

"Site Information is information which

- describes the Site and its surroundings and
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In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

1. Description of the Site and its surroundings

1.1. General description – Saldanha Multi-Purpose Terminal (SLD MPT)

The site is in the Port of Saldanha, Western Cape. The Multipurpose Terminal handles both containers and cargo that are not containerized. The terminal was designed to handle break bulk shipments via a skip process. Various types of commodities are loaded and transported internally. The equipment used within this area is of a heavy port nature, including straddle carriers, haulers and trailers, 45-ton Reach Stackers and mobile harbour cranes, rail truck gantries (RTG), reefers, front end loaders, dumper trucks, forklifts, transport buses, double cap vans, cars, generators etc.

Access is available through the main TNPA and TPT Security check points. At all times the Contractor will familiarise and adhere to ALL Employers (TPT) rules and regulations regarding security / access control. The Contractor shall however be responsible for his / her own security and the Employer (TPT) will not be held liable / responsible for any stolen / lost property, tools, and equipment by the Contractor.

1.2. Existing buildings, structures, and plant & machinery on the Site

SLD MPT site is situated next to Warehouse 1 and 2 which is used to store manganese. The site is located within 50m of the Sea. During the construction work, SLD MPT will utilise a temporary fuel facility.





TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY

1.3. Subsoil information

The contractor will need to perform necessary tests as indicated in the works information.

1.4. Hidden services

The contractor will need to perform necessary tests as indicated in the works information.

1.5. Other reports and publicly available information

During the refurbishment work, Transnet will utilise a temporary facility as fuelling facility.

TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY

It is envisaged that the contraction site will be available to the contractor through the duration of the works.

Should there be a need to use a crane, Western Cape wind conditions make it dangerous to work at high elevation therefore when the wind speed is too high the contractor will stop work until it is safe to work.

Rain weather may also lead to delays.

1.6. Site Establishment

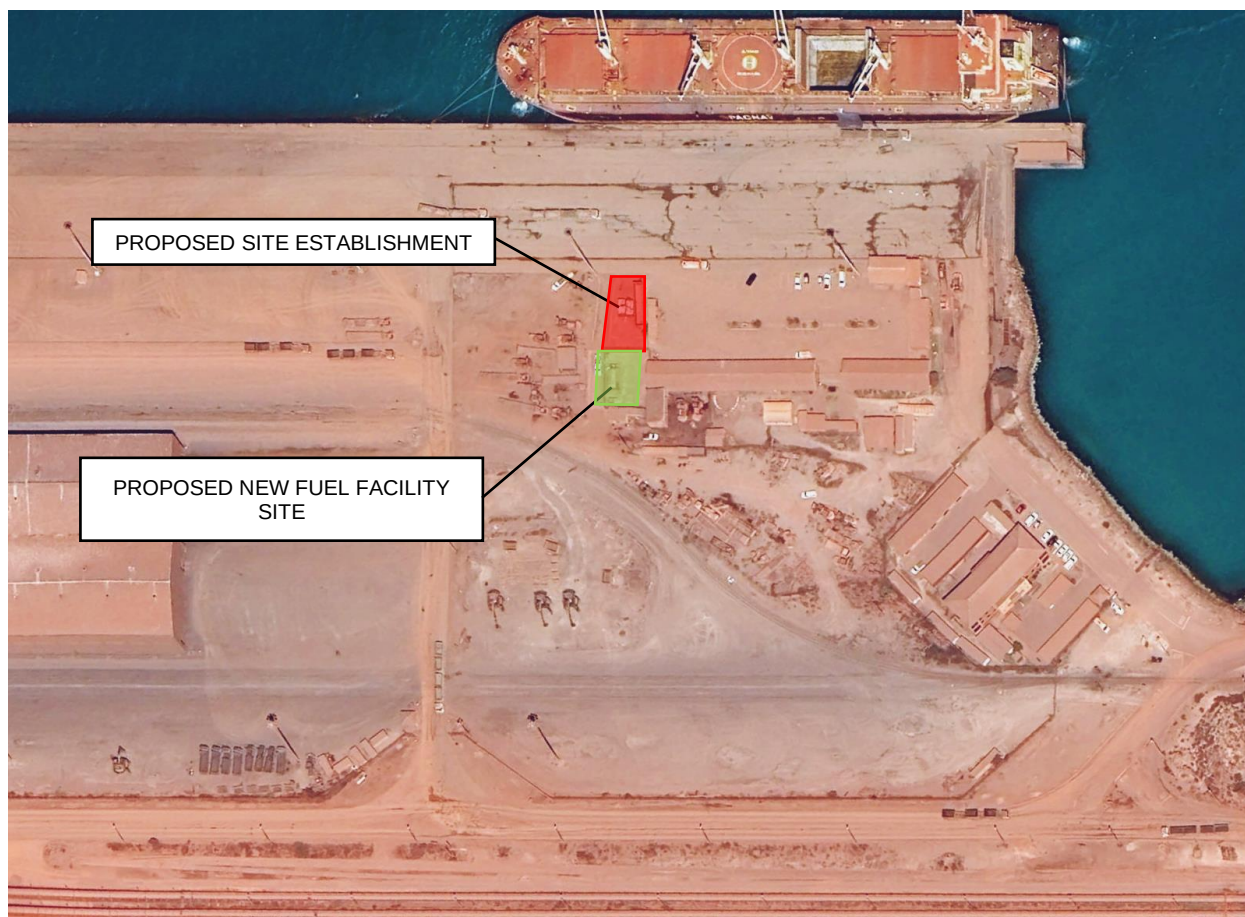
During the constructions works, the contractor site establishment will be situated within 50m of the construction site.



TRANSNET PORT TERMINALS

TENDER NUMBER: iCLM HQ 493/TPT

DESCRIPTION OF THE WORKS: THE STRUCTURAL REPAIRS AND CORROSION PROTECTION OF 3 STS CRANES AT THE PORT OF DURBAN CONTAINER TERMINAL PIER 1 OF TRANSNET SOC LTD (REG. NO 1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS (HEREINAFTER REFERRED TO AS "TPT"), AS A ONCE OFF SUPPLY





C1.3 Forms of Securities

Pro forma Performance Guarantee

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

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

Option X13: Performance bond

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

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

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

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

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

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

Transnet SOC Ltd
C/o Transnet
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.
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

Signed at _____ on this _____ day of _____ 201__

Signature(s)

Name(s) (printed)

Position in Guarantor company

Signature of Witness(s)

Name(s) (printed)

Annexure A- B-BBEE IMPROVEMENT PLAN

Transnet encourages its Suppliers/Service Providers to constantly strive to improve their B-BBEE rating. Whereas Respondents will be allocated points in terms of a preference point system based on its B-BBEE scorecard, in addition to such scoring, Transnet also requests that Respondents submit a B-BBEE improvement plan. Respondents are therefore requested to indicate the extent to which the elements of their B-BBEE scorecard will be maintained or improved over the contract period. This intent is to be submitted with their Bid proposal in the form of a B-BBEE Improvement Plan.

Respondents are to insert their current status (%) and future targets (%) for the B-BBEE Improvement Plan [i.e. not the % change but the end-state quantum expressed as a percentage] in the table below. This will indicate how you intend to sustain or improve your B-BBEE rating over the contract period. On agreement, this will represent a binding commitment to the successful Respondent.

Transnet reserves the right to request supporting evidence to substantiate the commitments made in the B-BBEE Improvement Plan.

OWNERSHIP INDICATOR	Required Responses	Current Status (%)	Future Target (%)
1. The percentage of the business owned by Black ¹ persons.	<i>Provide a commitment based on the extent to which ownership in the hands of Black persons as a percentage of total ownership of the organisation would be sustained or increased over the contract period.</i>		
2. The percentage of your business owned by Black women.	<i>Provide a commitment based on the extent to which ownership in the hands of Black women as a percentage of total ownership of the organisation would be sustained or increased over the contract period.</i>		
3. The percentage of the business owned by Black youth ²	<i>Provide a commitment based on the extent to which ownership in the hands of Black youth as a percentage of total ownership of the organisation would be sustained or increased over the contract period.</i>		
4. The percentage of the business owned by Black persons living with disabilities	<i>Provide a commitment based on the extent to which ownership in the hands of Black disabled persons as a percentage of total ownership of the organisation would be sustained or increased over the contract period.</i>		
5. New Entrants ³ (Early stage business)	<i>Provide a commitment based on the extent to which new entrants will be supported over the contract period.</i>		

¹ "Black" means South African Blacks, Coloureds and Indians, as defined in the B-BBEE Act, 53 of 2003

² "Black youth" means Black persons from the age of 16 to 35

³ "New Entrants" means an early stage business which is similar to a start-up. However, an early stage business is typically 3 years old or less.

MANAGEMENT CONTROL INDICATOR	Required Responses	Current Status (%)	Future Targets (%)
6. The percentage of Black Board members in relation to the total number of Board members	<i>Provide a commitment based on the extent to which the number of Black Board members, as a percentage of the total Board, would be sustained or increased over the contract period.</i>		
7. The percentage of Black female Board members in relation to the total number of Board members	<i>Provide a commitment based on the extent to which the number of Black female Board members, as a percentage of the total Board, would be sustained or increased over the contract period.</i>		
8. Black Executives directors as a percentage of all executive directors	<i>Provide a commitment based on the extent to which the number of Black executive Directors as a percentage of all Executive Directors would be sustained or increased over the contract period.</i>		
9. Black female Executives directors as a percentage of all executive directors	<i>Provide a commitment based on the extent to which the number of Black female executive Directors as a percentage of all Executive Directors would be sustained or increased over the contract period.</i>		
Other Executive Management	Required Response	Current Status (%)	Future Targets (%)
10. Black Executive Management as a percentage of all executive directors	<i>Provide a commitment based on the extent to which the number of Black executive Managers as a percentage of all Executive Directors would be sustained or increased over the contract period.</i>		
11. Black Female Executive Management as a percentage of all executive directors	<i>Provide a commitment based on the extent to which the number of Black female executive Managers as a percentage of all Executive Directors would be sustained or increased over the contract period.</i>		
Senior Management	Required Response	Current Status (%)	Future Targets (%)
12. Black employees in Senior Management as a percentage of all senior management	<i>Provide the percentage of Blacks that would be appointed or retained by the Board and would be operationally involved in the day to day senior management of the business, with individual responsibility for overall and/or financial management of the business and actively involved in the development and implementation of overall strategy, over the contract period.</i>		
13. Black female employees in Senior Management as a percentage of all senior management	<i>Provide the percentage of Black females that would be appointed or retained by the Board and would be operationally involved in the day to day senior management of the business, with individual responsibility for overall and/or financial management of the business and actively involved in the</i>		

	<i>development and implementation of overall strategy, over the contract period.</i>		
Middle Management	Required Response	Current Status (%)	Future Targets (%)
14. Black employees in Middle Management as a percentage of all middle management	<i>Provide the percentage of Blacks that would be retained or appointed by the organisation in the middle management cadre and would be operationally involved in the day to day management of the business, with individual responsibility for a particular area within the business and actively involved in the day to day management of the organisation, over the contract period.</i>		
15. Black female employees in Middle Management as a percentage of all middle management	<i>Provide the percentage of Blacks females that would be retained or appointed by the organisation in the middle management cadre and would be operationally involved in the day to day management of the business, with individual responsibility for a particular area within the business and actively involved in the day to day management of the organisation, over the contract period.</i>		
Junior Management	Required Response	Current Status (%)	Future Targets (%)
16. Black employees in Junior management as a percentage of all junior management	<i>Provide a commitment based on the extent to which the number of Black Junior Managers as a percentage of the total junior Managers, would be sustained or increased over the contract period.</i>		
17. Black female employees in Junior management as a percentage of all junior management	<i>Provide a commitment based on the extent to which the number of Black female Junior Managers as a percentage of the total junior Managers, would be sustained or increased over the contract period.</i>		
Employees with disabilities	Required Response	Current Status (%)	Future Targets (%)
18. Black employees with disabilities as a percentage of all employees	<i>Provide a commitment based on the extent to which the percentage of Black disabled employees, in relation to the total of all employees in the organisation, would be sustained or increased over the contract period.</i>		
PREFERENTIAL PROCUREMENT INDICATOR	Required Responses	Current Status (%)	Future Targets (%)
19. B-BBEE procurement spend	<i>Provide a commitment based on the extent</i>		

	from all Empowering Suppliers ⁴ based on the B-BBEE procurement recognition level as a percentage of total measured procurement spend	<i>to which B-BBEE spend from all Empowering Suppliers would be sustained or increased over the contract period.</i>		
20.	B-BBEE procurement spend from all Empowering Suppliers QSEs based on the applicable B-BBEE Procurement Recognition Levels as a percentage of Total Measured Procurement Spend	<i>Provide a commitment based on the extent to which B-BBEE spend from Empowering Supplier QSEs would be sustained or increased over the contract period</i>		
21.	B-BBEE procurement spend from Exempted Micro-Enterprise based on the applicable B-BBEE procurement recognition Levels as a percentage of Total Measured Procurement Spend	<i>Provide a commitment based on the extent to which B-BBEE spend from EMEs would be sustained or increased over the contract period</i>		
22.	B-BBEE procurement spend from Empowering Suppliers that are at least 51% black owned based on the applicable B-BBEE Procurement Recognition Levels as a percentage of Total Measured Procurement Spend	<i>Provide a commitment based on the extent to which spend from Empowering Suppliers who are more than 51% Black-owned would be maintained or increased over the contract period.</i>		
23.	B-BBEE procurement spend from Empowering Suppliers that are at least 30% black women owned based on the applicable B-BBEE Procurement Recognition Levels as a percentage of Total Measured Procurement Spend	<i>Provide a commitment based on the extent to which spend from Empowering Suppliers who are more than 30% Black women-owned would be maintained or increased over the contract period.</i>		
24.	B-BBEE Procurement Spent from Designated Group ⁵	<i>Provide a commitment based on the extent to which spend from suppliers from</i>		

⁴ **"Empowering Suppliers"** means a B-BBEE compliant entity, which should meet at least three of the following criteria if it is a Large Enterprise or one if it is a QSE:

(a) At least 25% of cost of sales excluding labour cost and depreciation must be procured from local producers or local supplier in SA, for service industry labour cost are included but capped to 15%.

(b) Job creation - 50% of jobs created are for Black people provided that the number of Black employees since the immediate prior verified B-BBEE Measurement is maintained.

(c) At least 25% transformation of raw material/beneficiation which include local manufacturing, production and/or assembly, and/or packaging.

(d) Skills transfer - at least spend 12 days per annum of productivity deployed in assisting Black EMEs and QSEs beneficiaries to increase their operation or financial capacity.

⁵ **"Designated Groups"** means:

a) unemployed black people not attending and required by law to attend an educational institution and not awaiting admission to an educational institution;

b) black people who are youth as defined in the National Youth Commission Act of 1996;

c) black people who are persons with disabilities as defined in the Codes of Good Practice on employment of people with disabilities issued under the Employment Equity Act;

Suppliers that are at least 51% Black owned	<i>Designated Group Suppliers that are at least 51% Black owned would be maintained or increased over the contract period.</i>		
SUPPLIER DEVELOPMENT INDICATOR	Required Response	Current Status (%)	Future Target (%)
25. Annual value of all Supplier Development ⁶ Contributions made by the Measured entity as a percentage of the target	<i>Provide a commitment based on the percentage in your organisation's annual spend on Supplier Development initiatives, will be maintained or improved over the contract period.</i>		
ENTERPRISE DEVELOPMENT INDICATOR	Required Response	Current Status (%)	Future Target (%)
26. The organisation's annual spend on Enterprise Development ⁷ as a percentage of Net Profit after Tax [NPAT]	<i>Provide a commitment based on the retention or increase in your organisation's annual spend on Enterprise Development initiatives, as a percentage of its Net Profit after Tax, over the contract period.</i>		

d) black people living in rural and under developed areas; and

e) black military veterans who qualifies to be called a military veteran in terms of the Military Veterans Act 18 of 2011.

⁶ **"Supplier Development"** means monetary or non-monetary contributions carried out for the benefit of value-adding suppliers to the Measured Entity, with the objective of contributing to the development, sustainability and financial and operational independence of those beneficiaries:

(a) Supplier Development Contributions to suppliers that are Exempted Micro-Enterprises or Qualifying Small Enterprises which are at least 51% black owned or at least 51% black women owned.

Supplier Development within the contest of the B-BBEE scorecard must be differentiated from Transnet's Supplier Development Initiatives. Whereas the former relates to the definition above, the latter relates to improving the socio-economic environment through initiatives that are committed to as part of a contract award that contribute to the development of a competitive supplier base in relation to a particular industry.

⁷ **"Enterprise Development"** means monetary and non-monetary contributions carried out for the following beneficiaries, with the objective of contributing to the development, sustainability and financial and operational independence of those beneficiaries:

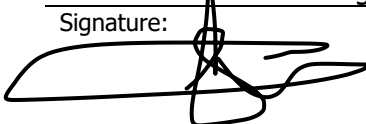
(a) Enterprise Development Contributions to Exempted Micro-Enterprises or Qualifying Small Enterprises which are at least 51% Black owned or at least 51% Black women owned;

Respondent's Signature

Date & Company Stamp

Transnet Port Terminals High Level Commissioning Plan Electrical Equipment

Document No:

Prepared by: Name: Samukelo Magcaba Date: May 2018
Signature:  Date

Reviewed by: Name: _____ Date: _____
Signature: _____ Date

Approved by: Name: Samukelo Magcaba Date: September 2022
Signature:  Date

00	May 2018	Issued for Review
Rev	Date	Revision Details

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1. INTRODUCTION

The purpose of the High Level Commissioning Plan is to outline the procedures associated with commissioning various types of electrical and mechanical systems and equipment. A detailed commissioning plan as where deemed appropriate at the discretion of the responsible engineer, shall be prepared as required for the various systems. International best practice norms and standards shall be followed in terms of inspection, testing for safety, setting and configuring, and rendering the installed equipment fully functional to its intended purpose.

2. STATUTORY REQUIREMENTS

All aspects of the commissioning process shall adhere to any and all relevant requirements of the following legislation, as appropriate:

- Occupational Health and Safety Act 85 of 1993
- National Environmental Management Act 107 of 1998
- South African National Standards and Codes of Practice
- All local, provincial or S.A. Government laws in force at the time.

3. GOVERNING CODES, STANDARDS AND SPECIFICATIONS

The commissioning process for all electrical and mechanical equipment shall adhere to any specific and relevant requirements contained in the following national and international standards. Where different standards call for different testing and commissioning procedures for the same equipment, the most stringent alternative shall apply.

Note: Where reference is made to a code, standard or specification, the reference shall be taken to mean the latest edition of the code, standard or specification, including latest Addenda, supplements and revisions thereto.

The commission process in general, shall be in accordance with the recommendations of:

- ♦ The International Electrotechnical Commission (IEC), and
- ♦ The Institute of Electrical and Electronic Engineers (IEEE)
- ♦ International Standards and Codes – ISO, DIN, BS, ASME, ASCE, ANSI, ASTM, EU

4. SCOPE

This plan covers site electrical pre-operational tests and commissioning tests required for electrical apparatus, wire, cables and other miscellaneous equipment and material as called for in the specifications and must be read in conjunction with the other specifications.

5. GENERAL INFORMATION

- 5.1. Pre-operational tests and acceptance certificates as herein specified are defined as those tests and inspections required by the ENGINEER prior to equipment being energized to

determine that the apparatus involved may be safely energized.

- 5.2. Calibrating tests, checks on limit switch settings, interlocking, PLC functioning etc. are so called cold commissioning or dry tests.
- 5.3. Hot commissioning tests are the tests as specified by the Engineer such as burn in tests for electronic equipment and continuous cycle tests etc. when the equipment is handling the product it was designed for.
- 5.4. Final acceptance will not only depend on equipment dependability, as determined by the subject tests, but will depend on complete operational tests on all equipment to show that the equipment will perform the functions for which it was designed.
- 5.5. These specifications intend that the workmanship methods, inspections and materials used in erection and installation of the subject equipment shall conform with accepted engineering practices, the specifications as prepared by the Engineer, Manufacturer's instructions and the relevant Standards as referred to in all the attached specifications.
- 5.6. **Thermographic images shall be taken, as directed by the Engineer, of all equipment put into service, as part of the commissioning documentation. These images shall be time and date stamped.**
- 5.7. The Contractor shall bear the costs of all tests required.

6. RESPONSIBILITY

- 6.1. The testing shall be performed by and under the immediate supervision of the Contractor and witnessed by the Engineer and/or his duly authorised representative. This representative may be an Independent Commissioning Engineer appointed by the contractor with the Engineer's approval.
- 6.2. The Contractor shall adjust, set, co-ordinate, calibrate and test all systems and equipment furnished and/or installed by him.
- 6.3. The Contractor shall determine, and the Engineer shall approve the individuals in whom final responsibility and authority rests for carrying out these tests and inspection procedures on particular equipment. The method to be followed in obtaining clearances on electrical equipment shall also be established and such method rigidly adhered to.
- 6.4. All testing shall be scheduled by the Contractor and cleared through the Engineer. No testing of any kind shall be done or scheduled without this clearance.
- 6.5. The Contractor shall notify in person or by letter all the interested parties at least 24 hours prior to tests, establishing the time the test is to be performed.
- 6.6. The interested parties to be informed will be determined in conjunction with the Engineer.
- 6.7. The parties notified shall be responsible for having their representatives present at the designated time. Absence of any one representative will not prohibit the test from proceeding on schedule, unless such representative is essential in doing the tests.
- 6.8. Each of the notified interested parties and the testers employed shall be individually responsible for the safety of all members of their organization during such time as the tests



are performed.

- 6.9. The Contractor will coordinate all testing to ensure that all trades are prepared and that the conditions are safe.
- 6.10. Detailed testing method and equipment shall be approved by the Engineer.
- 6.11. On some tests, particularly the final inspections of important equipment, the manufacturer's Engineer or representative shall be present and perform same. The request for a manufacturer's representative shall be made sufficiently in advance to the date the test is scheduled so that satisfactory arrangements for the representative's services can be made. Frequently, the manufacturer's responsibility applies to both electrical and mechanical equipment. Where such joint responsibility exists, the request for a manufacturer's representative shall be arranged to satisfy both electrical and mechanical requirements simultaneously.
- 6.12. Manufacturer's instructions shall be carefully read for any special conditions that may be required for testing.
- 6.13. Following established procedures, equipment will be energized after certification on the relevant form by the personnel performing the tests, that equipment is ready for energizing and with the concurrence of the Engineer.

7. TESTING EQUIPMENT

- 7.1. All testing equipment for tests which are to be performed shall be furnished by the Contractor.
- 7.2. Testing equipment required to prove guarantee values shall be calibrated immediately prior to the relevant tests to be performed. The error curves shall be submitted with the report.

8. TESTING RECORDS

- 8.1. Test results shall be entered in test forms provided by the Contractor or, if such forms are not available, in test forms approved by the Engineer.
- 8.2. Authorized, qualified representatives of the parties interested (see paragraph 3.0 shall be present to approve a test when made. One (1) copy of the rough draft-test report shall be given to each authorized representative at the time the test is made.
- 8.3. Formal test reports approved by the Engineer shall be supplied and prepared by the party performing the test within 48 hours, signed by the authorized representatives, and furnished to the Engineer for distribution.

9. SAFETY PRECAUTIONS

- 9.1. The Contractor shall exercise extreme care in performing the tests specified so as not to jeopardize the safety of personnel and to prevent equipment damage during any tests. All exposed live parts subject to testing shall be guarded by personnel, barricades, or other practical means to ensure against personnel being injured by coming in contact or close proximity to exposed parts.
- 9.2. All equipment, exposed live parts, etc., shall be completely discharged by grounding or other accepted methods so as to eliminate the possibility of injury to personnel from electrical shock after the tests have been completed.

10. PROVISIONAL ACCEPTANCE

- 10.1. The Engineer's Provisional Acceptance of any electrical installation shall be based upon the completion of tests and checks prescribed in clauses 8 through 13, submission of test data (where required), satisfactory materials and workmanship, and demonstration of satisfactory start-up.

11. EARTH CONTINUITY AND RESISTANCE TESTS

11.1. General:

- 11.1.1. All earthing and bonding cables must be checked for continuity and earth resistance.

11.2. Test procedure:

- 11.2.1. Measuring the cable and connection resistance simultaneously with a resistance bridge or accurate multi-meter.

11.3. Acceptance:

- 11.3.1. The resistance of the earthing and bonding cables and connections must be less than stated in SABS 0142/latest.
- 11.3.2. Complete and accurate records of all resistance readings of all earthing conductors of motors, transformers, power cables etc. must be made.

The records shall include the following:

- 11.3.2.1. Complete identification of the cable and connection points including its approximate length;
- 11.3.2.2. Resistance reading;
- 11.3.2.3. The approximate average cable temperature.
- 11.3.3. No electrical systems will be energized until the master copy of its test record is approved by the Engineer.

12. MEDIUM VOLTAGE CABLES

12.1. General:

- 12.1.1. The Contractor shall give all medium voltage cables a Very Low Frequency (VLF) Hi Pot test in compliance with the cable manufacturers specifications, after all splices and potheads or cable terminations have been made.
- 12.1.2. The Contractor shall then perform a Dissipation Factor (Tan-Delta) test on the cable as per the cable manufacturer's specifications.
- 12.1.3. The medium voltage cables shall be given a complete dielectric absorption test before and after the VLF and Tan-Delta test. The cable test shall be performed prior to connections to the electrical equipment at either end.
- 12.1.4. DC Hi Pot Testing is strictly prohibited on any MV cables or systems owned and operated by Transnet.
- 12.1.5. The Contractor shall supply all instruments for testing.



12.2. Test Procedures:

- 12.2.1. Medium voltage stress cone type terminations or potheads shall remain intact but testing shall not include any bus work beyond the pothead or stress termination.
- 12.2.2. Cable continuity and phase identification shall be checked.
- 12.2.3. In setting up the test set special safety precautions should be taken regarding grounding of the test equipment. The test set, its voltmeter and the cable shield should be grounded at the same ground.
- 12.2.4. All 4 core cables shall be tested between one conductor and ground with the other conductors and the metallic shield, metallic sheath or armour grounded to the same ground. Each conductor to be tested in this manner.
- 12.2.5. All single conductor cables shall also be tested between one conductor and ground with the other conductor in the same conduit grounded.
- 12.2.6. Each cable is to be given a full dielectric absorption test as herein specified with a suitable motor driven or electronic megger. The readings taken shall be recorded in the test record.
- 12.2.7. The dielectrical absorption megger test shall be applied for a long enough duration to fully charge the cable. Megger readings shall be taken every fifteen (15) seconds during the first three (3) minutes and at one (1) minute intervals thereafter. The test shall continue until three (3) equal readings one (1) minute apart are obtained. The cable may then be considered to be fully charged.
- 12.2.8. All cables should have approximately the same megohm reading. In the event that a cable shows an appreciably lower resistance value than the others in the same conduit or cable run, this condition shall be discussed with the Engineer prior to the application of the high potential test.
- 12.2.9. After an acceptable megger test, the Contractor shall give the cables a VLF high potential test in accordance with the requirements of IEEE 400.2-2013. After completion of the test, the contractor shall ensure that there is no residual charge contained in the cables. Any cable that does not perform as per manufacturer's specifications shall be rejected.

12.2.10. Cables shall then be subjected to the Tan-Delta testing.

12.2.11. The successful high potential test shall be immediately followed by another megger test as heretofore specified.

12.3. Acceptance:

12.3.1. The cable must withstand the specified high voltage without an appreciable increase in leakage current.

12.3.2. Final acceptance will also depend on satisfactory results of the two megger tests. The results of the final megger test should reasonably parallel those of the first megger test and should show no evidence of differing performance prior to the VLF Hi-Pot and Tan-Delta Testing.

12.3.3. Complete and accurate records of all megger and accompanying VLF and Tan-Delta tests shall be made. The records shall include the following:-

12.3.3.1. Complete identification of the cable including its approximate length;

12.3.3.2. Megger readings vs time data;

12.3.3.3. VLF and Tan-Delta test results with date and time of test.

12.3.3.4. The approximate average cable temperature taken by Thermographic Imager, with images recorded along the entire length of cable.

12.3.4. No cable shall be energized until the master copy of its test record is approved by the Engineer.

13. LOW VOLTAGE POWER CABLES

13.1. General:

13.1.1. All wires and cables shall be tested for continuity. Except for 60 volt services and below, all wires and cables shall be given a megger test.

13.1.2. All cable connections must pass visual inspections for workmanship and conformance with standard practice.

13.2. Test Procedure:

13.2.1. Continuity shall be checked by means of a DC test device using a beeper.

- 13.2.2. Bus tie cables shall be meggered before connections to buses are made.
- 13.2.3. Each 400 volt service cable from substations shall be meggered with the cable connected to the switch gear with the corresponding breaker racked in and open. Connections at the other end of each of these cables shall be as follows:-
 - 13.2.3.1. Cables to individual motors shall be disconnected from the motor for initial tests, and followed by cables connected to motors as per specification for rotating equipment;
 - 13.2.3.2. Cables to control centres shall be connected to the control centre main breaker with breaker in the open position.
- 13.2.4. Minimum megger readings shall be 1 Me 6 ohm.
- 13.2.5. The megger test must be held until the reading reaches a constant value. For 400 volt cables the cable megger test shall be held until three (3) equal readings, each one (1) minute apart, are obtained.
- 13.2.6. A 1000 volt motor-driven or electronic megger with a value of at least twice that of the RMS voltage shall be used on all service conductors.
- 13.3. Acceptance:
 - 13.3.1. Minimum megger requirements must be met.
 - 13.3.2. Any cable having a megger reading 50% lower than average, even though meeting minimum requirements, shall await further instructions from the Engineer as to drying or other treatment to be given the cable prior to acceptance.
 - 13.3.3. Complete and accurate records of all tests and inspections shall be made.

14. MEDIUM VOLTAGE SWITCH GEAR AND CIRCUIT BREAKERS

- 14.1. General:
 - 14.1.1. All switch gear shall be given operational tests. This shall include mechanical operation, as well as operation by control circuits, relays and tripping devices. All breakers and busbars shall be given a megger test.

14.2. Test Procedures:

- 14.2.1. Megger tests on the medium voltage bus shall be applied between each phase separately and ground with other phases tied to ground. All breakers shall be racked-out.
- 14.2.2. In addition each breaker shall be given a megger test in the racked-out and closed position. Megger tests shall be applied between each phase to ground and to each other phase.
- 14.2.3. A suitable motor driven or electronic megger shall be used. Each test shall be held until a constant reading is obtained. Minimum test values shall be as specified in specifications.
- 14.2.4. All test readings shall be recorded.
- 14.2.5. All circuit breakers shall be operated through at least three (3) open-close-open cycles in both the rack-in and test positions by manual operation and by control circuits from each control point. All indication lights, annunciators, alarms and targets shall be observed to determine correct operation and breaker mechanism shall be observed for correct alignment, freedom of binding and good contact. All breakers shall be checked for ease of rack-in and rack-out and checked to determine that the breaker cannot be moved out of operation position while the breaker is closed.
- 14.2.6. The interchangeability of the circuit breakers shall be demonstrated.
- 14.2.7. PT and CT data shall be recorded and PT and CT circuits shall be checked with a multi-tester.
- 14.2.8. Protective relays shall be adjusted and calibrated with an injection type test arrangement (multi-amp or equal). Results shall be recorded and the co-ordination of the protective relaying shall be proved.
- 14.2.9. After initial energization, switch gear shall be checked for correct phase sequence.

14.3. Acceptance:

- 14.3.1. Minimum megger requirements must be met;
- 14.3.2. Proper mechanical and electrical operation of switch gear must be assured;
- 14.3.3. Correct protective relaying operation must be proven;
- 14.3.4. Complete and accurate records of all tests and inspections shall be made.

15. POWER TRANSFORMERS

15.1. General:

- 15.1.1. Before testing, all transformers shall be inspected for cleanliness, damage, moisture (blue coloured silica gel), oil leaks and phase identification. Each transformer winding shall be given megger tests.
- 15.1.2. Oil filled transformers shall have the oil checked for dielectric strength.
- 15.1.3. Accessories and auxiliary circuits to switchgear and alarm panels shall be checked.

15.2. Test Procedures:

- 15.2.1. Transformer windings shall be meggered with cables disconnected. (The cables have to be disconnected anyhow for cable high potential tests). See clause 9.0.
- 15.2.2. The 400 volt connection to the switchgear does not have to be opened, but the secondary isolator shall be racked out.
- 15.2.3. The transformer neutral has to be disconnected from ground.
- 15.2.4. When meggering the primary side, the secondary winding has to be grounded and vice versa.
- 15.2.5. The minimum values of the specified megger tests shall be as specified in the standard specification.
- 15.2.6. All 2500 V megger tests shall be held at least five (5) minutes and until three (3) consecutive equal readings one (1) minute apart are obtained. Readings shall be taken every thirty (30) seconds during the first two (2) minutes and every minute thereafter. 1000 V Megger readings must be held until the reading reaches a constant value and until three (3) consecutive equal readings one (1) minute apart are obtained.
- 15.2.7. The oil samples for the dielectric strength test shall be taken from the bottom of the transformer tank and tested in accordance with SABS Specifications.
- 15.2.8. Oil temperature indicator, level gauge and pressure relief devices must be manually actuated to check operation of auxiliary circuits.
- 15.2.9. To check the Bucholz relay, air shall be injected at the test connection.

15.3. Acceptance:

- 15.3.1. Minimum megger requirements must be met.
- 15.3.2. Oil dielectric strength shall be above the minimum specified by the manufacturer.
- 15.3.3. Auxiliary circuits shall be fully operational.

16. LOW VOLTAGE SWITCH GEAR

16.1. General:

- 16.1.1. The 400 volt switch gear bus shall be given a phase-to phase and phase-to-ground megger test.
- 16.1.2. All switch gear, relays and control devices shall be given complete operational tests to show that the equipment performs all design functions and meets design and equipment procurement specifications.

16.2. Test Procedures:

- 16.2.1. With transformer secondary breaker and load breakers open, all current transformers shorted, all potential transformer fuses removed and all 400 volt feeder breaker load terminals grounded, the 400 volt bus shall be given a phase-to-phase and phase-to-ground megger test.
- 16.2.2. Megger tests on the 400 volt bus shall be applied between each phase and ground with phases not under test also grounded.
- 16.2.3. All circuit breakers shall be operated through at least three (3) open-close-open cycles in both the rack-in and test position by manual operation and by control circuits from each control point (draw out breakers only). All indicating lights, annunciators, and breaker mechanisms shall be observed for correct alignment, freedom of binding and good contact. Draw out breakers shall be checked for ease of rack-in and rack-out and checked to determine that the breaker cannot be moved out of operating position while the breaker is closed.
- 16.2.4. PT and CT data shall be recorded and PT and CT circuits shall be checked with a multi-tester.
- 16.2.5. Protective relays shall be adjusted and calibrated with an injection type test arrangement (multi-amp or equal). Results shall be recorded and the co-ordination of the protective relaying shall be proved.

16.2.6. After initial energization, switch gear shall be checked for correct phase sequence.

16.3. Acceptance:

16.3.1. Minimum megger requirements must be met.

16.3.2. Proper mechanical and electrical operation of switch gear must be assured.

16.3.3. Correct protective relaying operation must be proven.

16.3.4. Complete and accurate records of all tests and inspections shall be made.

17. COLD COMMISSIONING

17.1. The programmable logic control system shall only be tested once the LV switchboard and other control panels have been tested in the manual mode and been provisionally accepted by the Engineer.

17.2. The control system shall firstly be tested DRY, i.e. all motor fuses shall be removed or circuit breakers shall be in the OPEN positions.

17.3. All plant/external inputs to the PLC shall be individually checked in the field or motor control centre by operating the required field limit switch, relays etc. and checked on the programmer monitor if the status indication of the correct input reference alters.

17.4. All plant/external outputs shall be checked individually by forcing the PLC output coil by means of the programming unit and checking the field, motor control or mimic display panel if the correct relay, indication lamp or contactor has operated.

17.5. A signed test record showing all input/ output references and reference to which field, motor control centre or mimic panel device was initiated or was operated shall be made and handed to the Engineer before the second part of the DRY test commences.

17.6. The second part of the DRY test shall be by carrying out drive selections, route start ups and route stops for all possible drives as listed. All inputs which cannot be present because of the absence of any plant movement shall be simulated by a plant input simulator to be provided by the Contractor.

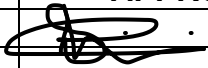
17.7. Upon completion of the tests, a signed test record showing all route selections, starts and stops simulated for every route and a list of all simulated inputs/outputs used shall be made and handed to the Engineer.

17.8. The Contractor shall then call upon the Engineer to witness a repetition of all previous DRY tests.

18. HOT COMMISSIONING

- 18.1. Commissioning of the whole installation shall not commence until all work which is essential for safe operation has been completed.
- 18.2. First, the electrical equipment and circuitry shall be checked and tested in each Motor Control Board and shall be rendered "healthy" and fully operational before any other part of the installation is commissioned.
- 18.3. The settings of all protective, instrument and timing devices are to be correctly based on the manufacturer's characteristic curves.
- 18.4. The operation of all equipment and motors shall be tested on the "manual" sequence first prior to attempting "automatic" sequence control.
- 18.5. Commissioning shall follow the electrical testing procedures necessary prior to start-up of the equipment.
- 18.6. The start-up of each system or plant shall be done in the presence of the authorized representatives of the machine suppliers, the mechanical contractors, the electrical suppliers of the boards, the Electrical Contractor and the Engineer, unless otherwise arranged by the Engineer.
- 18.7. During hot commissioning the temperature rise of all motors will be calculated using the resistance method.
- 18.8. For a period determined elsewhere in this document, after completion of the foregoing operations, the Electrical Contractor shall arrange for a competent representative to remain on site to test-run the installation to the satisfaction of the Engineer.

**SPECIFICATION FOR ELECTRICAL INSTALLATIONS TO BUILDINGS OTHER
THAN DWELLINGS HOUSES**

REVISIONS		
REV	DATE	APPROVED
0	September 2022	

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1.0 SCOPE

- 1.1 This specification covers the requirements with respect to the electrical installation, including the supply of all material and labour necessary to complete the EL&P installation for buildings.
- 1.2 This specification also applies to electrical alterations and additions carried out to existing installations.

2.0 REFERENCES

- 2.1 The following publications (latest edition) are referred to herein:

CODES OF PRACTICE

SANS 10313		Code of Practice for Protection of Buildings against Lightning.
SABS 086	-	Installation and Maintenance of Electrical Equipment used in Explosive Atmospheres.
SABS 0108	-	The Classification of Hazardous Locations and the Selection of Electrical Apparatus for use in such Locations.
SABS 0114	-	Artificial Lighting
SANS 10142-1	-	Code of Practice for the Wiring of Premises
SABS 0199	-	Bulkhead Lighting Fittings (surface mounted).

SPECIFICATIONS

SABS 152	-	Low Voltage Air Break Switches, Connectors, Switch Disconnecters, Fuse Combination Units.
SABS 156	-	Moulded Case Circuit Breakers.
SABS 160	-	Electric Air Heaters.
SABS 162	-	Screwed Metal Conduit and Fittings for Electrical Wiring.
SABS 163	-	Wall and Appliance Switches.
SABS 164	-	Two Pole and Earthing Pin Plugs and Switch Socket Outlets
SABS 165	-	Lampholders
SABS 172	-	Cartridge Type Fuse Links
SABS 181	-	Thermostats for Electric Storage Heaters
SABS 314	-	Flameproof Enclosures for Electrical Apparatus
SABS 743	-	Low Voltage Isolating Transformers
SABS 767	-	Core Balance Earth Leakage Protection Units.
SABS 763	-	Hot Dip Zinc (galvanised) Coatings
SABS 784	-	Metal Enclosed Busbar Trunking Systems
SABS 890	-	Ballasts for Fluorescent Lamps
SABS 908	-	Meter Cabinets
SABS 950	-	Non-metallic Conduit and Fittings.
SABS 1012	-	Electric Light Dimmers
SABS 1041	-	Tubular Fluorescent Lamps
SABS 1065	-	Screwed Metal Conduit
SABS 1085	-	Wall Outlet Boxes.

SABS 1092	-	Contactors
SABS 1119	-	Interior Luminaires for Fluorescent Lamps.
SABS 1180	-	Electrical Distribution Boards.
SABS 1197	-	Metallic Wireways for installation in floors
SABS 1247	-	Coatings Applied by the Power-coating Process
SABS 1278	-	Interior Luminaires for Discharge Sodium Lamps
SABS 1279	-	Floodlight Luminaires
SABS CKS 50199	-	Bulkhead Luminaires (surface mounted)
SABS IEC 439	-	Low Voltage Switchgear
SABS IEC 309	-	Plugs, Socket Outlets and Couplers for Industrial Purposes
SABS IEC 742	-	Isolating Transformers and Safety Isolating Transformers

3.0 SERVICE CONDITIONS

3.1 The cable shall be designed and rated for continuous operation under the following conditions :-

3.1.1 Ambient/Environment Conditions :

- 3.1.1.1 Altitude : Sea level.
- 3.1.1.2 Ambient temperature : -5° C to +45° C (daily average +35° C).
- 3.1.1.3 Relative humidity : As high as 96%
- 3.1.1.4 Lightning conditions : Severe, with a maximum lightning ground flash density 11 flashes per km² per annum.
- 3.1.1.5 Exposure conditions : Salt laden, industrial atmosphere as well as hazardous gases and dust atmosphere.
- 3.1.1.6 Electrolytic corrosion conditions prevail in all the areas owing to the proximity of direct current traction system and cathodic protection schemes.

4.0 ELECTRICAL INSTALLATION

- 4.1 The contractor shall carry out the installation in accordance with SANS 10142-1: Code of Practice for the Wiring of Premises and the requirements of this specification.
- 4.2 Where the local supply authority requirements differ from those specified herein Transnet Projects Electrical Engineer shall be approached for a decision.
- 4.3 All equipment and material shall comply with the relevant National or International standard specification. Where equipment does not comply it shall be submitted with the Transnet Projects Electrical Engineer for approval.

- 4.4 The system of supply will be three phase, 4 wire or single phase 2 wire 50 Hz. alternating current with earthed neutral at a nominal voltage of 400/230 volts. The voltage may vary within the range of $\pm 5\%$ of the nominal voltage.
- 4.5 Wiring
- 4.5.1 All wiring shall be carried out in cable trunking and/or conduit. Only the loop in system of wiring shall be accepted.
- 4.5.2 Joints in wiring, nor the cutting away of strands to facilitate connections shall be permitted.
- 4.5.3 Single core cable smaller than 1,5 mm shall not be used. PVC cables shall not be connected directly to the lampholders for incandescent lamps. Conductors shall terminate in an approved connector in the conduit box directly behind the luminaire, and connection to the lampholder made by means of adequately rated silicone heat resistant wire.
- 4.5.4 Colour identification of conductors shall be used.
- 4.5.5 Flameproof equipment shall comply with SABS 314 or BS 229 for installation in hazardous areas, as defined in SABS 0108.
- 4.5.6 Equipment in hazardous areas shall be installed in accordance with SABS Code of Practice 086.
- 4.6 The provision and installation of the supply cable to the building, the termination and the connection thereof to the distribution board main incoming isolating shall be the responsibility of the Contractor, as directed by the Engineer.
- 4.7 The Contractor shall be responsible for the provision and connection of power supplies to electric urns, stoves, geysers, frytops, fans etc. provided by others; unless otherwise stated in the Schedule of Requirements.
- 6.7.1 The Contractor shall provide power supplies to air-conditioning equipment. The connection to air-conditioning equipment will be undertaken by others.
- 4.8 Cables shall be adequately supported to prevent strain on the terminals.
- 4.9 Drilling or welding of steelwork for the mounting of electrical equipment will not be permitted unless approved by Transnet's Civil Engineer on site. Equipment shall be fixed to the steelwork by means of approved, purpose made clamp/brackets.
- 4.10 Lightning protection shall be in accordance with the requirements of the local supply authority and SANS 10313 : Code of Practice for Protection of Buildings against Lightning.

5.0 DISTRIBUTION BOARDS

- 5.1 Architrave type for flush mounting, and surface type for mounting on indoor walls shall comply with SABS 1180 Parts 1 and 2 respectively.
 - 5.1.1 These distribution boards shall be supplied with a cover plate or open window door and be suitably painted and finished to harmonise with wall finish.
 - 5.1.2 All switches and associated equipment shall be fully enclosed within the distribution board with only the operating handles protruding through the cover plate or door.
- 5.2 Cubicle type shall comply with IEC publication 439.
- 5.3 Distribution boards for outdoor use shall be weatherproof and corrosion resistant.
- 5.4 A substantial earthing terminal shall be firmly attached to the steel work of the distribution board and connected to the earthing bar.
- 5.5 Entries suitable for all incoming and outgoing cables shall be provided. Glands for bottom entry cables shall not be less than 600mm above floor level.
- 5.6 Space for mounting of 20% additional control units shall be allowed on all distribution boards. In addition, 20% spare conduits (20mm diameter) shall be provided between flush distribution boards and the ceiling/roof space in pitched roof buildings (minimum 2 conduits).
- 5.7 All circuits shall be clearly labelled. Labels shall be of the fabricated type and permanently secured. Embossed tape is not acceptable.
- 5.8 When called for labelling of moulded case circuit breakers shall be labelled by means of numerals. A legend inserted behind a clear plastic window on the inside of the door shall be provided to detail the various circuits.

6.0 ISOLATING SWITCHES

- 6.1 Isolating switches for machines shall be lockable in the open position.
- 6.2 Isolating switches shall comply with SABS 152.

7.0 MOULDED CASE CIRCUIT BREAKERS

- 7.1 Moulded case circuit breakers shall: -
 - 7.1.1 comply with SABS 156.
 - 7.1.2 have a breaking capacity as specified.
 - 7.1.3 be of the fixed pattern, non-adjustable type.
 - 7.1.4 be suitable for clip-on tray mounting.

8.0 EARTH LEAKAGE PROTECTION UNITS

8.1 Earth leakage protection units shall: -

- 8.1.1 be the integral moulded case type and comply with SABS 767.
- 8.1.2 have a sensitivity of 30 mA.
- 8.1.3 be similar in design to moulded case circuit breakers and suitable for clip-on tray mounting.
- 8.1.4 have a breaking capacity and current rating as specified.

9.0 FUSE SWITCHES

9.1 Fuse switches shall :

- 9.1.1 comply with SABS 152
- 9.1.2 be of the double break, horizontal drawout, air insulated type, suitable for flush mounting.
- 11.1.3 be of the quick break, dustproof type.

12.0 HIGH RUPTURING CAPACITY FUSE LINKS

12.1 High rupturing capacity fuse links shall :

- 12.1.1 comply with SABS 172
- 12.1.2 be of the cartridge type with a breaking capacity not less than that shown in the Category of Duty AC 50 table 2 of SABS 172.
- 12.1.3 have a class Q1 fusing factor
- 12.1.4 A spare set of fuse links for each of the different ratings shall be provided and accommodated in the distribution board.

13.0 CONTACTORS

13.1 Contractors shall comply with SABS 1992.

14.0 LUMINAIRES FOR INCANDESCENT LAMPS

- 14.1 Luminaires shall be suitable for accommodating 100 watt B.C. lamps.
- 14.2 The insulation of internal wiring shall be heat resistant.
- 14.3 Bulkhead luminaires shall comply with CKS 199.

14.4 Bowl type luminaires shall have porcelain or acrylic galleries with white opal, high impact acrylic screw-in type bowls.

14.5 Well glass luminaires shall consist of a body of non-corrosive material with a top entry for a 20mm conduit, have a clear glass cover and be completely weatherproof.

15.0 LUMINAIRES FOR FLUORESCENT LAMPS

15.1 Luminaires for fluorescent lamps shall comply with SABS 1119.

15.2 Lampholders shall be of the telescopic type.

15.3 The luminaires shall be suitable for 1,2m or 1,5m "rapid start" lamps to SABS 1041, class B, group 2, with rated colour 3. (warm white).

15.4 Anti-corrosive luminaires shall have a body channel constructed of fibre-glass or non-corrosive material with a moulded acrylic enclosing diffuser.

15.5 A gasket shall be provided between the body channel and the diffuser to ensure a reliable seal.

15.6 The enclosing diffuser shall latch to the body channel with captive-type non-corrosive latches.

15.7 It is essential that full descriptions and photometric data of the luminaires and lamps offered, accompany tenders. This information shall include description and drawings of the various items of equipment as well as full photometric data issued by the South African Bureau of Standards.

16.0 INTERIOR LUMINAIRES FOR HIGH INTENSITY DISCHARGE LAMPS

16.1 Interior luminaires for high intensity discharge lamps shall comply with SABS 1278 and be suitable for use in an ambient temperature of 40°C.

16.2 Suitable provision shall be made on the ballast housing for eyes or lugs, for the attachment of safety chains.

16.3 The electronic ignition device for high pressure of sodium and metal halide lamps shall be of the three wire type operating on the superposed pulse principle. The circuitry shall be such that at starting, or on failure of a lamp, high voltage pulses will be confined to the high voltage lead between the igniter and centre contact of the lampholder. Igniters incorporating a switching element are not acceptable.

16.4 A fully electronic ignition circuit shall be utilized to trigger the pulse transformer.

16.5 The natural frequency of the electronic ignition circuit shall be in the order of 100kHz.

16.6 The lamp ignition voltage shall remain constant within a mains voltage variation of between 200 and 250 volts.

16.7 Tenderers shall guarantee that pulsing of the igniter on a failed lamp will not have a detrimental effect on the life and efficient operation of the control gear, igniter, lampholders and circuit wiring.

16.8 It is essential that full descriptions and photometric data of the luminaires and lamps offered, accompany tenders. This information shall include description and drawings of the various items of equipment, as well as full photometric data issued by the South African Bureau of Standards.

17.0 ELECTRIC AIR HEATERS

17.1 Electric air heaters shall comply with SABS 160.

17.2 Tubular heaters shall be rated at 260 watt per metre length of tube and have an enclosed entry box containing terminals for incoming line, neutral and earth connections with a suitable entry for a flexible conduit connector.

17.2.1 Tubular heaters shall be mounted with the bottom 200mm above floor level

17.3 Convector Heaters shall:

17.3.1 be of the natural convection type, of good appearance and suitable for flush or surface mounting.

17.3.2 have incorporated a manually adjustable control switch, automatic controlling thermostat and indicating neon pilot lighting showing when the heater is on.

17.3.3 have a mounting box or housing suitable for a 20mm electrical conduit entry.

17.3.4 be installed with the bottom of the mounting box/housing 200mm above floor level.

17.4 Fan Heaters shall :

17.4.1 be of the wall mounted type with air flow directional adjustment and locking facilities.

17.4.2 have a totally enclosed type fan motor fully protected from damp and dust and fitted with self aligning noiseless bearings.

17.4.3 have a separate manually adjustable control unit incorporating an automatic controlling thermostat. The control unit shall be housed in a adequately ventilated sheet steelcase. Means of protecting and isolating the heater, shall be provided. The control unit circuit shall be arranged such that during summer months the heater can be switched off and the fan used alone for ventilation.

18.0 ROOM THERMOSTATS

18.1 Room thermostats shall comply with BS 3955 Part 2, section 2F, and be to category A.

18.2 An over-riding switch shall be mounted adjacent to the thermostat for manual control.

19.0 LIGHT SWITCHES

- 19.1 Light switches shall comply with SABS 163 and be of the rocker type.
- 19.2 They shall be mounted 1 500 mm above floor level and where possible 200 mm from door frames.

20.0 LIGHT SENSITIVE CONTROL UNITS

- 20.1 The complete unit shall be of the solid state type and housed in a sealed weatherproof enclosure suitable for mounting in any position.
- 20.2 The light sensitive cell shall operate in a manner to give an area of detection not less than a hemisphere.
- 20.3 The unit shall not operate due to light fluctuations of duration less than 5 minutes. They shall incorporate main contacts rated at least to 10 amps and be mounted at a height of not less than 2 400 mm.
- 20.4 An over-riding switch shall be provided.

21.0 SOCKET OUTLETS

- 21.1 All 220 volt, 16 amp socket outlets shall comply with SABS 164 and be of the 3 round pin shuttered type.
- 21.2 All 32V, 5A socket outlets for lead lights shall be of the industrial two pin, weatherproof type with a screw cover attached to the socket outlet by a short length of chain.
 - 21.2.1 They shall be mounted on columns/walls 1 500mm above floor level or in recesses provided in inspection pits.
- 21.3 Welding socket outlets shall be in accordance with IEC publication 309 and be rated for 63A (unless other rating is indicated on the drawing) and be of the 5 pin, 6 h configuration type.
 - 21.3.1 Welding plugs shall be supplied complete with matching male plugs and be mounted 1 500mm above floor level.

22.0 TRANSFORMERS 220V/32V

- 22.1 The transformers for 32V socket outlets shall be in accordance with SABS SV 118 and be designed for 220V to 250V primary power supply and have an output voltage of 32V.

23.0 ISOLATING AND SAFETY ISOLATING TRANSFORMERS

- 23.1 Isolating and safety isolating transformers shall comply with SABS IEC 742 and SABS 743.

24.0 POWER POINTS

- 24.1 Power points for hot water cylinders shall be equipped with a 2 or 3 pole isolating switch adjacent to the cylinder except for hot water cylinders mounted below sinks.
- 24.2 Where contactors are necessary for the operation of hot water cylinders these shall be installed adjacent to the appliance where practicable and in a suitable enclosure.
- 24.3 Power points for tubular heaters shall be equipped with a flush mounted 100mm x 100mm conduit box, blanked off with a cover plate accommodating a 15A flush mounted switch. Connection to the heater shall be by means of a PVC covered flexible conduit. The flexible conduit shall have sufficient slack to avoid strain but shall not touch the floor.
- 24.4 Power points for fan heaters shall be equipped with two recessed interconnected conduit boxes, one for connection to the heater and the other for connection to the control unit 1 500mm above floor level.
- 24.5 Power points for stoves, fry tops and boiling tables shall be equipped with a 2 or 3 pole isolating switch for the appliance shall be 1 500mm above floor level. The outlet for connection to the appliance shall be 500mm above floor level.
- 24.6 Power points for air-conditioning units shall terminate in a 100mm x 100mm conduit box mounted adjacent to the unit and equipped with a 2 pole isolating switch.
- 24.7 Power points for extractor fan units shall terminate in a 100mm x 100mm conduit box mounted adjacent to the unit.
- 24.8 Where a common thermostat is specified for controlling a number of fans, power points shall be so arranged to allow for circuit wiring between the fans and thermostat.
- 24.9 Power points for smoke detection and CO₂ equipment shall terminate in a 100mm x 100mm conduit box equipped with a 30A, 2 pole isolating switch, lockable in the "on" position, mounted 1500mm above floor level, with connecting facilities to the equipment.
- 24.10 Power points for air conditioning units shall terminate in a 100mm x 100mm conduit box mounted adjacent to the unit and equipped with a 2 pole isolating switch, with connecting facilities for the unit.
- 24.11 Power points for machinery shall terminate in a connection box suitable for mounting a 2 or 3 pole isolating switch, with connecting facilities to the machine.
- 24.12 Power points for lighting shall terminate in a circular conduit box fitted with an unswitched 5 A 3 pin socket outlet.

25.0 CONDUIT AND ASSOCIATED FITTINGS

- 25.1 Screwed metal conduit shall comply with SABS 162.

- 25.2 Non-metallic conduit and fittings shall comply with SABS 950. Non- metallic conduit shall not be cast into concrete.
- 25.3 Wall outlet boxes shall comply with SABS 1085.
- 25.4 In areas within 50 km of the coast only galvanised or non- metallic conduit shall be used. Where conduit is exposed to the weather elements only galvanised conduit shall be used or UV T. Routed P.V.C. pipe.
- 25.5 Threads of metallic conduit and associated fittings shall be effectively protected against rust by non-corrosive paint where they are exposed to moisture or weather elements.
- 25.6 Wall outlet boxes shall be positioned with the major dimension vertical and not more than 15 mm below the finished wall surface. Cover plates shall fit plumb and flush with wall surfaces.
- 25.7 Conduits are to be concealed and chased into plastered brick walls or cast into concrete work as building work proceeds. Where conduit cannot be concealed these shall be installed neatly on the surface as approved by the Engineer.
- 25.8 Conduits are to be concealed and chased into plastered brickwalls or cast into concrete work as the building work proceeds.
- 25.9 Chasing of finished walls or concrete work will not be allowed. Under no circumstances will chases be permitted through structural members of the building.
- 25.10 Chasing of face brick walls will not be permitted. Conduits and outlet boxes shall be built into walls.

26.0 CABLES AND GLANDS

- 26.1 Polyvinyl-chloride cables shall comply with SABS 150. Armoured cables shall be of the earth continuity conductor type.
- 26.2 Cable glands shall be of the compression type, (brass or bronze) and be suitable for termination of earth continuity conductor type cables. Glands shall be supplied with neoprene shroud.

27.0 BUSBAR TRUNKING

- 27.1 Busbar trunking shall comply with SABS 784.

28.0 CABLE TRAYS

- 28.1 Cable trays shall be protected against corrosion and be adequately supported so that when fully loaded the deflection does not exceed 10mm. They shall be wide enough to accommodate the power cables in a single layer.

29.0 EARTHING AND BONDING

- 29.1 The complete electrical installation shall be earthed in accordance with SABS 10142-1: Code of Practice for the Wiring of Premises.
- 29.2 Earth electrodes shall consist of an exterior copper layer molecularly bonded to a high strength steel core. The copper shall have a minimum thickness of 0.25mm.
- 29.3 Only approved non-corrosive substances may be used to reduce earth resistivity. The earth resistance as measured with a earth resistance tester shall not exceed 5 ohm.
- 29.4 Copper tape used for bonding and earthing of waste pipes shall have a minimum cross sectional area of 12mm², and when run along walls shall be fixed by means of non-ferrous screws in plastic plugs at intervals of 300 maximum.

30.0 PAINTING

- 30.1 All surfaces of distribution boards shall be light orange to SABS 1091 colour No. B26 unless otherwise stated in the Schedule of Requirements attached to this specification.
- 30.2 All surfaces shall be cleaned according to the appropriate method described in SABS 064 for the particular surface to be cleaned, the contamination to be removed and the primer to be applied.
- 30.3 Components that will be powder coated shall be cleaned and prepared in accordance with the requirements of SABS 064. Powder coating shall comply with the requirements of SABS 1274 - 1979 Type 4; Corrosion resistant coatings for interior use and using thermosetting high gloss coating.
- 30.4 All specified coatings shall be applied according to the relevant specification and the manufacturers instructions shall be followed. Coatings shall not be applied in conditions which may be detrimental to the effectiveness of the coating, or the appearance of the painted surface.
- 30.5 When examined visually the finished product shall have a uniform appearance as far as gloss is concerned and shall show no sign of damage. Damaged areas shall be repaired coat for coat to obtain the desired finish.

31.0 TESTS

- 31.1 Insulation, continuity and earthing tests in accordance with SANS 10142-1 shall be carried out to the satisfaction and in the presence of the Engineer or authorised deputy on completion of the work.
- 31.2 An installation Certificate of Compliance for the electrical installation issued by an accredited person as required by the Occupational Health and Safety Act, 1993 (Act 85 of 1993) shall be provided.
- 31.3 The Contractor shall provide the necessary approved instruments.



Technical Specification
Specification No. TPD: 001-EL&P SPEC

- 31.4 Transnet Projects reserves the right to use its own instruments should it be considered necessary.

WITNESSES

1.

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TENDERER

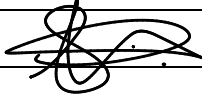
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**Transnet Projects
Design Services**

SPECIFICATION FOR LOW VOLTAGE DISTRIBUTION BOARDS

This specification covers Transnet's requirements for low voltage distribution boards

REVISIONS		
REV	DATE	APPROVED
0	September 2022	

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1. SCOPE

1.1. This specification covers Transnet's requirements regarding the design, supply, manufacture, population, works testing, delivery to site, site erection, site testing and commissioning of low voltage Distribution Switchboards consisting of fuse switches incorporating high rupturing capacity cartridge fuse links, air circuit breakers, moulded case circuit breakers and auxiliary equipment. The tenderer is required to familiarise themselves with all applicable Standards and Codes of Practice listed herein, and to ensure compliance in the execution of any work in terms of this document.

2. REFERENCES

2.1. The following publications (latest edition) are referred to herein:-

2.1.1. SOUTH AFRICAN BUREAU OF STANDARDS

Codes of Practice

SANS064	The preparation of steel surfaces for coating
SANS10111	Engineering Drawings.
SANS10142	Wiring of premises Part 1: Low voltage installations
SANS10313	Protection against lightning - Physical damage to structures and life hazard

Specifications

SANS60947	Low-voltage switchgear and control gear
SANS156	Moulded-case circuit breakers
SANS60269	Low-voltage fuses
SANS1091	National colour standards for paint
SANS1195	Busbars
SANS1274	Coating applied by the powder coating process
SANS1973-1	Low-voltage switchgear and control gear assemblies Part 1: Type-tested assemblies with stated deviations and a rated short-circuit withstand strength above 10 kA
SANS1973-3	Low-voltage switchgear and control gear assemblies Part 3: Safety of assemblies with a rated prospective short-circuit current of up to and including 10 kA
SANS60529	Degrees of protection provided by enclosures (IP Code)
SANS1507	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V)
SABS ISO 9000	Quality management systems -- Fundamentals and vocabulary
SANS1019	Standard voltages, currents and insulation levels for electricity supply
SANS170	Fasteners

International Electrotechnical Commission

BS 3938	Current Transformers
IEC 61508	Functional Safety of Electrical/Electronic/Programmable Electronic Safety-related Systems.
IEC 60051	Direct acting indicating analogue electrical measuring instruments and their accessories

3. SERVICE CONDITIONS

3.1 The equipment shall be designed and rated for continuous operation under the following conditions:-

3.1.1 Ambient/Environment Conditions:

- 3.1.1.1 Ambient temperature- 5°C to +40°C (daily average +35 °C).
- 3.1.1.2 Relative humidity- As high as 95%
- 3.1.1.3 Lightning conditions- Severe, with a maximum lightning ground flash density of eleven (11) flashes per km² per annum.
- 3.1.1.4 Atmosphere- Salt laden and corrosive industrial atmosphere

3.1.2 Electrical Conditions:

- 3.1.2.1 The system of supply shall be three phase, 4 wire, 50 Hz alternating current with solidly earthed neutral at a nominal voltage of 400 / 231 Volts.
- 3.1.2.2 The voltage may vary within the range of 95% to 105% of the nominal and all equipment installed shall be suitably rated.
- 3.1.2.3 All equipment shall be adequately rated for prospective fault level ratings.

4 DRAWINGS AND INSTRUCTION MANUALS

- 4.1 All drawings shall be in accordance with SANS 10111 – Engineering Drawings.
- 4.2 The successful tenderer shall supply the following instruction manuals, all of which shall be included in the tender price and be to the satisfaction of Transnet.
 - 4.2.1 THREE (3) sets of detailed drawings and instruction manuals, with illustrations where necessary and 2 sets of prints of the "As Built" General Arrangement drawings and the schematic and wiring diagrams to facilitate erection and adjustment of the switchgear.
 - 4.2.2 A full set of electronic media including all information requested above.
 - 4.2.3 These instruction manuals and drawings shall be supplied as soon as possible after placing of the order, but before delivery of the equipment.

5. STANDARD OF WORK, EQUIPMENT & MATERIALS

- 5.1. The distribution board shall conform to the requirements of the latest edition and amendments of SANS 10142-1 Code of Practice for the Wiring of Premises Part 1: Low voltage installations and any additional requirements thereto, described in this specification.
- 5.2. All equipment and material used shall be of high quality and the work shall be of a high standard of workmanship carried out by qualified staff under proper supervision by experienced and competent officers.
- 5.3. If any special tools are required for the maintenance of the switchboard, the tenderer shall supply three (3) sets at delivery of the switchboard to site.

6. DISTRIBUTION BOARDS

6.1. The distribution board shall comply with SANS 60439-1

6.1.1. The form of separation will be specified in the project specific documentation.

6.2. The degree of protection shall be to IEC Publication 144/EN60529 and shall conform to the following:

- Inside Substations and MCC Rooms: IP42
- Other Locations: IP65

6.3. The distribution board shall consist of either a framework of substantial steel sections covered with heavy gauge steel plates or of folded sheet steel sections, forming a robust construction.

6.4. Particular attention shall be given to the ventilation of panels, to eliminate build-up of excessive heat caused by the sun or internal heat generation. All necessary precautions shall be taken to ensure that the temperature of the air in any portion of the assembly does not rise more than 15°C above ambient air temperature

6.5. Every board shall be fitted with a suitable gasket incorporated into the frame to ensure that the arrangement is in accordance with the required degree of protection. Sealing strips and gaskets shall be made of durable, non-hardening rubber, neoprene or other synthetic material, suitably fixed to the door or frame to ensure that the seal does not become dislodged during normal operation.

6.6. Where possible the lock and door catch shall comprise of a combination unit. Door latching and delatching operations shall be smooth and quick, whilst ensuring proper compression of the sealing gaskets. Repeated opening and closing of the hinged doors and operations of the door locks and catches shall not cause chipping or scratching of the painted surfaces or any other blemishes to the finished boards

6.7. Lifting lugs shall be provided for floor standing enclosures and as needed for wall mounted enclosures.

6.8. The board shall have a separate latches hinged or removable front cover secured to the board by means of suitable captive type screws or bolts. When the cover is removed/ opened, easy access to that compartments components and wiring shall be possible.

6.8.1. The control units shall be mounted flush with the front cover so that only the operating handles protrude.

6.8.2. Large removable panels shall be supplied with handles for easy handling.

6.8.3. No possibility should exist for panels to come into contact with live parts.

6.9. Due care shall be taken to ensure that the live side of the MAIN SWITCH is suitably protected so that no live conductors are exposed when the panel door is opened or the panel cover is removed.

6.10. The board shall be equipped with a set of 3 phase and neutral copper busbars. The 3 phase busbars shall be continuously rated for the full load of the incoming supply switch. The neutral shall be 100% of the phase busbars. Earth bar shall be rated to fault current and touch voltage.

- 6.11. All busbars shall be designed, manufactured, marked and tested in accordance with SANS1195.
- 6.12. Busbar rating shall be 2A/mm^2 up to 630A and 1.6A/mm^2 thereafter.
- 6.13. Busbar temperature shall not exceed a 40°C temperature rise.
- 6.14. The busbars shall be adequately braced and supported. The busbars shall be covered with a sufficient number of layers of high quality insulating tape or heat shrinkable sleeving and finished in standard colours.
- 6.15. Where busbar joints and terminations have not been covered, a kit shall be provided for covering during installation.
- 6.16. Alternatively, busbars shall be suitable enclosed in a busbar chamber or behind a protective barrier for protection against inadvertent contact with "live" busbars with access panels removed.
- 6.17. Inter-connectors between the busbars and control units shall be by means of fully insulated, adequately rated conductors firmly bolted to the busbar and secured to the appropriate terminals of the control units using crimped-on terminal lugs. Solid flat conductors shall be used if the rating exceeds 400 A or if the fault current exceeds 25kA rating. No conductor of less than 16mm^2 shall be used between busbars and control units. All conductors shall be suitably rated for the fault level.
- 6.18. The other terminals of the incoming and outgoing panel units shall be connected by means of conductors conforming to clause 6.17, i.e. they shall be robust, insulated, easily accessible terminals, of adequate size, conveniently located in the distribution board near the incoming and outgoing cable entries but with sufficient clearance and space to enable the incoming and outgoing cables to be connected to their corresponding terminals without difficulty or strain.
- 6.19. All the outgoing connections of MCCB'S greater than 400A 3 phase shall be done by means of copper bus bars, securely clamped using approved busbar clamping insulators, fixed to a robust metal section of adequate size, conveniently located in the rear of the distribution board to enable the incoming cables to be terminated in the back of the distribution board cubical behind each respective MCCB. This is to allow for the easy termination of the larger incoming cables, with sufficient clearance and space to enable the outgoing cables to be connected to their corresponding busbar terminals without difficulty or strain to the MCCB's. Each MCCB up to 250A shall be fitted with extended terminal complete with phase barriers as supplied by circuit breaker supplier.
- 6.20. Outgoing cable tails that connect to the busbars in clause 6.19 shall have securing places to enable the cable to be secured with nylon type cable fasteners in an approved manner.
- 6.21. The busbars that protrude into the back compartment of the distribution board shall be covered with a perspex type barrier and shall have danger signs on each section.
- 6.22. Removable gland plates shall be provided. These gland plates shall be of adequate thickness or construction for the cables to be terminated without distortion of the gland plate, and shall not be less than 2mm mild steel (zinc passivated). Gland Plates shall not be mounted less than 300mm above ground floor level, alternatively a base frame of suitable depth may be provided.
- 6.23. Distribution board cases shall be of such dimensions that adequate space is available for manoeuvring and connecting the incoming and outgoing cables.

- 6.24. All cable entries shall be from the bottom of the distribution board unless stated otherwise.
- 6.25. Glands shall not be less than 300mm above floor level. Unless otherwise stated.
- 6.26. The terminals of all incoming and outgoing cables shall be firmly connected to the terminals on the lugs or ferrules, unless they are of a type that will grip the cable without splaying the strands of the conductor.
- 6.27. A substantial earthing terminal shall be firmly attached to the metal work of the distribution board and connected to an earth bar of cross sectional area not less than 50% of the phase bars, running the full length of the distribution board to which all earthing conductors of the incoming and outgoing circuits shall be firmly connected.
- 6.28. A removable link shall be provided in the Neutral busbar to ensure that the neutral busbar can be split in two sections for testing purposes. The link shall be secured in position with a bolt and nut arrangement.
- 6.29. The distribution board manufacturer shall allow for at least 30% capacity for the installation of additional switchgear in the distribution boards.
- 6.30. Each distribution board shall be fitted with the following labels as needed in suitable positions:
 - Live busbars
 - Flash signs
 - Main label (always required)
 - Voltage rating
 - Current rating
 - Fault level and time
 - IP rating
 - Job number
 - Reference number
 - Date of manufacture
 - Form of separation
 - Fed from
 - Each feeder/starter to be labelled
- 6.31. Each distribution board shall be supplied with a test certificate. This certificate shall include all items as indicated in annexure 1 of SANS 1973–1 and annexure E of SANS 1973–3.

7. ARC DETECTION SYSTEM

- 7.1. All switchgears shall be equipped with an efficient and reliable arc detection system designed according to IEC 61508 with a safety level meeting at least SIL 2.
- 7.2. The system shall consist of one or more arc monitoring units and light detectors.

7.2.1. Arc detection system:

Arc detection system shall not be activated by interfering influences such as portable lamps, electro-magnetic fields, vibration or touching. In case of an arc occurring in the switchgear it shall be possible to identify where and when the arc has occurred. This information should be accessible without opening the switchgear door and stored even if power is lost to the system. The HMI shall not affect the IP degree of the cabinet.

7.2.2. Arc monitoring unit and light detector:

The arc detection system shall use light as the main condition for tripping. Detectors shall cover each bus-bar section, respective circuit breaker and in any other areas where the designer of the switch gear considers or finds it as a potential risk for an arc. The detectors shall be made of optical fibre in order to avoid EMC disturbances. Without any extra calibration from the user the system shall not react for a light intensity lower than 3000 lux in order to avoid nuisance tripping. The light intensity shall also be constant regardless the length of the detector.

7.3. The trip signal shall be sent within less than 2 ms to the circuit breaker in an event of an arc

7.4. The arc monitoring unit shall provide at least three high speed solid state tripping outputs to the circuit breaker.

7.5. It shall be possible to configure the detectors to trip different breakers depending on which detector detects the arc.

7.6. The system shall have the possibility to mount up to 30 detectors in the space of the main unit in order to avoid space issues if the system would be extended.

8. FUSE SWITCHES

8.1. Fuse switches shall comply with SANS 152 and SANS 60947 – 3.

8.2. Fuse switches shall be enclosed, triple pole, quick break and dustproof.

8.3. Fuse switch handle shall have an IP rating of IP65 and the handle shall be defeatable to override the door interlock.

8.4. Fuse switches shall be of the double break type and the fuses shall be completely isolated when the switches are in the "OFF" position.

8.5. Fuse switch and handle shall have a test position. It will be possible to have an auxiliary for only indication test position.

8.6. The switches shall be interlocked to prevent the opening of the front covers unless the switches are in the "OFF" position and the closing of the switches with the covers open. The switches shall be lockable in the "OFF" position.

8.7. Fuse Switches shall have a lever or rotary action with a positive spring controlled opening and closing action for making or breaking the circuit under load conditions. Fuse carrier and base contacts shall be designed to give permanent high contact pressure and shall be designed to facilitate location of blown fuses without removal of the carrier. Fuse carriers and bases shall be of the highest grade phenolic mouldings to BS 771 and shall be non-flammable and nonhygroscopic, with a hard gloss black finish.

8.8. It shall be possible to install the fuse switch in any position without derating.

9. FUSE LINKS

9.1. HRC Fuse Links shall be of the high rupturing capacity type, compliant with SANS IEC 60269 –

1:2006. Fuse links shall incorporate a visual indication device to facilitate location of blown fuses and shall be designed to clip into the fuse carrier contacts without the use of fixing screws.

9.2. Breaking capacity of all fuse links shall be not less than Category of duty AC.50 at 415 Volts (SANS IEC 60269 - 1:2006). The Fusing factor of the fuses shall not exceed 1.5 (SANS IEC 60269 Class Q1).

9.3. Fuse current ratings shall be indicated on engraved 20 x 12mm white-black-white trifoliate labels in 4mm letters. The labels are to be fitted at the fuse bases and shall not be obscured by wiring.

9.4. Fifty- percent spare fuses of each size shall be provided in suitable cubicle on the switchboard. The door of this cubicle shall be suitably identified.

10. AIR CIRCUIT BREAKERS (ACB) SHALL CONFORM TO THE FOLLOWING CHARACTERISTICS.

10.1. Functional characteristics:

10.1.1. Air circuit breakers for use on the incoming supply side of the distribution board shall comply with SANS 60947.

10.1.2. The circuit breakers shall have a continuous enclosed current rating as indicated on the relevant drawings with a minimum Icu (ultimate breaking capacity) of 42kA at 415 volts. The circuit breakers shall be tested for category P.2, unless specified otherwise.

10.1.3. The circuit breakers shall have an Ics (service capacity) rating equal to the Icu (ultimate breaking capacity) rating.

10.1.4. The circuit breakers shall have an Icw (withstand current) of 1 sec and 3 sec. The 1 sec Icw rating shall be equal to the Icu rating.

10.1.5. The air circuit breakers shall be of the enclosed, ventilated, independent manual spring, draw-out type with a rated service voltage of 690 volts and a rated insulation voltage of 1000 volts and be equipped for shunt tripping from a 115 V DC battery supply. The shunt tripping facility shall be wired so that the ACB shall trip when it's associated high voltage transformer circuit breaker trips.

10.1.6. The circuit-breakers shall have a rated impulse withstand voltage of 12 kV.

10.1.7. The rated uninterrupted current shall be between 100 and 6300 A with the possibility of set trip threshold of L protection from 40A.

10.1.8. Different versions of circuit-breakers shall be available, divided into their category of use: A (current-limiting) and B (selective).

10.1.9. Different versions shall be available with rated ultimate breaking capacity from 42 to 150 kA at 440 V AC and from 42 to 100 kA at 690 V AC for circuit-breakers in category B and with 130 kA at 415 V AC, 85 kA at 690 V AC for circuit-breakers in category A.

10.1.10. The mechanical life shall be at least 12000 operations with a frequency of 60 operations/hour without the need for maintenance of the contacts and arcing chambers

- 10.1.11. The electrical life at a voltage of 440 V AC shall be (with a frequency of at least 10 operations/hour and without the need for maintenance of the contacts and arcing chambers):
- at least 9000 operations up to 2000 A
 - at least 5000 operations up to 3200 A
- These values are intended to be valid only for category B circuit-breakers.

10.2. Environmental characteristics

- 10.2.1. Operating temperature: -25 °C...+70 °C (-13 °F...158 °F) and storage temperature: -40
- 10.2.2. Altitude: operation without derating shall be up to 2000 metres above sea level. (6600 ft), and with derating up to 5000 metres above sea level. (16500 ft).
- 10.2.3. Suitability for use in a hot-humid environment. With regard to this, the circuit-breakers shall undergo a tropicalisation process which makes them suitable for use in a hot-humid environment, as established by the prescriptions of the main shipping registers and in accordance with the international IEC 60068-2-30 Standards.

10.3. Construction characteristics

- 10.3.1. All the models shall be available in the 3 and 4 pole versions both in the fixed (with rear horizontal, rear vertical and front terminals) and withdrawable (with rear horizontal, rear vertical, front and front terminals) versions.
- 10.3.2. There shall be total segregation between power and front shield, using double insulation where suitable so as to guarantee maximum operator safety.
- 10.3.3. Total segregation between the phases shall be guaranteed for safety reasons without need of phase barriers up to 1000V.
- 10.3.4. It shall be possible to inspect easily the arcing chambers easily and to check main contact wear with the circuit-breaker racked-out, by removing the arcing chambers.
- 10.3.5. All the circuit-breakers in the range shall have the same height and depth with the aim of standardising the supporting structures of the switchgear and the switchgear itself as far as possible.
- 10.3.6. IP30 degree of protection shall be guaranteed on the front part and IP20 on the rest of the circuit-breaker (excluding the terminals), with the possibility of having IP54 degree of protection (NEMA 3/3s/13) on the front, using the transparent cover which completely protects the front, but still leaves the panel underneath and the protection unit fully visible with the relative indications.
- 10.3.7. The whole range of air circuit-breakers shall be fitted with electronic protection releases. It shall be allowed the inter-changeability of protection releases from skilled personnel.

10.4. Special points for withdrawable versions:

- 10.4.1. The circuit-breakers in the withdrawable version shall be fitted with anti-racking-in locks to prevent racking a moving part into a fixed part with a different rated current.
- 10.4.2. In the case of the withdrawable version, the presence of a device shall prevent racking-out and racking-in with the apparatus closed.



10.5. Accessories

The following accessories shall be common to the whole range standard:

10.5.1. Electrical accessories:

- 10.5.1.1. Shunt opening/closing release.
- 10.5.1.2. Control and monitoring Test Unit - allows continuity of the different versions of the shunt opening releases to be checked;
- 10.5.1.3. Undervoltage release;
- 10.5.1.4. Time delay device for undervoltage release - allows release trip delay with established and adjustable times;
- 10.5.1.5. Geared motor for the automatic charging of the closing springs;
- 10.5.1.6. Mechanical and electrical signalling of overcurrent release trip;
- 10.5.1.7. Trip reset release;
- 10.5.1.8. Auxiliary contacts which allow signalling of the circuit-breaker state;
- 10.5.1.9. Current transformer for the neutral conductor outside the circuit-breaker;
- 10.5.1.10. Homopolar toroid for the main power supply earth conductor (star centre of the transformer).

10.5.2. Mechanical accessories:

- 10.5.2.1. Interlocks between 2 circuit-breakers or among three circuit-breakers can be used horizontally, vertically or in "L" position using different types of flexible cables:
- 10.5.2.2. Standard version (with maximum distance between two circuit breakers: up to 1200 mm if horizontally interlocked while up to 750mm if vertically interlocked).
- 10.5.2.3. Extended version (with distance between two circuit breakers: from 1200mm up to 1600 mm if horizontally interlocked while from 750 up to 1000 if vertically interlocked).
- 10.5.2.4. Mechanical locks to control enabling racking-in/out operations available also with interlocks. IP54 transparent front protection (NEMA 3/3S/13).

10.6. Protection Release

10.6.1. Basic Protection Functions

- 10.6.1.1. The release shall not require auxiliary power supplies since the power is taken from the current transformers.
- 10.6.1.2. The signals supplied by the release shall not operate with power supply supplied by internal batteries.

- 10.6.1.3. The protection against overload (L) with characteristic $t=k/I^2$ shall always have setting ranges with timing adjustable up to 144s with $I=3I_n$.
- 10.6.1.4. The protection of neutral shall be set at 50%, 100%, 200% and OFF of the phase currents without changing any component.
- 10.6.1.5. All the protection functions except protection against overload shall be excludable.

10.6.2. Measurement Functions

- 10.6.2.1. The release shall always be able to provide measurement of the currents and voltages in the three phases, in the neutral and of earth fault (ammeter function), both in self-supply and with an auxiliary power supply. Measurement function shall be active, even without external supply, starting from 140 A of single-phase current, independently from the circuit-breaker size. Accuracy of the ammeter measurement chain (current sensor plus ammeter) shall equal or better than 1.5% in the 30% - 120% current interval of I_n .
- 10.6.2.2. The release shall not normally require auxiliary power supplies since the power is taken from the current transformers. For measurements and programming at very low currents, a power supply at 24 V DC shall be available. As alternative the release shall be able to receive power supply directly from busbars or terminals, up to line voltage equal to 690 V AC.
- 10.6.2.3. The release shall be able to acquire the waveforms of electrical values with a sampling frequency selectable from 600 to 4.800 Hz and sampling interval from 3 s to 27 s. Acquisition shall be frozen after a trip or a configurable event. Acquisition data shall be retrieved from an external device (personal computer or similar) for fault analysis purposes. The release shall show voltage measurements on display, with a precision equal or higher than 1%.
- 10.6.2.4. Measurement functions that shall be available:
 - Current measurements
 - Voltage measurements
 - Power measurements
 - Power factor measurements.
 - Measurements of frequency and peak factor
 - Energy measurements
 - Historical measurements
 - The last 10 trips information
 - Complete trip information on display without batteries
 - Data logger included as standard

10.7. Advanced Protections Functions

- 10.7.1. Thermal memory for functions L (overload protection) and S (short circuit protection).
- 10.7.2. Protection against over-temperature. It shall be possible to signal the presence of anomalous temperatures on the release by means of two LEDs (Warning and Alarm) and, if decided during the unit configuration phase, when the temperature is over 85 °C, to simultaneously control circuit-breaker opening.

- 10.7.3. Protection against missing and unbalanced phase (U) with characteristic $t=k$ shall be possible.
- 10.7.4. Load control protection (K).
- 10.7.5. Undervoltage protection (UV)
- 10.7.6. Overvoltage protection (OV)
- 10.7.7. Residual voltage protection (RV)
- 10.7.8. Underfrequency protection (UF)
- 10.7.9. Overfrequency protection (OF)
- 10.7.10. Protection against reversal of active power (RP)

10.8. User Interface and Signalling LEDs

- 10.8.1. An alarm shall indicate by means of LEDs located on the release the disconnection of opening solenoid and current transformers. A trip shall also occur, after a short time delay, when the disconnection is detected.
- 10.8.2. The release shall allow parameterisation by means of keys and a LCD graphic display.
- 10.8.3. Access to control and configuration of the unit by means of a password (edit MODE).
- 10.8.4. The signals given by the permanent indicators shall guarantee maximum reliability.
- 10.8.5. Indication shall be available directly on display on request of the user for not less than 48 hours even without an auxiliary voltage and batteries and also be given in the case of re-losing on a fault. After 48 hours of inactivity the information shall be retrievable by external devices. Indication shall contain at least the protection tripped.
- 10.8.6. It shall be possible to read the current values and information on the last 10 measures (current values, protection tripped) at any time through external devices, some of which can transmit data via bluetooth;
- 10.8.7. In the event of CB tripped, shall be indicated the type of protective function that intervened.
- 10.8.8. Each alarm or warning alarm shall be clearly shown on the display, when it is active.
- 10.8.9. On the protection release two (2) led's shall be present.
- 10.8.10. Warning LED shall be in place indicating at least the following:
 - Presence of one or more phases with current values in the $0.9 \cdot I_n < I < 1.05 \cdot I_n$ range
 - Presence, between two or three phases, of unbalance higher than the value programmed during configuration
 - The first temperature threshold of $T=70\text{ }^{\circ}\text{C}$ has been exceeded
 - Contact wear $> 80\%$
 - Harmonic distortion
 - Out of range frequency
 - Breaker status error
 - Warning threshold override

- 10.8.11. Alarm LED shall be in place indicating at least following:
- Presence of one or more phases under overload with current values $I > 1,3 \cdot I_n$ (Overload Protection - L under timing)
 - Timing in progress for protection function S (Selective short circuit protection)
 - Timing in progress for protection function G (Earth fault protection)
 - The second temperature threshold of $T=85^\circ\text{C}$ has been exceeded
 - Contact wear 100%.
 - Timing in progress for protection function D;
 - Timing in progress for protection function UV(Under Voltage), OV(Over Voltage), RV (Residual Voltage);
 - Timing in progress for protection function RP(Reversal of Active Power);
 - Timing in progress for protection function
 - Timing in case of unbalance between the phases higher than the value set during configuration with trip set to ON;
 - Current Sensors disconnected;
 - Opening solenoid (Trip Coil) disconnected
- 10.8.12. The communication function shall be implemented on the release by means of:
- An internal bus, with interface RS485;
 - An external bus, with Modbus RS485 protocol 2-Wire Twisted Pair, 19.2 kbit/s max.
- 10.8.13. There shall be the possibility of setting the release in remote and in local operating mode, and with the latter it shall not be possible to carry out data transmission from the system to the release. It shall be possible to automatically set the local mode by means of an external contact. An 24VDC auxiliary supply shall be used.
- 10.8.14. The protection release shall be able to send to the system these data:
Protection parameters set, phase and neutral currents, state of the circuit-breaker (open closed), position of the circuit-breaker (connected-isolated), state of the springs (charged discharged), number of circuit-breaker mechanical operations, total and for each protection number of trips, last interrupted current, contact wear, state of the protection functions (pre alarm function. L, timing function. L, S,G...), overtemperature protection function, state of internal communication bus.
- 10.8.15. The system shall transmit to the protection release the following data: protection parameters, circuit-breaker opening and closing commands, reset for tripping of some protection functions.
- 10.8.16. Adjustable inverse definite minimum time (IDMT) overcurrent release facilities are required in addition to the instantaneous fault trip for the air circuit breakers.

11. MOULDED CASE CIRCUIT BREAKERS (MCCB) SHALL CONFORM TO THE FOLLOWING CHARACTERISTICS.

11.1. Functional Characteristics

11.1.1. AC rated service voltage for currents over 160 A: 690 V AC (50-60 Hz).

11.1.2. DC rated service voltage: 500 V DC for currents of 160 A and 750 V DC for currents over 160A.

- 11.1.3. Rated uninterrupted current for 1000 V AC or DC applications: 800 A (three and four poles).
- 11.1.4. Minimum rated insulation voltage for currents equal or over 160 A: 8 kV.
- 11.1.5. Rated insulation voltage for currents equal or over 160 A: 800 V AC.
- 11.1.6. Rated uninterrupted current between 160 and 3200 A with trip units settings starting from 1A.
- 11.1.7. According to IEC 60947-2 (§ 4.4) starting from 400 A the circuit breakers shall be category B
- 11.1.8. MCCBs shall be available with different ultimate short breaking capacities between 16kA and 200kA @ 380/415 V AC.
- 11.1.9. Both line up and line down supplying shall be possible without decreasing MCCBs performances or functionality
- 11.1.10. For rated uninterrupted currents up to 160 A, the MCCB limiting features shall be enough to assure its conformity to IEC 60439-1 (§ 8.2.3.1) once installed into a type AS or ANS switchboard as general breakers. This shall be valid up to the MCCB's rated uninterrupted current (limiting versions are excluded).
- 11.1.11. A test bottom for the correct functionality checking (moving contacts opening) shall be place in front of the breaker.

11.2. Ambient Characteristics

- 11.2.1. Operating temperature: -25 °C. +70 °C (ambient temperature)
- 11.2.2. Storage temperature: -40 °C .. +70 °C (ambient temperature)
- 11.2.3. Reference temperature for setting the thermal element of the thermomagnetic trip unit: +40 °C
- 11.2.4. Maximum relative humidity: 98%
- 11.2.5. Maximum altitude: 2000 m above sea level, 5000 m above sea level with derating suitability for being used in hot-humid places. With regard to this, the circuit-breakers shall undergo a tropicalization process to make them suitable for use in hot-humid places, as established in the prescriptions of the major naval registers and in compliance with the International IEC 60068-2-30 Standards.
- 11.2.6. Circuit-breakers fitted with electronic trip units shall comply with the prescriptions of the International Standards on electromagnetic compatibility.

11.3. Construction Characteristics

- 11.3.1. The range of moulded case circuit-breakers shall cover a range of rated uninterrupted currents from 160 to 3200 A
- 11.3.2. By means of the double insulation technique, moulded case circuit-breakers shall guarantee complete separation between the power circuits and the auxiliary circuits.
- 11.3.3. Moulded case circuit-breakers shall have an operating lever which always indicates the exact position of the circuit-breaker contacts (positive operation), by means of safe and reliable signals (I= closed, O= open, yellow-green line= open due to trip unit).

- 11.3.4. The operating mechanism shall be designed to operate all poles of the circuit breaker simultaneously for making, breaking and tripping.
- 11.3.5. Moulded case circuit-breakers shall be suitable for isolation in compliance with § 7.2.7 of the IEC 60947-2 Standard. This indication shall be clearly and indelibly marked on the circuit-breaker (in accordance with § 5.2 of IEC 60947-2) and in a position where it is visible with the circuit-breaker installed.
- 11.3.6. Moulded case circuit-breakers shall be available in the three-pole and four-pole version both in the fixed, and in any possible plug-in or withdrawable versions.
- 11.3.7. Circuit-breakers in the plug-in version starting from 250 A shall be available. In the case of a plug-in or withdrawable version, the presence of a device shall prevent racking-in or racking-out with the apparatus closed.
- 11.3.8. In the withdrawable version, racking-out with the door closed shall be possible.
- 11.3.9. The same depth and installation on a DIN EN 50022 rail shall be guaranteed up to the rated setting of 250 A inclusive. The same depth shall be guaranteed. This characteristic shall allow the switchboard and their support structures to be standardized.
- 11.3.10. Moulded case circuit-breakers with rated uninterrupted current up to 250 A shall have a 45 mm high face which makes them suitable for installation on modular panels.
- 11.3.11. All the installation positions shall be possible without jeopardizing the function of the apparatus. Starting from 630 A up to 1600 A the withdrawable version shall be mounted and operated horizontally.
- 11.3.12. For the front parts of the circuit-breakers the degree of protection of at least IP20 (excluding the terminals) shall be guaranteed, IP30 when they are installed in switchboards, and up to IP54 for circuit-breakers installed in a switchboard fitted with transmitted rotary handle and special accessory.

11.4. Protection Trip Units

- 11.4.1. Moulded case circuit-breakers shall be equipped with interchangeable trip units. From 160 A up to 800 A it shall be possible to choose between a thermomagnetic and an electronic protection. For the sizes higher than 800 A, the trip unit shall only be electronic. The trip unit shall be integrated in the volume of the apparatus.
- 11.4.2. From the 250 A size circuit-breakers, the trip unit shall be interchangeable. Trip units shall be adjustable and it shall be possible to fit lead seals to prevent unauthorised access to the settings

11.5. Thermomagnetic Overcurrent Trip Units

- 11.5.1. Thermomagnetic trip units shall be fitted with protection threshold against overload (whose thermal element shall consist of a bimetal) and with protection threshold against short circuit.
- 11.5.2. The protection threshold against overload shall be continuously adjustable starting from 0.7 times the rated current of the trip unit and up to its rated value.
- 11.5.3. The reference temperature for setting the thermal element of the protection trip unit is 40°C.

11.5.4. The temperature performance of the trip unit shall be indicated as the temperature varies.

11.5.5. The protection threshold against short-circuit shall be either the fixed or adjustable type with continuity from 5 and up to 10 times the rated current of the trip unit. In the four-pole version, the neutral pole shall always be protected. For current values equal to or higher than 125 A, protection of the neutral pole shall, at choice, be at 100% or at 50% of the rated current of the trip unit. Vice versa, for current values of less than 125 A, protection of the neutral pole shall always be 100%.

11.5.6. For circuit-breakers with rated uninterrupted current of 160 A, 250 A, 400 A and 500A, a thermomagnetic trip unit shall be available for generator protection with adjustable thermal threshold, starting from $0.7 \times I_n$, and fixed magnetic threshold at $3 \times I_n$ or adjustable magnetic threshold from 2.5 to $5 \times I_n$. Suitability for use in direct current.

11.6. Magnetic only overcurrent trip units

11.6.1. The overcurrent trip units with magnetic only threshold shall be suitable for protection against short-circuit.

11.6.2. The adjustable magnetic only trip units (suitable for motor protection) shall only be available in the three-pole version, whereas those with fixed threshold shall also be available in the four-pole version.

11.6.3. The adjustable magnetic only trip units shall be available for circuit-breakers up to 320 A. Suitability for use in direct current.

11.7. Electronic Overcurrent Release Trip Units

11.7.1. The electronic overcurrent trip units shall be self-supplied and shall be able to guarantee correct operation of the protection functions even in the presence of a single phase supplied with a current value equal to 20% of the phase current. They shall be unaffected by electromagnetic interference in compliance with the EMC directive on the matter.

11.7.2. The basic version shall be fitted with protection functions against overload (function L) and against short-circuit. The latter function can either be of the instantaneous type (function I) or, alternatively, with intentional delay selective short circuit protection (function S). The function of protection against short circuit shall be excludable.

11.7.3. A basic version shall also be provided with only the protection threshold against instantaneous short-circuit which cannot be excluded.

11.7.4. The complete version shall be fitted with protection threshold against overload (function L), against instantaneous short-circuit (function I) and with intentional delay (function S) and also with protection threshold against earth fault (function G). All the protection functions except for protection against overload shall be excludable.

11.7.5. The advanced version shall be suited for zone selectivity protection for the S and G protection functions. An integrated ammeter and many other additional features are provided over and above the protection functions. All the protection functions except for protection against overload shall be excludable.

11.7.6. The advanced version shall be suited for zone selectivity protection for the S and G protection

functions. An integrated ammeter and many other additional features are provided over and above the protection functions. All the protection functions except for protection against overload shall be excludable.

- 11.7.7. A version dedicated to ultra rapid short-circuit protection (with a detection time less than 5 ms) combined with zone selectivity shall be available.
- 11.7.8. An advanced version dedicated to motor protection shall be available with protection functions against overload (function L), against instantaneous short circuit (function I), against unbalanced or missing phase (function U) and against rotor block (function R).
- 11.7.9. A version dedicated to generator protection shall be available (up to 160A), with protection functions against overload (function L), against instantaneous short circuit (function I) and with intentional delay (function S). The S and I protection functions are not an alternative to each other. All these functions are imposed by the major naval registers.
- 11.7.10. All the advanced trip units shall be available with thermal memory.
- 11.7.11. All the protection functions shall be characterized by threshold and time tolerances according to the International Standards.
- 11.7.12. The trip unit shall allow parameterization of the trip thresholds and timing locally or remotely; in the case of any anomalies in remote parameterization, the protection shall automatically use the series of parameters set manually on the front of the circuit breaker.
- 11.7.13. On the advanced version, access to information and programming shall be allowed by a keyboard and graphic liquid crystal display.
- 11.7.14. Alarm signals for the protection functions will be available by means of LEDs located on the trip unit (complete version) and/or on the display (advanced version).
- 11.7.15. The size of the current sensors shall be a minimum of 10 A to a maximum of 3200 A so as to cover the widest possible current range.
- 11.7.16. Interchangeable rating-plugs shall be available starting from 400 A.
- 11.7.17. The four-pole circuit-breaker shall always be supplied with the neutral protected at 100% up to 125A excluded, and for higher values with protection selected between 50% and 100% of the rated current of the trip unit. Starting from 630A setting of the neutral at 150% and 200% shall be possible.
- 11.7.18. The current sensors for external neutral shall be optional.
- 11.7.19. Moulded Case Circuit breakers equipped with electronic releases shall be available a dedicated function to verify the correct connection between the trip unit, current sensor and trip coil. Eventual anomalies shall be signalled by a red led flashing.
- 11.8. Accessories for electronic trip units shall be available, such as the test unit for checking functioning of the tripping coil of the electronic trip unit, a trip signalling unit of the protections, a test and configuration unit which allows the electronic trip unit protections to be tested and configured, an actuation unit which allows circuit-breaker opening and closing by means of a motor operator

mounted on it, a battery unit which allows trip unit testing when the circuit-breaker and an external unit for wireless communication.

- 11.8.1. For both the complete and the advanced version a measurement module shall be available, in order to gauge the plant functioning parameters, such as phase and phase to phase voltages, powers and energies. On the advanced version all the available measurements can be displayed on the LCD. Furthermore, for the electronic trip units for motor protection, there shall also be a contactor control unit available.
- 11.8.2. The advanced version will be provided with a data logger function that automatically records and stores the instantaneous values of all the currents and voltages. Data shall be easily downloaded to any personal computer for elaboration. The data logger function freezes the recording whenever a trip occurs, so that a detailed analysis of faults can be easily performed. The sampling rate shall be adjustable up to 4800Hz, with total sampling time up to 27 s (@ 600Hz sampling rate). Tracking of up to 64 events shall be possible.

11.9. Protections

The minimum performances of the protection functions of the electronic protection trip unit for distribution, where present, shall be:

- 11.9.1. Function L: adjustable trip threshold $I1 = (0.4-1) \times I_n$, trip curves for the basic version with time settings from 3 to 12 seconds – 2 different trip curves - (at 6 times the set threshold), whereas for the advanced version with time settings from 3 to 18 seconds – 4 different trip curves - (at 6 times the set threshold). For the advanced version, L function according to IEC 60255-3 shall be available. *Cannot be excluded.*
- 11.9.2. Function S: adjustable trip threshold $I2 = (1-10) \times I_n$, trip curves for the basic version with time settings from 0.1 to 0.25 seconds – 2 different trip curves – (at 8 times the rated current of the trip unit), whereas for the advanced version with time settings from 0.05 to 0.5 seconds – 4 different trip curves with inverse short time with definite time characteristic or curves with definite time – (at 6 times the rated current of the trip unit). For circuit breakers from 250 A to 630 A, in the advanced version, $I2 = (0.6-10) \times I_n$. *Can be excluded.*
- 11.9.3. Function I: adjustable trip threshold $I3 = (1-10) \times I_n$ for the basic version (instantaneous trip), whereas for the advanced version $I3 = (1.5-15) \times I_n$ (instantaneous trip). *Can be excluded.*
- 11.9.4. Function G: adjustable trip threshold $I4 = (0.2-1) \times I_n$ with trip time settings from 0.1 to 0.8 s with curve with inverse short time and definite time characteristic. *Can be excluded.*
- 11.9.5. Function U: adjustable trip threshold $I6 = (2\% \dots 90\%) \times I1$ with trip time settings from 0.5 to 60 s with curve with inverse short time and definite time characteristic. *Can be excluded.*
- 11.9.6. Function OT: fixed at 85 °C (with instantaneous trip). *Can be excluded.*

- 11.9.7. Function UV: adjustable trip threshold $U8 = (0.5-0.95) \times U_n$ with trip time settings from 0.1 to 5 s with curve with inverse short time and definite time characteristic. *Can be excluded.*
- 11.9.8. Function OV: adjustable trip threshold $U9 = (1.05-1.2) \times U_n$ with trip time settings from 0.1 to 5 s with curve with inverse short time and definite time characteristic. *Can be excluded.*
- 11.9.9. Function RV: adjustable trip threshold $U10 = (0.1-0.4) \times U_n$ with trip time settings from 0.5 to 30 s with curve with inverse short time and definite time characteristic. *Can be excluded.*
- 11.9.10. Function RP: adjustable trip threshold $P11 = (-0.3...-0.1) \times P_n$ with trip time settings from 0.5 to 25 s with curve with inverse short time and definite time characteristic. *Can be excluded.*
- 11.9.11. Function UF: adjustable trip threshold $f12 = (0.9-0.99) \times f_n$ with trip time settings from 0.5 to 3 sec with curve with inverse short time and definite time characteristic. *Can be excluded.*
- 11.9.12. Function OF: adjustable trip threshold $f13 = (1.01-1.10) \times f_n$ with trip time settings from 0.5 to 3 s with curve with inverse short time and definite time characteristic. *Can be excluded.*
- 11.9.13. The minimum performances of the protection functions of the electronic protection trip unit for motor protection shall be:
- Function L: adjustable trip threshold $I1 = (0.4-1) \times I_n$, trip curves in class 10A, 10, 20 and 30 or 3E, 5E, 10E e 20E in compliance with the IEC 60947-4-1 Standard, with temperature compensation and sensitivity to missing/unbalanced phase. *Cannot be excluded.*
 - Function R: adjustable trip threshold $I5 = (3-10) \times I1 + \text{OFF}$, with 4 different trip curves with definite time with time settings $t5 = 1...10$ s. Automatic exclusion of the function during the motor starting phase, and automatically reactivated after this. *Can be excluded.*
 - Function I: adjustable trip threshold $I3 = (6-13) \times I_n$ (instantaneous trip) with recognition of the motor starting phase.
 - Function U: adjustable trip threshold $I6 = (0.4-0.9) \times I1$ e $t6 = 4$ s. *Can be excluded.*
 - Possibility of contactor control for trip of functions L and R.
 - Possibility of connection to a PTC (temperature probe) inserted in the motor.

11.10. Dialogue

For circuit-breakers from 250 A to 1600 A dialogue shall be available, making the following functions possible:

- 11.10.1. Remote setting of the protection function parameters, unit configuration and communication.

- 11.10.2. Transmission of measurements, states and alarms from circuit-breaker to system transmission of events to the system.
- 11.10.3. Dialogue units able to support different standard market protocols shall be available:
 - 11.10.3.1. Modbus RTU protocol, EIA RS485 physical transmission means, speed 9.6...19,2 Kbit/s, bus architecture.
 - 11.10.3.2. Profibus DP protocol, RS485 physical transmission, speed 9.6...19,2 Kbit/s, bus architecture.
 - 11.10.3.3. Device Net protocol, RS485 physical transmission, speed 9.6...19,2 Kbit/s, bus architecture. Wireless bluetooth protocol.
 - 11.10.3.4. The dialogue unit shall make all the parameterization and measurement information of the protection unit available on the field bus, as well as the state of the circuit-breaker (open/closed, racked-in/racked-out) and of the related trip units. Shall be providing a tool able to analyse all these data by PC.

11.11. Accessories

11.11.1. Electrical Accessories

- 11.11.1.1. Internal Accessories has to be the same up to 250A as well from 250A to 1000A.
- 11.11.1.2. Auxiliary contacts: these shall allow the state of the circuit-breaker (open or closed; contact on change-over) and trip unit to be known. Auxiliary contacts for use at 250 V AC/DC, 400V AC and 24 V DC (digital contacts) shall be available.
- 11.11.1.3. Releases: the shunt opening and under-voltage releases shall be available with different power supply voltages both in AC and DC.
- 11.11.1.4. With circuit-breakers up to 250 A the electrical accessories shall be available both in the pre- cabled version and with 1m long un-cabled cables.
- 11.11.1.5. The addition of the electrical accessories shall not increase the volume of the circuit breakers.

11.11.2. Mechanical Accessories

- 11.11.2.1. Terminals: different types of terminals (both front and rear) shall be available for all the sizes, suitable for connection with copper, copper-aluminium cable and bus bar connections.
- 11.11.2.2. Up to the 160 A size, the circuit-breakers can be fitted with different types of terminals combined in different ways (higher of one type, lower of a different type). Terminal covers and phase separators shall also be available.
- 11.11.2.3. Multi-cable terminals shall be available for circuit-breakers for the 250-320-400-630 A size. Support for fixing onto DIN rail: supports for fixing onto DIN EN 50022 rail shall be available up to the rated current of 250 A inclusive.
- 11.11.2.4. Mechanical interlocks: mechanical interlocks shall be available for the whole series of circuit-breakers; the interlock can be of the front type for circuit-breakers with rated

current up to 250 A. It shall be possible to interlock circuit-breakers of different sizes at least up to 250 A and between 250A and 630 A.

11.11.2.5. Rotary handle: a rotary handle operating mechanism both in the direct and transmitted version shall be available for the whole range of circuit-breakers, both padlockable in the open position and fitted, on request, with the following accessories: early contact for under-voltage release, compartment door lock and key lock in open position.

11.11.2.6. The whole range of moulded case circuit-breakers shall be fitted with motor operator (according to the rated current of the circuit-breaker, this can either be of the solenoid type, or with stored energy) for remote operation of the circuit-breaker.

11.12. Residual Current Release

11.12.1. General Aspects

11.12.1.1. The residual current releases used in low voltage installations shall be designed, constructed and tested in compliance with the International Standards and in particular with:

11.12.1.1.1. IEC 60947-2 appendix B and ANNEX M

11.12.1.1.2. IEC 60255-4 and IEC 61000: for protection against unwarranted trips

11.12.1.1.3. IEC 60755 for insensitivity to the continuous current components

11.12.1.2. It shall be possible to install the residual current releases in installations with line-to-line voltage up to 690 V.

11.12.1.3. They shall be able to be used in close connection with circuit-breakers and/or switch disconnectors.

11.12.1.4. Shall be guaranteed the normal operating up to -25°C

11.13. Construction Characteristics

11.13.1. It shall be possible to combine the range of residual current releases with all the circuit breakers making up the range of moulded case circuit-breakers so as to cover the whole current range of MCCBs.

11.13.2. It shall be possible to combine the residual current releases with circuit-breakers in fixed, plug-in and withdrawable version.

11.13.3. Their installation on a DIN rail shall be possible.

11.13.4. Control of correct operation shall be possible according to the prescriptions of the reference Standards, by means of a test pushbutton on the front of the apparatus.

11.13.5. Residual current releases shall be available both in the three-pole up to 250A and in the four-pole version.

11.13.6. Dedicated residual current releases shall be available up to 1600 A

11.13.7. Type B residual current protection shall be available

- 11.13.8. It shall be possible to select the maximum threshold of sensitivity to the residual current fault frequency (3 steps: 400 700 1000 Hz).

11.14. Electrical Characteristics and Performances

- 11.14.1. Up to the rated current of 250 A, the service voltage shall be between 85 and 500 V AC line-to-line (operation up to 50 V phase-neutral). Trip thresholds I_{dn} starting from 0.03A and up to 10 A shall also be available for the advanced version which shall also allow selection of the trip times (for the basic version, the trip shall be of the instantaneous type).
- 11.14.2. A contact signalling pre-alarm shall be available in the advanced version and the availability of an input for remote opening.
- 11.14.3. There shall be type A versions for alternating pulsed current, S selective and E for emergency stop of the residual current release.
- 11.14.4. The release shall be self-supplied and the power supply can come either from above or below.
- 11.14.5. Compliance with the International Standards on the matter of electromagnetic compatibility.
- 11.14.6. There shall be a switchboard residual current unit with voltage varying between 80 and 500 V AC and between 48 and 125 V DC. There shall be availability of several adjustment ranges from 0.03 to 30 A, with trip times from instantaneous to 5 s and pre-alarm threshold adjustment.
- 11.14.7. The toroidal transformers can either be closed (from 60 to 180 mm in diameter) or open (from 110 to 230 mm in diameter).

12. MINIATURE CIRCUIT BREAKERS SHALL CONFORM TO THE FOLLOWING CHARACTERISTICS.

12.1. Functional Characteristics (1 to 63 Amps)

- 12.1.1. Miniature Circuit Breaker for cable protection according to:
DIN VDE 0641 Teil 11,
EN 60898, IEC 60947-2, EN 60947-2,
UL1077/C22.2 No.235, UL489/C22.2 No.5
- 12.1.2. Rated short-circuit capacity I_{cn} shall be: 6/10/25 kA unless otherwise indicated.

12.2. Tripping Characteristics/curves shall be as follows

B: In 6/10/13/16/20/25/32/40/50/63 A
C: In 0,5/1/1,6/2/3/4/6/8/10/13/16/20/25/32/40/50/63 A
K: In 0,2/0,5/1/1,6/2/3/4/6/8/10/13/16/20/25/32/40/50/63 A
Z: In 0,5/1/1,6/2/3/4/6/8/10/16/20/25/32/40/50/63 A
Number of poles: 1/2/3/4/1+NA/3+NA
Energy Limiting Class: 3
Rated Voltage U_n :
Single-pole: 230/400 VAC
Multi-pole: 400VAC
Max. Operating Voltage U_{Bmax} DC:
Single Pole: 72 VDC

Double Pole: 125 VDC
Suitable for isolation acc. IEC 60898-1

12.3. Environmental Characteristics

- 12.3.1. Operating temperature: -25 °C...+70 °C and storage temperature: -40 °C...+70 °C.
- 12.3.2. Altitude: operation without derating up to 2000 m (6600 ft), and with derating up to 4000 m.
- 12.3.3. Suitability for use in a hot-humid environment. With regard to this, the circuit-breakers shall undergo a tropicalisation process which makes them suitable for use in a hot humid environment, as established by the prescriptions of the main shipping registers and in accordance with the international IEC 60068-2-30 Standards.

12.4. Construction Characteristics

- 12.4.1. Guide edge for labels
- 12.4.2. Prepared for locking devices
- 12.4.3. Quick and easy removal of installed device

12.5. Wiring

- 12.5.1. Busbars: Terminals for in and out coming feeder on top of busbars. The MCB shall have a "safe terminal". Each pole shall have 2 connection points. Combining busbar and wire in same terminal shall not be permitted. Combining wire of un-equal sizes in the same terminal shall not be permitted.

12.6. Accessories

- 12.6.1. Retrofit accessories (extract):
 - Universal signal contact/auxiliary contact (right): 1SO
 - Auxiliary contact (right): 1SO
 - Auxiliary contact (left): 1NO/1NC, 2NO or 2NC
 - Bottom-fitting auxiliary contact: 1NO or 1NC
 - (bottom fitted without increasing width of MCB)
 - Undervoltage- or Shunt trip release
 - Hand operated neutral
 - Motor operating device (remote control)
 - DDA-Block
 - Labelling system (marked or blank)
 - Locking devices

12.7. Functional Characteristics (80 to 100 Amps)

- 12.7.1. Miniature Circuit Breaker for cable protection according to:
DIN VDE 0641 Teil 11, DIN VDE 0660 Teil 101, IEC 60898, EN 60898, IEC 60947-2, EN 60947-2
- 12.7.2. Rated short-circuit capacity shall be minimum: 6 kA unless otherwise stated.

12.8. Tripping Characteristics

- 12.8.1. B mit In 80/100 A

C mit In 80/100 A
Number of poles: 1/2/3/4
Energy Limiting Class: 3
Rated Voltage:
Single-pole: 230 VAC and 60 VDC
Single-pole: 400 VAC and 125 VDC
Suitable for isolation acc.: IEC 60947-1/-3

12.9. General Features

- 12.9.1. Label holder
- 12.9.2. Prepared to get equipped with toggle-locking device

12.10. Wiring

- 12.10.1. Busbars: Terminals for in and out coming feeder on top of busbars. The MCB shall have a "safe terminal". Each pole shall have 2 connection points. Combining busbar and wire in same terminal shall not be permitted. Combining wire of un-equal sizes in the same terminal shall not be permitted.

12.11. Accessories

- 12.11.1. Auxiliary contact: 2 or 3 contacts (screw-able or push-in-able)
- 12.11.2. Auxiliary contact (low power): 1 or 3 contacts
- 12.11.3. Signal contact or signal contact/auxiliary contact: 3 contacts
- 12.11.4. Undervoltage release or shunt trip
- 12.11.5. Neutral conductor
- 12.11.6. Printed labels
- 12.11.7. Labels for individual printing
- 12.11.8. Locking devices

12.12. Functional Characteristics (DC Protection)

- 12.12.1. Miniature Circuit Breaker for cable protection according to: DIN VDE 0641 Teil 12, DIN VDE 0660 Teil 101, IEC 60898, EN 60898, IEC 60947-2, EN 60947-2, UL1077
- 12.12.2. Rated short-circuit capacity: 4,5/6 kA

12.13. Tripping characteristics shall conform to the following

B: In 6/10/16/20/25 A
K: In 0,2/0,3/0,5/0,75/1/1,6/2/3/4/6/8/10/16/20/25/32/40/50/63 A
In 0,5/1/1,6/2/3/4/6/8/10/16/20/25/32/40/50/63A
Number of poles: 1/2/3/4 (K,Z); 1/2 (B)

Rated Voltage:

Single-pole: 230/400 VAC and 220 VDC

Multi-pole: 400 VAC and 440 VDC

Suitable for isolation acc: IEC 60947-1/-3

12.14. General Features

12.14.1. Label holder

12.14.2. Prepared to get equipped with toggle-locking device

12.15. Wiring

12.15.1. Busbars: Terminals for in and out coming feeder on top of busbars. The MCB shall have a "safe terminal". Each pole shall have 2 connection points. Combining busbar and wire in same terminal shall not be permitted. Combining wire of un-equal sizes in the same terminal shall not be permitted.

12.16. Accessories

12.16.1. Auxiliary contact: 2 or 3 contacts shall be (screw-able or push-in-able)

12.16.2. Auxiliary contact (low power): 1 or 3 contacts

12.16.3. Signal contact or signal contact/auxiliary contact: 3 contacts

12.16.4. Undervoltage release or shunt trip

12.16.5. Neutral conductor

12.16.6. Printed labels

12.16.7. Labels for individual printing

12.16.8. Locking devices

13. CONTACTORS

13.1. Contactors shall comply with SANS 60947. Duty cycle shall be AC3. Contactor coil voltage may be either 230V or 400V unless otherwise stated.

13.2. Lighting contactors for 24 to 63 Amps (AC1) shall be DIN mounted on the same rail as the MCBs and feature a DC solenoid actuator and are thus hum-free. They shall have a switching position indicator, integrated coil protection circuits and overvoltage protection for the solenoid coil up to 5kV.

13.3. Contactors from 9 to 38 Amps shall be electronic coils.

13.4. For contactors from 50 to 300 Amps, standard coils will be accepted.

13.5. Contactors from 400 to 2050 Amps shall be electronic coils.

13.6. Mixture of contactors shall not be permitted.

13.7. Ambient characteristics

13.7.1. Climatic withstand according to IEC60068-2-0 AND 60068-2-11

13.8. Construction characteristics

13.8.1. Contactors with electronic coils 9 to 38 Amps AC3 shall have:

- 13.8.1.1. Maximum of two frame sizes from 9 to 16 amps AC3
- 13.8.1.2. Width not to exceed 45mm for contactors 9 to 38 amps AC3 rating
- 13.8.1.3. Contactor up to 16 amps to include built in auxiliary contact
- 13.8.1.4. Common auxiliaries for contactors 9 to 38 amps AC3

13.8.2. Contactors 9 to 110 Amps with standard coil shall have:

- 13.8.2.1. Mounting positions: only position 6 not permitted (see appendix 1)
- 13.8.2.2. Maximum of 4 frame sizes from 9 to 110 amps
- 13.8.2.3. Quick fixing on mounting rail according to IEC 60715 standards as:-
 - 35 x 7.5 mm for 9 to 40 amps contactors
 - 35 x 15 mm for 9 to 75 amps contactors
 - 75 x 25 mm for 50 to 110 amps contactors
 - Terminal with captive screws
 - Terminal screws to be of Pozidriv type up to 75 amps AC3
 - Terminal screws to be M8 Hexagon socket for main terminals and Pozidriv for coil terminals

13.8.3. Contactors 145 to 750 Amps AC3 with Standard or Electronic Coil shall have:

- 13.8.3.1. Maximum of 4 frame sizes from 145 amp to 750 amp
- 13.8.3.2. Mechanical design to incorporate power terminal at base of contactor, operating coil to be mounted on top of contactor. Coil removal to side of contactor shall not be permitted.
- 13.8.3.3. Shall have front access to coil , with no need to remove the power cables when changing coils
- 13.8.3.4. Shall have front access to main fixed and moving contacts , without the need to remove the power cables
- 13.8.3.5. Removal and replacement of the fixed and moving contacts shall be able to be accomplished without the need to remove the power cables
- 13.8.3.6. Contactor shall have quick release quarter turn screws for easy access to main contact inspection
- 13.8.3.7. Clear marking of contactor electrical information, marking to be clearly visible on front of contactor

13.8.3.8. Electrical characteristics and performances

- 13.8.3.8.1. All Contactors shall be electrically coordinated with upstream protection device, whether device or the fuse type, MCCB, or manual motor starter. All coordination to be backed up by Manufacturers coordination tables, available on request.

13.8.4. Contactors with electronic coils 9 to 38 Amps AC3

- 13.8.4.1. Same coil to cover both the AC or DC control supplies
- 13.8.4.2. Coil to be of torroidal design
- 13.8.4.3. Coil to have extended voltage operating limits.
- 13.8.4.4. 4 coil types only covering: 24..500 V 50/60Hz and 20..500 V DC
- 13.8.4.5. Coil Consumption not to exceed the following limits
- 13.8.4.6. On pull in 50VA
- 13.8.4.7. On holding 2.2VA
- 13.8.4.8. Built-in surge protection to be incorporated
- 13.8.4.9. Flexible position of Coil terminals i.e. can be transferred from the top to the bottom of contactor
- 13.8.4.10. With additional coil terminal block, it shall be possible to connect the coil both at the top and at the bottom.

13.8.5. Contactors with standard AC coil 50 to 30 Amps AC3 shall have:

- 13.8.5.1. Rated operational voltage 690V for contactors up to 40 amp AC3
- 13.8.5.2. Rated operational voltage 1000V for contactors 50 to 750 amps AC3.
- 13.8.5.3. Rated making capacity to be equal to 10 x AC3 rated operational current, or greater.
- 13.8.5.4. Rated breaking capacity to be equal to 8 x AC3 rated operational current, or greater.
- 13.8.5.5. Coil operating limits (according to IEC60947-4-1) 0.85 1.1 x rated Control circuit voltage, at temperature less or equal to 55degrees Celsius
- 13.8.5.6. Drop out voltage in %age of rated Control Voltage approximately 40 to 65%
- 13.8.5.7. Contactors 400 amp AC3 upward to incorporate electronic coil technology

13.8.6. Contactors with electronic coils 400 to 750 Amps AC3 shall have:

- 13.8.6.1. As above but to include the following
- 13.8.6.2. Same coil to cover both the AC or DC control supplies
- 13.8.6.3. Coil to have extended voltage operating limits.

- 13.8.6.4. Can withstand voltage interruptions or voltage dips in control supply up to 20ms.
- 13.8.6.5. Distinct opening and closing voltages as follows
- 13.8.6.6. Opening 0.55 x min operating voltage
- 13.8.6.7. Closing 0.85 x min operating voltage
- 13.8.6.8. Coil types only covering: 24..500 V 50/60Hz and 20..500 V DC

13.9. Accessories

- 13.9.1. All auxiliary contacts shall employ the "wipe action" mechanism for the self cleaning of the contact tips.
- 13.9.2. Front mounted auxiliary contact blocks rated insulation voltage equal to 690V a.c or greater
- 13.9.3. Rated operation voltage 24...690VAC
- 13.9.4. Rated making capacity 10 x AC-15 rated operational current
- 13.9.5. Rated breaking capacity 10 x AC-15 rated operational current
- 13.9.6. Rated short time withstand current 100amps for 1sec:, 140 amps for 0.1 sec
- 13.9.7. Electrical durability, max electrical switching frequency 1200 cycles per hour or greater

13.10. Side Mount Auxiliary Contact Blocks shall have:

- 13.10.1. Rated insulation voltage equal to 690V a.c or greater
- 13.10.2. Rated operation voltage 24...690V a.c
- 13.10.3. Rated making capacity 10 x AC-15 rated operational current
- 13.10.4. Rated breaking capacity 10 x AC-15 rated operational current
- 13.10.5. Rated short time withstand current 100amps for 1sec:, 140 amps for 0.1 sec
- 13.10.6. Electrical durability, max electrical switching 1200 cycles per hour or greater.

14. LIGHTNING AND SURGE PROTECTION

14.1. Main Distribution Board

- 14.1.1. According to the IEC 62305 recommendations, electrical installations shall be protected against direct lightning and surge impulses with din rail Class 1/Type 1 (10/350μs) lightning current arresters.
- 14.1.2. SPD shall use a triggered spark gap technology to allow high lightning discharge current, unpluggable type to avoid ejection of the cartridge during the discharge of the current and non-blow out technology to avoid fire risks.
- 14.1.3. The SPD shall provide either common protection in TNC network or common and differential mode protection in TT and TNS network according to the IEC60364 recommendations.

14.1.4. Lightning arresters shall have the following technical specifications:

- 14.1.4.1. Class of test (IEC 61643-1) I
- 14.1.4.2. Lightning impulse current: $I_{imp}/pole (10/350\mu s) \geq 25kA$
- 14.1.4.3. Nominal voltage U_n 230 / 400V
- 14.1.4.4. Maximum continuous AC voltage U_c 255V
- 14.1.4.5. Follow current extinguishing capability $I_{fi} \geq 50kA$
- 14.1.4.6. Protection level U_p : 2.5kV
- 14.1.4.7. Max. back up fuse gG/gL: 125A
- 14.1.4.8. Visual state indicator: Yes

14.2. Sub-Main Distribution Board

- 14.2.1. According to the IEC 62305 recommendations to avoid oscillations and magnetic coupling phenomenon, sensible equipments shall be protected against indirect surges with din rail Class 2 / Type 2 (8/20 μs) surge arresters.
- 14.2.2. The SPD shall have a safety reserve system and shall be pluggable for preventive and easy maintenance. The SPD shall provide either common protection in TNC network or common and differential mode protection in TNS and TT network according to the IEC 60 364 recommendations.
- 14.2.3. In case of common and differential mode protection the SPD shall use an association of MOV and GDT to provide isolation to the ground and low protection level in all protection modes. The associated switching element
- 14.2.4. (MCB/Fuse) (to insure a safe end of life) shall be the same brand as the SPD to insure a good coordination.
- 14.2.5. Surge arresters technical specifications:
 - 14.2.5.1. Class of test (IEC 61643-1) II
 - 14.2.5.2. Max. discharge current: $I_{max}/pole (8/20\mu s) \geq 40kA$
 - 14.2.5.3. Nominal current I_n / pole $\geq 20kA$
 - 14.2.5.4. Nominal voltage U_n 230 / 400V
 - 14.2.5.5. Maximum continuous AC voltage U_c 275 / 255V
 - 14.2.5.6. Protection level U_p at 20kA $\leq 1.5 kV$

14.2.5.7. Protection level Up at 3kA (Class 3 test)

14.2.5.8. Pluggable :Yes

14.2.5.9. Visual status indicator: Yes

14.2.5.10. Safety reserve: Yes

14.2.5.11. Remote indicator :Yes

14.3. Data line / Telecom line

14.3.1. The selection of the surge protection device shall be according the IEC 62305 recommendations and therefore shall be a type C2 SPD.

14.3.2. The SPD shall be pluggable type for easy maintenance and shall provide the dialling tone returns when the cartridge is withdrawn in case of end of life.

14.3.3. The cartridges, whatever the nominal voltage, shall be adaptable onto different base. The base shall be chosen according to the connection of the wire: it can be RJ11, RJ45 or screw connection. The connections to the earth shall be either by a DIN rail contact or by a screw terminal.

14.3.4. The SPD dimension shall not exceed 12.5 mm wide to save space. The SPD shall use two level of protection: the first one by GDT, the second one by zener diode. These two levels shall be coordinated and shall provide common and differential mode protection.

14.3.5. Low current surge arresters technical specifications:

14.3.5.1. Class of test (IEC 61643-21): C2

14.3.5.2. Nominal voltage U_n According to the Max.voltage of signal

14.3.5.3. Maximum continuous AC voltage U_c (L-N / N-G): According to the Max. voltage of signal

14.3.5.4. Loading current: 140mA

14.3.5.5. Max. discharge current: $I_{max} / \text{line} (8/20\mu s) \geq 10kA$

14.3.5.6. C2 Nominal discharge current $I_n / \text{line} (8/20\mu s) \geq 5kA$

14.3.5.7. Protection level Up (L-L / L-G): According to the Max. voltage of signal

14.3.5.8. Pluggable: Yes

15. ANTI-CONDENSATION HEATERS

15.1. Anti-condensation 220 Volt heaters shall be provided for all compartments. A switch with thermostat shall be provided to control the heaters.

15.2. The wiring from the heater elements to terminals shall be high temperature insulation covered, a suitable compression type gland shall be fitted for the incoming 231V supply.

16. INDICATING INSTRUMENTS

- 16.1. A flush mounted, industrial grade, 96 mm square voltmeters and ammeter conforming to SABS 1299 shall be mounted near the centre top of the front panel and connected to measure the busbar voltage and current.
- 16.2. The calibrated scale length shall be a minimum of 70 mm. Means shall be provided for zero adjustment from the front without any dismantling of the indicating instrument.
- 16.3. A voltmeters selector switch with phase to phase, phase to neutral, and "off" position shall be provided.
- 16.4. An ammeter selector switch shall be provided with an "OFF" position.
- 16.5. Meters shall indicate by means of colours the relevant phase that it is metering.

17. CURRENT TRANSFORMERS

- 17.1. Current transformers shall comply with BS 3938.

18. MECHANICAL CABLE GLANDS

- 18.1. Cable glands shall be of the compression type, manufactured in brass and/or bronze, and suitable for termination of earth-continuity conductor type cables where applicable.
- 18.2. The gland body shall incorporate a knurled cone for clamping the armouring and an integrally cast earth lug, complete with earthing screw.
- 18.3. All metal portions of the gland shall be electroplated for corrosion resistance.
- 18.4. The glands shall be supplied complete with weatherproof neoprene shrouds.
- 18.5. Entries for multi-core PVC, PVC, wire armoured, PVC sheathed cables shall comprise cone grip mechanical type glands mounted on robust gland plates.
- 18.6. The board shall be supplied complete with all glands for all outgoing and incoming circuits as indicated on the drawing.

19. LIGHT SENSITIVE CONTROL UNIT

- 19.1. Light sensitive control units shall be supplied by others.
- 19.2. A suitably rated single pole over-riding switch, for over-riding the unit in 19.1, and moulded case circuit breaker shall be provided, when called for in the drawings or appendices hereto.
- 19.3. The switch and circuit breaker shall be wired to a suitable terminal strip, mounted within the distribution board, to facilitate connection of the light sensitive control unit when installed.

20. EARTHING

- 20.1. The components shall be effectively bonded to the main frame of the distribution board, which shall also be bonded to the main earth bar. Earthing shall comply with SANS-10142 code of practice for the wiring of premises.

21. CABLING AND WIRING

- 21.1. All cables and wires used shall be stranded, 600/1000 V grade and comply with SABS 150, except where special cables have been otherwise specified.

22. LABELS

- 22.1. Labels shall be provided comprising conspicuous engraved black lettering on white background secured with rivets or screws on or adjacent to the items concerned, and worded in English.
- 22.2. Labels of embossed tape or labels secured with adhesive are not acceptable.
- 22.3. All fuse-switches, circuit breakers, isolators, contactors, relays, etc., shall be clearly designated.
- 22.4. The terminals of all outgoing circuits shall be provided with labels to correspond with the labelling of the units on the panel of the distribution board.
- 22.5. All terminal connections shall be provided with durable tags or clips, on which shall be clearly and indelibly marked, the identifying code letters of each wire. Such code letters shall correspond to those used on the wiring diagram.

23. PAINTING

- 23.1. All surfaces of the distribution board shall be light orange to SABS 1091 colour No. B26. (Transnet orange; Pantone 165C / 021U; Coats 50/50; Vermilion MW52; RAL 2004 rein orange; Trichromatic 70% magenta, 90% yellow), unless otherwise specified.
- 23.2. All surfaces shall be cleaned according to the appropriate method described in SABS 064 for the particular surface to be cleaned, the contamination to be removed and the primer to be applied.
- 23.3. Blast cleaning of components shall be in accordance with clause 4.3 of SABS 064 to a degree of cleanliness of at least Sa2 for inland exposure components and Sa 1/2 for coastal exposure components. See Table 1 of SABS 064 for the appropriate profile.
- 23.4. Sheet metal that cannot be blast cleaned shall be cleaned by pickling according to clause 4.6 of SABS 064.
- 23.5. Components that shall be powder coated shall be cleaned and prepared by the surface conversion process according to clause 5 of SABS 064 to a medium-weight classification of table 2 of that specification.
- 23.6. Oil and accumulated dirt on steel components where no rusting is present shall be removed according to clause 3 of SABS 064.
- 23.7. The powder-coating process shall be in accordance with SANS 1242 - type 4 : Corrosion-resistant coatings for interior use and using the thermosetting type high gloss coating.
- 23.8. All specified coatings shall be applied according to the relevant specification and the manufacturer's instructions shall be followed.

- 23.9. Coatings shall not be applied under conditions that may be detrimental to the effectiveness of the coating or the appearance of the painted surface.
- 23.10. When examined visually the finished products shall have a uniform appearance as far as gloss is concerned and shall show no sign of damage. Damaged areas shall be repaired coat for coat to obtain the desired finish.

24. ADDITIONS AND MODIFICATIONS TO EXISTING DISTRIBUTION BOARDS

- 24.1. Where the contractor needs to make modifications or additions to existing distribution boards, the following minimum criteria shall be adhered to :
 - 24.1.1. Re-labelling and proving of existing circuits in accordance with security of existing terminations to be confirmed
 - 24.1.2. Isolation barriers, cover blanks to be in place where required
 - 24.1.3. Panel modification in terms of architraves, DB covers, and the closing of redundant openings to be undertaken by an accredited switchboard manufacturer.
 - 24.1.4. Wiring to be examined for integrity correct sizing and tidied and/or replaced and neaten as required.
 - 24.1.5. A certificate of compliance shall be issued for the full distribution board and not the additions only.

25. INSPECTION

- 25.1. Transnet reserves the right to carry out inspection of any items of equipment and work at any time during the manufacture at manufacturer's works and to be present at any tests.
- 25.2. A final inspection by Transnet before delivery to site is required.

26. TESTS

- 26.1. All prescribed tests as referred to in the standard specifications may be called for at the discretion of Transnet.
- 26.2. Transnet also reserves the right to carry out any check tests on the equipment.
- 26.3. Notwithstanding the successful completion of tests, the tenderer shall still be responsible for the efficient operation of the equipment.
- 26.4. The tenderer shall bear all costs for any tests, which shall be required.

27. GUARANTEE

- 27.1. The Contractor shall undertake to repair all faults due to bad workmanship and / or faulty materials and to replace all defective apparatus or materials during a period of twelve (12) calendar months, calculated from the date of delivery.
- 27.2. Any defects that may become apparent during the guarantee period shall be rectified to the



satisfaction of, and free of cost.

- 27.3. The Contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7 days of his being notified by Transnet of such defects.
- 27.4. Should the Contractor fail to comply with the requirements stipulated above, Transnet will be entitled to undertake the necessary repair work or effect replacement of defective apparatus or materials, and the Contractor shall reimburse Transnet the total cost of such repair or replacements, including the labour costs incurred in replacing defective material.

28. SPARES

- 28.1. The tenderer shall state whether a complete range of spares is held in stock by their local representatives for subsequent purchase by Transnet as and when required.



WITNESSES

1.

.....
TENDERER

2.

.....
DATE

**Transnet Port Terminals
Design Services**

**SPECIFICATION FOR THE SUPPLY AND INSTALLATION OF MEDIUM VOLTAGE
AND LOW VOLTAGE ELECTRICAL CABLES**

REVISIONS		
REV	DATE	APPROVED
0	September 2022	

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APPENDICES

Appendix 1 - "Statement of Compliance"

1.1 SCOPE OF WORK

The scope of this specification covers the minimum requirements for the supply installation, testing and commissioning of medium and low voltage cables, instrumentation cables, cable racking, trenching, sleeves and earthing reticulation on Transnet sites on behalf of Transnet.

Contractors are required to familiarise themselves with all applicable Standards and Codes of Practice listed herein, and to ensure compliance in the execution of any work in terms of this document. Failure to comply may render the contractor liable for corrections at his own cost.

These Standards and Codes of Practice should be read in conjunction with all other Specifications and drawings as issued for a particular contract. Where discrepancies occur, these must be brought to the attention of Transnet in writing before commencement of work. In the event of any conflict between the contents of any documents forming part of a contract (as listed in the Master Index) and this document, the former shall prevail.

1.2 APPLICATION TO WORK ACTIVITIES

The Standards and Codes of Practice contained herein apply to all installations requiring Medium and Low voltage Electrical and Instrument Cabling, Racking, Trenching Sleeves and Earthing Reticulation and include amongst others the following standards:

- Supply of electrical and instrument cable trenches
- Supply, installation of electrical and instrument ladder racking reticulation
- Supply, installation of electrical and instrument dropper reticulation
- Supply, installation and termination of electrical and instrument cabling
- Cable Tagging and Core Identing standards for electrical and instrument cabling
- Supply, installation of instrument and electrical earthing

2. STANDARDS AND REFERENCES

2.1 The requirements of the materials, design, layout, fabrication, assembly, erection, examination, inspection and testing of equipment and facilities on site shall be in accordance with the relevant sections of codes: -

a)	SANS 10142-1	-	Code of Practice for the Wiring of Premises
b)	SABS 763	-	Hot dip (galvanising) Zinc Coating.
c)	SABS 1507	-	Electric cables with extruded solid dielectric Insulation for fixed installation.
d)	SANS 1574		
e)	ASME/ANSI.B31.3	-	Chemical Plant and Petroleum Refinery piping
f)	ASME/ANSI.B31.4	-	Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols.
g)	SABS 089:Part II-1965	-	The Petroleum Industry Part II: Electrical Code

- h) SABS 089 - Part II - The Handling, Storage and Distribution of Petroleum Products (Electrical Code)
- i) SABS 0198 - "The Selection, Handling and Installation of Electric Power Cables of rating not exceeding 33KV"
- j) API 2003 - Protection against ignitions arising out of static, Lighting and stray currents.
- k) SABS 03 - The Protection of structures against lightning.
- l) SABS 086 - The Installation and Maintenance of Electrical Equipment used in explosive atmospheres. Refer to Section 2 for Hazardous area classification.
- m) IEC 79-14 - Electrical Installations in Hazardous Areas
- n) Government, local authorities or other statutory bodies' regulations, laws, requirements or customs which are more stringent than those specified in this project specification.

2.2 The following standard specifications are to be used for reference purposes and need to be noted by Contractors in order to signify familiarity and compliance with the requirements. It is expected of Contractors that they be familiar with the applicable clauses and that these will be adhered to in the execution of any work in terms of this specification. Contractors will be required to confirm that they are able to meet these requirements.

- a) SABS 0108 : 1995 The Classification of hazardous locations and the selection of electrical apparatus for use in such locations
- b) The Occupational Health & Safety (OHS) Act No. 85 of 1993.
- c) SABS 0314 Flameproof Enclosures for Electrical Apparatus
- d) SABS 0549 Intrinsically Safe Electrical Apparatus
- e) API Manual of Petroleum Measurement Standards Chapters 4 to 12
IP Chapter 10 and Papers 2 and 3
- f) SABS 969 Enclosures for electrical apparatus
- g) BS 5490 Classification of degrees of protection provided by enclosures
- h) Safety Regulations for Contractors
- i) Technical Instruction No. 16 - Contractors Work Permit Procedures.
- j) VDE Standards

2.3 Where no specific rules, regulations, codes or requirements are contained in this specification nor covered by the above mentioned codes, the contractor shall, in consultation with Transnet, adhere to internationally accepted modern design and engineering practices in the Electrical and Petrochemical Industry.

3.0 SERVICE CONDITIONS

3.1 The cable shall be designed and rated for continuous operation under the following conditions :-

3.1.1 Ambient/Environment Conditions :

- 3.1.1.1 Altitude : Sea level.
- 3.1.1.2 Ambient temperature : -5° C to +45° C (daily average +35° C).
- 3.1.1.3 Relative humidity : As high as 96%
- 3.1.1.4 Lightning conditions : Severe, with a maximum lightning ground flash density 11 flashes per km² per annum.
- 3.1.1.5 Exposure conditions : Salt laden, industrial atmosphere as well as hazardous gases and dust atmosphere.
- 3.1.1.6 Electrolytic corrosion conditions prevail in all the areas owing to the proximity of direct current traction system and cathodic protection schemes.

3.1.2 Electrical Conditions:

- 3.1.2.1 The system of supply will be three phase, 3 wire, 50 Hertz, 11KV alternating current for medium voltage and three-phase, 4 wire, 50 Hz 400 Volts alternating current for low voltage.
- 3.1.2.2 The voltage may vary within the range of 95% to 105% of the nominal and all cable shall be suitably rated.

4.0 RESPONSIBILITY FOR WORK, SAFETY

- 4.1 The Contractor shall be responsible for all aspects associated with the provision of the cables. This includes items such as supply of testing cable to test the cables prior to commissioning, provision of site office and storage facilities.
- 4.2 Occupational Health and Safety Act (Act No 85 of 1993) must be complied with in all respects during the execution of this contract. The onus shall be on the contractor to ensure that staff under his control adheres to the provisions of the act at all times.

5.0 ELECTRICAL CABLE SPECIFICATION

This part of the specification covers the general specification of electrical cables to be used on Transnet sites on behalf of Transnet Port Terminals.

5.1 TYPES OF CABLE

5.1.1 CROSS-LINKED POLYETHYLENE (XLPE)

5.1.1.1 Cross-linked Polyethylene (XPPE)-insulated cables shall be individually screened, 3 core, stranded copper conductor, type A, cable manufactured in accordance with SABS.1339. The cable is to be supplied with an overall graphite coating to the outer PVC sheath.

5.1.1.2 The cable shall have embossed on the outer P.V.C. sheath next to the **S.A.B.S.** mark the following letters:

T/G/B

where T = TRANSNET STANDARD G = GRAPHITE COATED B = BEDDING TEST

Only the above mentioned cable shall be accepted.

5.1.1.3 The cable shall be capable of withstanding continuous operational temperatures up to 90° C.

5.1.1.4 Completed cable runs are subjected to the following tests :-

- a. As laid down in S.A.B.S. 1339 (Appendix "E" paragraph E-1.4)
- b. Anti-electrolysis insulation, applied between armouring and earth, tested at 10kV D.C. for one minute. Bedding shall be tested at 4kV D. C. for one minute.

All the above tests shall be carried out in the presence of the Engineer

5.1.2 PAPER INSULATED

5.1.2.1 Fully impregnated hygroscopic paper insulated, Helically lapped, insulated, Three core, Stranded copper conductors, Outer layer numbered for core identification, Seamless pure lead sheath, Covered with bitumen impregnated paper, Single steel wire armoured, extruded plastic sheathed, Operational voltage 6.35 to 11kV.

5.1.2.2 The cable shall have embossed on the outer P.V.C. sheath next to the **S.A.B.S.** mark the following letters:

T/G/B

Where: T = TRANSNET STANDARD
G = GRAPHITE COATED
B = BEDDING TEST

Only the above mentioned cable shall be accepted.

5.1.2.3 The cable is to be supplied with the P.V.C. outer sheath impregnated with a high quality graphite powder coating.

- 5.1.2.4 Type general purpose copper woven taped screened (Table 19) cable manufactured in accordance with S.A.B.S. 97 is required.
- 5.1.2.5 The cable shall be capable of withstanding continuous operational temperatures up to 70 / 80° C.
- 5.1.2.6 Completed cable runs are subjected to the following tests
- As laid down in S.A.B.S. 97
 - Anti-electrolysis insulation, applied between armouring and earth, tested at 10Kv D. C. for one minute. Bedding shall be tested at 4Kv D.C. for one minute.
All the above tests shall be carried out in the presence of the Engineer

5.1.3 LOW VOLTAGE PVC CABLE

- 5.1.3.1 Low voltage cables shall be PVC insulated cables with ECC, and shall comply with SABS.1507.
- 5.1.3.2 Earth continuity conductors shall be single core PVC insulated copper cables, and shall comply with SABS. 1507.
- 5.1.3.3 The cable shall be capable of withstanding continuous operational temperatures up to 70° C.
- 5.1.3.4 Electrical LV Power cabling installed in hazardous locations (flammable environment) running between Equipment located in the field, LV Panels or Motor Control Centre Panels, Valve Panels and Distribution Boards shall comprise of steel wire armoured, earth continuity conductor (ECC), PVC Insulated, four core cable, as follows:

Conductors.

Core Size : 4 core - Rated as per application (SABS 10142-1)
Stranded untinned copper, 7 strands minimum

PVC Insulated, Insulation Breakdown Voltage to withstand 2 kV 50Hz RMS for a 1 min period.

Insulation Colours: Colored RD-BL-YE/WT-BK (not numbered)

Lay Twist to be 40 – 60 mm (i.e. 16-25 twist per metre)

Inner Jacket

Extruded fire retardant black PVC with rip cord for jacket removal.
Minimum thickness 1.2mm

Outer Jacket

Overall weatherproof thermoplastic PVC jacket – fire retardant and UV resistant (Carbon black added).

Jacket thickness 1.5mm

Jacket to be totally bonded to a steel wire armoured sleeve.

Fire retardant, low halogen (20% Halogen, Blue Stripe) plastics to be used in non-ventilated areas. Fire retardant, high halogen (100% Halogen, Red Stripe) plastics may be used in ventilated areas. Fire retardant, no halogen (0% Halogen, White Stripe) plastics not required to be used.

- 5.1.3.5 Electrical Control cabling running between the Equipment located in the field, Control System Marshalling Cabinets, LV Panels and Incomer Breaker panels will comprise of steel wire armoured, PVC Insulated, multi-core cable, as follows :

Conductors.

Core Size : 7 core – 1.5 mm² (Valve Actuators)
12 core – 1.5 mm², 19 core – 1.5 mm² (Switchgear)

Stranded untinned copper, 7 strands minimum

PVC Insulated, Insulation Breakdown Voltage to withstand 2 kV 50Hz RMS for a 1 min
Insulation Colours: 7 core and less – colored BL-YE/WT-RD-GR-BK-BR-PR/OR
(Not numbered)

12 core and more – black, conductors to be numbered

Lay Twist to be 40 – 60 mm (i.e. 16-25 twist per metre)

Inner Jacket

Extruded fire retardant black PVC with ripcord for jacket removal.
Minimum thickness 1.2mm up to 7 core, 1.5mm for 12 and 19 core

Outer Jacket

Overall weatherproof thermoplastic PVC jacket – fire retardant and UV resistant.
Jacket thickness 1.5mm up to 7 core, 2.0mm for 12 and 19 core
Jacket to be totally bonded to a steel wire armoured sleeve.

Fire retardant, low halogen (20% Halogen, Blue Stripe) plastics to be used in non-ventilated areas. Fire retardant, high halogen (100% Halogen, Red Stripe) plastics may be used in ventilated areas. Fire retardant, no halogen (0% Halogen, White Stripe) plastics not required to be used.

- 5.1.3.6 Completed cable runs are subjected to the following tests as laid down in SANS 10142-1. Insulation resistance test between Phases, Phases and Neutral, Phases and ECC, Neutral and ECC.

5.1.4 INSTRUMENTATION CABLING

- 5.1.4.1 Instrument Cabling as defined within this and other Transnet Specifications includes the following types of cabling:
1. PVC SWA Multicore instrument cables running between Instrument Junction Boxes in the field and PLC Cabinets (IS and non-IS rated)
 2. PVC SWA Multicore instrument cables running between instruments in the field and PLC Cabinets (IS and non-IS rated)
 3. Dekabon armoured instrument cables running between Junction Boxes in the field and the instruments themselves (IS and non-IS rated)
- 5.1.4.2 All Instrumentation Cabling will comply in all respects to the specifications as contained in the Scope of Work attached to an Order. In the absence of cable specifications being detailed in the Scope of Work attached to an Order, the following cable specifications will apply.
- 5.1.4.3 Instrument cabling will be marshalled on Instrument racking and trenching as defined elsewhere within this specification.
- 5.1.4.4 Instrument multi-core cabling running between the Field Junction Boxes and the Control System Marshalling Cabinets will comprise of steel wire armoured, PVC Insulated, individual and overall screened multi-core cable. Note that Petronet has standardised on 1 pair, 2 pair, 8 pair and 16 pair cable – prior approval from Petronet will be required to deviate from these specifications.

Conductors

Core Size : 1.0 mm²

Stranded untinned copper, 7 strands minimum

PVC Insulated, Insulation Breakdown Voltage to withstand 2 kV 50Hz RMS for a 1 min.

Insulation Colours : Black and White

Multipair cores to be numbered (numeric on both conductors of the pairs)
Lay Twist to be 40 – 60 mm (i.e. 16-25 twist per metre)

Shield/Screen

Individual & overall screened – plasticised aluminium foil (100%) coverage
Stranded tinned copper drain wire 0.5 mm²

Inner Jacket

Extruded fire retardant black PVC with rip cord for jacket removal.
Minimum thickness 1.2mm up to 8 pair, 1.5 mm for 16 to 36 pair

Outer Jacket

Overall weatherproof thermoplastic PVC jacket – fire retardant and UV resistant (Carbon Black added).

Jacket thickness 1.5mm up to 8 pair, 2.0 mm for 16 to 36 pair.

Jacket to be totally bonded to a steel wire armoured sleeve.

Fire retardant, low halogen (20% Halogen, Blue Stripe) plastics to be used in non-ventilated areas. Fire retardant, high halogen (100% Halogen, Red Stripe) plastics may be used in ventilated areas. Fire retardant, no halogen (0% Halogen, White Stripe) plastics not required to be used.

IS Circuits: Jacket color light blue Non IS Circuits: Jacket color black.

- 5.1.4.5 Individual Instrument cabling running between the Field Junction Boxes and the individual field mounted Instruments will comprise of Dekabon armoured, PVC Insulated, individual and overall screened multi-core cable. Note that Petronet has standardised on 1, 2, 4 and Triad cable – prior approval from Petronet will be required to deviate from these specifications.

(Note that this specification only applies to cabling running on racks above the ground, all Instrument cables running in trenches will need to comply with the Instrument Multi-core Cable Specifications detailed above).

Conductors.

Core Size : 1.5 mm²

Stranded untinned copper, 7 strands minimum

PVC Insulated, Insulation Breakdown Voltage to withstand 2 kV 50Hz RMS for a 1 min

Insulation Colours : Black and White

Multipair cores to be numbered (alphanumeric on both conductors of the pairs)

Lay Twist to be 40 – 60 mm (i.e. 16-25 twist per metre)

Shield/Screen

Individual & overall screened – plasticised aluminium foil (100%) coverage

Stranded tinned copper drain wire 0.5 mm²

Inner Jacket

Extruded fire retardant black PVC with ripcord for jacket removal.

Minimum thickness 1.2mm

Outer Jacket

Overall weatherproof thermoplastic PVC jacket – fire retardant and UV resistant (Carbon black added).

Jacket thickness 1.5mm.

Jacket to be totally bonded to an inner waterproof aluminium sleeve, with a ripcord under the sleeve for jacket removal.

Fire retardant, low halogen (20% Halogen, Blue Stripe) plastics to be used in non-ventilated areas. Fire retardant, high halogen (100% Halogen, Red Stripe) plastics may be

used in ventilated areas. Fire retardant, no halogen (0% Halogen, White Stripe) plastics are not required to be used.

IS Circuits: Jacket color light blue Non IS Circuits: Jacket color black.

6.0 CABLE TERMINATIONS

6.1 Medium and Low Voltage cables shall be terminated to busbars and switchgear in the panels, distribution boards and kiosks using suitable cable lugs. Cable earth wires shall be brought into glands on gland plates. The insulation between cable armouring and cable earth wires shall be maintained at terminations. The separate earth conductor cable shall terminate to the main earth bar.

6.2 All materials necessary for installing all cable terminations shall be provided by the Contractor and the cost thereof shall be included in the tender price.

6.3 Glanding

6.3.1 All instrument and electrical cables will be glanded at both ends using the appropriate sized gland and will include associated adaptors, washers, ferrules, bands, etc. Provision for all glands, adaptors, washers, ferrules, bands etc. shall be included in the Tenderer's offers. All cable glands shall comply with the following specification, unless otherwise specified in the Scope of Work attached to an Order:

6.3.2 Dekabon Armoured Cabling (Instrumentation)
Increased Safety Ex"e" rated compression gland, IP68 rated, complete with UV resistant black shroud where required, in accordance with SABS 1031.

6.3.3 PVC SWA Cabling (Instrument & Electrical motors)
Increased Safety Ex"e" rated non-compression gland, IP68 rated, complete with SWA protection (CCG Corrosion Guard or similar), in accordance with SABS 1031.

6.3.4 PVC SWA Cabling (Ex"d" rated Valve Actuators)
Flameproof Ex"d" rated non-compression gland, IP68 rated, complete with SWA protection (CCG Corrosion Guard or similar), in accordance with SABS 808.

6.3.5 PVC SWA Cabling (Electrical and PLC Panels located within buildings rated as Safe Areas in terms of Hazardous Area Classifications SABS 0108)
Non-Flameproof rated, non-compression gland, IP68 rated, complete with UV resistant (black) shroud where required.

All glands will be waterproof and in the case of Hazardous Areas, correctly rated in terms of the Explosion Proof Classification of the equipment housings to which they are installed.

6.4 Termination

6.4.1 All cables will be terminated at field instrumentation, electrical equipment, field junction boxes, switchgear panels and control room marshalling cabinets according to

manufacturers specifications, instrument hook-up diagrams and control system specifications as provided/approved by Petronet.

6.4.1.1 Instrument Dekabon Cabling

- Outer Dekabon armouring shall be stripped back to the entry point into the associated termination/junction box. Protrusion of cable sheath/armouring into the termination/junction box (through the compression gland) shall be a minimum of 15mm and a maximum of 50mm.
- Cable pair inner aluminium foil shall be stripped back to the point at which the individual cores leave the PVC Trunking to be terminated onto the respective terminal rails. Ends of the inner foil shall be neatly taped/heat shrunk so as to prevent unravelling.
- Individual cable ends shall be sealed with the use of heat shrink tubing applied over the cable sheath/armouring at the point of entry into the termination/junction box/panel, in order to protect the cable and prevent the ingress of moisture.
- Both cable overall (drain wire) and individual screens shall be insulated with the use of appropriately sized green coloured sleeving, to prevent inadvertent contact with metallic surfaces.
- All individual cable cores (including spares) will be left long enough to accommodate 200mm slack, i.e. taking into account the routing via the trunking.
- Excess lengths of individual cable cores will be neatly folded and tied within the trunking provided. All spare cores shall be terminated into terminals so provided.
- Termination of individual cable cores in the termination strips will be such that all Control System related cabling will be terminated to one side of termination strips, whilst all field instrumentation/equipment cabling will be connected to the other side of termination strips.

In the case of Field Junction Boxes with dual terminal strips, multi-core cabling will be glanded in the centre of the gland plate and terminated into terminal rails provided, running from the centre PVC Trunking outwards. Individual Instrument cables will then be terminated into the terminal rails provided, running from the outermost PVC Trunking inwards.

In the case of Field Junction Boxes with single terminal strips, multi-core cabling will be glanded on the right side of the gland plate and terminated into terminal rails provided, running from the right hand side of the panel inwards. Individual Instrument cables will then be terminated into the terminal rails provided, running from the left hand side of the panel inwards.

- All cables connected to individual instruments/equipment will be provided with a single loop of minimum diameter of 150mm. All loops will be neatly strapped.

- All cores (including spares) will be terminated into allocated termination strips/rails in the respective Instrumentation, Termination and Field Junction Boxes

6.4.1.2 Instrument PVC SWA Multi-core Cabling

- Cable SWA armouring shall be stripped back to the entry point into the associated marshalling cabinet/junction box and shall be glanded in such a manner so as to ensure electrical continuity with the gland. When terminated in hazardous areas, cable armouring shall be bonded to the panel equi-potential bonding system via means of earthing rings provided as an integral part of the gland. Contact between the gland and the gland plate shall not be considered as sufficient for bonding purposes.
- Protrusion of cable inner PVC sheaths into the marshalling cabinet will be a minimum of 25mm and a maximum of 50mm.
- Cable inner aluminium foil shall be stripped back to the point at which the individual cores leave the PVC Trunking to be terminated onto the respective terminal rails. Ends of the inner foil shall be neatly taped/heat shrunk so as to prevent unravelling.
- Cable ends shall be sealed with the use of heat shrink tubing applied over the cable inner sheath at the point of entry into the termination/junction box/panel, in order to protect the cable and prevent the ingress of moisture.
- Both cable overall and individual screens shall be insulated with the use of appropriately sized green coloured sleeving, to prevent inadvertent contact.
- All individual cable cores (including spares) will be left long enough to accommodate 200mm slack, i.e. taking into account the routing via the trunking.
- Excess lengths of individual cable cores will be neatly folded and tied within the trunking provided. All spare cores shall be terminated into terminals so provided.
- Termination of individual cable cores in the termination strips will be such that all Control System related cabling will be terminated to one side of termination strips, whilst all field instrumentation/equipment cabling will be connected to the other side of termination strips.

In the case of Field Junction Boxes with dual terminal strips, multi-core cabling will be glanded in the centre of the gland plate and terminated into terminal rails provided, running from the centre PVC Trunking outwards. Individual Instrument cables will then be terminated into the terminal rails provided, running from the outermost PVC Trunking inwards.

In the case of Field Junction Boxes with single terminal strips, multi-core cabling will be glanded on the right side of the gland plate and terminated into terminal rails provided, running from the right hand side of the panel inwards. Individual Instrument cables will then be terminated into the terminal rails provided, running from the left hand side of the panel inwards.

- All cores (including spares) will be terminated into allocated termination strips/rails in the respective Instrumentation, Termination and Field Junction Boxes

6.4.1.3 **Electrical Power and Control Cabling (Low Voltage)**

- Cable SWA armouring shall be stripped back to the entry point into the associated equipment housing/termination box/panel and shall be glanded in such a manner so as to ensure electrical continuity with the gland. When terminated in hazardous areas, cable armouring shall be bonded to the panel equip-potential bonding system via means of earthing rings provided as an integral part of the gland. Contact between the gland and the gland plate shall not be considered as sufficient for bonding purposes.
- (Option 1) Cable inner PVC sheath shall be cut back at the point of entry into the equipment housing/termination box/panel, protrusion of the inner sheath into the associated switchgear cabinet/equipment housings shall be a minimum of 25mm and a maximum of 50mm. Heat shrink tubing shall be applied at the point of entry into the equipment housing/termination box/panel, in order to protect the cable and prevent the ingress of moisture.

(Option 2) Where cables are glanded into panels, cable inner PVC sheaths may be taken directly into trunking/marshalling arrangements, with the inner PVC sheaths cut back at point of termination. Note that in this instance, heat shrink need not be applied at the point of entry into the cabinet.
- All individual cable cores (including spares) will be left long enough to accommodate 200mm slack, i.e. taking into account the routing via the trunking.
- Excess lengths of individual cable cores will be neatly folded and tied within the trunking provided.
- Termination of individual cable cores in the termination strips will be such that all Starter related cabling will be terminated to one side of termination strips, whilst all field cabling will be connected to the other side of termination strips.
- All cables connected to individual instruments/equipment will be provided with a single loop of minimum diameter of 150mm. All loops will be neatly strapped.

6.5 **Cable Core Lugging**

All individual cable cores will be neatly terminated. Appropriately sized lugs will be attached to all core ends, using the appropriate crimping tool (not side cutters or ordinary pliers). The colouring of crimps will match the size of the associated cable core. All cable lugs utilised shall comply with the following specification, unless otherwise specified in the Scope of Work attached to an Order:

- Instrument Cables - bootlace ferrules

- Electrical Power Cables - spade lugs for compression terminals, ring lugs for screw terminals (pin lugs are not acceptable)
- Electrical Control Cables - spade lugs for compression terminals, ring lugs for screw terminals (pin lugs are not acceptable)

6.6 Cable Screening – Instrument Cabling

6.6.1 Individual Screens

6.6.1.1 All Individual Instrument Cable Pair Screens shall be terminated into terminals provided within the Instrument Termination Boxes as well as the Field Junction Boxes, and shall be grounded to a common insulated earth rail to be provided in each of the Control System Marshalling Cabinets, alongside the Termination Rails provided. Individual Screens shall be terminated in such a manner so as to be continuous from the Instrument/Instrument Termination Box to the Control System Marshalling Cabinets i.e. individual instrument cables as well as multi-pair cables.

6.6.1.2 Individual screen terminals shall be insulated in the Termination Boxes and Field Junction Boxes provided, thus ensuring that the individual cable pair screens are not grounded at instrument/equipment ends, i.e. to prevent common mode noise. Where Instrument Cables terminate directly into Instrument housings, individual screens shall be cut back and insulated within the Instrument housing using heat shrink sleeving, to prevent inadvertent contact with any conducting surfaces.

9.6.1.3 All individual screen earth rails in the Control System Marshalling Cabinets will be connected to the existing panel Instrument Earth bar via means of a 25mm insulated earth cable, which shall in turn be connected at two points via means of PVC Cu 70mm² insulated earth cables (Yellow/Green in colour), to the Instrument Earth bar located within the control room.

6.6.2 Overall Screens

6.6.2.1 All Instrument Cable Overall Screens/Drain wires shall be terminated to insulated earth bars provided within the Field Junction Boxes, and shall be earthed to a common electrical earth bar to be provided in each of the Control System Marshalling Cabinets. Overall Screens /Drain Wires shall be cut back and insulated within the Instrument Termination Boxes and Instrument housings (where applicable) to prevent inadvertent contact with the Termination Box housing, utilising heat shrink sleeving. Overall Screens shall be terminated in such a manner so as to be continuous from the Instrument Junction Box to the Control System Marshalling Cabinets.

6.6.2.2 The electrical earth bar shall be earthed to the Cabinet Frame, and connected at two points via means of PVC Cu 70mm² insulated earth cables (Yellow/Green in colour), to the Electrical Earth bar located within the control room.

6.7 Cable Screening – Electrical Cabling (Power & Control)

6.7.1 All electrical cable screens/drain wires (where applicable) will be grounded to a common electrical earth bar to be provided in each of the Control System Marshalling Cabinets/Switchgear Cubicles. The electrical earth bar shall be earthed to the Cabinet Frame,

and connected at two points via means of PVC Cu 70mm² insulated earth cables (Yellow/Green in colour), to the Electrical Earth bar located within the control and switchgear rooms.

7 ADDITIONAL REQUIREMENTS FOR EX IA/IB INSTALLATIONS

7.1 All I.S. (Ex ia/ib Intrinsically Safe) Installations shall be in strict compliance with IEC 79-14 Electrical Installations in Hazardous Areas, and in particular Chp 12 "Additional Requirements for type protection Intrinsic Safety", inclusive of the under mentioned items.

7.2 Clause 12.2.

In installations with Zone 1 and 2 classifications, IS apparatus and the intrinsically safe parts of associated apparatus shall comply to at least category "ib". Note that Petronet has standardised on category "ia" protection, and permission will need to be sought in writing for relaxation to "ib".

7.3 Cables – General

Where multi stranded cables are used in a hazardous area, the ends of the conductor shall be protected against separation of individual strands, by means of cable lugs.

Where cable screens are required, these shall be connected to earth at one point only, normally in the non-hazardous area. (Refer to Section 9.6 and 9.7 of this specification).

Cable armouring shall normally be bonded to the equi-potential bonding system via the cable entry devices (glands), at the end of each cable run. Where interposing Junction Boxes exist or other apparatus, the armouring shall be similarly bonded to the equi-potential bonding system at these points. In this regard and where earthing rings are provided as an integral part of the gland, use of these is recommended in serving this function. Contact between the gland and the gland plate shall not be considered as sufficient for bonding purposes.

Conductors of intrinsically safe circuits and non-intrinsically safe circuits shall not be carried in the same cable.

Conductors of intrinsically safe circuits and non-intrinsically safe circuits in the same bundle or duct shall be separated by an intermediate layer of insulated material or by an earthed metal partition. No segregation is required if metal sheaths or screens are used for intrinsically safe or non-intrinsically safe circuits. Note that Petronet has standardised on physical separation regardless of whether the cabling is screened or not, and permission will need to be sought in writing for relaxation.

7.4 Cables – Marking

Un-armoured Cables containing intrinsically safe circuits shall be marked. If outer sheaths are marked by color, the color used shall be light blue. Note that whilst armoured cabling

is not required to be marked in terms of IEC79-14, Petronet has standardised on the principle of marking all cable outer sheaths carrying intrinsically safe circuits by color (light blue), whether armoured or not, and that this will need to be complied with in all instances.

7.5 Cable Insulation Tests

All cables carrying intrinsically safe circuits shall be proven to be capable of withstanding an RMS AC test voltage of twice the normal voltage of the intrinsically safe circuit with a minimum of 500 V between the armouring and screens joined together and the individual conductors. Tests shall be conducted in accordance with manufacturers specifications. Where no such method is available, tests shall be carried out as follows:

- Voltage shall be an ac voltage of sinusoidal waveform at a frequency of between 48 and 62 Hertz
- Voltage shall be derived from a transformer of at least 500 VA output
- Voltage shall be increased steadily to the specified value in a period of not less than 10 seconds and maintained for a period of not less than 60 seconds.

7.6 Cable Termination

All terminals shall be reliably separated from non-intrinsically safe circuits (for example by a separating panel or gap of at least 50mm). Terminals of intrinsically safe circuits shall be marked as such. Petronet has standardised on marking by color - the specified color being light blue. All terminals, plugs and sockets shall satisfy the requirements of IEC79-11 Sections 6.3.1 and 6.3.2 respectively (6mm creepage and clearance rules 4mm to earth).

7.7 Zone 1 Installations - Surge Protection

All equipment installed in Zone 0 areas and exposed to hazardous potential differences (e.g. lightning surges), shall have a surge protection device installed between each non-earth bonded conductor/core and the local earthed structure as near as is practically possible. The surge protection device shall be capable of diverting a minimum peak discharge current of 10kA (8/20 microsecond impulse according to IEC60-1, 10 operations). The bonding connection between the protection device and the structure shall have a minimum cross sectional area equivalent to 4 mm² copper.

Note that Petronet has extended these requirements to include all analogue transmitters installed in the field, whether in hazardous areas or not, and will need to be complied with in all instances.

8. CABLE JOINTS

8.1 MEDIUM VOLTAGE CABLE JOINTS

- 8.1.1 The contractor shall give the Engineer advance notice of his intention to do jointing of medium voltage cables to enable arrangements to be made for measuring and inspection.

- 8.1.2 The complete cable installation, including all joints shall be fully insulated from earth throughout.

8.2 LOW VOLTAGE CABLE JOINTS

- 8.2.1 The low voltage cable through joints shall be of the epoxy resin filled type. The low voltage joints shall be constructed according to manufacturer's instructions.

9. CABLE ROUTES

- 9.1 All low voltage cables and associated earth continuity conductors shall be installed as shown in drawings PPD: BDD059C-E-01, sheet 1 of 3.

10. SURVEY OF ROUTE

- 10.1 The drawings showing the proposed cable route listed in the "Schedule of Drawings" shall not be taken to show the precise final cable route. The Contractor shall within 30 days after being awarded the Contract carry out a final route survey, which shall include digging test holes, and using the routes shown on the drawings as a general guide, to determine a suitable route.
- 10.2 The Contractor shall submit details of the cable routes selected in final survey to the Engineer for approval. No excavation of any section of the cable route shall commence until the Engineer has authorised the commencement of work on the section concerned.
- 10.2.1 After completion of all cable laying and jointing and before commissioning of any cable the Contractor shall carry out a final "as laid" survey of the cable routes and hand to the Engineer cable route plans. The cable route plans shall include the following information:
- (i) Overall length of each cable.
 - (ii) Centre to centre distances between all joints and between final joints and terminations of each cable including auxiliary cables.
 - (iii) Accurate indications of the position of each cable joint and cable marker preferably by triangulation, i.e. indicating two distances to each joint or marker from structures not likely to be moved such as permanent buildings, bridge piers, etc.
 - (iv) Tables showing all information regarding each high-voltage cable necessary for cable fault location by the reflected pulse method.
 - (v) Soil thermal resistivity and temperature values as determined on final survey shown on the plans at the positions where they were determined.

11. EXCAVATIONS

- 11.1 Excavations shall be carried out in strict compliance with the specification for works on, over, under or adjacent to a railway line No. E.7 (July 1998) (Part 1) that forms part of the tender documents.
- 11.2 The procedure and the order of doing the work shall be subject to the approval of the Engineer.
- 11.3 The Contractor shall, before trenching commences, familiarise himself with the route and conditions on site. The Contractor shall be advised of any known buried services such as cables, pipes, etc., in the vicinity of the cable route. However, the Contractor shall at all times exercise care to ensure that any uncharted services are not damaged.
- 11.4 Power driven mechanical excavators may be used for trenching operations provided that they are not used in close proximity to other cables, water mains, or any other plant liable to be damaged by the use of such plant. Their use along sections of the route shall in each case be subject to approval of the Engineer.
- 11.5 Trenches shall be as straight as possible and each trench shall be excavated to the dimensions indicated in this specification. The Contractor shall provide shuttering for use in places where danger exists should the sides of the trench collapse. The strength of such shuttering must be adequate especially where railway tracks in proximity are concerned and the shuttering must be braced across the trench. Provision of shuttering will be paid for per metre length of shuttered trench.
- 11.6 The bottom of each cable trench shall be as firm as conditions permit and be of smooth contour.
- 11.7 In sections where the soil or water level conditions indicate that the cable trench will endanger rail tracks or any nearby structures, the Contractor must restrict the length of continuous open trench to a distance to be indicated by the Engineer.
- 11.8 The Contractor shall take all reasonable steps to ascertain if the cables will be liable to be subjected to chemical or other damage or electrolysis action and shall submit his recommendations for approval, of any precautionary measures to be taken, in such instances.
- 11.9 The material excavated from each trench shall be placed adjacent to the trench in such a manner as to prevent nuisance or damage to adjacent ditches, railway lines, drains, gateways and other properties and shall be stacked so as to avoid undue interference with traffic. Where, owing to certain considerations, this is not permissible, the excavated materials shall be removed from the site and be returned for refilling the trench on completion of laying.
- 11.10 Surplus material shall be disposed of by the Contractor at his cost. Where the possibility exists that railway line ballast may be fouled by excavated material or material brought on site, the Contractor shall take precautions as directed by the Engineer.
- 11.11 The Contractor shall not trench beneath any railway line without departmental supervision. Should the contractor wish to carry out such work the Engineer must be

advised not less than 14 working days before hand to arrange for the necessary supervision. The cost of such supervision shall not be charged to the Contractor.

- 11.12 Prior to laying the cable, the trench shall be inspected thoroughly by the Engineer or his authorised representative to ensure that it is free from all objects likely to damage the cable either during or after cable laying operations. Cable laying shall not proceed unless the Engineer or his authorised representative is satisfied with the condition of the trench.
- 11.13 When trenching, the Contractor shall take all precautions necessary to prevent damage to any other cables, water mains, roads, pavements, drainage systems, building or any structure etc. Should any of the above be damaged by the Contractor's staff, it shall be reported immediately to the Engineer, who shall arrange for the necessary repairs. The Contractor is responsible for the cost of repairs.
- 11.14 Should it be necessary for any reason to remove accumulated water or other liquid from the trench, this shall be done by the Contractor at his expense and should be taken into account at the time of tendering. The Contractor is to provide all pumps and appliances required to carry out this operation. Water or any other liquid removed shall be disposed of without creating any nuisance or hazard.
- 14.15 Trenching procedure shall be programmed in advance with the Engineer and the programme approved by the Engineer shall not be departed from save with his consent.
- 11.16 Programming of trenching shall be on the basis of the Contractor giving the Engineer an assurance that any length of trench opened on a particular day will be back-filled and compacted to an adequately firm surface on the same day where possible. If it is anticipated that trenching will remain open for longer periods, the Contractor shall first obtain the approval of the Engineer. No new sections of trenching shall commence if previously uncompleted sections still exist. Under no circumstances may sections greater than 300 metres be opened.

Where such approval is given, the onus shall be on the Contractor to safeguard the works to the satisfaction of the Engineer during the extended period such trenches remain open. Where cables have already been laid, but not covered, steps shall be taken by the Contractor to protect cables and the personnel around.
- 11.17 The near side of any cable trench shall preferably not be less than 2500mm from any adjacent railway line. Approval from the Engineer will be required if the above clearances cannot be achieved. The conditions of clause 13.1 shall apply.
- 11.18 The removal of obstructions along the cable routes shall be subject to the approval of the Engineer and shall be paid for at pre-agreed rates.
- 11.19 The area traversed by the cable routes has been used for many years. It is inevitable that there will be uncharted services. On encountering any such service the Contractor shall promptly advise the Engineer who shall direct what action shall be taken.
- 11.20 Transnet reserves the right to alter any cable route or portion thereof in advance of cable laying. Payment in respect of any additional or wasted work involved shall be at scheduled rates.

11.21 Any existing electrical cables obstructing the cable routes shall be removed or deviated as appropriate by the Contractor. The work shall be paid for at scheduled rates.

11.22 The bottom of the trench shall be filled with 200mm of suitable soil sifted through a 6mm mesh and levelled off. Only soil with a satisfactory thermal resistivity may be used for this purpose and ash which occurs on the route shall not be used. Where no suitable soil is available in proximity, imported fill shall be arranged. The manufacturer's assurance is required that the current rating of cables is not reduced by the ground conditions.

12.0 TRENCH/EXCAVATION SPECIFICATION

Separate Trenches shall be supplied to cater for the following cable types:

12.1 ELECTRICAL HV/MV TRENCHES

Trench Dimensions	:	1200 mm deep by 500 mm wide (two cables), add 300mm width for additional cables
River Sand Bedding	:	PVC Piping – 75 mm above pipe, 50mm under pipe
	:	Direct Burial – 100 mm
Identification	:	PVC or Concrete Interlocking Tiles at a depth of 350mm
Cable Markers	:	Concrete with engraved anodised aluminium ID plates cable Marker Colour – Brilliant Green
Cabling	:	Medium and High Voltage Power Cabling > 400 VAC
Separation	:	400 mm (LV cabling), 800mm (Instrument cabling)

12.2 ELECTRICAL LV TRENCHES

Trench Dimensions	:	800 mm deep by 300 mm wide
River Sand Bedding	:	PVC Piping – 75 mm above pipe, 50mm under pipe
	:	Direct Burial – 100 mm
Identification	:	Polythene Marker Tape (150mm wide, yellow and marked with the words "Electric Cable" at a depth of 350mm
Cable Markers	:	Concrete with engraved anodised aluminium ID plates. cable Marker Colour – Black
Cabling	:	Low Voltage Power Cabling 400 VAC/230 VAC (e.g. Actuators, Aux Motors, DB circuits)
	:	Control Cabling (e.g. MV Breaker Inter-tripping cables, Actuator control signals, Aux Motor local stop/start panels etc.)

Separation : 400 mm (HV/MV cabling), 800mm (Instrument cabling)

12.3 INSTRUMENT TRENCHES

Trench Dimensions : 500 mm deep by 300 mm wide

River Sand Bedding : PVC Piping – 75 mm above pipe, 50mm under pipe

: Direct Burial – 100 mm

Identification : PVC Tiles / Polythene Marker Tape (150mm wide, yellow and marked with the words “Electric Cable/Elektriese Kabel”) at a depth of 350mm

Cable Markers : Concrete with engraved anodised aluminium ID plates
cable Marker Colour – Light Blue

Cabling : Instrument Multi-core & Single Pair Cabling (IS and non IS)

Separation : 800mm (HV/MV/LV Electrical cabling)

13. CABLE LAYING

13.1 CABLES BURIED UNDERGROUND.

13.1.1 HV, MV, LV AND Instrument cables shall be spaced as indicated in Table 1 below. Pilot cables shall be laid beside the associated power cable. Cables crossing beneath railway tracks, roads, etc., shall be enclosed in 150mm diameter uPVC pipes. Where more than one length of pipe is required for a crossing, uPVC couplings with PVC glue, shall be used to prevent water from penetrating the joint. Cable pipes must maintain or exceed the specified cable spacing.

Table 1

CABLE	MINIMUM SPACING BETWEEN CABLES
MV To MV	300mm
MV To LV	400mm
LV TO LV	300mm
MV To instrumentation	800mm
LV To instrumentation	800mm

13.1.2 All pipes laid beneath the railway lines, roads, pavements shall be laid with their tops not less than 900mm below the formation level, and shall where possible extend at least 2000mm on either side of the centre of the outer most line. Where there is more than one

line crossed and in the case of roads and pavements at least 900mm on either side of the road and 1 or pavement. All pipes shall be graded for water drainage ; the required grade is 75mm in 30m.

- 13.1.3 All Low voltage cables shall be laid at a depth of 750mm. All cable depth measurements shall be made to the top of the cable when laid direct in the ground, otherwise to the top of the duct concerned.
- 13.1.4 Except where ducts, tunnels or pipes are provided and unless instructed to the contrary by the Engineer, the Contractor shall lay the cables direct in the ground.
- 13.15 Rollers may be used during the laying of cables, but they shall have no sharp projecting parts liable to damage the cables. They shall be carefully placed in the trench or duct in such a manner that they will not readily capsize during cable laying operations.
- 13.1.6 The Contractor shall ensure that all cable is laid in the same direction. No crossing of conductors inside through joints or end boxes will be permitted.
- 13.1.7 Where cables have to be drawn around corners, skid plates shall be used for this purpose and these plates shall be well lubricated. The skid plates shall be securely fixed between rollers and shall be constantly examined during the cable laying operations.
- 13.1.8 Cable shall be visually inspected for damage during and after laying.
- 13.1.9 Cable pulling and laying shall preferably be done manually whenever possible. Mechanical means such as winches and the like may only be used subject to the approval of the Engineer. No cable shall be subjected to a tension exceeding that stipulated by the cable manufacturer.
- 13.1.10 In the event of mechanical means of cable pulling being approved, the Contractor shall establish means of communication between the operator of the winch or other pulling device and the persons tending the drum from which the cable is being run off, to the satisfaction of the Engineer.
- 13.1.11 The contractor shall be wholly responsible for making his own arrangements for transporting all materials to and from and on the working sites.
- 13.1.12 At locations where cables run under concrete bridges, the cables shall be supported on suitable brackets secured on the side of concrete wall. These brackets shall be spaced a maximum of 500mm apart. Brackets and fixing material shall be of robust design and shall meet with Engineer's approval. Drawing of proposed ' bracket shall accompany tender. Brackets shall be galvanised in accordance with SABS 763, and thereafter painted to the satisfaction of the Engineer.

14.0 CABLES LAID IN DUCTS, CABLE TRAYS AND LADDERS

- 14.1.1 Cables in stalled in ducts shall be supported by cable ladder installed along the walls of the ducts or installed on the duct floor. If the cable ladder is installed on the duct floor, it shall be supported at +/- 50mm from the duct floor.

14.1.2 Cables installed in perforated cable trays and cable ladder shall be secured by means of heavy duty cable ties, cable clamps, etc.

14.1.3 Where medium and low voltage cables share the same wire-ways a reasonable space shall be left between the medium voltage and low voltage cables.

15.0 CABLE SLEEVING

15.1 All areas subject to vehicle traffic, rail crossings and paved areas shall be sleeved.

15.2 Sleeves shall be designed and installed so as to ensure 25 % spare capacity.

15.3 Sleeve Specifications

Material : PVC or PHD Polyethylene

Dimensions : 100 mm OD min

Standards : DIN EN50086-2, BS EN50086-2-4:1994

16.0 DRAW BOXES

16.1 Where cable sleeves are utilised and to facilitate the hauling of cables, brick draw boxes shall be provided at all trench junctions, complete with concrete slab, as detailed below:

Draw Box Dimensions (min) : Internal 450 mm square, 3 courses of stock brick deep.

Base & Top : Concrete 50mm thick

17. COVERING, BACKFILLING AND REINSTATEMENT

17.1 Filling in of trenches shall not be commenced until the Engineer or his authorised representative has inspected and approved the cables in situ in the section of trench concerned. Such inspection shall not be unreasonably delayed.

17.2 Where, in the opinion of the Engineer, the soil on site is unsuitable for riddling or backfilling, the Contractor shall arrange for the importation of approved material. A 75mm thick layer of soil sifted through a 6mm mesh shall be laid above the high-tension cables and consolidated by hand ramming only. The conditions of clause 13.20 apply in this case also.

17.3 All excavations made (whether for the purpose of cable laying, joint bays or trial holes) shall be back-filled in 150mm layers, the earth in each layer being well rammed and consolidated and sufficient allowance being made for settlement. The back-filling shall be completed to the satisfaction of the Engineer.

15.4 The refilled trench shall be maintained by the Contractor at his expense in a thoroughly safe condition for the duration of the contract. In the case of tarmac surfaces, until such time as this surface has been restored.

- 17.5 All backfilling of road crossings shall be mechanically rammed by means of approved type of mechanical power driven rammer.
- 17.6 The replacement of made up surfaces, such as roads, pavements, tarred aprons, verandas, floors, etc., necessitated by trenching or other works shall be arranged by the contractor at his cost. The price thereof shall be included in the tender price.
- 17.7 Concrete cable protection slabs to Drawing No. PPD-PA-10 shall be laid on top of the 75mm layer of soil referred to in clause 15.2 before the trenches are backfilled. Cable protection slabs shall be laid close butted, convex end to concave end, directly above each cable throughout the underground portion except where otherwise protected such as by pipes, etc. Three coloured slabs to drawing PPD-PA-9 shall be provided to give the indication of the route in the case of a change of direction. Only unbroken cable protection slabs, and those actually laid will be paid for.
- 17.8 When back filling of cable trench has reached a level, after consolidation, approximately 150mm below the normal level of the surface of the surrounding area the Contractor shall lay a continuous plastic cable warning tape directly above each cable for the full length of the cable trench before completing the backfilling.
- 17.9 Concrete cable markers to Drawing No. PPD-PA-12 shall be provided and installed by the Contractor at his cost. The price thereof shall be included in the tender price. Initial cable markers shall be installed as close as possible to cable terminations, thereafter at approximately 60m intervals and at cable joints, also on either side of crossings of oil pipelines and at ends of underground cable pipes.
- 17.10 Changes of direction and joints in cable runs shall be indicated by installing two markers at such positions in the manner shown on Drawing No. PPD-PA-12. The markers shall be coloured orange with oxide mixed into the concrete. Cable markers shall project approximately 25mm above normal ground level except where projecting cable markers could be a hazard to pedestrians such as in shunting yards, walkways, pavements, etc. In such cases the cable markers shall be flush with the surface.
- 17.11 If more than one cable is laid in one trench, only one row of cable markers shall be placed on the centre line of the trench to define the general route of the cables.

18. CABLE TESTING AND TEST DATA

- 18.1 All tests on completed cables shall be carried out in the presence of a representative of Transnet Projects. Not less than 14 working days notice of the Contractor's intention to carry out such tests shall be given to the Engineer.
- 18.2 On completion of the jointing and termination of cables, the 11kV cables are to be subjected to the test laid down in paragraph E-1.4 of Appendix E of S.A.B.S.1339 and the low voltage type cables to be tested for insulation and loop resistance.
- 18.3 The anti-electrolysis insulation of each 11kV cable run complete, shall withstand for 1 minute, a test voltage of 10kV D.C., applied from the cable armouring to earth. The bedding shall withstand a test voltage of 4kV D.C. between screen and armouring for 1 minute.

- 18.4 As a graphite coating is required to be applied to the PVC oversheath (in accordance with British Standard), a D.C. voltage test will be carried out on all cables after installation. The D.C. voltage test can only be carried out on the installed system if the joints are suitably insulated from earth, otherwise the D.C. voltage test should be carried out prior to jointing.
- 18.5 The contractor shall obtain written confirmation from the manufacture of all cables, joints and terminations -etc. that the test that Transnet Projects requires the contractor to carry out in terms of this specification meets with the manufacturers approval. Such confirmation must be obtained prior to any, tests commencing.
- 18.6 The electrical Contractor shall on completion of the tests submit three copies of all test results. The costs of all the tests mentioned above shall be borne by the Contractor.
- 18.7 In addition the cable manufacturer shall provide test sheets of each manufactured cable drum length together with the cable drum numbers which shows all the test results.
- 18.8 Transnet Projects reserves the right to carry out any further tests deemed necessary itself, using either the Contractor's instruments and cable, or its own, or both. The costs of such tests shall not be charged to the Contract.

18.9 Cable Testing – Low Voltage Cables (< 1 kV)

Each individual core of all cables (including spares) will be checked for continuity and insulation breakdown, in accordance with SABS 150 (PVC):

- Insulation Resistance shall be measured with a 1000V Megger and the readings tabulated and certified.
- Similarly, earth continuity resistance shall be measured and recorded.
- All cables will be checked for correct termination.

18.10 Cable Testing – Medium Voltage Cables (< 22 kV)

Each section of laid and jointed cable shall be tested, in accordance with SABS 97 (PILC/SWA):

- Insulation Resistance shall be measured with a 1000V Megger, followed by the relevant pressure test. Readings shall be tabulated and certified.
- AC test voltage must be applied to each phase in turn for one minute, or alternatively the DC test voltage for fifteen minutes. Leakage current shall be measured and recorded for each test.
- All cables will be checked for correct termination.

19. MEASUREMENTS OF CABLES

- 19.1 All measurements for payment purposes shall be made jointly by representatives of the Contractor and Transnet Projects and shall be agreed and approved by both parties.

- 19.2 Measurements of cable length shall be made from centre to centre of cable joints and to the cable ends and will exclude any wastage due to jointing and terminating.
- 19.3 Measurements of trench width and depth shall be made to the nearest 50mm and shall not take into account subsidence or unnecessarily large excavations. No allowance shall be made where trenches have to be widened at the bottom to accommodate cables, cable joints and protection slabs

APPENDIX 1

STATEMENT OF COMPLIANCE (TO BE COMPLETED BY TENDERER)

This tender complies with specification TPD: 003-CABLESPEC in all respects.

SIGNATURE : _____ DATE : _____

This tender complies generally with specification TPD: 003-CABLESPEC but differs from it on the following points.

SIGNATURE : _____ DATE : _____

Transnet Port Terminals

**SPECIFICATION FOR EARTHING AND THE PROTECTION OF BUILDINGS AND
STRUCTURES AGAINST LIGHTNING.**

REVISIONS		
REV	DATE	APPROVED
0	September 2022	

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1.0 SCOPE

- 1.1 This specification covers Transnet Projects requirements with respect to the protection of buildings and structures against lightning and the requirements for air terminal systems, down conductors and earthing of installation of this specification
- 1.2 This specification applies to assessing, testing and upgrading of existing lightning protection systems and earthing on existing buildings and structures.

2.0 STANDARDS, SPECIFICATIONS AND DRAWINGS

- 2.1 The following publications (latest editions and amendments) are referred to herein.

South Africa Bureau of Standards (South African National Standards)

SANS 10313	-	The protection of structures against lightning.
SABS IEC 61643	-	Surge protective devices connected to low voltage power distribution systems.
SANS IEC 60950	-	Information technology equipment – safety.
SANS 10142	-	Code of practice for the wiring of premises
BS 6651	-	Code of practice for protection of structures against lightning.
BS 7430	-	Code of Practice for Earthing.
SABS 064	-	Code of Practice for the Preparation of Steel Surfaces for Coating.
SABS 086	-	Installation and Maintenance of Electrical Equipment used in Explosive Atmospheres.
SANS 10108	-	The Classification of Hazardous Locations and the Selection of Electrical Apparatus for use in such Locations.
SABS 0199	-	The design and Installation of Earth Electrodes SPECIFICATIONS
SABS 763	-	Hot Dip Zinc (galvanised) Coatings
SABS 1091	-	National Colour Standards for Paints.
SABS 1507	-	Electric Cables with Extruded Solid Dielectric Installation for Fixed Installations
SABS IEC 742	-	Isolating Transformers and Safety Isolating Transformers.

OCCUPATIONAL HEALTH AND SAFETY ACT OF 1993 (ACT 85 OF 1993).

3.0 SERVICE CONDITIONS

- 3.1 The earthing shall be designed, rated and installed for continuous operation under the following conditions :-

3.1.1 Ambient/Environment Conditions :

- 3.1.1.1 Altitude : Sea level.
- 3.1.1.2 Ambient temperature : -5° C to +45° C (daily average +35° C).
- 3.1.1.3 Relative humidity : As high as 96%
- 3.1.1.4 Lightning conditions : Severe, with a maximum lightning ground flash density 11 flashes per km² per annum.
- 3.1.1.5 Exposure conditions : Salt laden, industrial atmosphere as well as hazardous gases and dust atmosphere.
- 3.1.1.6 Electrolytic corrosion conditions prevail in all the areas owing to the proximity of direct current traction system and cathodic protection schemes.

4.0 EQUIPMENT AND MATERIALS

- 4.1 Equipment and materials to be used, shall be of high quality, and shall comply with all relevant specifications, codes as mentioned in this specification as well as the Occupational Health and Safety Act of 1993(Act 85 of 1993).
- 4.2 Where equipment and material does not comply with the relevant specifications it shall be submitted to Transnet Project's Engineer for approval.
- 4.3 All materials used for the lightning protection system shall withstand the electric and electromagnetic effects of lightning current and predictable stresses without being damaged.
- 4.4 Materials and sizes shall be chosen bearing in mind the possibility of corrosion of either the lightning protection system or the structure to be protected.
- 4.5 Components of the lightning protection system may be manufactured from the materials listed in Table 8 of SANS 10313, provided they have sufficient electrical conductivity and corrosion resistance.

5.0 LIGHTNING PROTECTION REQUIREMENTS

- 5.1 The contractor shall carry out the installation in accordance with SANS 10313: Code of Practice for the protection of structures against lightning and the requirements of this specification.
- 5.2 Where the local supply authority requirements differ from those specified herein Transnet Projects's Electrical Engineer shall be approached for a decision.
- 5.3 All equipment and material shall comply with the relevant National or International standard specification. Where equipment does not comply it shall be submitted to the Transnet Projects Electrical Engineer for approval.

- 5.4 The system of protection will be finials/air terminals, down conductors and earth spike or roof conductors, down conductors and earth spike.
- 5.5 The earth resistance for separate earth electrodes if down conductors are not connected to a ring earth shall be not exceed the following;
- $R_t = 10 \text{ Ohm}$ for category A structures
 $R_t = 15 \text{ Ohm}$ for category B and C structures.

6.0 DESIGN OF LIGHTNING PROTECTION

The designer of lightning protection shall take into consideration the following principles and requirements during the design of the system.

6.1 GENERAL PRINCIPLES

- 6.1.1 Basic Principles of Lightning Protection:** the requirements of the basic principles of lightning protection as detailed in SABS 0313 shall be taken into consideration to ensure proper protection of structures against lightning.
- 6.1.2 Evaluation of Risk:** The risk of lightning stroke shall be evaluated as described in SANS 10313.
- 6.1.3 Effective height of a structure (H_e):** The effective height of the highest point shall be determined by considering the average height of building, trees and structures and land profile of the surrounding area.
- 6.1.4 Ground flash density (N_g):** The ground flash density (N_g) for general buildings, structures and installations shall be estimated from the average ground flash density given in table 1 of SANS 10313 as a general guide. For important structures and installations the value of the ground flash density shall be determined on the basis of at least 5 lightning years, or from existing records
- 6.1.5 Number of flashes to structure per 100 year (N_t):** The number of flashes to structures per 100 year shall be determined taking into consideration type and the height of the structure as described in SANS 10313.

6.2 HAZARD CATEGORY

- 6.2.1 Buildings and structures where lightning protection system will be installed shall be categorised prior to the installation. Hazard categories are based on the nature of the building, its content and occupancy.
- 6.2.2 The Hazard categories are classified as follows in SABS 03 -1985 Code of practice for the protection of buildings structures against lightning.

Category A: High Hazard

Category A1: Structures and areas containing explosives of Category Z.

Category A2: Structures and areas classified as

- a) Division 0 areas in accordance with SABS089: Part II, or
- b) Class I, Division 0 locations in accordance with SABS 0108.

Category A3: Strategic control and communications installations such as airport towers

Category A4: Thatched-roof structures of historic values or that contain irreplaceable works of art or like values.

Category B: Medium Hazard

Category B1: Structures and areas containing explosives of Category X or Y.

Category B2: Structures and areas classified as

- a) Division 1 or 2 areas in accordance with SABS089, Part II, or
- b) Class I, Division 1 or 2 locations, or Class II, Division 1 location in accordance with SABS 0108.

Category B3: All structures not included in Category A and to which the public normally has access or which are of historic value.

Category B4: Large temporary structures used for exhibitions and entertainment.

Category B5: Thatched roof dwelling houses.

Category B6: Communications towers, water towers and reservoirs.

Category B7: Caravans and Yachts.

Category B8: Buildings and areas used for livestock, fuel or flammable material.

Category C: Low Hazard

Category C1: Small buildings that are infrequently occupied.

Category C2: Dwelling houses other than thatched-roof houses.

Category C3: Farm buildings, other than those included in category B8.

6.3 ZONES PROTECTION AND SHIELDING ANGLES

6.3.1 The zone of protection shall be the area covered by either one of the following types of protection:

- a) Single Vertical air terminal
- b) Single horizontal air terminals
- c) Area between two or more air terminals
- d) Area between roof conductors.

6.3.2 The shielding angles α and β are given in table 3 of SABS03-1985, Code of practice for the protection of buildings and structures against lightning.

6.3.3 The zone protection for Shielding Angles on Steep Slopes and High Ridges is not considered effective beyond a horizontal distance from the nearest air terminal of greater than $2H_e$, where H_e is the effective height of the part of the air terminal above its immediate surroundings.

6.3.4 In roof areas away from the edges of tall structures (generally of $H_e > 50\text{m}$), shielding angles given in table 3, SABS 0313 can be used appropriate to hazard category of the roof area so protected and the effective height H_e of the air terminal above the roof area.

6.4 SELECTION OF AIR TERMINAL

- 6.4.1 Mast Protection:** An air terminal consisting of one or more masts that cover the structure or area to be protected with the appropriate shielding angle will, with the possible exception of a few weak lightning strokes, successfully intercept lightning strokes.
- 6.4.2 Air Terminals as Part of the Structure:** An air terminal as part of the structure may be one or more of the following:
- A continuous metal roof.
 - A metal roof structure supporting a metal roof
 - The metal reinforcement in the roof of a reinforced concrete structure with peripheral conductors and finials where necessary.
 - Roof conductors and finials, where necessary, on a non-conducting roof.
 - Finials in chimney, gable ends, parapet walls, etc.
- 6.4.3 Air Terminal Systems For Category A Hazards:** The protection is based on the principle that a primary air terminal system must be provided for the interception of major lightning strokes with, if necessary a secondary air terminal system for the interception of those weak lightning strokes that might penetrate the protection of the primary air terminal system. The secondary air terminal system shall not be intended to carry currents of major lightning strokes.

One of the following lightning protection systems shall be used as detailed in SANS 10313.

- Mast protection used as a primary air terminal
- Metal roof used as primary air terminal system
- Reinforced concrete structure used as primary air terminal system.

6.5 MASTS AND CATENARY CONDUCTORS OVER THE STRUCTURE TO BE PROTECTED

6.5.1 GENERAL

- 6.5.1.1** A lighting protection system consisting of free standing masts separate from the structure provides the highest degree of protection, subject to the correct positioning of the mast and to the correct choice of shielding angle.
- 6.5.1.2** The number and height of masts (and, where necessary, the provision of the catenary conductors between the masts) shall be based on cost, aesthetics, shielding angles and mechanical consideration

6.5.2 CLEARENCE FROM STRUCTURES

- 6.5.2.1** A safe clearance distance shall be kept between the mast and the catenary conductor strung between the masts and the structure to be protected by the mast or the catenary conductor. The clearance distance depends to various factors detailed in SANS 10313.
- 6.5.2.2** Where a common earth electrode is provided for mast and structures in close proximity, the following clearance distance “d” shall be maintained with a minimum of 100 m.
- Between the mast and any point of structure: $d \geq 0,06.h$ m.

- b) Between the catenary conductor and any part of the upper surface of the structure: $d \geq 0,1 \cdot (L/2)$ m for Category A hazard, and $d \geq 0,06 \cdot (L/2)$ m for Category B and C hazards.
- c) Between a network of conductors and any part of the upper surface of the structure: $d \geq 0,1 \cdot (D + (L - D)/N)$ m for Category A hazard, and $d \geq 0,06 \cdot (D + (L - D) / n)$ m for Category B and C hazards.

Where L = length of path measured from the base of one mast along the catenary conductor to the base of the other mast between which the catenary conductor is suspended, m.
 D = spacing between the mesh of the network measured along the catenary conductor, m
 h = height of structure, m
 n = number of cross bonds between two catenary conductors.

6.5.2.3 Where the earth electrode of a mast is separate from the metal water main, other services or the earth electrode of a structure, the following clearance distance “d” shall be maintained with a minimum of 1.00 m:

- a) Between the mast and any point of the structure: $d \geq 0,06 \cdot h + 0,1 \cdot R_s$ m.
- b) Between a horizontal catenary conductor and any part of the roof of the structure: $d \geq 0,06 \cdot (L/2) + 0,1 \cdot R_s$ m.

Where R_s = numerical value of the earth electrode resistance of the mast or, where masts are connected together by a catenary conductor, of the mast thus connected together, measured in ohms.

6.5.2.4 The minimum clearance distance “d” where the structure has no earth electrode and has limited water or electricity supply, shall be maintained within the following minimum clearance distances:

- a) $d \geq 1,00$ m between the mast or catenary conductor and any part of the structure.
- b) $D \geq 0,1 R_s$ m between the mast and any water pipe or electric cable, whether buried or above ground unless the mast electrode is bonded to the metal pipe of the underground water main. If R_s is not known, the clearance distance D must be at least 3m.

6.5.3 MAST PROTECTION IN THATCHED ROOFS

6.5.3.1 Thatched roofs shall be protected by one or more free-standing masts only. The zone of protection of the masts must include gable ends, chimneys, antennas, vent pipes and any other metal objects.

6.5.3.2 Telephone wires, overhead services connections to the electricity supply, or other overhead metal wires or pipes, shall not enter the structure through or close to the thatch.

6.5.3.3 On remote chimneys or gable ends close to imaginary surface of the protection zone, install a finial and down conductor well away from the thatch.

6.5.3.4 Metal wires and metal-coated insulating sheets used in the construction of the thatched roof shall be bonded together and to the earthed metal water main or electrode of the structure.

6.5.3.4 Where metals used in the construction of the roof are not bonded and earthed, a minimum clearance distance c of 1m between metals of the roof and water pipes, vent pipes, tanks, gas pipes, antennas, telephone and bell wires, bugler alarms and electrical wiring and conduits shall be maintained.

7.0 INSTALLATION

7.1 AIR TERMINALS ON THE STRUCTURE TO BE PROTECTED.

- 7.1.1 The purpose of an air terminal on a structure to be protected shall be to intercept lightning strokes at preferential points of an air terminal, thereby:
- a) Minimizing penetration of a lightning discharge current which could have followed a random path in the roof structure with possibility of a resultant fire.
 - b) Preventing the loosening of masonry or the cracking of precast panels or reinforced concrete.
- 7.1.2 The selection of the air terminal system and the the position of down conductors shall be so selected such that at any likely point of incidence of lightning stroke, there are at least two parallel paths for the current to floe to earth.
- 7.1.3 Parallel routes shall not be necessary in the following cases.
- a) An air terminal on a small structure having only one prominent point of incident.
 - b) Dead-ended conductors, i.e those conductors of the air terminal for which it is not feasible to provide a connection to a down conductor.
- 7.1.4 Where a peripheral roof conductor is required for the protection of the outer side edge of a structure, the conductor shall be installed as close to the edge as is practicable (preferable not more than 100mm from the outer edge)
- 7.1.5 Where buttresses or parapet walls are not already equipped with an air terminal in the form of continuous metal cladding or similar metalwork and peripheral conductors are to be provided at an effective height H_e of 15 m or more, finials shall be added on all exposed outer corners and at intervals not exceeding 30 m between outer corners. The finials shall be placed as close as possible to the outer edge, and so position the down conductors such that their connection to the peripheral conductor is close to the finial.
- 7.1.6 Concrete masonry chimneys or gables ends that are not protected with the appropriate shielding angle of another structure shall be protected by means of a finial or metal cap. Where the chimney or gable end is of masonry, a peripheral conductor along the gable or around the chimney shall be used instead.
- 7.1.7 Where it is not feasible to provide a down conductor at one end of an air terminal or a connection to another part of the lightning protection system, a dead ended conductor shall be used provided it is not longer than 10 m an generally flows a horizontal or downward course from the free end to end connected to the remaining part of the lightning protection system.
- 7.1.8 Where a dead-ended conductor partly flows an upwards course, the dead-ended conductor shall be not longer than 7.5 m. If the top of the protected part is considerably lower than the ridge conductor to which the dead-ended conductor is connected, a finial shall not be used at the free end, unless it is required for the enhancement of the protection of the surrounding area, in which case an additional down conductor at the free end is recommended.
- 7.1.9 Metal gutters shall be bonded along the outside perimeter of the roof to the nearest down conductor, or to the metal of the roof, where applicable.

7.2 METAL ROOFS AND NON-METAL ROOFS SUPPORTED BY METAL ROOF STRUCTURES

- 7.2.1 Structures having roofs covered with electrically continuous metal sheets do not require air terminals, but shall be earthed by down conductors.
- 7.2.2 Sheet metal separated from each other by insulating strips or by epoxy or plastic coating s, may be regarded as providing continuous metal roof. However where sparking between such roofing is considered undesirable because of magnetic interference, all sheets adjacent to the ridge conductor or peripheral conductor shall be bonded.
- 7.2.3 A non-metal roof consisting of non-combustible roofing material held by metal fasteners to a roof supporting structure of metal construction may be considered to be a metal if the metal structure is earthed by down conductors, or supported by earthed metal columns, and spacing between roof beams does not exceed 15m for Category B and C hazards.

7.3 REINFORCED CONCRETE STRUCTURES

- 7.3.1 Reinforced steel shall not be used as parallel paths to enable lightning discharge current to flow safely to general mass of the earth.
- 7.3.2 Air terminals or finials and where necessary peripheral conductors shall be installed, taking into consideration the likely points of incidence of lightning and the path of the current through internal down conductors.
- 7.3.3 Where the outer support columns of the structure may be regarded as continuous from roof to basement, the peripheral and air terminal conductors shall be bonded to the internal or external down conductors.
- 7.3.4 Peripheral conductors and finials shall be used for medium height structures with reinforced concrete. Where the peripheral conductor is on a parapet wall that surrounds a metal roof or the air terminals of other structures, the other air terminal shall be connected to the peripheral conductor, preferably close to a down conductor. The peripheral conductor and other air terminal shall be connected to internal or external down conductor.
- 7.3.5 If the upper edge of the structure with chimneys and cooling towers and of medium height is not metal clad, horizontal conductors around the upper circumference of the structure, equipped with finials at intervals of not more than 15 m, with a minimum of two shall be installed.
- 7.3.6 On tall reinforced concrete structures, one of the following shall be installed in order to increase the protective efficiency, depending on the risk and the degree of protection required, height and slenderness of the structure:
 - a) At intervals of not more than 10 m, install oblique finials along the upper perimeter, pointing upwards and outwards such that the tip of each finial points outwards at an angle of 30° to the vertical through the outer edge of the structure, and is at least 400mm above the structure, each finial being connected to a peripheral conductor.
 - b) A horizontal conductor that follows the contour of the structure and that is so raised on oblique struts of length at least 500 mm that the conductor is displaced outwards at an angle of 30° to the vertical through the outer edge of the structure.
 - c) Oblique finials spaced as in (a) above, positioned on a horizontal conductor arranged as in (b) above and in line with the oblique struts, each finial pointing upwards and outwards at an angle of 30° to the vertical through the outer edge of the structure, and of length such that the tip of the finial is at least 800 mm above the outer edge of the structure.

Where the structure is slender, an air terminal as in (b) or (c) above is to be preferred to that in (a)

The air terminal shall be bonded to the internal down conductor at intervals not exceeding 10 m, or where the circumference exceeds 60 m, at appropriate intervals not exceeding 30m with a minimum of six bonds.

7.4 FINIALS AND ROOF CONDUCTORS

- 7.4.1 Roof conductors and finials shall be installed along the ridges of the roof and on other projections, in accordance to SANS10313 – code of practice for the protection of structures against lightning.
- 7.4.2 Protruding metal objects shall be bonded in a horizontal or in a downwards direction to the nearest roof or down conductor where the distance between the metal object and the conductor is less than 7.5m otherwise provide a separate down conductor. In all cases where the pitch of the roof is less than 30°, metal gutters and roof conductors shall be bonded or eaves conductors shall be provided.
- 7.4.3 In the case of large roofs of non-conducting material, additional conductors shall be installed across the surface of the roof, perpendicular to the long side of the roof and at extremely equal spaces not exceeding 15m. If the width of the roof exceeds 15m install conductors to form a grid at approximately equal spacing not exceeding 15m in either direction.
- 7.4.4 Roof conductors, finials and roof conductor grids shall be connected to the closest down conductor.
- 7.5.5 All roof conductors shall be manufactured from SABS approved single-core bare aluminium conductor with a minimum cross sectional area of 25mm².

7.5 DOWN CONDUCTORS

- 7.5.1 Down conductors shall be installed close to the point of the air terminal that are most likely to be struck by lightning and preferably run them vertically along the most direct route to the earth electrode.
- 7.5.2 At least two down conductors shall be provided in a building, such that in plan view no point of a structure is more than 15m from the nearest down conductor, except for masts and small structures having only one prominent point of incident, such as rondavels, these need only one down conductor.
- 7.5.3 Each down conductor shall be supplied with a separate earth electrode. This will reduce the current flow per down conductor, resulting in a lower voltage drop across the down conductor caused by the surge impedance of the conductor.
- 7.5.4 Down conductors shall not be placed close to doorways or entrances to buildings. Maintain a minimum clearance distance of the order of 1 m from the door and window frames, balustrades and other large metal objects.
- 7.5.5 Where down conductors deviate from a vertical route due to sharp bends and loops required to carry a conductor over eaves and parapet walls, shall be permitted, provided that all requirements stated in SANS 10313, clause 6.1.4 are met.
- 7.5.6 Steel columns and internal metal storm water drain-pipes shall be used as down conductors only if they are joined by screwing, bolting or welding.
- 7.5.7 External metal stair cases, fire escapes or other large frames shall be used as down conductors if they

are electrically continuous over their full height. If not electrically continuous they shall be bonded to the lightning protection system at the top or at the bottom of the framework.

- 7.5.8 In the case of structures of Hazard Category A, Test joints shall be installed in down conductors at convenient heights above finished ground level.
- 7.5.9 Internal reinforcing steel of vertical concrete column, particularly those on the outer corners can be used as down conductors, provided that the reinforcement is electrically continuous.
- 7.5.10 Vertically discontinuous reinforcement shall be bonded between the reinforcement of each section to provide a continuous path to ground or an external down conductor shall be installed.
- 7.5.11 Large external metal frames, balconies and metal cladding on the top floors of tail structures (typically 30 floors or more) that may be exposed to direct lightning strokes must be bonded to the reinforcement of the structure or to a down conductor that is connected to the reinforcement of the roof.

8.0 STATUTORY REQUIREMENTS

- 8.1 The Contractor shall ensure that the installation satisfies the requirements of all relevant South African Statutory Regulations
- 8.2 Where applicable, equipment items shall carry the SABS mark to demonstrate compliance with the regulations.

9.0 RESPONSIBILITY FOR WORK

- 9.1 The tenderer shall be responsible for the complete installation of the lightning protection system including testing, earthing conductors, surge protection devices, spikes etc. as required for various buildings and structures. These installations shall include the review and the upgrading of the existing lightning protection systems. Due considerations shall be taken of the effects of lightning covered herein below in clause 8, in providing the lightning protection system.
- 9.2 The tenderer shall undertake to repair all faults due to bad workmanship and/or the use of faulty materials and to replace all defective materials within six months after the installation date.
- 9.3 The tenderer shall rectify all the defects to the satisfaction of Transnet Projects, that may become apparent during the guarantee period.
- 9.4 The tenderer may be required to carry out builders work such as cutting of concrete columns and coring of holes for testing of the continuity of the existing steelwork or cabling. Good contact between reinforcing bars should be ensured.

9.0 APPLICABLE INFORMATION

- 10.1 **Electrical effect** – The current discharged through the earth electrode resistance produces a resistive volt drop which may raise the potential of the system to a high value relative to true earth.
- 10.2 **Side-flashing** – The point of strike may be raised to a high potential, and there is a risk of flashover from the protection system to any metal or in the structure.
- 10.3 **Thermal effect** – The thermal effect of a lightning discharge is confined to the temperature rise of the conductor through which the current passes.

- 10.4 **Mechanical effect** – When a high current is discharged along parallel conductors in close proximity or along a single conductor with sharp bends, a different mechanical effect is exerted by a lightning flash. This is due to a sudden rise of 30 000K in air temperature and the resulting explosive expansion of the adjacent air in the channel along which the charge is propagated.

11.0 PROTECTION AGAINST CORROSION

- 11.1 The tenderer shall ensure that atmospheric, chemical and or electrolytic corrosion of copper and other metals is prevented from occurring when used for the lightning protection system.
- 11.2 The contact surfaces of dissimilar metals shall be kept completely dry and protected against ingress of moisture to prevent the acceleration of electrolytic corrosion.
- 11.3 Although copper is highly resistant to many types of chemical attack, lead coating shall be recommended wherever subjected to severe corrosion due to presence of sulphur compounds.
- 11.4 Stainless steel material of similar grading shall not be used unless prior approval is obtained.

12.0 EARTHING CODES OF PRACTICE

This part of specification details standards and codes of practice to be adhered to in the supply, installation and termination of earthing systems on all Transnet Sites.

12.1 National Standards

- 12.1.1 The requirements of the materials, design, layout, fabrication, assembly, erection, examination, inspection and testing of an earthing system on site shall be in accordance with the relevant sections of codes: -

- SABS 089 Part 2 1965 Electrical Code for Petroleum Industry
- SABS 0121 1977 Cathodic Protection of Buried and Submerged Structures
- SABS 0123 1976 The Control of Undesirable Static Electricity
- SABS 0198 Part 12 1988 Installation of Earthing System
- SABS 0199 1985 The Design and Installation of and Earth Electrode
- SABS 0200 1985 Neutral Earthing in Medium Voltage Industrial Power Systems
- SABS 0292 1999 Earthing of Low Voltage (LV) distribution systems
- SANS 10313 Latest amended Protection of Structures against Lightning
- SABS 1063 1998 Earth Rods and Couplers
- SABS IEC 61000-5-2 1997 Electromagnetic Compatibility (EMC)
Part 5: Installation and mitigation guidelines

Section 2: Earthing and Cabling

- SABS IEC TS 61312-2 1999 Protection against Lightning Electromagnetic Impulse (LEMP) Part 2: Shielding of structures, bonding inside structures and earthing
- SABS IEC 61024-1 1990 Protection of Structures against Lightning Part 1: General principles
- SABS IEC 61024-1-1 1993 Protection of Structures against Lightning Part 1: General principles
Section 1: Guide A – Selection of protection levels for lightning protection systems
- SABS IEC 61024-1-2 1998 Protection of Structures against Lightning Part 1-2: General Principles
Guide B – Design, Installation, maintenance and inspection of lightning protection systems
- SABS IEC 61312-1 1995 Protection against Lightning Electromagnetic Impulse Part 1: General principles
- SABS IEC 61312-4 1998 Protection against Lightning Electromagnetic Impulse Part 4: Protection of Equipment in existing structures
- SABS IEC 61643-1 1998 Surge Protective Devices Connected to Low Voltage Power Distribution Systems
Part 1: Performance requirements and testing methods
- SABS IEC TS 61312-2 1999 Protection against Lightning Electromagnetic Impulse (LEMP) Part 2: Shielding of structures, bonding inside structures and earthing

12.1.2 Statutory Requirements

- a) The Contractor shall ensure that the installation satisfies the requirements of all relevant South African Statutory Regulations
- b) Where applicable, equipment items shall carry the SABS mark to demonstrate compliance with the regulations.

12.2 Technical Requirements

12.2.1 General

- a) A common integrated station earthing system shall be provided for electronic and electrical systems equipment, static and lightning protection in accordance with the requirements of this document.
- b) A soil resistivity survey shall be carried out by a specialist earthing consultant/contractor. The consultant/contractor shall prepare a detailed report on the conditions identified and provide the survey data recordings together with proposals, for a basis of the earthing system design.
- c) Major electrical equipment such as switchgear, transformers, lighting boards, floodlight towers on poles, control panels etc. and associated metallic support frameworks, shall be connected to the station safety earth via Electrical Earth bars located nearby.

Use of embedded conductors within a power cable (spare core earth) may be utilised as the primary equipotential bonding system provided the following conditions are met: (SABS 086-1:2001)

- The embedded conductor has a cross-sectional area equal to those of the live and neutral conductors or equal to the values in Table 1 of SABS 0142)

In addition, a second visual earth connection shall be provided to each item of electrical equipment, to prevent the potential to earth of such equipment rising above spark potential. (SABS 089-2:2000)

- d) The neutrals of generators and transformers shall be connected to the main earth grid either directly or via an earthing resistor, as required. Where neutrals of transformers are connected directly to earth, this shall be done via means of connections to both an individual earth rod located nearby as well as to the station earth mat by means of Electrical Earth bar located within the Switchgear Room.
- e) Frames of motors shall be connected to the earthing system in accordance with the following table:

Motors kW Rating	Minimum Earth Conductor Size
Up to 30	16 mm ²
37 – 132	50 mm ²
150 – 175	70mm ²

Note:

In order to minimize the number of different sizes of earth conductor, the above three sizes only shall be used throughout, unless specifically stated otherwise.

- f) Cables supplying lighting fixtures shall be 3 core for single-phase supplies and 5 core for 3 phase supplies, of which one core shall be used as the earth conductor.
- g) Plant Infrastructure such as manifold piping, tanks and metallic support frameworks, shall be connected to the station safety earth, either directly or by means of Electrical earth bars located nearby.

- h) Flanged joints in metallic pipelines shall be considered inherently continuous provided the surfaces of one of the bolts are cleaned and identified for earthing. Flanges of metallic pipelines that have insulated linings for purposes other than cathodic protection shall be bonded to ensure electrical continuity.

Pipelines shall only be connected to the earthing system where they enter and leave the battery limits.

- i) Storage tanks that are not cathodically protected shall be earthed through at least two separate connections to the tank. Tanks shall be earthed in accordance with the relevant SABS code.

Electrically continuous structural steel columns may be used as down conductors by means of which elevated tanks, vessels, etc. shall be deemed to be connected to the earthing system.

All tank covers, gauge floats and stirrers etc. as well as all pipes entering the tanks shall be earthed.

The steel roof shall be in a direct electrical contact with, or bonded to the tank shell.

Earthed grids, gauges, gratings and the like placed in or across the inlets of tanks are not to be used as a means of static discharge. Individual bonding shall be made to the earthing system.

- j) Cable trays and cable racks shall have continuous earth continuity. This shall be ensured by installing 10mm² earth straps across the racking fishplates (joints). Cable Trays shall be connected to the earthing system in two places - where they enter and leave the battery limits.

- k) Earthing connections to all equipment and process plant shall comprise of welded earth bosses in compliance with SABS 089 Part II:1965 regulation 5.1.4K with properly provided terminations i.e. 10mm diameter earth studs. Anchor bolts shall not be used.

Earth connections to all equipment shall be effectively bolted, using crimped lugs. All cable connections shall be fitted with a "star" or serrated washer in addition to the backnut, to ensure good earth contact.

- l) All earthing connections between the station earth system and respective earth bars/lightning protection systems shall where possible be made above ground, by means of bolts, crimped lugs and PVC taped.

All cable connections shall be fitted with a "star" or serrated washer in addition to the backnut, to ensure good earth contact.

Earth connection points shall be clearly labelled.

In cases where earth connection points are required to be made underground (e.g. to earth rods), inspection wells shall be provided comprising of pre-cast concrete/PVC surrounds complete with covers, to facilitate periodic inspection.

- m) Earthing conductors rising through paving or other concrete work shall be run in suitable protective sleeves which shall project above finished level.

- n) Earthing and bonding conductors shall be sized and installed in compliance with regulations detailed in the current SAIEE Standard Regulations for the Wiring of Premises and in SABS 03 as applicable.
- o) Extendable earthing rods shall be manufactured from stainless / copper clad / galvanized steel (dependant on soil acidity and chlorides and existence of cathodic protection systems) 16mm diameter, 1200 mm long sections, and shall have molecular bond between the two metals to prevent moisture ingress. Where it is necessary to join earth rods together, a non-ferrous corrosion resistant coupling device shall be used which shall prevent the ingress of moisture into the joint.
- p) Lightning and static earthing protection shall be provided for all tall steel, masonry and concrete structures, towers, vessels, tanks etc, as well as all buildings used to house sensitive electrical/electronic equipment. Lightning protection systems shall be connected both to individual earth rods as well as bonded to the station earth mat. Where possible, the mesh method (as defined in SANS 10313) should be utilised in the protection of buildings against lightning strikes i.e. the use of masts and catenary conductors are to be avoided.

Tall steel structures such as towers or structure columns, provided they are electrical continuous, shall be considered inherently protected against lightning by their connection to the earth.
- q) **The resistance of the common earthing system to the general mass of earth shall not exceed 1 Ohm.**
- r) Where a separate system is installed for other than electrical equipment in remote locations, e.g. storage tanks; its resistance to the general mass of earth shall not exceed 7 Ohms. (Note: This applies only for Lightning Protection and remote valve chambers that are not connected to the Station Earth).

12.2.2 Station Safety Earth

In cases where a new Station Safety Earth Mat is required to be provided, the following specifications shall apply:

The **Earth Mat** shall consist of a completely buried, lattice network of 40x3mm, bare copper tape. All the crossover points of the lattice shall be braised or cadwelded and protected with PVC insulation tape. Buried joints or splices shall not be clamped or bolted. The earth mat shall be buried, 1000mm minimum, below finished grade.

The interconnecting conductors shall be radially interconnected to form a common earthing system, for all electrical equipment, lightning protection and static earthing in accordance with relevant SABS requirements.

If required, additional earth electrodes may be installed to achieve the specified resistance, of the common earthing system to the general mass of earth. Where earth rods are paralleled in a group to reduce the earth resistance to the permissible value, they shall be spaced apart for a distance at least equal to their buried depth length.

12.3 Switchgear Room Building and Equipment

12.3.1 A Main Safety/Electrical Earth Bar comprising of a copper bar, 50mm x 5mm min shall be installed in the basement/false floor of the Switchgear Room. Where possible, this Earth Bar shall be designated as the Primary Test Point for the station earthing system with the following equipment directly connected:

- **Station Earth Mat.** Where possible, a minimum of four separate connections shall be taken into the Switchgear Room via separate routes from the Earth Mat, by means of 40mm x 3mm Cu Earth tape. Connection to the Main Safety Earth bar shall be made in two places by means of 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductor, to facilitate testing of the Earth System.
- **Transformers.** By means of 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductor
- **MV/LV Panels.** By means of dual 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductors
- **Generator.** By means of 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductor
- **Instrument Earth.** By means of dual 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductors
- **Manifold Earth.** By means of dual 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductors

Note that on existing sites, the earth mat has been connected to the station earthing system in multiple places (namely; the Switchgear Room, Control Room and Manifold), and thus designation of a single Primary Test point is not possible. Multiple test points have thus been defined as follows: Switchgear Room, Control Room and Manifold Mainline Pumps 1 & 4 (where possible).

12.3.2 All secondary earthing within the substation shall be attached to this station earth bar at appropriate demarcated points.

12.4 Control Room Building and Equipment

12.4.1 A secondary Safety/Electrical Earth Bar comprising of a copper bar, 50mm x 5mm min shall be installed in the basement/false floor of the Equipment/Control Room in an easily accessible position. Where possible, this Earth Bar shall be directly connected to the Main Safety/Electrical Earth bar located in the Switchgear Room, by means of dual 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductors.

Note that all marshalling and equipment panels shall have an electrical earth bar, separate from an insulated instrument earth bar, installed and to which all electrical equipment earths shall be connected.

12.4.2 An Instrument Earth Bar comprising of a copper bar, 50mm x 5mm min shall be installed in the basement/false floor of the Equipment/Control Room in an easily accessible position. Where possible, this Earth Bar shall be directly connected to the Main Safety Earth bar located in the Switchgear Room, by means of dual 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductors.

Note that all marshalling and equipment panels shall have an insulated instrument earth bar, separate from the electrical earth bar, installed and to which all clean/instrument earths shall be connected.

12.4.3 Instrument and Electrical Earth systems shall be clearly labelled.

12.5 Manifold Area and Equipment

12.5.1 All manifolds shall have an insulated manifold earthing system installed, comprising of the following specifications:

- 40mm x 3mm min flat copper tape, to run the entire length of the main electrical racking reticulation and supported off of insulators at distances of no more than 2m apart. Use of existing electrical racking reticulation supports shall be permitted. All joints will require to be braised. Earthing reticulation shall be installed in such a manner so as to be unobtrusive and yet accessible and shall be positioned so as to avoid obstruction to walkways and access routes.
- The Manifold Earth bar shall be connected to the main safety/electrical earth located in the Switchgear Room, by means of dual 70mm², 600-volt class, green colored, PVC insulated, stranded copper conductors.

Note that on existing sites, the earth mat has been connected to the earthing system in multiple places (namely; the Switchgear Room, Control Room and Manifold), and thus designation of a single Primary Test point is not possible. Secondary test points have thus been defined where possible as follows: Switchgear Room, Control Room and Manifold Mainline Pumps 1 & 4.

12.4.2 All process plant and equipment located within the manifold area shall be attached to this manifold earth bar at appropriate demarcated points, via appropriately sized insulated PVC copper cable (green/yellow colored insulation), as follows:

- All electrical equipment shall be earthed via two separate earths, namely via the power cable earth core back to the respective Starter Panel electrical earth bar, and secondly via a separate visual earth from the motor frame to the manifold earth bar. Use of cable armouring as an earth conductor is not acceptable.
- All instrument stands and field junction boxes shall be separately earthed via means of an insulated 16mm² min PVC copper cabling.
- All process vessels (tanks, vessels and piping) and racking reticulation shall be earthed via insulated 70mm² min PVC copper cabling in two separate places.

All earth conductors utilized shall comprise of stranded, PVC insulated copper conductors with crimped cable lugs. All connections shall be fitted with a "star" or serrated washer in addition to the backnut, to ensure good earth contact.

12.6 Earth System Identification Standards

12.6.1 Earth Bar Labels

Earth bars shall be clearly labelled according to their functionality (e.g. "EB xx" to denote an electrical earth bar, "IB xx" to denote an instrument earth bar, where xx denotes a unique consecutive number). The Functional Identifier "EB 00" shall always denote the Station Earth Mat.

In addition, earth bars designated as Test Points shall be labelled accordingly.

Labels shall comprise of the Traffolyte engraved type, and fixed by means of stainless steel screws. Finish shall comprise of black letters against a white background, with text 40mm height.

Labels shall be readable/visible after the wiring has been done.

12.6.2 Earth cable Identification

Earth cables may be divided into two types, namely primary earth cabling running from subsystem earth bars directly or indirectly to the main station earth (and used for testing purposes), and secondary earth cabling running between the subsystem earth bars and equipment or infrastructure.

Only Primary earth cabling (i.e. those used for testing purposes) is required to be identified, by means of a Functional Identifier denoting both source and destination earth bars.

Identification numbers will comprise of the following specification:

- Grafoplast Targa Metal TGT System (Carrier Rail 58mm in length) 316 Stainless Steel Markers, with punched text 6 mm height minimum, fastened onto the cable at both ends via means of Stainless Steel cable ties

Examples:

EB01 – EB00 Cable Identifier for Earth cable running between Electrical Earth bar EB01 and the Station Earth Mat

IB01 – EB00 Cable Identifier for Earth cable running between Instrument Earth bar IB01 and the Station Earth Mat

12.7 Testing

12.7.1 Earth Resistivity and Electrode Testing

It will be the Contractors responsibility to carry out all necessary earth resistivity tests on site, where applicable. Tests will be in accordance with the requirements of BS 1013 as amended.

After all earth electrodes/trench earth's have been installed, an earth megger shall be used to test the earth resistance at the earth bar or connection point to the main station earth and the results recorded. Note that all ECC connections, and any other bonding material shall be disconnected from the earth connection point whilst the earth is being tested.

Earth Continuity Testing.

Earth continuity readings shall be measured and recorded from the earth bar to each item of equipment and process plant, and shall include all piping, vessels, transformers, motors, actuators, switchgear cabinets, marshalling enclosures and instrumentation.

12.7.2 The following are the maximum acceptable earth electrode resistances:

Electrical Earth

- Main substation - 1 ohm
- Miniature substations and kiosks - 2 ohms
- Highmasts - 5 ohms.

Instrument Earth

a) Instrument Earth - < 1 ohm

13.0 INSPECTION AND GUARANTEE

- 13.1 Transnet Projects reserves the right to inspect the installation and the equipment to be used.
- 13.2 All lightning protection systems shall be inspected and certified by an accredited person after completion of the installation, to verify conformance as required by Code of Practice, SANS 10313.
- 13.3 All components of the lightning protection system shall be inspected to ensure that they are in good condition and are capable of performing their designed functions.
- 13.4 The tenderer shall ensure that all elements of the electrical installation have been incorporated into the protected space by bonding or extensions to the lightning protection system.
- 13.5 The mechanical condition of all conductors, bonds, joints and earth electrodes shall be checked and the observations noted. .
- 13.6 The tenderer shall undertake to repair and replace all faults and faulty materials due to bad workmanship during a period of six months.
- 13.8 The tenderer shall be required to guarantee the installation for a period of twelve (12) months.

END

SIGNATURE OF TENDERER: -----

DATE: -----

**TRANSNET PROJECTS
DESIGN SERVICES**

TRANSNET PROJECTS

STANDARD SPECIFICATIONS FOR

AUTOMATIC FIRE ALARM AND SMOKE DETECTION

SYSTEM

REVISIONS		
REV	DATE	APPROVED

STANDARD TECHNICAL SPECIFICATION FOR AN AUTOMATIC FIRE ALARM AND SMOKE DETECTION INSTALLATION

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STANDARD TECHNICAL SPECIFICATION
FOR AN
AUTOMATIC FIRE ALARM INSTALLATION

1 INTRODUCTION

This Standard Technical Specification forms part of, and shall be read with, the Conditions of Contract, Supplementary Specification, schedules, drawings and other parts that form part of the tender / contract documents.

1.1 SCOPE

1.1.1 This Standard Technical Specification covers the general technical requirements for automatic fire/smoke detection systems and installations. The following aspects are covered:

- System requirements
- Equipment requirements
- Installation methods and materials
- Commissioning and handing over
- Documentation and drawings

1.1.2 The Supplementary Specification, drawings and schedules will take precedence over this Standard Technical Specification.

1.1.3 The Supplementary Specification, drawings and schedules shall be referred to for the specific requirements for the system.

1.2 DEFINITIONS

See also the definitions in EN 54-1, BS 5 839- 1 and SANS 10139.

Analogue Addressable System

In an analogue addressable system the control equipment receives analogue signals from the sensing devices in the system and knows with which sensing device it is communicating by reading the address of each sensing device.

Analogue

The term analogue refers to an electronic signal, which can represent a large number (e.g.256) of values. This signal can be in the form of a current level, pulses, frequency or any combination of these.

Addressable Device

A device is addressable if the control equipment can communicate with the device, or select such device by sending an address to it.

Approved

Approved shall mean accepted by Transnet Projects for a specific installation. Transnet Projects does not keep a list of approved equipment, and equipment accepted for a specific installation does not necessarily imply approval or acceptance for another installation.

Access Levels

The levels of access applicable to the control panel. (These definitions modify those of BS 58384 in that level 4 is added and level 1 allows the silence function).

Level 1: No password or key:	Access by members of the general public. In addition silence & function shall be accessible or operational.
Level 2: Password or key	Access by the person responsible for the system and trained on the system, and for system maintenance.
Level 3: Password or key	Access by persons trained to reconfigure the system.
Level 4: Password or key	(a) Access by persons authorised by the system owner to allocate passwords to levels 2 and 3.

- (b) Access by persons trained and authorised by the manufacturer to repair, or to alter the firmware, thereby changing its basic mode of operation.

Conventional System

A system is conventional if the control equipment determines the status of the zone wiring as follows:

- Fault : low or no current
- Normal : current within limits
- Fire : high current
- Short circuit : abnormally high current

Control Equipment, Unit, or Panel

The control equipment receives information from the field devices and displays information as described in BS 5839-4 or EN 54-2.

The following references have the same meaning: Control equipment:

- Control unit
- Control panel
- Fire panel
- Fire alarm panel

Detector

That part of an automatic fire detection system which constantly, or at frequent intervals, monitors suitable phenomena, such as smoke, fire, heat, etc.

Detectors are also field devices.

1.3 STANDARDS AND REGULATIONS

The following is list of the applicable standards. In all cases the most recent amendments, of the standards, shall apply.

1.3.1 The completed system and its components shall be in accordance with the following

regulations :

- The wiring of code (SANS 10142-1)
- Occupational Health and Safety Act (Act 85, 1993)
- Local municipal by-laws and regulations
- Local fire regulations
- Regulations of Telkom
- Regulations of the local electrical and gas supply authorities

National Building Regulations Act No 103 of 1977 (SANS 0400)

1.3.2 The design of an automatic fire detection system, the equipment supplied for the system, and the installation of such equipment shall be in accordance with the Standards listed below. The equipment and components shall be deemed to have been tested and approved by a reputable and recognised international test laboratory to prove compliance with at least one or more of these Standards. Copies of test certificates shall be provided by tenderers with their tenders:

EN 54	:	Components of automatic fire detection systems
BS 5445	:	Components of automatic fire detection systems
SANS 10139	:	Fire detection and alarm systems for buildings

1.3.3 Material for which an SABS specification exists, shall be in accordance with such a specification, and shall bear the SABS mark.

1.3.4 All equipment used shall originate from suppliers which have been certified in accordance with SABS ISO 9001 (ISO 9001) or SABS ISO 9002 (ISO 9002) for Quality assurance. Copies of certificates of approval shall be provided by the tenderers with their tenders.

1.3.5 Equipment designed to BS 5446, Fire systems for residential premises, or similar other standards, are not acceptable.

1.4 DESIGN

- 1.4.1 Any uncertainty which may exist in regard to the specification requirements shall be submitted to Transnet Projects in writing.
- 1.4.2 The requirements and design standards of the specification shall be adhered to unless otherwise approved by the Transnet Projects or the representative in writing.
- 1.4.3 Small items of equipment forming part of a system are not covered by this specification. However, Transnet Projects still requires that the total system shall comply with the highest standard of the design and fire protection practice.

1.5 MATERIALS

- 1.5.1 All materials used on the contract shall be new and of the very best of their respective types and kind.
- 1.5.2 No equipment or parts older than 2 years, at the commencement of the contract, shall be installed in this system.
- 1.5.3 All equipment and parts used in a particular system shall originate from one supplier as far as practicable.

2 SYSTEM REQUIREMENTS

2.1 REMOTE INDICATOR LIGHTS

- 2.1.1 Detectors mounted in hidden areas, or areas which may be kept locked for specific reasons, shall each be provided with a permanently marked remote indicator LED light mounted in a conspicuous position on the wall outside the area and close to the point of entry into such areas. The method and equipment used to mount the remote LED shall be acceptable to Transnet Projects.

2.2 SOFTWARE (NOT APPLICABLE)

- 2.2.1 The requirements stipulated hereunder in connection with the availability and the usage of software for computer based equipment (not fire control panels) which is to be supplied to Transnet Projects in terms of the contract shall be adhered to:
 - a. Computer based systems shall not become unserviceable due to the loss of, or damage to software.

- b. It shall be possible to reinstate software after maintenance or after possible damage to the software. Full back-ups must therefore be available on site.

2.2.2 Software shall be loaded when so required, even if the time at which the software is to be loaded, does not suit the supplier of the software.

2.2.3 The Department shall also be able to reload software on systems without the assistance of the supplier or contractor.

2.2.4 The Department will only be interested in reloading of software into a system for which the software was originally written, and not in the copying of software from one system to another.

2.2.5 Back-ups of software shall be supplied to the Department for future use.

2.2.6 The Department will use the original contractor or supplier of the system to reload software, whenever possible or practicable.

2.3 SCADA SOFTWARE (NOT APPLICABLE)

Software to be used for monitoring and reporting, or SCADA (Supervisory Control and Data Acquisition) application, shall comply with the following requirements:

2.3.1 The software shall be able to run on an MS-DOS based PC computer.

2.3.3 Software packages shall be approved by Transnet Projects for the installation.

2.3.3 The software shall not be system specific, i.e. it shall be compatible with a number of control panels on the market.

2.3.4 The software shall be available from a supplier other than the manufacturer of the equipment.

2.3.5 Upgrading of the software shall be possible at a later stage without changing the system configuration.

2.4 FIRE ZONES

Devices shall be grouped into zones as follows, unless the zones are indicated on the drawings and / or Supplementary Specification:

- 2.4.1 A zone shall not have more than 20 field devices.
- 2.4.2 Each building shall have separate zones.
- 2.4.3 The roof space shall be on a separate zone or zones.
- 2.4.4 The floor area of a single zone shall not exceed 2000 **M2**
- 2.4.5 Every floor of a building larger than 300 **M2** shall be on a separate zone.
- 2.4.6 Every area enclosed by fire walls shall be on a separate zone.
- 2.4.7 In analogue addressable systems, each zone shall be enclosed by 2 line isolators.

2.5 SPARE CAPACITY

- 2.5.1 20% spare capacity shall be allowed in the design of the control panels, loops, zones, etc.
- 2.5.2 The control panel shall have facilities to accommodate a further two detector circuits, additional to the required number of zones, without having to replace or add additional cabinets (extensions) to the control panel unless specified otherwise.

3 EQUIPMENT REQUIREMENTS

3.1 QUALITY OF EQUIPMENT

Only equipment complying with the following shall be used:

- 3.1.1 The equipment required under any contract shall be of the latest manufactured equipment of its kind on the market.
- 3.1.2 The equipment shall preferably be manufactured in the RSA, and equivalent or replacement equipment shall also be available in the RSA.
- 3.1.3 Replacement units shall be available for the equipment and the complete maintenance of equipment shall be undertaken in the RSA.
- 3.1.4 Equipment shall have been installed in the RSA in a similar installation as the one specified in the Supplementary Specification and shall have operated reliably and satisfactorily for at least 1 year.

- 3.1.5 Equipment shall exist of completely enclosed units and the units shall be verinin-proof.
- 3.1.6 All items of equipment shall be fitted with nameplates containing information, such as serial numbers, model numbers, type numbers, manufactures name, etc. This information, together with the description of each and every piece of equipment, shall be listed in the Maintenance Manual.
- 3.1.7 All components and PC boards shall also be marked with type numbers and descriptions and this information shall be contained in the Maintenance Manual.
- 3.1.8 No equipment without detailed specifications and testing results will be allowed.
- 3.1.9 All components of the system offered and installed, shall be available for a period of at least 15 years from the onset of the contract. A certificate of guarantee to this effect shall be submitted by the supplier of such components.

3.2 FIRE ALARM PANELS (CONTROL PANELS)

- 3.2.1 Control panels shall conform to BS 5839 part 4 or EN 54-2. See clause 1.3.2.
- 3.2.2 A control panel shall be able to function as a stand-alone unit, together with its own power supplies, and shall not be dependent on external control equipment, such as computers, for functioning.
- 3.2.3 Provision in the form of suitable terminals, connectors, or ports, shall be made on the control panel for the connection of peripheral equipment, such as computers, printers and interface equipment, to enable the accumulation of data generated by detectors and the control panel, to be used for future reference, or for the relaying thereof to remote monitor or control equipment.
- 3.2.4 Control panels shall be constructed for minimum power usage in both battery and mains power supply modes.
- 3.2.5 The control panel shall be of the wall mounted type, and shall also be suitable for mounting flush in a console, if so required in the Supplementary Specification.
- 3.2.6 Battery charging equipment mounted in the control panel, or elsewhere, shall be mounted in such a way that 230 Volt terminals and wiring and other mains voltage

equipment are shielded against accidental contact. All shields shall be marked "230 VOLT".

- 3.2.7 No 230 Volt terminals shall be located directly next to other terminals containing wiring at other voltages.
- 3.2.8 Reset of the control panel shall only be possible at access level 2.
- 3.2.9 Terminals shall be clearly grouped and marked with a label strip for identification, so as to simplify installation and connection of wires on site by installation personnel. All outgoing and incoming terminals, and all other equipment in the control panel, shall be suitably labelled to simplify maintenance and installation, and all panel mounted equipment shall likewise be labelled. Outgoing and incoming power and field wiring shall be individually, and correspondingly, numbered at each point of termination.
- 3.2.10 The control panel shall have knockouts in the bottom plate thereof to terminate conducting for all power cabling, and knockouts in the top plate thereof to terminate conducting for signal and other electronic cabling / wiring. Holes drilled on site for this purpose will not be acceptable.
- 3.2.11 All identification labels, as well as wire terminal numbers shall be clearly shown on all wiring diagrams in the Maintenance Manual.
- 3.2.12 It shall be possible to silence the audible alarms without influencing the visual alarms or alarm transmissions to the Fire Brigade. This shall be possible at access level 1.

3.3 CONVENTIONAL FIRE ALARM PANELS (CONTROL PANELS)

- 3.3.1 Conventional Control panels shall be conform to BS 5839-4 or EN 54-2. See clause 1.3.2
- 3.3.2 The control panel shall be suitable to operate in conjunction with conventional detector heads or detector bases.
- 3.3.3 The control panel shall further have the facilities to execute the following functions:
 - a. Transmission of a general fire alarm to the Fire Brigade. Transmitting equipment shall however not be supplied with the control panels specifically specified in the Supplementary Specification.

- b. Switching off of air conditioning equipment in case of a general fire alarm.
- c. Closing of dampers over ventilation openings in case of a general fire alarm.
- d. The connection of an external repeater panel for remote indication of fire and fault alarms.
- e. A maintenance mode or one man test facility' for routine testing shall be possible where the control panel resets a fault or alarm condition a short time after the event. This will allow easy testing of the field devices. The control panel shall give a warning when it is in this mode.

3.4 **ANALOGUE ADDRESSABLE FIRE ALARM PANELS (CONTROL PANELS)**

3.4.1 Analogue Addressable Control panels shall conform to BS 5839-4 or EN 54-2. See clause 1.3.2.

3.4.2 Type of System

- a. An analogue addressable system consists of a control panel connected to analogue addressable field devices.

The control panel continuously monitors a number of parameters of the field devices, and takes actions based on the information received.

- b. Sensing devices shall not switch into an alarm state. All decisions shall be taken by the control panel only.
- c. To enable the system to be tailored to suit the protected building and to permit future changes, the alarm management shall be configurable from the control panel via a keypad. This configuration shall be maintained under power failure conditions in non-volatile memory.
- d. The front panel of the control panel shall comprise a keyboard, alpha numeric display, text and indicator LEDs, etc. The occurrence and location of an event shall be displayed on the screen.
- e. Outputs for communicating with devices such as remote text display units, graphic display units, computers, printers and intelligent mimic panels shall be, provided where necessary.

- f. Control panels shall incorporate facilities for operating as stand-alone units, or as part of a network with full communication capability.
- g. Control panels shall be supplied complete with printout facilities. Only connections (a printer port and 24 Vdc power connector) for a portable printer shall be required, unless otherwise specified.
- h. The control panel shall further have the facilities to execute the following functions:
 - Transmission of a general fire alarm to the Fire Brigade. Transmitting equipment shall not be supplied with the control pane unless specified in the Supplementary Specification.
 - Monitored switching off of air conditioning equipment in case of a general fire alarm.
 - Monitored closing of dampers over ventilation openings. switching on of stairwell pressure fans. etc. in case of a general fire alarm.
 - Monitored alarm outputs, e.g. sirens.
 - Monitored outputs and inputs for gas control panels.
- i. Consecutive alarms shall be stored by the control panel in chronological order and shall have the ability to determine the priority order of alarms by means of repetitive receipt of data from detectors.
- j. The transmission of all data shall be via a two-wire system, which shall carry both the supply voltage and the data.
- k. The type of wire or cable used shall be suitable for the speed of data transmission so that signals can be carried over without losses or corrupted data. Wiring shall meet the requirements of the detection system manufacturer, which requirements shall be published in a formal wiring specification.

3.4.3 Ring (loop) Wiring

- a. Wiring shall to be arranged in a return loop (ring), in such a manner that, in the event of an open circuit or a short occurring on the line, the control panel communicates with the detectors from both sides of the loop.
- b. The arrangement shall be such that during an open or short circuit no more than 20 detectors shall be deactivated. To enable this, line isolators shall be provided on the line on each side of each zone.

3.4.4 Master Control Panel

- a. The purpose of a master control panel will be to communicate with more than one satellite fire control panel, to simplify the central monitoring and control of the other satellite panels.
- b. A master control panel will be required when two or more control panels are to be linked. This master control panel shall conform to all the requirements of the other control panels and shall be of the same manufacture as the other control panels.
- c. The master control panel shall have its own battery back-up system.
- d. All communication to computers, the Fire Brigade, etc. shall be handled by the master control panel.
- e. All communication between satellite and central panels, as well as between satellite panels, shall utilise a protocol which verifies the receipt and accuracy of each message sent. Receipt of all messages shall be acknowledged by the receiving panel, and messages shall be re-transmitted by the sending panel in the event of failure to receive such an acknowledgment. An industry standard method, such as a CRC check sum technique, or similar, shall be used to verify the accuracy of each message received. Messages received incorrectly shall be retransmitted by the sending panel. Re-transmission shall continue until the receiving panel acknowledges receipt of a correctly received message. If, after a number of transmission attempts, the transmitting panel still does not receive an acknowledgment from the receiving panel, it shall register a fault signal.

3.4.5 Remote Display / Mimic Panels

- a. Remote display / mimic panels, or fireman's panels, shall communicate with the control panel. No "hard wiring" to these panels will be allowed.
- b. Remote panels shall function completely independently of the control panels, and shall not affect the functioning of the control panels.

3.4.6 Programmability

- a. The control panel shall be fully programmable through the keypad on the front of the panel, and through an RS 232 port by using a separate computer.
- b. It shall be possible to make back-ups of the programmed data onto separate magnetic media by means of an external computer linked to an RS 232 port on the control panel.

3.4.7 Communications

- a. Communications with other equipment, such as computers, shall be achieved through RS 232 ports using a fully documented public domain protocol. The protocol documentation shall also be included in the Maintenance Manual so that it will be possible for another party to communicate with the control panel without the approval of the control panel manufacturer.
- b. All communications with other equipment shall be bi-directional, and at least the functions and displays available on the front of the control panel shall be possible through the communications port. Programming of the control panel by means of other equipment is not required (except as described earlier).

3.4.8 Local Printer

- a. A printer shall be available as an option.
- b. The printer shall provide a hard copy of the following:



- Alarms
- Faults
- Maintenance data
- Control panel operations
- Outputs Operated
- Configuration report
- Status report

c. The printer shall print out the following information for each alarm or signal:

- Type of Alarm or Fault
- Device Type
- Device Number
- Zone Number
- User message
- Day
- Date
- Time

d. It shall be possible to set the printer to print out alarms, faults, control panel operations, and outputs operated, either individually or in any combination.

3.4.9 Device Addresses

- a. Each sensing device shall be numbered individually and uniquely to correspond with its address on the control panel.
- b. If a detector head is moved from its base to another base, the address of such a detector **shall remain** at its original location indicated on the control panel.
- c. The address of each device shall be manually set to the desired value.

3.4.10 Display

- a. The control panel shall be equipped with an alpha numeric display capable of displaying at least 80 characters.

- b. A message of at least 40 characters long per device shall be programmable and displayable on the display.
- c. The display of the following reports 1 information shall be possible:
 - Device information
 - List of devices isolated
 - List of devices that need maintenance.
 - List of the most recent events
 - I/O mapping
 - Device messages

With reference to 3.4.9(b), the following will also be acceptable to the Department:

"If a detector head is removed from its base to another base, and this results in the address being moved to another zone. then an alarm shall be generated in the control panel. This alarm can only be cancelled by replacing the head in its original zone."

3.4.11 Device Status

Addressable devices shall be polled by the control panel and the equipment condition and analogue status shall be read and stored in the control panel.

The varying status of each device shall be assessed by software algorithms and the control panel shall indicate the following conditions:

- a. Analogue Detectors
 - Detector removed
 - Incorrect type of Detector
 - Detector failed
 - Detector contaminated
 - Pre-alarm
 - Fire Alarm
 - Detector healthy
- b. Interface to contacts
 - Fire Alarm

Interface removed
Interface faulty
Contact wiring open circuit
Contact wiring short circuit
Contacts normal

3.5 POWER SUPPLY

- 3.5.1 Power supplies shall conform to BS 5839-4 or EN 54-4. See clause 1.3.2.
- 3.5.2 The Power pack of the control panel shall be able to accept an incoming 230 Volt single phase supply and shall be equipped with transformers, rectifiers, inverters, condensers, and integrated circuits for the supply of stabilised power to the control panel equipment and detector circuits.
- 3.5.3 The power supply unit shall be equipped with over voltage protection and spike arresters to prevent damage to the equipment by lightning or other spikes, or damage due to over voltages.
- 3.5.4 The battery charger shall be able to deliver the full charging current to discharged batteries, and thereafter the charger shall automatically vary the charging current to the batteries as may be required by battery voltage conditions.
- 3.5.5 Batteries shall not be subjected to overcharging.
- 3.5.6 The battery charger shall be protected against reverse polarity and short circuits on the DC supply side.
- 3.5.7 The power pack of the control panel shall regulate the supply voltage to detectors so that detectors or bases are operated in their nominal supply voltage range.
- 3.5.8 on loss of mains power, the power supply unit shall automatically revert to battery power, where after the system shall remain fully operational for a period of 24 hours and shall be able to operate the total alarm load for a further period of 1 hour. The unit shall automatically revert back to mains power upon mains power restoration and manual resetting of the unit shall not be necessary.
- 3.5.9 The power supply shall be equipped with the following indications on the front of the unit:
 - a. "Mains On" Green LED
 - b. "Charger Fault" Amber LED

- 3.5.10 Batteries shall be mounted in a separate ventilated pad-lockable cubicle. Batteries shall be mounted in such a way that contamination of other equipment by batteries cannot take place. Batteries shall be in a special plastic container to contain any possible spillage.
- 3.5.11 Any supply fault, charging fault or low battery voltage shall be transmitted to the control panel so that an alarm can be generated.
- 3.5.12 No fuses or switches shall be accessible on the front of the 12V power supply unit without removing the door.
- 3.5.13 Batteries shall be of the sealed lead acid type and the sizes of the batteries to be used shall be indicated on a label in the battery cubicle..
- 3.5.14 Batteries shall be charged to 85% of their capacity within 24 hours.

3.6 DETECTORS AND DETECTOR BASES IN GENERAL

- 3.6.1 Ionisation smoke detectors, optical smoke detectors and heat detectors are covered under this heading.
- 3.6.2 The detector base shall be such that the detector head is held firmly in the base by means of an insert and twist (bayonet) action.
- 3.6.3 Reverse polarity or faulty circuit wiring shall not cause damage to the detector head or base.
- 3.6.4 The detector base shall be suitable for surface mounting on a ceiling and shall fit on a 65 mm Ø standard C-type electrical outlet box with fixing holes at 50 mm centres. Fixing lugs or holes in the base shall be substantial and shall withstand repeated insertion and removal of the head without damage.
- 3.6.5 The base shall be provided with wire terminals suitable for wire sizes up to 1,5 MM².
- 3.6.6 The wiring terminals of the unit shall be able to accept wiring lugs and shall be of the screw and clamp plate type to hold a lug firmly pressed against its contact surface. Spring-loaded push-in contacts will **not** be acceptable.
- 3.6.7 Terminals for circuit wiring shall be clearly marked.

- 3.6.8 The base shall be suitable for the connection of a remote indicator LED.
- 3.6.9 The detector or base shall be fitted with a local indication LED which shall flash illuminate under an alarm condition.

3.7 CONVENTIONAL DETECTORS AND DETECTOR BASES

- 3.7.1 Conventional detectors and bases shall conform to BS 5445 or EN 54 or BS 5839. See clause 1.3.2.
- 3.7.2 It shall be possible to reset detectors from an alarm condition to normal by disconnecting the supply voltage to the unit.
- 3.7.3 Upon removal of a detector head, the control panel shall indicate that a head has been removed and also the zone where the head has been removed.
- 3.7.4 The base at end of circuit, in the case of radial circuits, shall be suitable to accept a termination resistor/ circuit.

3.8 ANALOGUE ADDRESSABLE DETECTORS AND BASES

- 3.8.1 Analogue addressable detectors and bases shall conform to BS 5445 or EN 54 or BS 5839. See clause 1.3.2.
- 3.8.2 The removal of a detector from the base shall not affect the operation of other detectors on the line.
- 3.8.3 The control panel shall indicate when a detector head has been removed and also the address where it has been removed. Likewise it shall indicate when a wrong type of head is inserted in a base as well as its address.
- 3.8.4 The detector shall be suitable to operate on a two-wire system carrying both power and signals for the operation of each and every detector in the system.
- 3.8.5 The detector shall be able to receive and decode signals transmitted to it by the control panel. Upon receipt of a signal directed at its particular address, the detector shall transmit data back to the control panel for processing and storage thereof by the control panel. Such data transmitted shall represent the analogue values present in the electronic circuits of the detector head / base combination at that point of time.
- 3.8.6 The detector, when "addressed" by the control panel, shall transmit data to enable the control panel to deduce the following basic information:

- a. The type of head generating the data (i.e. ionisation, optical, heat, etc.)
- b. The address of the detector
- c. The reference limits of calibration of the detector
- d. The % visible or invisible combustion particles per meter present in the detector chambers at that point in time, or the temperature measured at the detector.

3.9 MANUAL CALL POINTS (BREAK GLASS UNITS)

- 3.9.1 Manual call point units shall be in accordance with BS 5839-2, except that it shall be resettable i.e. the front face of the unit shall not be a frangible element.
- 3.9.2 The unit shall be finished in RED.
- 3.9.3 The unit shall be large enough to cover a 65 mm Ø conduit draw box when the unit is surface mounted.
- 3.9.4 Flush mounted units shall be provided with a special flush mounting box which can accept electrical conduit terminations.
- 3.9.5 Surface mounted units shall be deep enough to terminate 20 mm Ø conduits into the unit, and shall be mounted solidly on the wall by means of their back plates.
- 3.9.6 Addressable manual call point units shall be fitted with an address card which will enable communication with the control panel.
- 3.9.7 The wiring terminals of the unit shall be able to accept wiring lugs, and shall be of the screw and clamp plate type to hold a lug firmly pressed against its contact surface. Spring-loaded push-in contacts will not be acceptable.

3.10 AUDIBLE ALARMS (SOUNDERS)

- 3.10.1 Sounders shall conform to BS 5839 part 1 and part 4.
- 3.10.2 The sounders shall operate off a 24 volt DC supply. Electronic sounders will be preferable.

3.10.3 The sound level for sounders and audible alarms shall be as follows:

- Audible indications (e.g. in the control panel) - 65 dB(A) at 1 m
- Evacuation sounders - at least 103 dB(A) at 1 m
- Outdoor sirens - 112 dB(A) at 1 m

3.10.4 The frequency, or major frequency in a two tone alarm, shall lie in the range of 500 to 1000 Hz.

3.11 FIRE BRIGADE SIGNALLING FACILITIES

3.11.1 The transmitting equipment, when required for the transmission of a general fire alarm to the local Fire Brigade, shall form an integral part of the fire control panel.

3.11.2 The transmitting equipment shall be fully compatible with the receiving equipment already installed at the Fire Brigade. Any facilities necessary to accomplish this be included in the transmitting equipment.

3.11.3 The output to the Fire Brigade shall be a monitored output.

3.11.4 The transmitting equipment shall not be supplied, & unless specifically specified in the Supplementary Specification.

3.11.5 Even if the transmitting equipment is not specified in the Supplementary Specification, a appropriate port, or ports, shall be provided on the control panel for connecting any future transmitting equipment.

3.12 FLAME DETECTORS

All flame detectors designed to detect hydrocarbon fires shall comply with at least the following requirements, in addition to the specified standards:

3.12.1 Flaming fires shall be detected by the flame detector by detecting infra-red and 1 or ultraviolet radiation emitted from the flames.

3.12.2 Detectors that monitor only ultraviolet radiation will not be acceptable.



- 3.12.3 At least two different radiation frequencies shall be detected and analysed by the flame detector in order to increase the reliability of the detector in the presence of following:
- Artificial light sources
 - Sunlight
 - Hot vibrating bodies
 - Arc welding
 - Lightning
- 3.12.4 Flame detectors shall be fitted with automatic self test circuits which will simulate a fire condition by generating artificial radiation through the lenses. Dirty lenses shall, therefore, also generate a fault.
- 3.12.5 The flame detector shall be able to detect a 0,1 M2 petrol fire at a distance of 14 m.
- 3.12.6 Detection integration time shall be adjustable up to 30 seconds.
- 3.12.7 The detector shall have at least a 50% sensitivity at a horizontal angle of 45° from the centre line.

4 INSTALLATION METHODS AND MATERIAL

4.1 DEVICES

- 4.1.1 The base of a detector shall always be mounted in the area which it protects so that the indicator LED can be seen from the doorway which normally provides access to the room. The indicator LED shall face towards the main entrance or lobby or side of main approach in the passage. See also clause 2.1.1.
- 4.1.2 Bases shall be provided with dust caps to protect the base against dust and dirt whilst construction work is in progress. This is only applicable to bases that contain electronic components.
- 4.1.3 Surface mounted units shall be solidly fixed to the wall by means of their back plates.
- 4.1.4 Manual call point units shall be mounted at 1,4m above finished floor level, unless otherwise specified in the Supplementary Specification.

4.2 CIRCUIT WIRING

4.2.1 The following methods are acceptable for the wiring of detector circuits:

- a. Steel conduit and conduit accessories cast into, or built into, the building structure and wired with insulated conductors of a type which complies with the requirements of this specification.
- b. Steel conduit and conduit accessories, surface mounted in building structures and wired with insulated conductors of a type approved by the Department.

4.2.2 Wires and cables may also be installed in wiring trunking and armoured cable may also be installed on cable racks, all as specified further herein.

4.2.3 Cables with stranded wires shall be terminated by the crimping on of lugs. No stranded wires without lugs will be accepted.

4.2.4 T - Junctions shall be made only in approved draw boxes at detector outlets.

4.2.5 Separate wiring installations for detector circuits, evacuation communication wiring, audible alarms, electrical lock wiring, card reader wiring, AC and DC power circuits, remote control circuits and monitor wiring, video cables, computer cables, etc., shall all be done in separate conduits or trunking installations. Detector wiring shall not be installed together with any other wires in wire-ways.

4.2.6 Detector wiring may share the same draw boxes or expansion joint boxes with other fire fighting system wiring or security system wiring, but the boxes shall be subdivided by means of steel plates,

4.2.7 All electrical work and wiring associated with "FIRE DETECTION SYSTEMS" shall be carried out in compliance with the requirements of the "SPECIFICATION FOR ELECTRICAL INSTALLATIONS TO BUILDING OTHER THAN DWELLING HOUSES".

4.2.8 No wiring shall be installed vertically for more than 1,5 m. Cables installed over vertical distances of more than 1,5 m, shall be properly supported at intervals of less than 1,5 m.

4.3 ARMOURED CABLES

4.3.1 Armoured cables shall be used in sleeves, in cable tunnels and on cable racks or trays.

- 4.3.2 Armoured cables shall have twisted pairs and / or screens if so required in the wiring specification of the manufacturer of the equipment.

4.4 CONDUIT AND CONDUIT ACCESSORIES

- 4.4.1 The Contractor for the fire detection system shall be responsible for the supply and installation of all conduits, conduit accessories, wiring trunking and cable trays, as may be necessary or required for the system, Unless specified otherwise in the Supplementary Specification.
- 4.4.2 PVC conduit and conduit accessories shall be cast in, or built into, the building structure in new buildings. No surface mounting will be acceptable in new buildings or structures.
- 4.4.3 Surface mounted conduit and conduit accessory work will be allowed only in existing buildings or as approved by the Project Manager.
- 4.4.4 PVC conduit and conduit accessories surface mounted on building structures, steelwork and woodwork, shall be done neatly and in straight lines and shall be saddled at 1 m centres with spacer saddles.
- 4.4.5 M4 machine screws shall be used for fixing of spacer saddles onto steelwork. Suitable holes shall be drilled and tapped in the steelwork for this purpose.
- 4.4.6 PVC conduit and conduit accessories, surface mounted in roof spaces of buildings or structures with pitch roofs, shall follow the roof structural elements.
- 4.4.7 The quality of materials and the methods of installation of steel conduit and conduit accessories shall be carried out in compliance with the requirements of the "SPECIFICATION FOR ELECTRICAL INSTALLATIONS TO BUILDINGS OTHER THAN DWELLING HOUSES." and SANS 10142-1.
- 4.4.8 Conduit installations shall be done in such a way that detector circuit wiring can be done without interruption and without T-joints.
- 4.4.9 Round draw boxes for detectors shall be mounted hard against the ceiling in the case of false ceilings or ceilings of pitch roof buildings and detector bases shall be mounted against boxes so that no open wiring occurs anywhere in a conduit and wiring system.

Only flexible conduit which is not of the spiral type may be used in special applications.

4.5 WIRING TRUNKING

- 4.5.1 The quality of materials and the methods of installation of wiring trunking shall be carried out in compliance with the requirements of the "SPECIFICATION FOR ELECTRICAL INSTALLATIONS TO BUILDINGS OTHER THAN DWELLING HOUSES".
- 4.5.2 Trunking shall be fitted throughout with covers.
- 4.5.3 PVC wiring trunking may be used only to house detector circuit wiring, but then only-as specified in the section "CIRCUIT WIRING" in the Specification-and only with the type of cable as specified.
- 4.5.4 NO wiring trunking may be used in microfilm vaults and in high risk areas such as fuel, oil, tyre, paint, wood, Paper, cardboard box storage areas, record-rooms and vaults.

4.6 CABLE RACKS AND LADDERS

- 4.6.1 The quality of materials and the methods of installation of cable racks and ladders shall be carried out in compliance with the requirements of the "SPECIFICATION FOR ELECTRICAL INSTALLATIONS TO BUILDINGS OTHER THAN DWELLING HOUSES".
- 4.6.2 No cable racks and ladders may be used in microfilm vaults and in high risk areas such PL fuel, oil, tyre, paint, wood, paper, cardboard box storage areas, record rooms and vaults.
- 4.6.3 Only armoured cable may be mounted on cable racks and ladders.
- 4.6.4 The type of wire or cable used shall be suitable for the speed of data transmission, so that signals can be carried over without losses or corrupted data.

4.7 LIGHTNING AND SURGE PROTECTION

- 4.7.1 All wiring going out from and coming into any building shall be fitted with suitable surge absorbers, which have been approved by the manufacturer of the equipment. This includes 230 V supplies, telephone lines and detector lines.

- 4.7.2 Special attention shall be given to the proper connecting and earthing of the system.

5. COMISSIONING OF SYSTEMS

5.1 COMMISSIONING AND HANDING OVER TESTS

- 5.1.1 The testing of the system shall be done in the presence and to the satisfaction of an authorised representative of the Project Manager,
- 5.1.2 Tests shall include simulation of fire conditions in each zone to prove the efficiency of all aspects of the system to the satisfaction of the Project Manager.
- 5.1.3 All equipment, material, etc., which may be necessary for these tests shall be supplied by the Contractor, including a suitable smoke generator.
- 5.1.4 The Contractor shall do his own complete commissioning tests before the actual first take-over tests are done. This is to satisfy himself that everything is working and is in accordance with the specification.

6 DOCUMENTATION, DRAWINGS AND MAINTENANCE

6.1 BLOCK PLAN

- 6.1.1 An approved block plan, indicating the zones and appropriate zone reference numbers, shall be installed at all control panels and repeater panels.
- 6.1.2 The block plan shall be discussed with the Project Manager **before** manufacturing takes place.
- 6.1.3 The block plan shall have a professional appearance. Text shall be in English and at least one other official language to be decided in conjunction with the Department and the User Department. A freehand drawing or badly finished plan **will not** be acceptable.
- 6.1.4 The block plan shall clearly indicate the position of the zone in which a fire has started, when read together with the displays and indications on the control panel.
- 6.1.5 Non-fading material shall be used for the artwork. The block plan shall be mounted in a frame behind glass, or shall be covered with a transparent stick-on material, to protect the artwork.

- 6.1.6 The block plan shall be mounted in an approved position at the control panel.
- 6.1.7 For an addressable system, the addresses of all field devices shall be shown on the block plan.
- 6.1.8 The exact requirements of the panel and block plan will be specified in the Supplementary Specification.

6.2 TRAINING PROGRAM

- 6.2.1 Tenderers shall allow in their tender prices for a training course, to train on site at least four (4) persons, as nominated by the User Client from his own operating personnel. The training shall be adequate for the installation, to ensure that operating staff fully understand the system. During this period the personnel shall be made fully conversant with the operation of, and daily maintenance required for, each item of equipment of the system. The training especially on computer equipment and control panels, shall be of such a standard that will enable the User Department to carry out his own in-house training of other personnel.
- 6.2.2 The training course shall start only after first take-over inspection of the system.
- 6.2.3 The training course shall be carried out in the language medium as chosen by the User Department.
- 6.2.4 The Operating Manual of the contract shall include a full description of the contents of the training course, referred to in clause 6.2. 1. above.

6.3 OPERATING INSTRUCTIONS

- 6.3.1 Instruction cards, indicating clearly the procedure to be followed in the event of a "FIRE" alarm, shall be supplied and framed under Perspex in approved teak or non-ferrous material frames. The instruction cards shall be in English and at least one other official language to be decided in conjunction with the Department and the User Department. The frame shall be neatly mounted on the walls alongside the control panel and external indicator panels respectively, where they can be clearly read.
- 6.3.2 In the case of the control panel, the instruction card shall also state clearly the Procedure to be followed in the event of a "FAULT" alarm.

6.4 OPERATING MANUALS

- 6.4.1 Three complete sets of the Operating Manuals, in English, shall be provided to be used by the User's personnel who will operate the system. The Operating Manuals shall be in the form of plastic display binders and shall contain the following:
- a. Complete operating instructions.
 - b. Action to be taken during "FAULT" and "FIRE" conditions.
 - c. Names, telephone and facsimile numbers, and addresses of contact personnel.
 - d. Operating procedures, as contemplated in clause 6.3 hereof.
 - e. Full description of the training course, as stipulated in clause 6.2.1 hereof.
- 6.4.2 The Operating Manuals shall contain no technical information. This shall be included in the Maintenance Manuals.
- 6.4.3 A concept copy of the Operating Manual(s) shall be submitted to the Department's consultant, at least two (2) weeks prior to the anticipated first hand-over of the installation, for scrutiny and possible amendment.
- 6.4.4 First delivery of an installation will not be taken unless acceptable manuals are submitted the installations

6.5 MAINTENANCE MANUALS

- 6.5.1 Three complete sets of the Maintenance Manuals, in English only, shall be provided. The manuals shall contain the following:
- a. A complete set of "as built" drawings of the contract, in a form acceptable to the Department. No drawings shall be smaller than A4 size. Large drawings shall be reduced to A3 or A4 size for inclusion in the manuals, provided they remain legible.
 - b. A complete set of "machine shop" drawings of the contract, showing dimensions, finishes, general arrangements of panels, consoles, computer assemblies, etc.
 - c. A complete set of wiring diagram drawings of all equipment, showing component identification, types and values.

- d. A block diagram drawing for each piece of equipment containing more than one PC board, showing the interconnections of boards, complete with connector and plug numbers, and PC board identification markings.
 - e. A complete list of all equipment containing the following information:
 - i. Name of the equipment (or description thereof).
 - ii. Serial number of equipment.
 - iii. Type number of equipment.
 - iv. Manufacturer of equipment.
 - v. Equivalent replacement model of equipment (where applicable).
 - vi. Names, addresses, telephone and facsimile numbers of firms supplying equipment.
 - f. A complete and comprehensive description of the operation of the system and of each individual piece of equipment.
 - g. A complete and comprehensive description of the maintenance of the system and of each individual piece of equipment in respect of daily, weekly, monthly or annual maintenance.
 - h. Advanced technical information of the system may also be bound into the Maintenance Manuals as additional information. Any literature not in the English language, shall have the English translation attached.
- 6.5.2 A concept copy of the Maintenance Manual(s) shall be submitted to the Department's consultant at least two (2) weeks prior to the anticipated first hand-over of the installation for scrutinising and possible amending.
- 6.5.3 First delivery of the installation will not be taken, unless acceptable manuals are submitted prior to the first hand-over instructions.

6.6 MAINTENANCE



6.6.1 Maintenance and Guarantee

- a. The tenderer for this contract shall allow in his tender price for the maintenance of the complete installation for a period of twelve (12) months, starting from the date of the first take-over of the contract by the Department.
- b. It is a specific requirement of this contract that the Contractor shall allow for **monthly** inspection visits during the 12 month maintenance period, and that he shall submit full reports for each monthly visit. The reports shall contain the status of the system as well as the faults which occurred on the system during the previous month.
- c. A log book shall be supplied by the Contractor. The log book shall be kept on site in charge of the responsible person appointed by the User Department for this purpose. The Contractor shall complete the log book, showing all maintenance done by him, as well as repairs of faults which may have occurred
- d. The log book shall also contain the following information:
 - Date
 - Type of fault reported and by whom
 - Date of fault report
 - Work done
 - Name and signature of person carrying out the work
 - Name and signature of the person in charge of the site.
- e. The log book shall be completed in TRIPLICATE. One copy shall accompany the monthly report to the Regional Representative of the Department, one copy shall be for the Contractor's own use, whilst the third copy shall remain in the log book as a record.
- f. The Contractor shall also allow for a complete maintenance service of the system after every six (6) months. i.e. two such services in the twelve (12) months guarantee period. The log book shall also be filled in and reports submitted for these services to the Regional Representative of the Department.

- g. The reports shall be submitted to the Project Manager within seven (7) days of the service. Serious faults shall immediately be reported to the Regional Representative and the Consulting Engineer by telephone.
- h. No maintenance or repair work shall be done on site without the knowledge, and approval, of the responsible person in charge on the site.

6.6.2 Maintenance Program

- a. The Contractor shall draw up a complete maintenance program document for the system, which shall enable the User Department to maintain the system on a daily basis. This program must be inserted into both the Operating Manuals and Maintenance Manuals.
- b. This document shall be in English and at least one other official language to be decided in conjunction with the Department and User Department, and shall indicate clearly the steps to be taken to prevent failure of the system.
- c. The normal maintenance which is, for example, necessary for the maintenance of batteries in the system, shall be clearly indicated in the documentation in a separate section.

APPENDIX 1

SCOPE OF WORK

1. SCOPE

- 1.1 The contractor shall design, supply and install an automatic fire detection, smoke detection and gas suppression fire alarm system in Substation C&D in the Port Of Richards Bay.

2. GENERAL

- 2.1 The fire detection system shall be designed and installed as specified in Appendix 2, electrical drawings.

APPENDIX 2
ELECTRICAL DRAWINGS

This appendix lists the Transnet Projects Drawings, which shall be read in conjunction with this specification

DRG No.	Description
4221259-1-SUB-E-LA-1001-03-3-TP	Proposed New Area C&D Substation – Fire Detection Layout

SIGNATURE OF TENDERER : _____

DATE : _____

APPENDIX 3

STATEMENT OF COMPLIANCE (TO BE COMPLETED BY TENDERER)

This tender complies with specification TPD: 005-FIRESPEC in all respects.

SIGNATURE : _____ DATE : _____

This tender complies generally with specification TPD: 005-FIRESPEC, but differs from it on the following points.

SIGNATURE : _____ DATE : _____

Transnet Projects

SPECIFICATION FOR INDOOR MEDIUM/ HIGH VOLTAGE (1KV TO 33 KV) ALTERNATING CURRENT SWITCHGEAR AND CONTROL GEAR

REVISIONS		
REV	DATE	APPROVED
	16/01/2023	Samukelo Magcaba

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1. SCOPE

This specification covers Transnet Projects requirements for the supply, delivery and installation of indoor, high voltage, 3 phase, 50-hertz switchgear and control gear in the range 1 kV to 36 kV as detailed in **Appendix 1** "Schedule of Requirements".

2. REFERENCE LIST

The following publications and documents (latest edition) are referred to herein.

Note: We suggest that latest IEC standards are used, which allows the greatest selection of reputable suppliers and does not favour any particular supplier. For voltages above 11kV most switchgear is in any case imported and standards other than IEC standards are generally excluded.

2.1 International Electro Technical Commission

IEC PUBLICATION 62271-100 High-voltage alternating current circuit breakers.

IEC PUBLICATION 60060 High-voltage test techniques.

IEC PUBLICATION 62271 Specification for AC metal enclosed switchgear and control gear, for voltages above 1kV up to and including 52kV

Part:

- 1 Common specifications for HV switchgear and control gear standards (IEC 60694)
- 100 Alternating current Circuit breakers (IEC60056)
- 102 Alternating current disconnectors and earthing switches (IEC 60129)
- 103 Switches for rated voltages above 1kV and less than 52kV (IEC60265-1)
- 106 Alternating current contactors and contactor-based motor-starters (IEC60470)
- 200 AC metal-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV

IEC PUBLICATION 60027-7 Electrical drawing symbols used.

IEC PUBLICATION 60243 Recommended methods of test for electric strength of solid insulating materials at power frequencies.

IEC PUBLICATION 60282 High-voltage fuses.

IEC PUBLICATION 62271-200 High-voltage metal enclosed switchgear and control gear.

IEC PUBLICATION 62271-103 High-voltage alternating current fuse-switch combinations and fuse-circuit-breaker combinations.

IEC PUBLICATION 60051 Direct acting indicating electrical measuring instruments and their accessories.

IEC PUBLICATION 62271 -106 High-voltage switchgear and control gear - Part 106: Alternating current contactors, contactor-based controllers and motor-starters

IEC PUBLICATION 60071 Insulation coordination

- IEC PUBLICATION 60282-1 Protection fuses
- IEC PUBLICATION 60529 Degree of protection (IP rating)
- IEC PUBLICATION 60044-1 Current transformer
- IEC PUBLICATION 60044-2 Voltage transformer
- IEC PUBLICATION 60044-8 Current sensors
- IEC PUBLICATION 60044-7 Voltage sensors

IEC PUBLICATION 61343-5	Voltage detection system VDS
IEC PUBLICATION 60071-1	Insulation coordination
IEC PUBLICATION 60125	Protection relays
IEC PUBLICATION 60376	SF6 gas

- 2.2 The equipment offered shall comply with the latest editions of the relevant International Electro-technical Commission.
- 2.3 Users of this specification must ensure that they are in possession of the latest issues of the above-mentioned standards.

3. INFORMATION AND METHOD OF TENDERING

- 3.1 Tenderers shall submit their main offers in accordance with the requirements of this specification. Deviations from the requirements of this specification which are of a minor nature and do not depart materially, will be considered at the discretion of Transnet Projects. The acceptance of alternative tenders will be considered only if a main tender is submitted as per this specification.
- 3.2 The "Technical Data Sheet" forming Appendix 2 of this specification shall be completed in detail, for each offer. Alternative offers shall be clearly marked "Alternative Offer No. _____".
- 3.3 Failure to comply with the above requirements may preclude a tender from consideration.
- 3.4 All tender documents shall be presented in a clear format with index, uniquely numbered pages and cross-referenced. The total number of pages shall be clearly stated in the index.
- 3.5 **Type test reports/certificates shall be issued or certified by the appropriate test authority, that is accredited according to ISO/IEC 17025.**

4. APPENDICES

The following appendices form an integral part of this specification and shall be read in conjunction with it.

- 4.1 **Appendix 1 - Schedule of Requirements.**
This appendix details special requirements.
- 4.2 **Appendix 2 - Technical Data Sheet.**
This appendix calls, for specific technical information to be furnished with tenders. All Technical Data Sheets shall be signed by the Tenderer and returned as part of the tender. Failure to comply may result in a tender being excluded.
- 4.2.1 Equipment offered in this appendix shall be supplied in terms of this specification and no changes or substitutes will be allowed without the written consent from Transnet Projects.
- 4.2.2 Acceptance by Transnet Projects of the equipment offered in this appendix, in no way relieves the tenderer of his obligation to fulfil his statement of compliance with the specification.
- 4.2.3 This appendix is used during adjudication of tenders to assess the equipment offered.

4.2.4 The tenderer is responsible for the accuracy of information submitted in this appendix.

4.3 **Appendix 3 – Scope of Work**

This appendix details the scope of work associated with this tender.

4.4 **Appendix 4 - Electrical Drawings**

This appendix lists the electrical drawings associated with this tender.

4.5 **Appendix 5 - "Statement of Compliance"**

This appendix shall be completed by all tenderers and signed. Where tenderers do not fully comply, all deviations shall be clearly indicated in the space provided or by means of a covering letter. **Failure to complete the statement of compliance will result in tenders being excluded.**

5. **AMBIENT/ENVIRONMENTAL CONDITIONS:**

The equipment shall be designed and rated for continuous operation under the following conditions:-

Altitude....	Sea level.
Ambient temperature....	-5 C to +40 C (daily average +35 C).
Relative humidity....	As high as 95%.
Lightning conditions .	Severe, with a maximum lightning ground flash density of 11 flashes per km ² per annum.
Atmospheric conditions....	Salt laden as well as industrial atmosphere. Electrolytic corrosion conditions prevail in all areas owing to the proximity of direct current traction systems and cathodic protection schemes.

6. **DRAWINGS AND INSTRUCTION MANUALS**

6.1 All drawings shall be in accordance with SANS 10111 – Engineering Drawings.

6.2 The successful tenderer shall supply the following instruction manuals, all of which shall be included in the tender price and be to the satisfaction of Transnet Projects:

6.2.1 Structural Drawings

Structural drawings shall be completely dimensioned, showing:

- Arrangement.
- Plan, front view, and other elevation views if pertinent.
- Required clearances for opening doors and for removing breakers.
- Conduit or cable entrance locations for bottom entrance.
- Busbar locations and configurations.
- Incoming and outgoing cable termination positions.
- Anchor bolt locations.
- Earthing connections.

- Mass of equipment. Individual mass of stationary units and breakers, if shipped separately.
- Foundation holding down bolting details showing mounting rails and run-out rails for draw-out circuit-breakers.

6.2.2 One Line Diagrams

One line diagrams shall show:

- Instrument transformers
- Relays with their ANSI device numbers.
- Meters and meter switches.
- Other pertinent devices.

6.2.3 Schematic Diagrams

Schematic wiring diagrams shall be furnished for each different electrically operated breaker control scheme and show the following:

- All control devices and device contacts, each of which shall be labelled with its correct ANSI device function number, or reference.
- Device terminal numbers, terminal block numbers and terminal numbers.
- All internal interconnections, bus wiring, inter panel wiring and connections to external equipment.
- Relay internal logic configuration
- Protection relay setting sheet

6.2.4 As-Built Drawings

- 6.2.4.1 On completion of installation and commissioning of the relevant equipment, the originals of the above drawings shall be updated by the equipment supplier to reflect the as-built status.
- 6.2.4.2 The supplier shall then also provide Transnet Projects with three copies of all relevant CAD data for drawing records and drawing reproduction. The drawings must be in a format that can be read by AutoCAD 2000, format ("dwg" or "dxf" format).

6.2.5 Maintenance Manuals

- 6.2.5.1 On completion of installation and commissioning of the relevant equipment, the contractor shall submit three copies of the equipment maintenance manuals in both hard copy and electronic format. (The electronic format must be in Microsoft "Word", or .pdf format)

- 6.3 The maintenance manuals shall include all the necessary information on electrical and electronic equipment to enable the maintenance staff to fully comprehend the function of the equipment and to maintain service and repair the equipment. In order to comply with this condition the following information (as applicable) shall be included in the manuals:

6.2.6 Complete circuit diagrams.

6.2.7 System Block or Logic Diagrams.

- 6.2.8 Test Procedures (Flow Chart form preferred) and information to enable testing such as voltage values and tolerances, waveforms, polarities etc.

- 6.2.9 Component lists, which shall contain complete electrical information and standard identification in respect of all components, unless this is indicated directly on diagrams.
- 6.2.10 A complete description of the electronic equipment, including the function of all input and output points, maintenance and calibration procedures, reference to special test instruments required, etc.
- 6.3 All symbols used on diagrams shall be in accordance with IEC Publication 60027-7 wherever possible. A legend shall be supplied for all symbols that do not appear in the IEC Publications.
- 6.4. All information submitted in manuals should be clearly cross-referenced, indexed and accurately descriptive of the equipment provided. All filed changes to equipment shall be incorporated in the updated diagrams/sheets before expiry of the guarantee period.
- 6.5 Photocopies of original material shall only be acceptable if these are clearly legible and preferably colour copies.
- 6.6 A preliminary copy of the maintenance manual shall be forwarded to Transnet Projects for approval prior to issue and in advance of the delivery of equipment.
- 6.7 **Late submission of drawings, manuals and instructions shall incur delivery penalties on the full contract price. The contract will only be deemed to be complete on reception of all drawings, manuals and instructions.**

7. SWITCHGEAR AND CONTROLGEAR

7.1 General

- 7.1.1 All switchgear and control gear shall be designed, manufactured and tested in accordance with the recommendations of IEC PUBLICATION 298, IEC 62271-100, IEC 62271-200 and IEC 62271-102. The switchgear panels shall be of arc proof, metal clad, air insulated, free standing, extensible type, containing power busses, earthing bus, draw out type switching devices, auxiliary control devices, instrument transformers, protection relays and control switches. They shall be supplied complete with all necessary terminal plates, cable glands for cable entry, wiring trunking for LV wiring and multi core cables.
- 7.1.3 The switchgear and control gear shall be of the air-insulated, indoor, modular, free standing, metal clad, cubicle type housing with a minimum Aluzinc sheet metal thickness of 2mm, powder coated with a minimum thickness of 50µm to the colour as specified in the detail specification.
- 7.1.3 The switchgear and control gear panels shall be bolted together to form a continuous, self-supporting and self-contained switchgear and control gear board of uniform appearance capable for extension at both ends with similar panels.
- 7.1.4 Access to the current transformer and cable terminations shall be from the rear of the panels.
- 7.1.5 All cubicles shall be so constructed by means of modular design to ensure inter-changeability of all components of the same type between different panels.
- 7.1.6 All removable plates shall be secured by means of bolts and nuts. All bolts, nuts, washers fixing

equipment etc. shall be stainless steel. Nuts shall be either welded in position or secured by means of a mechanical fixing device. Self-tapping screws will not be considered.

- 7.1.7 High-voltage and low-voltage equipment shall be housed in separate compartments.
- 7.1.8 The busbars shall be contained in a separate compartment. Air insulated equipment shall be easily accessible.
 - 7.1.8.1 There shall be no barriers down the busbar runs except on either side of the busbar section switch. Barriers shall not be used to provide mechanical support for busbars or connections.
 - 7.1.8.2 Entry through barriers between cubicles shall be via purpose designed bushings.
- 7.1.9 Each switchgear panel shall be a self-contained unit with a minimum degree of protection of IP4X for indoor installations based on IEC 60529.
- 7.1.10 The pollution level (IEC 186) shall be taken as "Medium" (creepage distance of 20mm/kV) for all equipment installed indoors or inside enclosures.
- 7.1.11 The panels shall be built to withstand internal faults and shall be based on IEC 62271-200. In the event of an internal arc fault, a person standing at the front, rear or alongside the panel shall not be burnt or electrocuted.
 - 7.1.11.1 A means of pressure relief shall be provided and the tenderer shall describe in full the method used.
 - 7.1.11.2 Vent outlets, if used, shall be suitably designed to prevent accidental inward opening.
- 7.1.12 The rated insulation levels shall be in accordance with, the recommendation of IEC PUBLICATION 298 Appendix EE test 2.
- 7.1.13 Fault-make integral earthing shall be provided to earth the circuit on the cable side of all switching devices.
- 7.1.14 Where separate earthing switches are used, they shall be so interlocked as to prevent operation when the main circuit is closed.
- 7.1.15 Fault-make integral earthing on the busbar side shall be provided for each busbar section. The busbar-earthing device shall be interlocked to prevent the earthing of an energized busbar. The earth switch can be located in the bus section / bus riser, or dedicated busbar earthing cubicle. If required the busbar earth switch can be located in the same cubicle as the busbar VT.
- 7.1.16 Where separate earthing switches are provided the switching devices shall be capable of earthing either the cable or busbar side.
 - 7.1.16.1 The earthing switching device will be tested at the routine testing of the switchgear as specified in this specification.
- 7.1.17 Integral earthing shall be capable of being padlocked in the earthed position.

- 7.1.18 An earthing bus shall be provided for the entire length of the board and shall provide connection points at each panel section. The cross sectional area of the earthing conductor shall be such that the current density shall not exceed 200A/mm² under the specified earth fault conditions. Provision will be made for solder-less connectors for 70mm² copper cables.
- 7.1.19 All compartment doors giving direct access to high voltage equipment shall be mechanically and electrically interlocked so that the door cannot be opened whilst the equipment is alive.
- 7.1.20 Each switching device panel shall be fitted with "close" and "open" controls. Where "close" and "open" pushbuttons protrude to the outside of panel they shall be of the shrouded type.
- 7.1.21 Means shall be provided for easy inspection and maintenance of the switchgear and control gear.
- 7.1.22 Applied insulation shall be in intimate contact with conductors and conductor joints to obviate voids.
- 7.1.23 Anti-condensation 230 Volt heaters shall be provided for each individual compartment and the bus bar chamber of each switch-gear. A switch shall be provided to control the heaters.
 - 7.1.23.1 A thermostatically controlled switch, adjustable between 10°deg.C and 40°deg. C, shall be provided in the supply circuit to the heaters. An over-riding switch shall be provided for the thermostat.
 - 7.1.23.2 The wiring from the heater elements to terminals shall be high temperature insulation covered. A suitable compression type gland shall be fitted for an incoming 230V supply.
- 7.2 The successful tenderer shall supply all material required to assemble the switchgear on site.
- 7.3 Two copies of all type and routine test certificates shall be supplied in accordance with NRS 003 for all equipment in the panels as applicable.

8. WITHDRAWABLE SWITCHGEAR AND CONTROLGEAR

- 8.1 Suitable indication shall be provided to mechanically indicate the position of the switching device, i.e. racked-in, racked-out (isolated), earthed, on/off. The indication shall be readily visible from the front of each panel.
- 8.2 Each switching device shall be mounted on a transporting truck device and fitted with wheels.
- 8.3 Connection and disconnection of the switching device shall be by means of suitable contacts mounted on robust insulators.
- 8.4 In addition to interlocks recommended in IEC PUBLICATION 62271-200 the following shall be provided.
 - 8.4.1 Separate shutters shall be provided to cover the "Busbar" and "Circuit" high-voltage sockets. These shutters shall automatically cover the sockets with a positive action when the switching device is withdrawn. The shutters shall be equipped with a fail-safe device to prevent their manual opening when the circuit breaker is removed from the compartment and the door is open.

In addition to the above;

- 8.4.1.1 Facilities shall be provided for independently padlocking each shutter in the closed position.
- 8.4.1.2 Busbar shutters shall be red (colour D29 in CKS 279) and shall be clearly marked "Busbars". The "Circuit" shutters shall be yellow (colour D26 in CKS 279) and shall be marked "cable".
- 8.4.1.3 Provision shall be made for testing the operation of the switching device when fully withdrawn from the panels.
- 8.5 Non-withdrawable switchgear shall only be offered if called for in Appendix 1 A of this specification.
- 8.6 LSC type in accordance with IEC62271-200 shall apply. LSC2B shall apply for withdrawable switchgear and LSC2A shall apply for non withdrawable switchgear, as called for in Appendix 1.
- 8.7 Partitioning shall be in accordance with IEC 62271-200. For withdrawable switchgear PM shall apply, for non withdrawable switchgear PI shall apply.
- 8.8 All operations shall be from the front of the switchgear from behind closed doors. No part of any operation / racking / shutter actuation shall be allowed with the door open or partially open.
- 8.9 The internal arc capability of the switchgear shall be in accordance with IEC62271-200 Appendix 1, and rated at AFLR, for the short circuit current for a duration of 1 second.
- 8.10 The switchgear shall be fitted with an arc vent duct that will contain the internal arc and safely vent the arc within the switch room or vent to the exterior of the switch room. The manufacturer should access each installation and make recommendations based as to the most suitable option for the switchgear installation. The manufacturers recommendations should be supported by a calculation that will calculate the pressure rise in the room, consider the room volume, and design fault level.

9. SWITCHING DEVICES

9.1 General requirements

- 9.1.1 All switching devices shall be ganged triple pole.
- 9.1.2 The method of securing the moving contact to the armature shall feature a safety device in addition to the normal securing mechanism.
- 9.1.3 A thermal overload device in addition to the low voltage circuit protection shall protect all motors used for spring charging or other applications.
- 9.1.4 Tripping shall be by means of trip coils
- 9.1.5 Electrically held tripping mechanisms shall not trip due to transients or voltage dips to zero for 10 cycles or 70% of the rated voltage. This is not applicable when tripping occurs due to protective system operation.
- 9.1.6 Tripping mechanisms operating on power failures shall restore the switching device to the condition

prior to the power failure.

- 9.1.7 If a direct means of indicating contact wear and the necessity for replacement is not provided, a concise description of how this can be determined shall be provided on a label permanently fixed to the switching device or switch panel.
- 9.1.8 Two spares normally open and two spare normally closed auxiliary contacts shall be provided on each switching device. The spare contacts shall be wired to a terminal strip in the panel. For withdrawable switchgear and control gear auxiliary plugs and sockets shall be used.

9.2 Circuit -Breakers

- 9.2.1 The insulation and arc-quenching medium will be vacuum.
- 9.2.2 Circuit breakers shall be designed manufactured and tested in accordance with IEC PUBLICATION 62271-100. The 50Hz electrical ratings of the circuit breaker shall be in accordance (or better) than the data listed in the manufacturer's data sheet.
- 9.2.3 The circuit breaker shall be of the vertical or horizontal isolating, draw out type. Where trolleys are required to remove circuit breakers, VT's or Contactors from the panel, at least two trolleys of each size / type per substation will be provided as standard operating equipment to facilitate swapping of similar equipment.
- 9.2.4 The control mechanism of the circuit breaker shall of the spring assisted trip free type with anti-pumping circuitry. The circuit breaker shall be equipped with mechanical tripping and closing in addition to electrical trip and close.
- 9.2.5 The first pole to clear factor shall be 1,5.
- 9.2.6 The making time shall not be greater than one second.
- 9.2.7 Rated insulation level for circuit breakers shall be in accordance with IEC 62271-100 and will be listed in the data sheet.
- 9.2.8 Interlocking shall be provided to prevent connecting the circuit breaker to or disconnecting it from the bus stabs unless the circuit breaker is open.
- 9.2.9 Barrier shutters shall be provided which effectively close the bus stab disconnect openings when the circuit breaker is withdrawn. These shutters will be pad lockable and clearly marked to indicate the primary circuit, i.e. Busbar, Cable, Left Busbar or Right Busbar. Facilities shall be provided for independently padlocking each shutter in the closed position.
- 9.2.10 All compartment doors giving direct access to high voltage equipment shall be mechanically interlocked so that the door cannot be opened whilst the equipment is live.
- 9.2.11 Suitable indication shall be provided to mechanically indicate the position of the switching device, i.e. racked-in, racked-out (isolated), earthed, on/off.
The indication shall be readily visible from the front of each panel.
- 9.2.12 Circuit breakers shall have the following class rating, in accordance with IEC 62271-200

Extended Electrical life rating of E2
Extended mechanical life of rating M2
Very low re-strike probability or rating C2

9.2.13 Circuit breakers shall have stored energy mechanisms. Where spring assisted stored energy mechanisms are provided these shall be charged by means of a motor. For magnetic actuated circuit breakers the stored energy device shall be charged via an electronic controller. In both cases the circuit breaker may not be able to be closed until there is sufficient energy in the stored energy mechanism to enable the breaker from being opened immediately. The circuit breaker closing and opening mechanisms must not consume more than 750 W of power peak during opening or closing operations.

9.2.14 It shall be possible to mechanically trip the circuit breaker with the CB door closed.

9.3 Switch Disconnectors (Isolators) and Earthing Switches

9.3.1 All disconnectors and earthing switches shall be designed, manufactured and tested in accordance with the recommendation of IEC PUBLICATION 62271-102.

9.3.2 Integral type circuit test facilities shall be provided on all switch-disconnectors.

9.3.3 Earth switches shall be rated for the same fault ratings as the circuit breaker and busbars.

9.3.4 The busbar earthing shall be interlocked to prevent earthing of an energised busbar.

9.3.5 The integral earthing shall be capable of being padlocked in the earthed position.

9.3.6 Both the cable circuits as well as busbars shall be provided with fault-make rated earthing switch, unless otherwise approved. Each busbar section shall be provided with its own earthing switch.

9.3.7 The type of operation shall be independent manual.

9.3.8 The operating mechanism shall be positioned on the front of the panel and be lockable in all switching states. Reliable mechanical indication of these states shall be visible from the front of the panel.

9.3.9 Earth switches shall be equipped with mechanical and electrical interlocking to prevent:

- Closing a cable earth switch unless the circuit breaker is open and disconnected from the bus stubs.
- Reconnection of the circuit breaker to the bus stubs if the earth switch is closed
- Closing the circuit breaker

9.3.10 A notice bearing the following inscription shall be provided adjacent to the operating mechanism:
"DO NOT OPERATE UNDER LOAD"

10. BUSBARS

10.1 All busbars shall be designed, manufactured, marked and tested in accordance with BS 159.

10.2 The busbars shall be air Insulated and contained in an isolated compartment or gas-filled type.

- 10.3 Busbars shall be made from electrical grade high conductivity hard drawn copper, capable of carrying the continuous rated current as specified in the detail specification, without exceeding the maximum temperature rise specified in the relevant Standard.
- 10.4 The busbars shall be mechanical braced for the asymmetrical ampere rating and duration of the circuit breaker having the highest interrupting rating. There shall be no barriers down the busbar runs except on either side of the busbar section switch. Barriers shall not be used to provide mechanical support for busbars or connections. Entry through barriers between cubicles shall be via purpose-designed bushings.
- 10.5 All joints and tees in busbars shall be made with high tensile stainless steel bolts, nuts and washers, securely tightened with a torque wrench to the manufacturers specified torque settings. These settings shall aim to minimise contact resistance and avoid distortion and / or hardening of the copper due to oversteering.
- 10.6 Insulated bushings shall comply with SABS 1035.

11. BUSHINGS

- 11.1 All bushings shall be designed, manufactured and tested in accordance with SABS 1035.

12. CABLE BOXES, GLANDS AND TERMINATIONS

- 12.1 All cable end boxes shall be suitable to terminate (sizes up to a maximum of 1000mm² wire armoured cable) and clamp all cable types.
- 12.2 Cable armouring shall be insulated from the board with insulating material which shall withstand 4 kV or greater for one minute when tested in accordance with IEC PUBLICATION 60071.
- 12.2.1 Insulated gland plates with substantial links or straps connected to the earth terminal shall be provided for bonding the cable sheath and armouring to the earth conductor of the boards.
- 12.3 Cables shall terminate in air-insulated compartments.
- 12.4 Adequate space shall be allowed from the cable terminations to facilitate connecting onto the boards.

13. INSULATING MEDIUM

- 13.1 The insulation medium will be vacuum or SF₆, refer to Annexure 1

14. HIGH-VOLTAGE FUSES

- 14.1 All fuses shall be designed, manufactured and tested in accordance with the recommendation of IEC PUBLICATION 60282.
- 14.2 Integral three pole earthing facilities to earth both sides of the switching device shall be provided

unless otherwise approved.

- 14.3 All fuses shall be of the air insulated, cartridge, striker pin type.
- 14.4 Parallel connection fuse cartridges shall not be used unless no single fuse cartridge of the same characteristic is available.
- 14.5 Integral type circuit test facilities must be provided.

15. CURRENT TRANSFORMERS

- 15.1 Current transformers shall comply with the requirements of SABS IEC 60044/1 shall be tested in accordance with the following procedure:
- Each unit must be pre-stressed at 1,04x line voltage and the peak discharge measured at 1,1x the phase voltage.
 - The discharge level shall not exceed 50 pC for a wound primary and 10 pC for a bar primary.
 - A representative from Transnet Projects shall witness this test, unless routine test certificates, issued by a recognised independent testing authority, are submitted
- 15.2 Short circuit ratings and voltage classes shall match the ratings of the associated circuit breaker and the current transformers shall also be rated to ensure the correct operation of the equipment constituting the burden.
- 15.3 Current transformers shall be of accuracy class 3 for measuring purposes be of accuracy class 0,2 for metering purposes and be connected to the cable side and be fitted with a 10 amp test winding. Testing windings shall be fitted on the higher current ratio of multi-ratio transformers.
- 15.4 All current transformers will have a permanent thermal current carrying rating of a minimum of 120% of the maximum specified ratio.
- 15.5 The limits of temperature rise of the windings of the current transformers at the full load continuous primary current rating of the switchgear panel shall comply with SABS IEC 60044.
- 15.6 Ring type current transformers shall have separate insulation between live conductors of the main circuit and inner surface of the current transformers. This insulation shall be capable of withstanding the high voltage test as specified. A rigid system of mounting shall be used to ensure that concentricity is maintained.
- 15.7 All current transformers shall be naturally air-cooled. Their secondary terminal connections shall be safely and readily accessible with the circuit isolated. The current transformers in a switchgear panel shall be readily accessible with only the circuit-side isolated for removal/replacement without extensive dismantling of primary circuits.
- 15.8 The secondary rating of the transformer shall be either 1 or 5 amp as required by the protection or metering equipment.
- 15.9 All terminals of the current transformers shall be terminated individually into terminals in the LV compartment to facilitate changing of ratio's or the star point. The current transformer neutral earthing point will be taken through an earthing link located in the LV compartment.

- 15.10 Each current transformer shall be connected to test block with shorting strips located on the LV compartment door.
- 15.11 Unless specified, each current transformer shall be equipped with a test winding, terminated in the LV compartment, on terminals equipped with test plugs to allow for easy testing. Test winding terminals shall be clearly marked
- 15.12 Each current transformer rating (VA, ALF, V_{kp} etc) shall be decided and calculated by the manufacturer to meet the protection requirements. Manufacturers shall provide proof of the calculations.

16. VOLTAGE TRANSFORMERS

- 16.1 All voltage transformers shall be designed, manufactured and tested in accordance with SABS IEC 60044/2.
- 16.2 Dry type cast epoxy resin insulated voltage transformers of the withdrawable type shall be provided for protection and metering purposes. When isolated the plug connections on the switchboard shall be fully shrouded by means of automatic shutters with padlocking facilities.
- 16.3 Where directional protection elements are required, voltage transformers shall be of a single phase or five limb construction, star/ star/ residual open delta connected, with primary neutral earthed and secondary neutral earthed via an earthing link in the LV compartment. Ratios shall be:

$$\frac{V_L}{\sqrt{3}} : \frac{110}{\sqrt{3}} : \frac{110}{3}$$

A suitable anti Ferroresonance device shall be fitted to the open delta winding to prevent any Ferro resonance voltages that may occur.

- 16.4 The voltage transformers shall be successfully tested in accordance with the following procedure:
 - Each unit shall be pre-stressed at 1,04 x line voltage and then the peak discharge measured at 1,1 x the phase voltage. This discharge level shall be less than or equal to 100 pC. A representative from Transnet Projects shall witness this test, unless routine test certificates, issued by a recognised independent testing authority are submitted.
- 16.5 Voltage transformers secondary shall have the following minimum accuracy classes :
 - 16.5.1 Indicating instruments - 3
 - 16.5.2 Protective systems - 6P
 - 16.5.3 Metering - 0,2
- 16.6 The primary of the voltage transformer shall be connected to the busbar side through high-voltage fuse-links.
- 16.7 Voltage transformers shall be fitted with three pole moulded case circuit breakers for protection of the secondary winding. The MCB's shall be mounted in the LV compartment of the panel
- 16.8 Phase or neutral earthing of the secondary winding through a removable link shall be provided. No fuses or miniature circuit breakers shall be fitted in this connection to earth.

- 16.9 The burden shall be suitable for the connected load but shall be not less than 25 VA per phase.
- 16.10 Where voltage transformers are fitted these shall be inside the arc proof enclosure. If voltage transformers are fitted outside the arc proof enclosure these shall be fully screened type. The arc capability of the switchgear must not be de-rated due to fitting of voltage transformers. Suitable documentary proof shall be provided for the design to prove compliance to the internal arc capability of the switchgear.
- 16.11 Busbar VT's shall be rackable type from behind a closed door. Busbar VT's can be situated in the cable riser cubicle, and if necessary a dedicated VT cubicle shall be supplied. Cable VT's shall only be accessible once the cable circuit is de-energised and a cable earth applied.

17. INDICATING LIGHTS AND INSTRUMENTS

- 17.1 All indicating instruments shall be designed, manufactured and tested in accordance with IEC 60051.
- 17.2 All indicating instruments shall have the following features:
- 17.2.1 be flush-mounted and dustproof.
 - 17.2.2 be of minimum accuracy class 2,5.
 - 17.2.3 have a scale length of not less than 85 mm.
 - 17.2.4 be provided with zero adjustment from the front without requiring dismantling of the indicating instrument.
 - 17.2.5 be marked with the ratios of the associated current and/ or voltage transformers.
- 17.3 Ammeter full-scale shall be the first standard value above the normal primary current rating of the associated current transformers.
- 17.4 Voltmeter full-scale deflection shall indicate nominal voltage at approximately 75% of the scale length and shall be marked with a red line.
- 17.5 Maximum demand ammeters shall be of the 15 minute thermal type and shall be integrated with the indicating ammeters.
- 17.6 All panels will be equipped with cluster LED type lights on the panel door indicating:
- Circuit Breaker Open
 - Circuit Breaker Closed
- 17.7 All earth switch position statuses will be clearly indicated with LED type semaphores or on the protection relay LCD graphical display.
- 17.8 All alarms and trip conditions will be clearly indicated via either programmed LED's on the protection relay or an alarm annunciator.
- 17.9 A capacitive integrated voltage indicator for permanent monitoring of all three line voltages for "cable live", and "busbar live" indication shall be provided on each panel.
- 17.10 The voltage indicators shall comply with IEC 61243-5, consisting of flashing LED diodes deriving its power

directly from the primary system via capacitive coupling electrodes. Test points shall provide for phasing and phase rotation checks.

18. ENERGY METERS

- 18.1 Energy meters shall be designed, manufactured and tested in accordance with BS 37.

19. PROTECTIVE SYSTEMS AND RELAYS

- 19.1 Protective relays shall be designed, manufactured and tested in accordance with IEC Publication 60125.
- 19.2 Protective relays shall have been type tested to verify performance and safety. Proof of these tests in the form of type test certificates shall be included in tender documents.
- 19.3 Standing load calculations for the all the protection schemes as supplied shall be calculated and submitted with the tender to allow for Battery charger sizing.
- 19.4 Unless otherwise stated in Appendix 1, each relay shall:
- 19.4.1 Have an error class index of 10.
 - 19.4.2 Have an operating time class index of 60.
 - 19.4.3 Have a rated number of contact operations with electrical duty class index N3.
 - 19.4.4 Have a mechanical stability class index S2.
- 19.5 Each Relay shall:
- have at least 1 over current elements
 - be rated in conjunction with its associated current transformer(s), to withstand the over current in the secondary winding of the current transformer/s under fault conditions
 - be continuously rated for any current setting
 - be clearly marked with the current ratio of the current transformer associated there-with
 - have contacts rated to make and carry the current of their associated circuits. The trip coil current shall be interrupted by auxiliary contacts on the circuit breaker.
 - have manual reset and flag indications for the protection function that operated
 - have an additional set of normally open and normally closed contacts, or auxiliary relays, for remote indication of the relay operation. The contacts shall be capable of handling 50 W in the range of 24 to 110 V DC, and shall be wired to a terminal strip at the back of the panel.
- 19.6 Microprocessor based digital protection relays with the following features
- A graphical display depicting the status of the devices connected to the protection relay
 - A delay closing function as part of the CB control
 - Clearly labelled LED indication
 - Web server functionality
 - Local Remote selection
 - Disturbance and event recordings
 - Time synchronization

- IEC 61850 communications for both MMS and Goose messaging

19.6.2 Digital relays shall incorporate PT100 RTD inputs where required.

19.6.3 Where microprocessor based relays are supplied, communication cables and software will be supplied to configure the protection relays.

19.7 Over-current and Earth Fault Relays

19.7.1 The relays shall have the time/current characteristics as specified below

- IEC Normal inverse.
- IEC Very inverse.
- IEC Extremely inverse.
- IEC Definite Time

19.7.2 The relays shall have current settings adjustable either infinitely or in not less than equal steps in the following ranges:

Overcurrent Low Set	10% to 500%
Overcurrent High Set	10% to 4000%
Overcurrent Instantaneous	100% to 4000%
Earth Fault Low Set	10% to 500%
Earth Fault High Set	10% to 4000%
Earth Fault Instantaneous	100% to 4000%

Where 100% corresponds to the secondary rating of the current transformer specified.

19.7.5 Sensitive earth fault relays shall have at least a current setting of 2% - 3% and an operating time adjustable from 2 - 10 seconds.

19.8 Differential Pilot Wire Feeder Protection

19.8.1 Only to be used where a communication medium (pilot wires or fibre optic) exists or can be installed between the ends of the cable

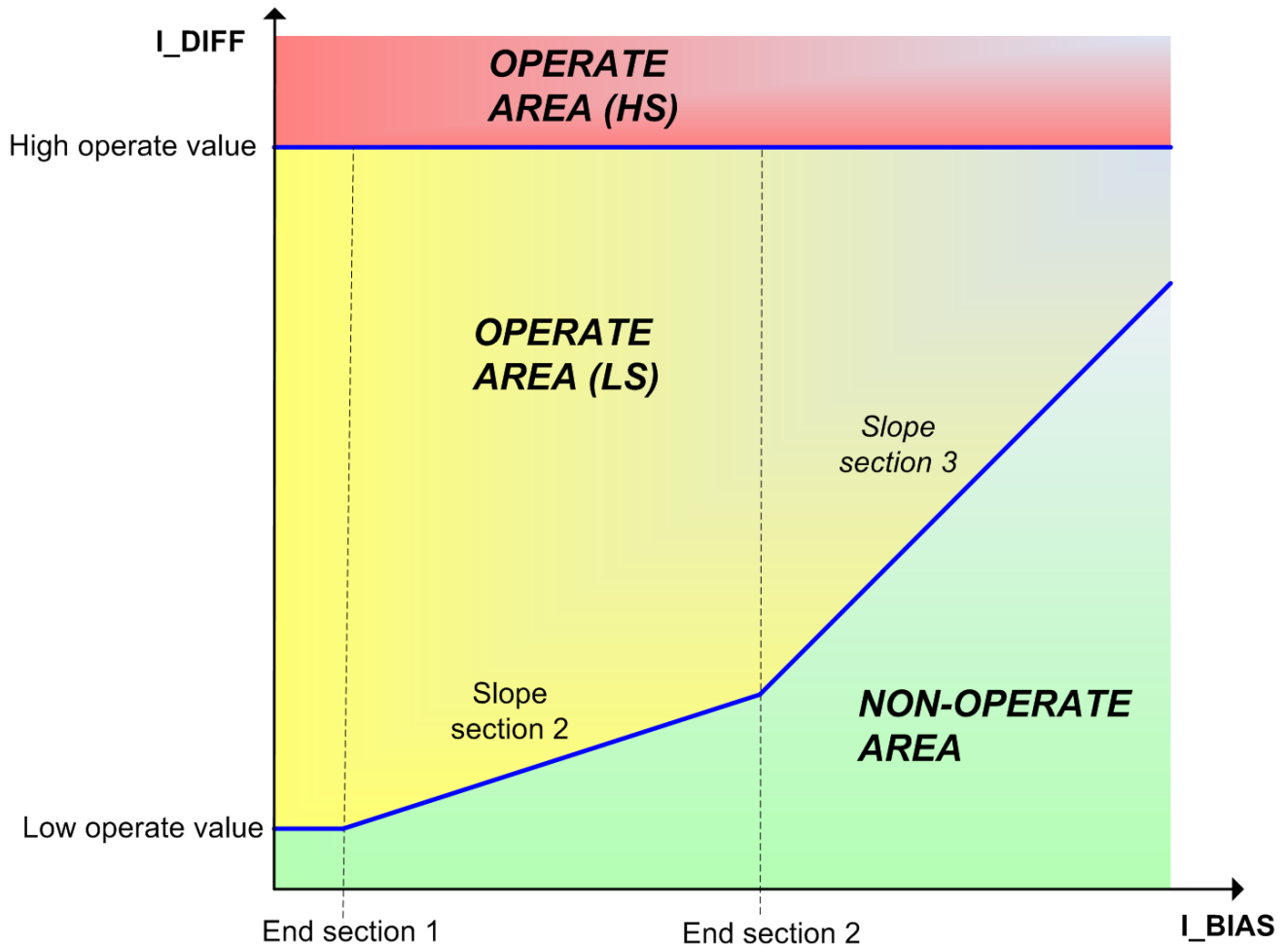


Figure 1

19.8.2 Relays incorporated in this system shall have a setting range of between

- I_{diff} restrained 10% to 500%
- I_{diff} un restrained 10% to 500%
- CT compensation 20% to 500%

They shall be compensated for any inherent out-of-balance in the current transformers supplied and shall be automatically biased against tripping on through-faults.

19.8.3 It shall be the responsibility of the tenderer to ensure that the current transformers and relays supplied will match exactly the equipment installed at the other end of the cable to be protected and that the whole protective system will be stable on through-faults but will operate satisfactorily on feeder faults.

19.9 Arc Protection and Busbar Blocking Scheme.

19.9.1 A combination of Arc Protection and a Busbar blocking scheme shall be used to detect tbusbar fault under the following 3 conditions:

- Earth faults
- Phase to Phase faults.
- Three Phase faults.

19.9.2 The switchgear protection “Zones” must be split over two sections

19.10 Arc protection

19.10.1 The individual zone relays shall trip all the switching devices in their respective zones to isolate the fault from all sources of supply.

19.10.3 The reaction time of the busbar protection system shall be such as to limit the duration of an internal arc fault to the withstand capability of the board.

19.10.4 Each relay shall:

19.10.4.1 Have its current setting adjustable in not less than seven equal steps
Overcurrent 50% to 600%

Earth Fault 5% to 50%
where 100% corresponds to the secondary rating of the current transformer specified.

19.10.4.2 tripping the Incomers and sections directly and loading Input on the feeder breakers to clear to zone

19.11 Transformer Protection - (3 phase, 2 winding power transformers)

19.11.1 Over-current and Earth Fault Protection relays shall consist of the following elements:

The relays shall have the time/current characteristics as specified below

- IEC Normal inverse.
- IEC Very inverse.
- IEC Extremely inverse.
- IEC Definite Time

19.7.2 The relays shall have current settings adjustable either infinitely or in not less than equal steps in the following ranges:

Overcurrent Low Set	10% to 500%
Overcurrent High Set	10% to 4000%
Overcurrent Instantaneous	100% to 4000%

Earth Fault Low Set	10% to 500%
Earth Fault High Set	10% to 4000%
Earth Fault Instantaneous	100% to 4000%

Where 100% corresponds to the secondary rating of the current transformer specified.

19.11.2 Relays provided for Restricted Earth Fault Protection of Star Windings shall be of the Low impedance instantaneous type and shall be tuned to 50 Hz.

19.11.2.1 Stability on through faults shall be maintained up to the fault rating of the switchgear.

19.11.2.2 Sensitivity shall be equal to the rated current of the current transformer.

19.11.2.3 The current transformer, to be installed in the neutral connection of the power transformer, shall be supplied and installed.

19.11.2.4 The insulation of the neutral current transformer shall be equal to the rated voltage of the switchgear.

19.11.2.5 The tenderer shall advise the maximum load burden.

19.11.2.6 The current transformer for the neutral connection of the power transformer shall be installed by the Tenderer, who shall be responsible for the correct operation of the complete protective system.

19.11.3 Biased Differential Protection relays shall have a high speed characteristic and be biased to provide stability during through faults. They shall not be operated by normal magnetising inrush currents.

19.8.2 Relays incorporated in this system shall have a setting range of between

- I diff restrained 10% to 500%
- I diff un restrained 10% to 500%
- CT compensation 20% to 500%
- Vector group Compensation
- Harmonic restraint

19.11.3.1 Current transformers for the higher voltage winding of the power transformer will be installed by others but the tenderer shall advise the maximum load burden.

19.11.4 Over temperature, Gas Detection and Overpressure Protection shall be provided unless otherwise stated in Appendix 1. All circuit breakers controlling transformers shall be provided with the following instantaneous trip auxiliary relays:

- One relay for over-temperature protection.
- One relay for Bucholz or over-pressure protection.

19.11.5 The circuit-breaker panel shall be provided with an instantaneous type relay for protection against

Tank-earth faults.

19.12 Electrical Inter-Trip

19.12.1 When electrical inter-tripping between two circuit-breakers is specified in Appendix 1 and/or on the relevant drawings, tripping of the driving unit shall close a set of contacts, to instantaneously energise the trip circuit of the follower unit.

19.12.2 All circuit breakers, controlling transformers shall be provided with the equipment specified above for driving units.

20. CLOSING AND TRIPPING SUPPLIES

20.1 A battery and battery-charging unit when specified in Appendix 1 shall be supplied, with the switchboard. The battery shall be capable of providing 8 hours standby time in the event of loss of supply. The battery shall be charged via a constant voltage charger that is supplied from a 220VAC supply. The charger shall be sufficiently rated to deliver the average 24hr standing load as well as the battery charging current for a discharged battery. The charger and battery shall have a 20% overcapacity to cater for aging and unforeseen loads. The manufacturer shall provide a preliminary calculation with the tender that shall be finalised on design approval.

21. TEST TERMINAL BLOCKS

21.1 Readily accessible, suitably enclosed test terminal blocks (equal or similar approved to MMLG/MMLB type) shall be provided on the front panel of each switch unit for the purpose of testing all protective systems.

21.2 Test terminal blocks need not be provided for frame protection system if the associated current transformers are mounted externally.

21.3 The test blocks shall be wired to the protective relays and associated current transformers.

22. CONTROL SWITCHES

22.1 All control switches shall be designed manufactured and tested in accordance with the recommendation of IEC PUBLICATION 337.

22.2 Rotary pistol grip type switches shall be used on electrically operated switching devices.

22.3 The electrical and mechanical endurance of the control switches shall not be less than 100 000 operations.

23. MINIATURE CIRCUIT-BREAKERS

23.1 Miniature circuit breakers shall be designed, manufactured and tested in accordance with SANS 156 and shall be mounted in the relay compartment and be readily accessible.

24. LOW VOLTAGE WIRING

- 24.1 Internal LV wiring shall be multi-strand copper conductor with PVC insulation having a minimum insulation rating of 600V/1000V to SANS 1411. When subjected to movement, the wiring shall be fully flexible with a minimum of 40 strands (2.5mm²).
- 24.2 Wiring shall be enclosed in a metal conduit when in the high voltage compartments.
- 24.3 Insulated crimp terminal lugs shall be used to terminate all wires. Lugs shall be correctly crimped to the lug manufacturers' specification.
- 24.4 All wiring from heaters to terminals shall be heat resistant.
- 24.5 Wiring shall be suitably strapped and enclosed in flexible conduit when looping from panels to doors and shall be continuous without joints.
- 24.6 Current transformer star points on secondary windings shall be earthed in the immediate vicinity of the transformer as well as onto the main circuit earth.
- 24.7 Terminal blocks or strips shall have a minimum of 10% spare terminals for future additions and be of the box type incorporating a pressure pad between the conductor and clamping screws.
- 27.8 LV wiring shall be colour coded and the ends of every wire shall be numbered as per NWS 1958 and in accordance with the approved schematic diagrams. Wiring shall also be neatly done and suitably strapped or housed in wire channels. Ferrule numbers shall be oil and moisture resistant.
- 24.9 Unless otherwise specified, the following guideline will be followed:
- DC Circuits (Indication and control) 1.5mm² Grey
 - DC Circuit (Spring rewind motor) 2.5mm² Grey
 - AC Circuits (VT) 1.5mm² Colour coded
 - AC Circuits (1A CT) 4mm² Colour coded
 - AC Circuits (5A CT) 4mm² Colour coded
 - AC Circuits (Panel Heaters) 2.5mm² Black
 - AC Circuit (Cable Live Indicators) 1.5mm² Colour coded
 - DC Buswiring (Supply) 4mm² Grey
 - AC Buswiring (Supply) 4mm² Black
 - DC Buswiring (Signalling) 1mm² Screened

25. REMOTE CONTROL

- 25.1 All electrically operated switching devices shall be equipped with circuits for remote operation and indication.
- 25.2 The circuits shall include the following :
- TWO set of N/O and N/C auxiliary contacts to indicate the "open" or "closed" states of the switching device.
 - Relays for remote closing and opening shall require a maximum of 50 watts at 110 Volts DC.

- 25.3 All remote circuits shall be wired to a terminal strip at the back of the panel.
- Selectors switch on the front of the panel to select between "local" and "remote" operation.
- 25.4 An additional socket shall be allowed for at the front of the panel for remote operation via a handheld pendant type remote control unit (chicken switch).

26. ARC DUCTING

- 26.1 The switchgear should be fitted with arc ducting to safely vent the gases away from the operator, to the outside of the building.
- 26.2 The arc ducting can be vented into the sides of the switchgear or two the rear of the switchgear. The manufacturer must determine the most suitable venting arrangement for his switchgear from the substation drawings.
- 26.3 If arc ducting cannot be vented to the exterior of the building then the arc ducting can vent into the switch-room through an absorber.
- 26.4 The design of the switchgear arc ducting system must be supported by type test certificates.
- 26.5 If the arc ducting is fitted with an absorber then the pressure rise within the switch-room must be determined by means of a calculation.
- 26.6 The maximum height of the arc ducting should be 2600 mm from the floor to the top of the switchgear including the arc ducting.

27. NAMEPLATES AND LABELS

- 27.1 Labelling shall be done according to NRS 003. Graphic symbols for wiring diagrams shall comply with NRS 002.
- 27.2 Each switchgear and control gear panel shall be fitted with a nameplate in a conspicuous position indicating:
- | | |
|------------------------|------------------------|
| Maker's name: | Maker's type number |
| Maker's serial number: | Client contract number |
| Service voltage: | Number of phases |
| Continuous rating: | Rating kA seconds |
- 27.3 Identical nameplates as that on all current and voltage transformers shall be mounted in a conspicuous position inside the relay compartment. The phase colour with which each current/voltage transformer is associated shall appear beneath each nameplate.
- 27.4 Interchangeable, engraved labels, showing panel designation (circuit breaker number and circuit name), shall be fitted to the front and the rear of the fixed part of each cubicle and associated withdrawable equipment for easy identification.

- 27.5 Only screws with nuts or rivets shall be utilized to fix label. Self-tapping screws or similar will not be used.
- 27.6 All equipment shall be clearly designated in position in accordance with the wiring and schematic drawings.
- 27.7 Voltmeter labels shall state whether busbar or cable voltage is indicated.
- 27.8 All labels shall be made of composite sandwich type plastic material with black lettering on white background. Letters must be of sufficient size to be clearly legible. All nameplates and labels shall be in English.
- 27.9 Danger Notices: White lettering on red background. Letters must be of sufficient size to be clearly legible.

28. PAINTING

- 28.1 All surfaces of the distribution board shall be light orange to SANS 1091 colour No. B26.
- 28.2 All surfaces shall be cleaned according to the appropriate method described in SANS 064 for the particular surface to be cleaned, the contamination to be removed and the primer to be applied.
- 28.3 Blast cleaning of components shall be in accordance with clause 4.3 of SANS 064 to a degree of cleanliness of at least Sa2 for inland exposure components and Sa 1/2 for coastal exposure components. See Table 1 of SANS 064 for the appropriate profile.
- 28.4 Sheet metal that cannot be blast cleaned shall be cleaned by pickling according to clause 4.6 of SANS 064.
- 28.5 Components that will be powder coated shall be cleaned and prepared by the surface conversion process according to clause 5 of SANS 064 to a medium-weight classification of table 2 of that specification.
- 28.6 Oil and accumulated dirt on steel components where no rusting is present shall be removed according to clause 3 of SANS 064.
- 28.7 The powder-coating process shall be in accordance with SANS 1274 type 4: Corrosion-resistant coatings for interior use and using the thermosetting type high gloss coating.
- 28.8 All specified coatings shall be applied according to the relevant specification and the manufacturer's instructions shall be followed.
- 28.9 Coatings shall not be applied under conditions that may be detrimental to the effectiveness of the coating or the appearance of the painted surface.
- 28.10 When examined visually the finished products shall have a uniform appearance as far as gloss is concerned and shall show no sign of damage. Damaged areas shall be repaired coat for coat to obtain the desired finish.

29. TESTS

- 29.1 All prescribed tests as referred to in the standard specifications may be called for at the discretion of Transnet Projects
- 29.2 Transnet Projects also reserves the right to carry out any check tests on the equipment.
- 29.3 Notwithstanding the successful completion of tests, the tenderer will still be responsible for the efficient operation of the equipment.
- 29.4 The tenderer shall bear all costs for any tests that will be required.

30. INSPECTION

- 30.1 The successful tenderer shall advise Transnet Projects at least four (4) weeks in advance of panel testing to enable Transnet Projects to witness the testing at the manufacturer's premises once Switchboards are 100% ready before shipment.
- 30.2 All transport cost to enable Transnet Projects personnel to attend such test must be included in the tenderers price (Max. 2 persons)
- 30.3 In the event of major faults ie; wiring discrepancies, VCB"S failed to trip; busbar earthing device not demonstrated on the day, The successful tenderer shall again arrange for a retest at the tenderer cost.

31. TOOLS AND APPLIANCES

- 31.1 One set of any special tools and appliances required for normal operation and maintenance shall be supplied with each board.

32. SPARES

- 32.1 The tenderer shall state whether their local representatives hold a complete range of spares in stock as and when required.
- 32.2 The tenderer shall submit a separate quote for recommended spares for maintenance purposes of supply a detailed description of each item including manufacturer's catalogue number.
- 32.3 A complete spare parts list, including parts location diagrams or drawing and prices, which the manufacturer recommends for the first two years' operation, shall be submitted with the tender.
- 32.4 A separate list detailing items likely to be used in a 10-year period shall also be submitted with the tender.

33. PACKING

- 33.1 The equipment shall be packed in such a manner that it will be protected during handling and transport by road, rail or sea as applicable. The movements of instruments, meters and relays shall be protected against vibration damage during transit.
- 33.2 When sea transport is involved, a dehydrating agent shall be provided where necessary.

34. GUARANTEE

- 34.1 The tenderer shall guarantee the equipment supplied by him in terms of this specification for a period of one year after successful completion of hot commissioning of the plant. The tenderer shall state his compliance herewith.
- 34.2 This guarantee shall cover all materials, parts, workmanship, performance and efficiency (normal wear and tear excluded). The guarantee shall include all equipment supplied.
- 34.3 If any part/equipment fails during the 12-month guarantee period, the supplied shall immediately replace such part/equipment free of charge.

WITNESSES

1.
TENDERER

2.
DATE

Transnet Projects

ANNEXURE 1
SCHEDULE OF REQUIREMENTS

BERTH 102 SUBSTATION (11KV)						
Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Panel Designation	E26 Incomer 1 E33 Incomer 2	E29 – Transformer 03, E31 – Transformer 04	E30- Bussection E30a Busbar ES & VT 1, E30b Busriser & VT 2	E27, E28, E32– Feeders.	
1.1	General					
	Type of panel	New	Yes	New	New	
	Number of switching devices	Two	Two	Three	Three	
	Neutral Earthing: Unearthed: _____ Solidly Earthed: _____ Reactance Earthed: _____ Resonant Earthed: _____	Solidly Earthed				

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Arrangement drawing reference of the switchboard with details of each panel and its components and accessories	To be submitted by tender				
	Cable trench layout to be agreed with the supplier Yes/No	No Existing Building				
1.2	Ratings of switchgear panels					
	Rated voltage Kv	11 kV				
	Rated frequency 50 Hz	50 Hz				
	Busbars Rated normal current (amps) Type of Material: Copper..... Insulation	1250A Copper Air Insulated	1250A Copper Air Insulated	1250A Copper Air Insulated	1250A Copper Air Insulated	
	Rated insulation level KV	95kV				
	Max. Three phase and earth fault current kA / 3 seconds	31.5				
	IAC Rating	AFLR				
	Max Internal arc Fault rating kA / 1 second	31.5				
	Rated normal current for Circuits A	1250A	630A	1250A	630A	

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Anticondensation Heaters: Yes/No	Yes. In cable and CB compartment.				
	Switchboard Colour	Grey, RAL7035				
1.3	Environnemental conditions					
	a) altitude m	0 to 1800m				
	b) max. daily temperature °C	+45				
	c) min. daily temperature °C	-5				
	d) average daily temperature °C	+35				
	e) humidity %	96				
	f) exposure conditions	Salt laden and industrial atmosphere				
	g) Lightning Conditions	Severe: 11flashes/ km ² /annum				
1.4	Circuit-breakers					
	Circuit-breaker type required (Withdrawable)	Vacuum				
	Closing mechanism if other than a stored energy type	Stored Energy, spring or Capacitor				
	Rating according to IEC 62271-100	E2, M2, C2				
	Closing Supply: Rated Voltage:_____ Peak Power:_____	110 Volts, Battery Peak Power 750W				
	Tripping Supply: Rated Voltage:_____ Peak Power:_____	110 Volts, Battery Peak Power 750W				

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Stored Energy Mechanism Type: Motor/Capacitor Voltage :_____	110 Volts, Battery Peak Power: 750W				
	Peak Power: _____					
	Number of spare auxiliary contacts required on circuit-breakers					
	- “Normally open ” contacts	5	5	5	5	
	- “Normally Closed” contacts	5	5	5	5	
1.5	Safety earthing					
	Are earthing facilities required on main circuits? Yes/No	Yes	Yes		Yes	
	Are earthing facilities on busbars required? Yes/No			Yes one per busbar section 1 x ES in Bus Section or Bus Riser (RHS) 1 x ES in BB VT / ES Cubicle (LHS)		
	Are these facilities to be rated for fault making? Yes/No	Yes	Yes	Yes	Yes	

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Interlock BB E/S with all incoming and Feeders CB, racking.			Yes via Fortress Type Key Interlock		
1.6	Cable terminations					
	Type and size of cable	TBA	TBA		35mm ² , 3-core XLPE	
	Cable termination compartments					
	Type of cable boxes required	Air Insulated.	Air Insulated.		Air Insulated.	
	Type of filling required: XLPE Air insulated Cables.	Termination kits to be provided.	Termination kits to be provided.		Termination kits to be provided.	
	Are gland plates required? Yes/No	Yes	Yes		Yes	
1.7	Current transformers (CTs)					
	Current transformer specification applicable	Yes	Yes	Yes	Yes	
	a) Class type: Protection:	1	1	1	1	
	- quantity	3	3	3	3	
	Class X	400-10/1 0.03 A RCT < 2.8Ohm	Nil	Nil	Nil	
	- ratios	800/1	100/1	800/1	100/1	
		5P20 7.5VA RCT < 6.8 Ohm	5P20 2,5VA RCT < 0.9Ohm	5P20 7.5VA RCT < 6.8 Ohm	5P20 2,5VA RCT < 0.9Ohm	
	c) Metering CTs					

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Where required?	Incomer				
	Class type:	1	1		1	
	- quantity	3	3		3	
	- ratio	800/1	100/1		100/1	
	- accuracy %	Cl 0.5 - 7.5VA	Cl 0.5 - 7.5VA		Cl 0.5 - 7.5VA	
	Test Blocks Yes/No	Yes RXTP type On LV Door				
1.8	Voltage transformers (VTs)					
	Panel to which VTs are to be fitted			Busbar riser / BB VT Panel.		
	VT requirements					
	Connected to			Busbar		
	Quantity			3 x Single Phase		
	a) Class type / VA: Indicating Instruments / Meters			Class 0.5 / 50VA		
	b) Class type / VA: Protection			6P / 150VA		
	- quantity			1 per busbar section		
	- ratios			11000v3/110v3/110/3 Volts		
	VT Protection device			Loading resistor or VT guard.		
	Connection of VT primary to: Busbar side/circuit side			Busbar Side, Withdrawable		

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Are HV fuse-links required? Yes/No			Yes		
1.9	Live circuit indication					
	According to IEC 61243-5	Yes	Yes		Yes	
	Is live circuit indication required Yes/No	Yes	Yes		Yes	
	If Yes, on which panels?	Incomer	Transformer		Feeders	
1.10	Control, protection and alarm circuitry					
	Drawing number, if applicable, for all panels	To be submitted by Manufacturer				
	Are control wires to be terminated with crimped lugs? Yes/No	Yes				
	Colour of auxiliary wires, if not grey	As per specification.				
	Requirements for alarm circuits					
	Protection of d.c. circuits Fuses/MCCBs	MCB's				

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Are Ammeter required? Yes/No	Yes via IED				
	Are Voltmeters required? Yes/No	Yes via IED				
C.11	Battery, battery charger and d.c. supplies					
	Are a battery and battery charger to be supplied? Yes/No	Yes				
	If Yes, details of the battery V A.h capacity suitable for 8hour standby	110 Volt (gel type, maintenance free batteries) Manufacturer to calculate the Ah capacity required				
	Auxiliary supply	Yes 380/220V Local AC DB existing				

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
1.12	Protection Relays Overcurrent and Earth Fault Relays: Overcurrent: Number of elements IDMT Inverse IDMT Extremely Inverse High Set Instantaneous Instantaneous Definite Time Earth Fault: Number of elements IDMT Inverse IDMT Extremely Inverse High Set Instantaneous Instantaneous Definite Time	Yes Three Yes Yes Yes Yes Yes Three Yes One Yes	Yes Three Yes Yes Yes Yes Three Yes One Yes	Yes Three Yes Yes Yes Yes Three Yes One Yes	Yes Three Yes Yes Yes Yes Three Yes One Yes	
	Autoreclosing	No	No	No	No	
	Cable Differential Protection	Yes	No	No	No	
	Power Factor Protection	No	No	No	No	
	Busbar Blocking	Yes	Yes	Yes	Yes	
	Details of indication functions required					
	Current Indication	Yes in IED	Yes in IED	Yes in IED	Yes in IED	
	Voltage Indication	Yes in IED	Yes in IED	Yes in IED	Yes in IED	

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Energy Metering	Yes in IED	Yes in IED	NA	Yes in IED	
	Specify	P, Q, Pf	P, Q, Pf	NA	P, Q, Pf	
	Binary Inputs	12 Inputs	16 Inputs	16 Inputs	12 Inputs	
	Binary Outputs	6 Normal + 4 Power Outputs	6 Normal + 4 Power Outputs	6 Normal + 4 Power Outputs	6 Normal + 4 Power Outputs	
	Communications	Ethernet RJ45				
	Communications Protocol	IEC 61850				
	Type of IED	Similar to ABB REF615 HBFEAEAGNB A1BNA1XD	Similar to ABB REF615 HBFEAEAGNB A1BNA1XD	Similar to ABB REF615 HBFEAEAGNB A1BNA1XD	Similar to ABB REF615 HBFEAEAGNB A1BNA1XD	
	Differential Protection	Solkor	No	No	No	
	Pilot wire Modem required Yes/No	No	No	No	No	
	Arc Protection	REA 101	REA107	REA107	REA107	
	Arc Protection system	Non Selective Tripping				
1.13	Electrical Intertrip	Remote Cable Differential Signal	Yes via IED, Rcd from LV ACB	No	No	
	Driving unit: Breaker No. Follower unit: Breaker No	Cable Differential Trip Signal	Main LV ACB	NA	NA	

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Where are VT fuses or links located?			On VT		
1.14	Remote Switching	Remote Wired Control Panel and SCADA	Remote Wired Control Panel and SCADA	Remote Wired Control Panel and SCADA	Remote Wired Control Panel and SCADA	
1.15	Tests					
	Routine test and type test of metering CTs required	Yes according to IEC 60044-1				
	Routine test and type test of protection CTs required	Yes according to IEC 60044-1				
	Routine Test and Type test of VTs required			Yes according to IEC 60044-2		
	Number of copies of routine test certificates required	Three				
1.16	Marking/labeling/documentation					
	Are main circuit labels to be engraved? Yes/No	Yes				
	Documentation to be provided with the offer.	General Arrangement and details of equipment offered				

Item	Description					
	Panel No	E26 & E33	E29, E31	E30	E27, E28 and E32,	
	Quantity of Operational and Maintenance manuals required:	Three copies				
1.17	Accessories					
	Supply of cabinet required Switchgear Operating Tools Wall Mounted tool cabinet CB service trolley	Yes Yes If Required				
	Number of as-built drawings and O and M manuals required.	Three				
	Spares					
	Period required for routine maintenance spares	1 year				
	Minimum availability of spares from date of supply	10 years				
	Delivery					
	Delivery period EXW in Weeks					
	Delivery period installation in weeks					
	Delivery period for commissioning in weeks					

Tenderer:
Date:

Witness 1:
Witness 2:

ANNEXURE 2

TECHNICAL DATA SHEET To be completed by the Tenderer

BERTH 102 SUBSTATION (11KV)						
Item	Description					
	Panel No.					
1.1	General					
	Details of provisions for lifting/slinging					
	Type of transporting device if not an integral device					
1.2	Circuit-breakers					
	Circuit-breaker type offered					
	Rating of the closing device					
	a) rated control voltage V					
	b) rated current A					
	c) rated power kW					
	d) time lag fuses or MCCBs?					

Item	Description					
	Panel No.					
	e) alternative methods of tripping if any					
	Number of spare auxiliary contacts offered on circuit-breakers					
1.3	Safety Earthing					
	Details of earthing facilities offered					
	Details of earthing busbars in bus-section and/or bus-coupler panels					
1.4	Cable termination compartments					
	Type of compartment offered					
1.5	Current transformers (CTs)					
	Current transformer specification offered					
	Type of CT offered					
	Are separate CTs used for indications?					

Item	Description					
	Panel No.					
	Is approval for connection of protection or indicating instruments to metering CTs required? Yes/No					
1.6	Voltage transformers (VTs)					
	Type of VTs offered					
1.7	Live circuit indication					
	Type of indication offered					
	Voltage divider bushing details					
	- manufacturer					
	- type					
	- dielectric					
	- rating					
1.8	Battery, Battery Charger and dc supplies					
	Type of battery offered					
	Type of battery charger offered					
	Battery load					
	Peak current from all switchgear A					
	Standby current A					

Item	Description					
	Panel No.					
1.9	Protection relays and instruments					
	Details of protection equipment offered					
1.10	Terminals for auxiliary circuits					
	Type of test block offered					
1.11	Painting/Coating					
	Paint/coating system offered					
1.12	Tests					
	Summary of type test certificates available					
	Test authority for type certificates					
	Are any test certificates overseas products?					
	If Yes, is the South African product identical?					

Item	Description					
	Panel No.					
	How many units installed in South Africa?					
1.13	Accessories					
	Details of the accessories supplied					
1.14	Spares					
	Is a complete range of spares held in stock by the local representative? Yes/No					

Tenderer:.....

Date:

Witness 1:

Witness 2:

ANNEXURE No.3
ELECTRICAL DRAWINGS

This appendix lists the Transnet Port Terminals Drawings, which shall be read in conjunction with this specification:

DRG No.	Description
	Main Switching Layout
2233497-2-000-E-LA-0001-02	Berth 102 Substation Proposed Equipment Layout
2233497-2-000-E-LA-0001-04	Berth 102 Substation Proposed MV Single Line Diagram

SIGNATURE OF TENDERER

DATE

ANNEXURE 4

TEST REQUIREMENTS

1. TYPE TESTS

- 1.1 Type testing shall be carried out in accordance with the Recommendations, Standards, or Specifications referred to in this specification.
- 1.1.1 Type test certificates shall be submitted with tender documents.

2. ROUTINE TESTS

- 2.1 The following additional routine tests shall be carried out on the completed switchgear or control gear at the Manufacturers works prior to delivery.
- 2.2 The ratio, polarity and magnetism curve of each current transformer after their installation in the board.
- 2.3 The characteristic curves of each protection relay where applicable.
- 2.4 The ratio of each voltage transformer.
- 2.5 The errors of all indicating instruments.

3. FUNCTIONAL TESTS

- 3.1 A functional test of the complete board including all protective relays by primary injection shall be carried out by the manufacturer.
- 3.2 The breaker opening times shall be indicated in these tests.

4. GENERAL

- 4.1 Four copies of all approved routine test certificates shall be supplied, at a date not later than the delivery date of the switchgear or control gear.
- 4.2 All routine testing shall be witnessed and inspection carried out by the Engineer (Electrical) or his duly appointed representative.

SIGNATURE OF TENDERER

DATE

ANNEXURE 5

**STATEMENT OF COMPLIANCE
(TO BE COMPLETED BY TENDERER)**

This tender complies with specification TPD: 007-MVSWITCHSPEC in all respects.

SIGNATURE : _____ DATE : _____

This tender complies generally with specification TPD: 007-MVSWITCHSPEC but differs from it on the following points:

SIGNATURE : _____ DATE : _____

Transnet Integrated Management System (TIMS) POLICY COMMITMENT STATEMENT

Transnet is a State-Owned Company that operates as an integrated freight transport company, formed around six core operating divisions namely Transnet Freight Rail (TFR), Transnet Engineering (TE), Transnet National Ports Authority (TNPA), Transnet Port Terminals (TPT) and Transnet Pipelines (TPL) and Transnet Property (TP) that complement each other.

Transnet has developed and implemented a TIMS that forms an integral part of the core business. We are committed to **transporting freight, passengers, and provide excellent service** to our customers along key transport corridors. This is done in order to **competitively grow our business**, enhance efficiency of South Africa's logistics system and thereby contribute to economic vibrancy.

TIMS is established, implemented and maintained in accordance with recognised best practices that will enable us to:

- Incorporate and comply with applicable **legislation, regulations, codes, standards, protocols, best practices and customer requirements** to which we subscribe in order to achieve our business objectives;
- Set and achieve **objectives and targets** that address significant enterprise-wide **strategic, tactical and operational risks, opportunities and mitigate the consequences** thereof;
- Proactively implement **waste and pollution prevention strategies** to prevent **environmental degradation**;
- Continually promote the prudent and **sustainable** use of **energy and natural resources**;
- Provide **quality products and services** in order to meet our customers' requirements;
- Provide **safe and secure environment** for our employees and stakeholder;
- Carry out our business in a manner which **protects our assets and information** and **prevents injuries and ill health** to our employees and stakeholders;
- Promote **safe operational principles** during operations to minimize occurrences of safety incidents;
- Strategically **source our contractors** through fair, equitable and transparent processes;
- Provide **socio-economic development** as a good corporate citizen;
- Promote **food safety practices** in our food preparation and handling environments;
- Ensure **proficiency and preparedness** to deal with and **effectively recover** from any **emergency situations**;
- **Develop, train and manage our employees** through inspirational leadership, provide the necessary **organizational information, knowledge and resources** to achieve the intention of this policy statement;
- **Communicate, engage and provide support and appropriate information** to relevant stakeholders in order to build relationships based on care, openness, mutual trust and involvement as well as promote a TIMS risks awareness culture;
- Allocate **responsibilities and accountabilities** for meeting the requirements of the TIMS policy statement.
- Drive an **integrated assurance management programme** to ensure **continual improvement** of TIMS.

The TIMS Policy Commitment Statement shall be **reviewed every three years or as circumstances dictate** to ensure that it remains **current and relevant**. Our progress on the achievement of the policy statement commitments shall be reported in the respective Governance Structures. Transnet recognises its accountability for TIMS; all employees including contractors have a role to play in delivering on the commitment set out in this policy statement.


Group Chief Executive

Date: 29/07/2020
Next Review Date: 29/06/2023

Copies of the approved TIMS Policy Commitment Statement can be made available to external Stakeholders on request.

CONTRACTOR ENVIRONMENTAL AND SUSTAINABILITY SPECIFICATION GUIDELINES

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Version number	3.0
Classification	Unclassified
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SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
3.0	• Addition of reference documents (section 3) • Inclusion of additional definitions • Removal of DEA and replacing it with DFFE • Removal of Transnet EO and replacing with Transnet Environmental Resource (PER) • Inclusion of additional abbreviations • Inclusion of minimum environmental requirements for construction (section 5) • Inclusion of details of site inspections/audits (table 1) • Inclusion of Records Management	6-7 7-10 11 12 12-23 23 45	June 2023

Note: Only latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	Senior Specialist: Environmental Risk and Compliance		01/10/2023
Accepts document for adequacy and practicability. Comments:			
Approval Committee:	GM: Corporate Sustainability		01/10/2023
Approves document for use. Comments:			

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1. PURPOSE

This document describes the minimum requirements for environmental management to which Contractors must comply. This document must be read in conjunction with the Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP).

In this document, unless the context clearly indicates otherwise:

- Words importing any one gender shall include the other gender;
- The singular shall include the plural and vice versa; and
- Any reference in this document to legislation or subordinate legislation is to such legislation or subordinate legislation at the date of promulgation thereof and as amended and/or re-enacted from time to time.

2. APPLICABILITY

This standard applies to Contractors that work on site under the authority of Transnet SOC Ltd.

3. REFERENCE DOCUMENTS

Name	Applicable Section
Constitution of South Africa, Act 108 of 1996	Section 24
National Environmental Management Act, 107 of 1998	Section 2 National Environmental Management Principles
National Water Act, 36 of 1998	Section 164, Permissible Water Use
National Environmental Management: Waste Act, 58 of 2008	Part 1 15 (1) (i) and (2) Part 6 26 (10) (a) and (b) Schedule 3, Defined Wastes Category A: Hazardous Wastes Part 8: Contaminated Land
Environment Conservation Act, 73 of 1989	Section 20
Occupational Health and Safety Act, 85 of 1993	Asbestos Regulations, 2001

Name	Applicable Section
	Government Notice R155 in Government Gazette 23108 of February 2002 General Safety Regulations-Reg. 2 (2) PPE
GNR 326, 7 April 2017 as amended, EIA Regulations	Chapter 15, Appendix 4
Transnet Environmental Risk Management strategy and Framework	2015:42
Environmental Management Systems ISO 14001: 2015	Clause 5, 6, 7, 8, 9 and 10

4. DEFINITIONS AND ABBREVIATIONS

4.1 Definitions

Compliance	Meeting of all the organization's regulatory requirements
Conformance	The action or fact of conforming to this standard and other internal Transnet policies, procedures, guidelines and best practice.
Construction Environmental Management Standard Operating Procedure	Is a document which is used to define how environmental management will be practiced on any construction site under the management of Transnet to ensure that the environment is considered, negative impacts avoided or minimized, and positive impacts are enhanced.
Contractor	The Principal Contractor as engaged by Transnet for infrastructure construction operations, including all sub-contractors appointed by the main contractor of his own volition for the execution of parts of the construction operations; and any other contractor from time to time engaged by Transnet directly in connection with any part of the construction operations which is not a nominated sub-contractor to the Principal Contractor.

Contractor Environmental and Sustainability Specification Guidelines	A set of minimum environmental standards for all Transnet SOC Ltd-managed construction sites.
Environmental Aspect	Element of an organization's activities or products or services that interacts or can interact with the environment.
Environmental Impact	Change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
Environmental Risk	The product of the likelihood and severity of an unforeseen occurrence/incident/aspect and the impact it would have, if realised, on the environment.
Fauna	A group of animals specific to a certain region or time period.
Flora	A group of plants specific to a certain region or time period.
General waste	Waste that does not pose an immediate hazard or threat to health or to the environment; and includes:- (a) domestic waste; (b) building and demolition waste; (c) business waste; (d) inert waste;
Indigenous vegetation	Plants that naturally occur in an area.
Liquid waste	Waste that appear in liquid form such as used oil, grease and/or contaminated water or waste water.

Method statement	A document that describes how the Contractor will apply environmental management measures associated with a particular activity during construction.
Monitoring	Determining the status of a system, a process or an activity
Natural Vegetation	All existing species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.
Responsible Authority	A Responsible Authority, according to the National Water Act 36 of 1998, relates to specific power or authority in respect of water uses that is assigned by the Minister to a Catchment Management Agency or to a Regional Office.
Rehabilitation	Refers to measures that must be put in place to restore the site to its pre-construction or enhanced state, subsequent to construction taking place.
Scope of Work	The construction work for which the Contractor has been appointed in terms of the Contract with Transnet.
Sensitive area	Any area that is denoted as sensitive by this Specification due to its particular attributes, which could include the presence of rare or endangered vegetation, the presence of heritage resources (e.g. archaeological artefact or graves), the presence of a unique natural feature, the presence of a watercourse or water body, the presence of sensitive social receptors etc. As a minimum, habitats that fall under this definition include: mountain catchments, Ramsar wetland sites, coastal shores, estuaries and endangered ecosystems.
Solid waste	All solid waste, including construction debris, chemical waste, excess cement/ concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

Spoil	Excavated material which is unsuitable for re-use as material in the Works or any other use; or is material which is surplus to the requirements of the Works.
Sub -Contractor	is a person or organisation who has a contract with the contractor to: Construct or install part of the contractor's work. Provide a service necessary to provide the works; or Supply plant and materials which the person or organisation has wholly or partly designed specifically for the works.
Temporary Storage	A once-off storage of waste for a period not exceeding 90 days.
Topsoil	Means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility appearance, structure, agricultural potential, fertility and composition of the soil.
Waste	Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes. Waste or a portion of waste ceases to be a waste only once the waste is, or has been re-used, recycled or recovered.
Wastewater	means water containing waste, or water that has been in contact with waste material
Watercourse	Refers to - a river or spring; a natural channel in which water flows regularly or intermittently;

a wetland, lake or dam into which, or from which, water flows;
and

any collection of water gazetted by the National Water Act, 36 of 1998 as a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Wetland

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

4.2 Abbreviations

Acronym	Meaning In Full
CEM SOP	Construction Environmental Management Standard Operating Procedure
CM	Construction Manager
CV	Curriculum Vitae
DEFF	Department of Environment, Forestry and Fisheries
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
CESSG	Contractor Environmental and Sustainability Specification Guidelines
EO	Environmental Officer

Acronym	Meaning In Full
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EGF	Environmental Governance Framework
NEMA	National Environmental Management Act 107 of 1998
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004
NWA	National Water Act 36 of 1998
PER	Project Environmental Resource
PES	Project Environmental Specification
PM	Project Manager
SAHRA	South African Heritage Resource Agency
SDS	Safety Data Sheet
SHEQ	Safety, Health, Environment and Quality
TRANSNET	Transnet SOC Ltd

5. MINIMUM ENVIRONMENTAL REQUIREMENTS FOR CONSTRUCTION

5.1 Tender Documents

Any construction-related tender issued to the market must include:

- Transnet Integrated Management System Policy Statement;
- The Transnet Construction Environmental Management Standard Operating Procedure (CEM SOP);
- The Contractor Environmental & Sustainability Specification Guideline; and
- The Project Environmental Specification (PES).

Any construction-related tender must be recommended for issue by the Transnet Project Environmental Resource/s before it is released to the market.

5.2 Project Environmental Specification (PES)

Must incorporate all relevant recommendations of the Environmental Impact Assessment (EIA) and other environmental studies for the project and the relevant conditions of the EA and/or other applicable environmental permit(s) and licence(s), and the Transnet Operating Division's Environmental Management requirements (where applicable) into an environmental performance specification for implementation during the construction phase of the project.

The PES need not be a separate document; however it can be in a format of an appendix/addendum making reference to environmental authorisation(s), permit(s) or licence(s) applicable to the project. In cases where the project does not trigger any of the NEMA listed activities or any permit(s)/licence(s); the PES may be compiled to prescribe additional environmental management measures over and above the measures stipulated in the MERC.

5.3 Contractor's Environmental Policy

The Contractor's Environmental Policy must be signed and dated by Top Management.

The content of the Contractor's Environmental Policy must:

- be appropriate to the purpose and context of the Contractor's organization, including the nature, scale and environmental impacts of its activities, products and services;
- provide a framework for setting environmental objectives;
- include a commitment to the protection of the environment, including prevention of pollution and other specific commitment(s) relevant to the context of the Contractor's organization;
- include a commitment to fulfil compliance obligations; and
- include a commitment to continual improvement of the Contractor's environmental management system to enhance environmental performance

5.4 Contractor's Environmental Management Plan (EMP)

The Contractor's EMP must include:

- the name of the person who compiled the EMP;
- the expertise of the person who compiled the EMP, including a CV;
- a description of the Contractor's scope of work;
- a detailed description of the environmental aspects related to the Contractor's scope of work;
- a map at an appropriate scale which depicts all construction activities including associated structures, and infrastructure and environmental sensitivities affected by the construction footprint , as well as no go-areas and associated buffers;
 - The map must include the following:
 - an accurate indication of the project site position as well as the positions of the alternative sites, if any;
 - road names or numbers of all the major roads as well as the roads that provide access to the site(s)
 - a north arrow;
 - a legend;
 - the prevailing wind direction;
 - site sensitivities, including but not limited to vegetation, wetlands, watercourses, heritage sites, critical biodiversity area/s, World Heritage Site, etc. and it must be overlaid by the study area; and

- GPS co-ordinates (Indicate the position of the proposed activity with the latitude and longitude at the centre point for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should be to at least three decimal places. The projection that must be used in all cases is the WGS-84 spheroid in a national or local projection).
- a description of the impacts and risks that need to be avoided, managed and mitigated during the execution of the Contractor's scope of work including (as relevant);
 - planning and design;
 - pre-construction activities;
 - construction activities;
 - rehabilitation; and
 - operation of Transnet assets.
- a description and identification of impact management outcomes required for the identified aspects;
- a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated above will be achieved, and must, where applicable, include actions to:
 - avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
 - comply with any prescribed environmental management standards or practices; and
 - comply with any applicable local, provincial and national legislation.
- the method of monitoring the implementation of the impact management actions contemplated above;
- the frequency of monitoring the implementation of the impact management actions contemplated above;
- an indication of the persons who will be responsible for the implementation of the impact management actions;
- the timeframe within which the impact management actions contemplated above must be implemented;
- the mechanism for monitoring compliance with the impact management actions contemplated above;

- a program for reporting on compliance, taking into account the requirements of this document;
- an environmental awareness plan describing the manner in which:
 - the Contractor intends to inform his employees of any environmental risk which may result from his scope of work; and
 - risks must be dealt with in order to avoid pollution or the degradation of the environment.
- any specific information that may be required by Transnet.

5.5 Contractor's Environmental Officer (EO)

The Contractor's EO should have relevant environmental qualifications and experience required for the project. The level of qualifications and experience must be in line with the complexity of the Contractor's scope of work coupled with the sensitivity of the site. The level of competency will be determined by Transnet during tender.

5.6 Management of Sub-Contractors

The Contractor must ensure that all his sub-contractors comply with this document in so far as it relates to their specific scope of work or services.

5.7 Pre-Site Access Environmental Governance

The Contractor must appoint the EO recommended in his tender proposal. Should the EO no longer be available, the Contractor must submit a CV of an alternative EO with similar or better qualifications and experience for approval by the Transnet PM and PER. The same principle will apply if the Contractor's EO is replaced for whatever reason at any stage. No construction may take place without a duly appointed Contractor's EO.

The Contractor must provide his EO with all environmental documents provided by Transnet during tender and submitted as a part of the Contractor's proposal.

The Contractor must obtain the contact details of the responsible Transnet PER and Transnet PER and provide these details to his EO.

The Contractor's EO must develop an appropriate environmental file for approval by the Transnet PER, including but not necessarily limited to (the environmental file must always be available and up to date on the construction site):

- Documents from the tender as described above.
- His CV.
- An organogram indicating reporting lines of all Contractor's staff (with names included).
- Contact Information for: the overall responsible person acting on behalf of the Contractor to execute the construction works; Contractor's Construction Manager (CM); Contractor's EO; and all relevant emergency personnel.
- A list of the Contractor's plant and equipment indicating a description of the plant/equipment, its fuel capacity, any hazardous components (oils, greases etc.), individual service/maintenance cycles and noise levels.
- A list of hazardous substances to be used during construction indicating: official substance name from Material Safety Data Sheets (MSDS)/ Safety Data Sheet (SDS); quantity on site; storage method; transport method to site; and period to be used on site. All substances listed must have MSDS/ SDS on site in the environmental file.

The MSDS/ SDS should contain the following minimum requirements:

- Section 1: Product and company name
- Section 2: Hazard identification
- Section 3: Composition/information on ingredients
- Section 4: First aid measures
- Section 5: Fire fighting measures
- Section 6: Accidental release measure
- Section 7: Handling storage
- Section 8: Exposure controls/personal protection
- Section 9: Physical and chemical properties
- Section 10: Stability and reactivity
- Section 11: Toxicological Information
- Section 12: Ecological Information
- Section 13: Disposal Consideration

- Section 14: Transportation
- Section 15: Regulatory Information
- Section 16: Other Information
- Photographic pre-construction report that details the site before any activities commence.
- Site Layout Plan indicating but not necessarily limited to,: access roads, site offices, material laydown areas, stockpile areas and parking areas, waste and effluent storage and handling facilities, entire construction footprint, no-go-areas, sewage and sanitary facilities. The plan must be appropriately drawn on a computer and must be clearly visible and properly scaled.
- A site establishment method statement (minimum requirements for method statements are described below in this document).
- Environmental Induction Material to be used to educate site staff and visitors (minimum requirements for environmental induction are described below in this document).
- An activity-based environmental risk assessment.

The Contractor's EO must submit the environmental file for acceptance to the Transnet PER.

The Contractor must obtain a Site Access Certificate from the Transnet PM before accessing the site.

5.8 Safety Data Sheets

Each hazardous substance used on site must have a valid SDS. The SDS must comply with the requirements of the Occupational Health and Safety Act, 85 of 1993.

5.9 Environmental Induction

The Contractor will ensure that all management, foremen and the general workforce, as well as all sub-contractors, suppliers and visitors to site have attended the Transnet Environmental Induction Programme prior to commencing any work on site. Where new personnel commence work on site during the construction period, the Contractor will ensure that these personnel also undergo the Transnet Environmental Induction Programme and are made aware of the environmental specifications on site.

The Contractor must ensure that all of his personnel understand the requirements of the CEM SOP; MERC; EA, EMPr, relevant permits and licences and PES as relevant to their scope of work.

5.10 Environmental Method Statements

- Environmental Method Statements as identified by the Transnet PER based on the Contractor's activity-based environmental risk assessment will be written submissions by the Contractor to the Transnet CM and PER describing:
- The proposed activity, setting out the plant, equipment, materials, labour and method the Contractor proposes using to carry out an activity;
- The environmental management of site conditions – waste management, housekeeping, site establishment etc;
- Transportation of the equipment to and from site;
- How the equipment/ material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Description of potential positive and negative environmental impacts and how they will be managed;
- Conformance/ non-conformance with this document and any other statutory and best practice standards;
- Monitoring and reporting requirements;
- Records Management; and
- Any other information deemed necessary by the Transnet CM and Transnet PER as well as ECO where applicable.

The Environmental Method Statements will enable the potential positive and negative environmental impacts associated with the proposed construction activity to be identified and mitigation measures put in place. All method statements must be signed by the Contractor, Transnet CM and PER, with the addition of the ECO on authorized projects, thereby indicating that the works will be carried out according to the methodology described therein.

Activities may only commence once the Environmental Method Statements have been approved by the Transnet CM, Transnet PER and ECO (where relevant). In some instances, local authorities may also need to approve the method statements. This will be highlighted in the Project Environmental Specification, where applicable.

All changes to the original Environmental Method Statements must be approved by the Transnet PER and Transnet CM prior to implementation.

To enable timely approvals, the environmental method statements will be submitted to the Transnet CM and Transnet PER for review two (2) weeks prior to the intended date of commencement of the activity, or as directed by the Transnet Project Manager/CM.

Emergency construction activity Environmental Method Statements may also be required. The activities requiring Environmental Method Statements cannot commence if they have not been approved by the CM and PER or ECO.

NOTE: No advice, approval of method statements or any other form of communication from Transnet will be construed as an acceptance by Transnet of any obligation that indemnifies the Contractor from achieving any required level of performance. Further, there is no acceptance of liability by Transnet which may result from the Contractor failing to comply with the specifications, i.e. the Contractor remains responsible for achieving the required performance levels.

5.11 Environmental Occurrences (Incidents)

The Transnet PER shall provide the Contractor with the procedure to follow in managing environmental occurrences during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

In the event of an environmental occurrence, the Contractor must, as soon as is reasonably practicable:

- classify an environmental occurrence in line with the Transnet Environmental Management Occurrence process flow;

- take all reasonable measures to contain and minimise the effects of the occurrence, including its effects on the environment and any risks posed by the occurrence to the health, safety and property of persons;
- undertake cleanup procedures;
- remedy the effects of the occurrence; and
- assess the immediate and long-term effects of the occurrence on the environment and public health

5.12 Environmental Non-Conformances (Defects)

Environmental Non-Conformances shall be handled as per the terms and conditions of the Contract.

The Transnet PER shall provide the Contractor with the procedure to follow in managing environmental non-conformances during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

The Transnet Project Manager shall ensure that all Non-conformances are appropriately closed out within the timeframe specified in the Non-Conformance Report.

Any environmental non-conformance will be dealt with similarly to a Defect as defined in the Contract. A defect is due to non-compliance with the Works Information and it is the responsibility of the Contractor to correct the defect in order to ensure that the work takes place in accordance with the Works Information. Similarly, non-conformance/non-compliance with any other permit or licence will be regarded as a non-conformance with the Works Information. The Contractor is responsible for rectifying any defect (non-conformance) as defined above promptly.

The Contractor's EO shall be responsible to search for and identify non-conformances with the environmental specifications at inspection intervals agreed to with the Transnet PER. The Transnet PER shall also undertake such inspections on a monthly basis. If such monthly inspections indicate that any part of the Contractor's work is non-conformant with the environmental requirements, the Transnet PER shall advise the Transnet PM to issue a Defects Notification to the Contractor accordingly. The Contractor shall correct the non-

conformance (defect) within the timeframes specified in the report and notification and submit proof of such correction to the Transnet PER.

The Transnet PER shall not recommend that a Site Closure Certificate be issued to the Contractor if any non-conformances have not been properly closed out. In such an event, the Transnet Project Manager may also make use of any reasonable contractual means to rectify the non-conformance(s) as allowed by the Contract (retention moneys etc.).

5.13 Community Grievances (Public Complaints)

The Transnet PER shall provide the Contractor with the procedure to follow in managing community grievances during pre-site access governance.

The Contractor shall follow the procedure provided to him by the Transnet PER and maintain required records thereof.

5.14 Environmental Inspections and Audits

Environmental inspections and audits may be conducted using five basic techniques:

- Interviews with Contractor's staff including Sub-contractors and suppliers;
- Document review;
- Observations;
- Monitoring; and
- Measurement and verification.

Table 1 sets out the areas and aspects of the construction site that will be inspected or audited, the frequency of such inspections/audits, the inspector/auditor and the inspected party/auditee. It should be noted that the list is not exhaustive and that each site will have specific issues that will need to be inspected/audited.

Table 1: Details on Environmental Inspections/Audits (where Transnet is the Inspected Party/Auditee, respective Contractors must give full cooperation).

Place	Inspector/Auditor	Inspected Party/Auditee	Inspection/audit frequency
Construction Site	Contractor's Environmental Officer	Contractor	Daily/Weekly Inspection
Project (including all construction sites).	Transnet Project Environmental Resource/Project Environmental Manager	Contractor	Monthly Inspection
Project (including all construction sites)	Transnet Environmental Specialist: Assurance	Transnet Project Environmental Resource	As stipulated on the annual audit plan
Project (as defined in Environmental Authorisation)	Environmental Control Officer	Transnet (represented by Transnet Environmental Resource)	As stipulated in the Environmental Authorisation
Project (as defined in Water Use Authorisation)	Independent Auditor	Transnet (represented by Transnet Environmental Resource)	As stipulated in the Water Use Authorisation

The Contractor's EO will be required to conduct inspections of all work areas for which the Contractor is responsible, at intervals agreed to with the Transnet PER. Monitoring shall

be conducted as per the Contractor's approved EMP and all required records shall be maintained by the Contractor.

The Transnet PER will be required to conduct inspections of all work areas for which the Contractor is responsible on a monthly basis or at intervals agreed to with the Transnet Project Environmental Manager. Monitoring shall be conducted as per the Project Environmental Specification. The Inspection Checklist to be used shall be approved by the Transnet PER prior to each inspection.

5.15 Contractor's Environmental Performance

The Transnet PER will explain how the Contractor's performance will be scored during pre-site access governance to the Contractor's EO. The standard/minimum requirement for all environmental inspections will be 90%.

5.16 Site Planning and Establishment

The Contractor shall establish his construction camps, offices, workshops, eating areas and any other facilities on the site in a manner that does not adversely affect the environment. These facilities must not be sited in close proximity to sensitive areas; the buffer to be determined by the ecological requirements of the fauna/flora found on-site.

The site offices should not be sited in close proximity to steep areas. It is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles be located as far away as possible from any watercourse.

5.16.1 Site Layout Plan

The Site Layout Plan must as a minimum include but not limited to:

- Detailed layout of the construction works areas including access roads, site offices, material laydown areas, temporary stockpile areas and parking areas;
- Detailed locality and layout of all waste storage and handling facilities for litter, kitchen refuse and workshop-derived effluent;
- Proposed areas for the stockpiling of topsoil and excavated spoil material;
- Demarcation of the construction footprint including areas not to be disturbed by the development;

- Location of sewage and sanitary facilities at the site offices and staff accommodation at all localities where there will be a concentration of labour.

Any changes to the location of the facilities and site activities as per the approved site layout plan shall be re-submitted to the Transnet CM and Transnet PER for approval prior to implementation.

The Contractor may be required to submit a separate layout plan dealing only with his site camp. If so this will be specified in the PES.

5.16.2 Identification and Establishment of Suitable Access Routes/Roads

Existing access routes to the construction/works areas must be used as far as possible. The building of access roads must be restricted to prevent unnecessary disturbance of the surrounding environment. Access tracks must be maintained in a good condition at all times during construction to minimize erosion and dust generation.

5.16.3 Demarcation of Site Limits

Prior to the commencement of construction, the site must be clearly demarcated by means of visible barriers. Vegetation within the demarcated zone may be cleared only upon obtaining approval from the Transnet PER. No activities are allowed outside of the approved footprint on the Site Layout Plan.

5.16.4 Eating Areas

The Contractor is responsible for providing adequate eating facilities within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags/bins must be provided at all established eating areas and when full it should be disposed of appropriately.

5.16.5 Liquid Waste Management

Liquid waste water from site shall be stored on-site in a properly designed and constructed system, situated so as not to adversely affect water courses. Only domestic type wastewater, i.e. toilet, shower, basin, kitchen water shall be allowed to enter the designated system.

5.17 Sewage and Sanitation

The Contractor is responsible for providing adequate sanitary facilities including toilets, toilet paper, wash basins etc. to all workers on site and for enforcing the proper use of these facilities.

Toilet facilities shall be serviced regularly and the waste material generated from these facilities shall be disposed of at a registered waste water treatment works/macerator and relevant permits for transportation of waste and proof of servicing and disposal shall be maintained.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on site, and away from sensitive areas. Use of open areas (i.e. the veld) is not allowed. For projects of high mobility a mobile toilet facility shall be made available by the Contractor.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. Toilets must not be placed in areas susceptible to flooding and high winds. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such facilities in a clean, orderly and hygienic condition to the satisfaction of the Transnet CM.

5.18 Waste Management

Waste shall be grouped into “**general**” or “**hazardous**”, depending on its characteristics. The classification shall determine handling methods and the ultimate disposal of material.

General waste which is likely to be generated on site during construction include but not limited to the following:

- Trash (waste paper, plastics, cardboard, etc.) and food waste from offices, warehouses and construction personnel;
- Uncontaminated construction debris such as used wood and scrap metal; and
- Uncontaminated soil and non-hazardous rubble from excavation or demolition.

The Contractor shall classify all waste expected to be generated during the construction period. Examples of typical construction waste which could be expected on the site and how they should be classified are indicated in the following table:

TABLE 2: EXAMPLE OF CONSTRUCTION WASTE CLASSIFICATION

Waste	Classification	
	Hazardous	General
Aerosol containers	X	
Batteries, light bulbs, circuit boards, etc.	X	X
Clean soil		X
Construction debris contaminated by oil or organic compounds	X	
Domestic waste		X
Empty drums (depends on prior use)	X	X
Empty paint and coating containers		X
Explosive waste	X	
PCB waste	X	
Rubble (not contaminated by oil or organic compounds)		X
Waste Cable		X
Waste plastic		X
Waste paint and/or solvent	X	
Waste oil	X	
Waste concrete		X
Waste cement powder	x	
Waste empty cement bags (must be thoroughly decanted)		x
Waste containing fibrous asbestos	X	
Waste timber		X
Sewerage sludge	X	
Scrap metal		X

Waste	Classification	
	Hazardous	General
Chemically-derived sanitary waste	X	

Waste will be managed in accordance with the Waste Management Hierarchy depicted in Figure 1 below:

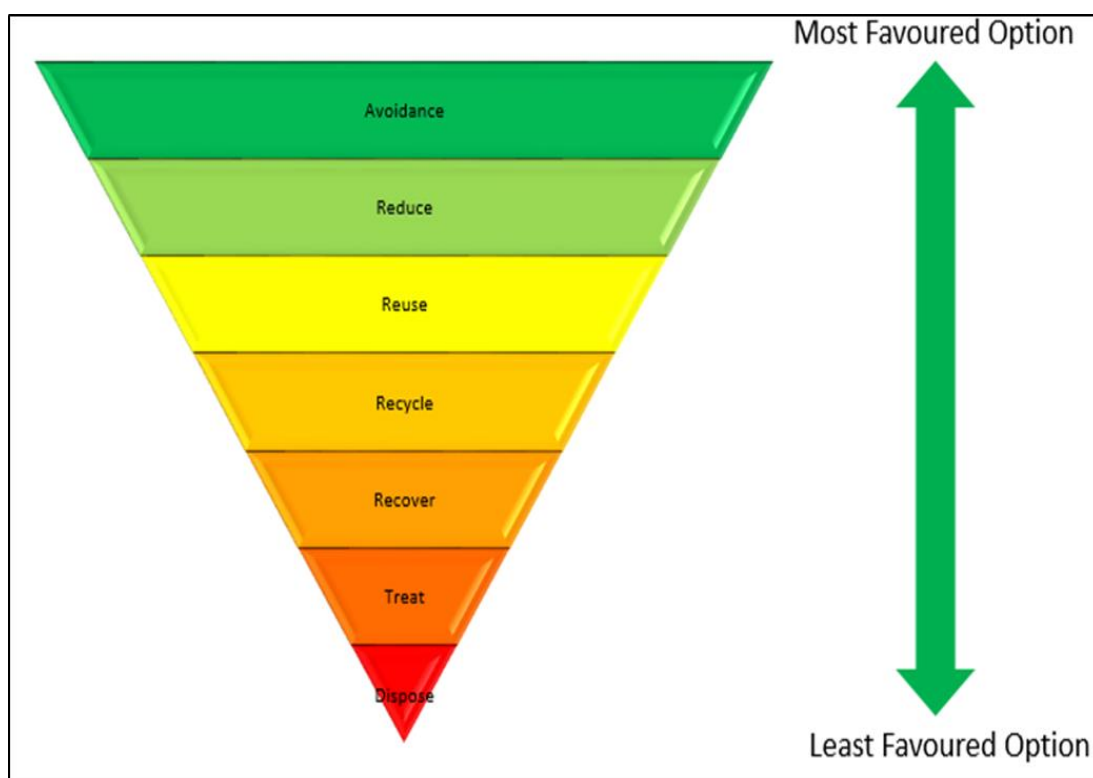


FIGURE 1: THE WASTE MANAGEMENT HIERARCHY

(Transnet Environmental Risk Management strategy and Framework, 2015:42)

- 1. Avoidance/Prevention:** using goods in a manner that minimises their waste components
- 2. Reduction/Minimisation:** reduction of the quantity and toxicity of waste generated during construction
- 3. Re-use:** removing an article from a waste stream for use in a similar or different purpose without changing its form or properties

- 4. Recycling:** separating articles from a waste stream and processing them as products or raw materials
- 5. Recovery:** reclaiming particular components or materials, or using the waste as a fuel
- 6. Treatment:** processing of waste by changing its form or properties in order to reduce toxicity and quantity
- 7. Disposal:** burial, deposit, discharge, abandoning or release of waste

The Contractor is responsible for the removal of all waste generated from site. The Contractor shall ensure that all waste is removed to appropriate licensed waste management facilities. (For the identification of an appropriate facility, the following source may be utilized: <http://sawic.environment.gov.za/>).

The Contractor shall manage **GENERAL WASTE** that is anticipated to be generated by operations as follows:

- Notify waste hauler when container is full so that it can be removed and replaced with an empty container/skip;
- No littering is allowed on site. In the event where staff mobility is high, refuse bags will be made available by the Contractor;
- Provide documented evidence of proper disposal of waste (Waste Disposal Certificate)

The Contractor shall recycle **GENERAL WASTE** (as far as practically possible) that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for the following (whichever relevant) and locate them at secure designated locations on site:
 - Office Waste;
 - Aluminium;
 - Steel;
 - Glass;
 - Ferrous Metals;

- Non Ferrous Metals; and
- Waste Timber
- Establish recycled material collection schedule;
- Arrange for full bins to be hauled away;
- Spent batteries, circuit boards, and bulbs, while non-hazardous, require separate storage, special collection and handling; and
- No burning, burying or dumping of waste of any kind will be permitted.

The Contractor shall manage **HAZARDOUS WASTE** anticipated to be generated by his operations as follows:

- Obtain and provide an acceptable container with correct and visible classification label;
- Place hazardous waste material in allocated container;
- Inspect the container on a regular basis as per the Contractor's EMP;
- Track the accumulation time for the waste, haul the full container to the registered hazardous disposal site;
- Notify the waste hauler when container is full so that it can be removed and replaced with an empty container/skip; and
- Provide documented evidence of proper waste disposal of the waste (Waste Disposal Certificate).

The Contractor shall maintain the following waste records for submission to the Transnet PER on request:

- Date of waste management activity;
- Activity Type (reuse, recycle, recover, treat, dispose);
- Description (e.g. contaminated soil, medical waste, tyres, plastic, domestic waste etc.)
- Classification (General/Hazardous);
- Estimated Quantity in kilograms
- Disposal Site Name and Reference Number (where relevant);
- Method of Transport; and
- Signed Collection or Disposal Records

5.19 Workshops, equipment maintenance and storage

All vehicles and equipment must be kept in good working order to maximise efficiency and minimise pollution. Maintenance, including washing and refueling of plant on site must be done at designated locations approved on the Site Layout Plan. The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities.

All machinery servicing areas must be bunded. Stationary plant that leak harmful substances shall not be permitted on site. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided and the wastewater should be disposed of appropriately in accordance with its waste classification.

5.20 Vehicle and Equipment Refueling

5.20.1 Stationary/Designated Refuelling

No vehicles or machines shall be serviced or refueled on site except at designated servicing or refueling locations included on the approved Site Layout Plan.

The Contractor shall provide details of his refueling activities in his EMP or Refueling Method Statement. Facility design shall comply with the regulations of the National Water Act, (Act 36 of 1998), the Hazardous Substances Act, (Act 15 of 1973), the Environmental Conservation Act, (Act 73 of 1989), National Environmental Management Act, (Act 107 of 1998), and the Occupational Health and Safety Act, (Act 85 of 1993), mainly the Construction - and Hazardous Chemical Substances Regulations.

5.20.2 Mobile Refuelling

In certain circumstances, the refueling of vehicles or equipment in a designated area is not a viable/practicable option and refueling has to be done from a tank, truck, bowser or container moved around on site. In such circumstances, the Contractor may request approval from the Transnet CM to conduct mobile refueling subject to the following control measures:

- Secondary containment equipment shall be in place. This equipment shall be sized to contain the most likely volume of fuel that could be spilt during transfer.

- Absorbent pads or drip trays are to be placed around the fuel inlet prior to dispensing.
- Mobile refueling units are to be operated by a designated competent person.
- The transfer of fuel must be stopped prior to overflowing. Fuel tanks or refueling equipment on vehicles may only be filled to 90% carrying capacity.
- Mobile fuelling equipment must be stored in areas where they are not susceptible to collisions.
- Mobile refueling operations shall not take place within 30 meters of any watercourses or 7.5 meter from other structures, property lines, public ways or combustible storage.

All mobile refueling tanks are to be properly labelled and fire extinguishers with valid service dates shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.

5.21 Spill Response

The Contractor shall have adequate spill response materials/equipment on site which must be aligned with the volumes of hazardous substances used on site and the risk of pollution to sensitive environmental features.

The Contractor shall have an approved Spill Response Plan, either in his EMP or in the form of a method statement approved by the Transnet CM and Transnet PER.

The Contractor shall instruct construction personnel on the following spill prevention and containment responsibilities:

- All plants to be inspected daily to ensure that they are in good condition;
- Immediately repair all leaks of hydrocarbons or chemicals;
- Take all reasonable measures to prevent spills or leaks;
- Do not allow sumps receiving oil or oily water to overflow;
- Prevent storm water runoff from contamination by leaking or spilled drums of oil or chemicals; and
- Do not discharge oil or contaminants into storm water or sewer systems.

If a spill occurs on land, the Contractor must:

- Immediately stop or reduce the spill;

- Contain the spill;
- Recover the spilled product;
- Remediate the site;
- Implement actions necessary to prevent the spill from contaminating groundwater or off-site surface water; and
- Manage the contaminated material in accordance with Waste Management requirements in this document.

Any spill to water has the potential to disperse quickly, therefore, the spill must be contained immediately using appropriate containment equipment.

If a spill to water occurs, the Contractor must:

- Take immediate action to stop or reduce the spill and contain it;
- Notify the appropriate on-site authorities;
- Implement actions necessary to prevent the spread of the contamination by deploying appropriate absorbent material;
- Recover the spilled product; and
- Manage the contaminated material in accordance with Waste Management requirements in this document. Water samples to be taken downstream from where the spill took place to trace the extent of pollution.

All spills must be recorded as occurrences and managed in accordance with the requirements for Occurrences in this document.

5.22 Spray Painting and Sandblasting

Spray painting and sandblasting must be kept to a minimum. All painting must, as far as practicable, be done before equipment and material is brought on site. Touch-up painting is to be done by hand painting or as per the approved EMP or Method Statement.

The relevant Contractor will inform his EO when and where spray painting or sandblasting will be carried out prior to commencement of work. The Contractor's EO will monitor these activities to ensure that adequate measures are taken to prevent contamination.

Sand may only be acquired from approved commercial sources and in instances where sand is collected from the natural surrounds, such collection must be approved by the Transnet PER.

If the area is in confined or high (elevated) areas, a protection plan must be issued for approval by the Transnet PER.

5.23 Dust Management

The usage of water for dust management will be minimized as far as practically possible. Discretion must be applied in this regard especially relating to drought conditions. Only water from approved sources may be used. Dust control measures must be approved by the Transnet PER prior to commencement of the Works.

The following minimum dust management practices must be implemented on site:

- Vehicles must be operated within speed limits, where no speed limit has been specified, the limit shall be 40km/h;
- Haulage distances must be minimized as far as reasonable practicable;
- Where water suppression is insufficient or impractical, environmentally friendly soil stabilizers must be used;
- Stockpiles and open areas that may cause dust must be stabilized and vegetated where required;
- Dust suppression measures must be implemented on inactive construction areas. (An inactive construction site is one on which construction will not occur for a month or more);
- Disturbance of natural vegetation must be minimized to reduce potential erosion, runoff, and air-borne dust;
- Material in transit must be loaded and contained within the load bin of the vehicle in such a way as to prevent any spillage or creation of dust clouds. If necessary, the load bin of the vehicle shall be covered with a tarpaulin;

5.24 Storm Water and Dewatering Management

Apart from runoff from overburden emplacements and stock piles, storm water can also be contaminated from batch plants, workshops, vehicle wash-down pads, etc., and contaminants during construction may include hydrocarbons from fuels and lubricants, sewerage from employee ablutions and excess fertilizer from rehabilitated areas, etc.

Discharges to controlled waters such as the sea, rivers, and groundwater or to sewerage systems are controlled under South African Water Legislation. The following specific measures are required:

- Temporary drainage must be established and maintained on site during the construction period until permanent drainage is in place. Secondary drainage that prevents erosion must be provided, where necessary.
- Contractors must employ good housekeeping in their areas to prevent contamination of drainage water.
- Stagnant water shall be cleared at a frequency approved by the Transnet PER.
- Any surface water flows off-site must be approved by the Transnet PER. Where necessary, silt traps shall be constructed to ensure retention of silt on site and cut-off ditches shall be constructed to ensure no runoff from the site except at points where silt traps are provided. The Contractor shall be responsible for checking and maintaining all silt traps for the duration of the project.
- The removal from groundwater is defined as a water-use under the National Water Act 36 of 1998. Therefore, it must be ensured that the project has been authorised by the Responsible Authority to remove and discharge groundwater prior to dewatering taking place. If applicable, the Contractor shall be responsible for collection, management, and containment within the site boundaries of all dewatering from all general site preparation activities.
- On-site drainage shall be accomplished in accordance with a plan approved by a suitably qualified civil engineer.

5.25 Erosion Control

Erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include, but not limited to the following:

- Activities must be scheduled to minimise the extent of disturbance of an area at any one time;
- Re-vegetation must be implemented as early as feasible;
- Construction traffic must be properly managed and controlled;
- Areas must be graded to the extent feasible at drainage ditches;
- Loose soil will be compacted as soon as possible after excavation, grading, or filling;
- Silt fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary berms or swales, small sedimentation basins must be used;
- The transport of sediment must be minimised;
- An erosion and sedimentation control plan must be developed, approved by the Transnet PER and communicated to staff; and
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls.

5.26 Noise Management

- The following specific measures are required:
- Keep all equipment in good working order;
- Operate equipment within its specification and capacity and don't overload machines;
- Apply regular maintenance, particularly with regards to lubrication;
- Operate equipment with appropriate noise abatement accessories, such as sound hoods;
- Relevant stakeholders shall be notified of any excessive noise-generating activities that could affect them;
- Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS 10103:2004 or the latest at the time, so that it will not produce excessive or undesirable noise when released;

- All the Contractor's equipment shall be fitted with effective exhaust silencers and shall comply with the South African Bureau of Standards recommended code of practice, SANS 10103:2004 or the latest at the time, for construction plant noise generation
- Contractor's vehicles shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road.
- If on-site noise control is not effective, protect the victims of noise by ensuring that all noise-related occupational health provisions are met. (Occupational Health and Safety Act, (Act 85 of 1993).

5.27 Protection of Heritage Resources

5.27.1 Archaeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the Transnet CM and Transnet PER of such a discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority is to be contacted and will appoint an Archaeologist to investigate the find. Work may only resume once clearance is given in writing by the Archaeologist.

5.27.2 Graves

If a grave is uncovered on site, or discovered before the commencement of work, all work in the immediate vicinity of the grave shall be stopped and the Transnet CM and PER informed of the discovery. The South African Heritage Resources Agency (SAHRA) or relevant Authority should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with the SAHRA, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred.

5.28 Fire Prevention

Fires shall only be allowed in facilities or equipment specially constructed for this purpose.

A firebreak shall be cleared and maintained around the perimeter of the camp and office sites where and when necessary. In cases where construction is taking place in a Critical Biodiversity Area as listed under NEM:BA; it must be ensured that the requirement of a firebreak is screened against the NEMA Listing Notice 3 to confirm legislative requirements.

All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented.

5.29 Water Protection and Management

No water shall be abstracted from any water course (stream, river, or dam) without the expressed permission of the Transnet CM and Transnet PER. Such permission shall only be granted once it can be shown that the water is safe for use, that there is sufficient water in the resource to meet the demand, and once permission has been obtained from the Department of Water and Sanitation in accordance with the requirements of the National Water Act (Act 36 of 1998).

Water for human consumption shall be available at the site offices and at other convenient locations on site. The generally acceptable standard is that a supply of drinking water shall be available within 200m of any point on the construction site.

Method Statement(s) must be prepared by the Contractor for the various water uses. The Contractor shall keep a record of the quantities of water used on-site during construction (including use by sub-contractors), irrespective of the purpose of use.

5.30 Protection of Fauna and the collection of firewood

On no account shall any hunting or fishing activity of any kind be allowed. This includes the setting of traps, or the killing of any animal caught in construction works.

On no account shall any animal, reptile or bird of any sort be killed. This specifically includes snakes or other creatures considered potentially dangerous discovered on site. If such an animal is discovered on site, an appropriately skilled person should be summoned to remove the creature from the site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

The Contractor shall provide adequate facilities for all his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The Contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

5.31 Environmental Awareness Training

An Environmental Awareness Program is considered a necessary part of the Construction Environmental Management Plan for the Project. Training of the appropriate construction personnel will help ensure that all environmental regulations and requirements are followed which must be defined in the relevant Method Statement to be prepared by the Contractor.

Objectives of environmental awareness training are:

- Environmental Management – protecting the environment from the effects of construction by making personnel aware of sensitive environmental resources.
- Regulatory compliance – complying with requirements contained in project – specific permit conditions, also complying with requirements in regional and local regulations.
- Problem recognition and communication – training personnel to recognise potential environmental problems, i.e. spills, and communicate the problem to the Contractor's EO for a solution.
- Liability control - non-compliance with regulatory requirements can lead to personal and corporate liability.

All individuals on the Project construction site will need to have a minimum awareness of environmental requirements and responsibilities. However, not all need to have the same degree of awareness. The required degree of knowledge is greatest for personnel in the Safety, Health, and Environmental Sections and the least for the manual personnel.

The Contractor shall present environmental awareness programmes on a weekly/bi-monthly basis (depending on project requirements) and keep record of all the environmental related training of the personnel.

5.32 Handling and Batching of Concrete and Cement

Concrete batching shall only be conducted in demarcated areas which have been approved by the Transnet CM and Transnet PER.

Such areas shall be fitted with a containment facility for the collection of cement-laden water. This facility shall be bunded and have an impermeable surface protection so as to prevent soil and groundwater contamination. Drainage of the collection facility will be separated from any infrastructure that contains clean surface runoff.

The batching facility will not be placed in areas prone to floods or the generation of stagnant water. Access to the facility will be controlled so as to minimise potential environmental impacts. Hand mixing of cement and concrete shall be done on mortarboards and/or within the bunded area with impermeable surface or concrete slab. Bulk and bagged cement and concrete additives will be stored in an appropriate facility at least 10m away from any watercourses, gullies and drains.

Waste water collected in the containment facility shall be left to evaporate. The Contractor shall monitor water levels to prevent overflows from the facility. It is acknowledged that all waste water will evaporate; it must be ensured that the remaining water can be pumped into sealed drums for temporary storage and must be disposed of as liquid hazardous waste at an authorised hazardous waste management facility.

All concrete washing equipment, such as shovels, mixer drums, concrete chutes, etc. shall be done within the approved washout facility. Water used for washing shall be restricted as far as practically possible.

Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated and approved by the Transnet CM and PER for this purpose.

The Contractor shall periodically clean out hardened concrete from the wash-out facility or concrete mixer, which can either be reused or disposed of as per accepted waste management procedures.

Empty cement and bags, if temporarily stored on site, must be collected and stored in weatherproof containers. Used cement bags may not be used for any other purpose and

must be disposed of on a regular basis in accordance with the Contractor's solid waste management system.

Sand and aggregates containing cement will be kept damp to prevent the generation of dust.

Concrete and cement or any solid waste materials containing concrete and cement will be disposed of at a relevant registered disposal facility and SDCs kept on the file. Where disposal facilities for general waste are utilised, written consent from the relevant municipality must be obtained by the Contractor and filed in the Green file.

5.33 Stockpiling, Soil Management and Protection of Flora

The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated. Sensitive areas shall be cordoned off and avoided in this regard.

Stockpiling may only take place in designated areas indicated on the approved site layout plan. Any area to be used for stockpiling or material laydown shall be stripped of all topsoil.

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works. Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible when and where necessary. The detail of vegetation clearing shall be subject to the Transnet CM's approval and shall occur in consultation with the Transnet PER.

Stockpiles must be positioned in areas sheltered from the wind and rain to prevent erosion and dispersion of loose materials. Stockpiled soil shall be protected by adequate erosion-control measures. Soil stockpiles shall be located away from drainage lines, watercourses and areas of temporary inundation. Stockpiles containing topsoil shall not exceed 2m in height unless otherwise permitted by Transnet.

Topsoil shall be stockpiled separately from other materials and prevented from movement. Excavated subsoil, where not contaminated, must be used for backfilling, if possible, and topsoil for landscaping and rehabilitation of disturbed areas. Where topsoil

has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil shall be provided by the Contractor.

No vegetation located outside the construction site shall be destroyed or damaged. As far as is reasonably practicable, existing roads must be used for access to the site. Before site clearance takes place, vegetation surveys must be conducted and protected species identified.

No protected plant species shall be removed without written consent from the relevant authorities. The development of new embankments or fill areas must be undertaken in consultation with the Transnet PER.

No dumping of solid waste or refuse shall be allowed within or adjacent to areas of natural vegetation.

The Contractor shall identify and eradicate all declared alien and invasive plant species occurring on site.

5.34 Traffic Management

Vehicles usage is permitted only on access roads. Vehicles should only be parked within designated parking areas as demarcated on the site layout plan.

Turning of vehicles should only take place within a clearly demarcated "turn area" located within the approved construction footprint.

The Contractor must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any one time and that side-tracks are not created on the site.

5.35 Transportation of Materials

The Contractor is responsible for ensuring that all suppliers and delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of the SOP CM and this Specification. Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover, where ADTs are not utilised, to prevent spillage from the vehicles. The Contractor will be held responsible for any clean-up resulting from the failure to properly secure transported materials.

5.36 Borrow Pits and Quarries

The Contractor shall ensure that suppliers of rock and sand raw materials are in possession of the required permit/license and keep record of the quantity of material supplied.

The Contractor will not make direct use of any borrow pits and quarries unless the borrow pit has a valid permit, he has obtained written approval from the Transnet CM and Method Statement has been submitted and approved. The Method Statement will provide the detailed description of the location of the borrow pits and/or quarries and the procedures that will be followed to adhere to any pertinent national or local legislation (e.g. mineral extraction, rehabilitation, safety and noise levels).

5.37 Social and Labour Issues

The criteria for and selection of labourers, sub-contractors and suppliers for the project shall demonstrate preference for the local community and shall be aligned with the criteria set by Transnet SOC Ltd in appointing the Contractor. The Contractor shall keep records of the identity of all staff.

Under no circumstances shall the Contractors engage in formal discussions with landowners without prior consent by the Transnet CM.

No activity on private property shall be allowed without written consent by the relevant landowner and Transnet CM/Transnet PER.

Any damage to private property caused by the Contractor during the construction period, shall be repaired to the satisfaction of the Transnet CM, the Transnet PER and the landowner.

The Contractor shall keep record of any complaint raised during the construction period relating to the Contractor's activities.

No job-seekers shall be allowed on site and signs reflecting such shall be displayed on the notice boards.

5.38 Energy Management

The Contractor shall measure and keep updated records of the following:

- Electricity consumption (to be measured in Kilowatt Hours)
- Fuel consumption (to be measured in liters)

5.39 Handling, Storage and Management of Hazardous Substances

All hazardous materials/substances shall be stored in a secured, designated area that is fenced, bunded and has restricted entry.

All storage shall take place using suitable containers to the approval of the Transnet CM and PER.

All hazardous liquids shall be located in a secure, demarcated area and an adequate bund wall (110% of the total volume stored) shall be provided. The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled/leaked liquids into the soil.

No spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area.

Hazard signs indicating the nature and volume of the stored materials shall be displayed on the storage facility or containment structure.

Weigh bills of hazardous substances shall be sourced from suppliers and kept on site for inspection by the Transnet PER.

The Contractor must provide a method statement detailing the hazardous substances that are to be used during construction, as well as the storage, handling and disposal procedures for each substance. Emergency procedures in the event of misuse or spillage that might negatively affect the environment must be specified.

Information on each hazardous substance will be available to all persons on site in the form of MSDS/SDS. Training and education about the proper use, handling, and disposal of the material will be provided to all workers handling the material.

The Contractor's EO must be informed of all activities that involve the use of hazardous substances to facilitate prompt response in the event of a spill or release.

5.40 Housekeeping

The Contractor must ensure proper housekeeping of the site for the duration of the project. If practical the contractor shall amongst construction personnel, assign one to be responsible for good housekeeping

Materials shall be stored in a neat and tidy manner in designated areas as per the approved site layout plan.

5.41 Rehabilitation

Contractors shall rehabilitate the entire site upon completion of work. Where applicable, rehabilitation must be in line with the measures outlined in the Project Environmental Specification. A rehabilitation plan will be submitted to the Transnet CM and PER for approval at least six weeks before project completion. The following, but not limited are critical issues to be included in the rehabilitation plan:

- Details of soil preparation procedures including proposed fertilisers or other chemicals being considered for use;
- A list of the plant species that will be used in the rehabilitation process. Note that these should all be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified Botanist/Horticulturist should be sought in developing this list;
- Procedures for watering the planted areas (frequency of watering, methodology proposed etc.);
- An indication of the monitoring procedures that will be put in place to ensure the successful establishment of the plants (duration and frequency of monitoring, proposed criteria for declaring rehabilitation as being successful); and
- Procedures for the prevention of the establishment and spread of alien invasive species.

5.42 Documentation and Records Management

The Contractor's EO will complete and maintain copies of all documents and records and ensure that these documents and records are kept up to date.

The Contractor's EO will submit these documents to the Transnet PER on a frequency as agreed to with the Transnet PER, except where documents have remained unchanged in which case written notification to this effect must be provided to the Transnet PER. The Contractor's EO must ensure that electronic copies of these documents are saved on the Transnet system.

Once the construction activities have been completed and the Transnet PER has conducted a site closure inspection and notified the Contractor that site closure will be granted, all documents described above must be handed over to Transnet after which a Site Closure Certificate will be issued by the Transnet Project Manager.

NOTE: All documents/records are to be retained, within the Transnet Document Control System, for a period of 10 years. In the event of environmental documentation/record being lost before receiving a Site Closure Certificate, the Contractor will be penalised according to the specifications laid down in the Contract.

6. RECORDS

Refer to CEM SOP.

7. ANNEXURES

None.

STANDARD OPERATING PROCEDURE

CONSTRUCTION ENVIRONMENTAL MANAGEMENT

Document number	009-TCC-CLO-SUS-11386
Version number	1.0
Classification	Unclassified
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SUMMARY VERSION CONTROL

[illegible]

Note: Only latest amendments and/or additions are reflected in italics in the body of the document.

DOCUMENTATION SIGN-OFF SHEET

I, the undersigned hereby approve this procedure.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Process Owner:	Senior Specialist: Environmental Compliance and Permitting		01/10/2023
Accepts document for adequacy and practicability. Comments:			
Sponsor:	General Manager: Corporate Sustainability		01/10/2023
Approves document for use. Comments:			

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1. PURPOSE

- 1.1** The purpose of this Standard Operating Procedure (SOP) is to define how environmental management will be practiced on any construction project under the management of Transnet to ensure that the environment is considered, negative impacts avoided or minimized, and positive impacts are optimized and/or enhanced throughout the lifecycle of the asset.
- 1.2** It further defines environmental management responsibilities for key stakeholders involved in the construction management process.
- 1.3** It must be read in conjunction with the Contractor Environmental and Sustainability Specification Guidelines (CESSG) and the Project Environmental Specification (PES) relevant to the project.
- 1.4** In this document, unless the context clearly indicates otherwise:
- Words importing any one gender shall include the other gender.
 - The singular shall include the plural and vice versa; and
 - Any reference in this document to legislation or subordinate legislation is to such legislation or subordinate legislation at the date of promulgation thereof and as amended and/or re-enacted from time to time.

2. APPLICABILITY

- 2.1** The SOP applies to any construction project under the management of Transnet SOC Ltd or its Construction Agent.

3. REFERENCE DOCUMENTS

Name	Applicable Section
Constitution of South Africa, Act 108 of 1996	Section 24 (a) right to an environment that is not harmful to health or wellbeing Section 24(b) (i) right to have environment protected for current and future generations through legislation and measures that prevents pollution and ecological degradation.
Capital Governance and Assurance Policy	Entire document
Capital Governance and Assurance Framework	Entire document
Capital governance and Assurance Manual	Entire document.
PLP Manual – Execution	Entire document
National Environmental Management Act, 107 of 1998	Section 2 National Environmental Management Principles (4) (viii), (e), (h), (j) and (p).
National Water Act, 36 of 1998	Section 164, Permissible Water Use Section 19
National Environmental Management: Waste Act, 58 of 2008	Part 1 15 (1) (i) and (2) Part 6 26 (10) (a) and (b) Scheduled 3, Defined Wastes Category B: Hazardous Wastes Part 8: Contaminated Land
Environment Conservation Act, 73 of 1989	Section 20
Occupational Health and Safety Act, 85 of 1993	Asbestos Regulations, 2001 Government Notice R155 in Government Gazette 23108 of February 2002

Name	Applicable Section
	General Safety Regulations-Reg. 2 (2) PPE
GNR 326, 7 April 2017 as amended, EIA Regulations	Chapter 15
Integrated Management System – Policy Statement Procedure (TRN-IMS-GRP-PROC-002)	Whole document
Integrated Management System – Competency, Awareness and Training Procedure	Whole document
Integrated Management System¹ – Document, Data and Record Management Procedure (TRN-IMS-GRP-PROC-010)	Whole document
Integrated Management System – Occurrence and Non-Conformance Management Procedure (TRN-IMS-GRP-PROC-013)	Whole document
Transnet Environmental Risk Management Strategy and Framework	2015:42
Environmental Management Systems ISO 14001: 2015	Clause 5, 6, 7, 8, 9 and 10

¹ Management of certain documents, data and records will be in accordance with NEC3 – Engineering and Construction Contract prescripts

4. DEFINITIONS AND ABBREVIATIONS

4.1 DEFINITIONS

Compliance	The action or fact of complying with legislation or regulations.
Conformance	The action or fact of conforming to this standard and other internal Transnet policies, procedures, guidelines and best practice.
Contractor	The Principal Contractor as engaged by Transnet for infrastructure construction operations, including all sub-contractors appointed by the main contractor of his own volition for the execution of parts of the construction operations; and any other contractor from time to time engaged by Transnet directly in connection with any part of the construction operations which is not a nominated sub-contractor to the Principal Contractor.
Contractor Environmental and Sustainability Specification Guidelines (CESSG)	A set of minimum environmental standards for all Transnet SOC Ltd-managed construction sites.
Corrective Action	It is generally a reactive process used to address problems after they have occurred. Corrective action may be triggered by a variety of events, e.g. Non-conformance to documented procedures and work instructions, non-conformances raised through internal audits, unacceptable monitoring and measurement results, internal & external SHEQ complaints, etc.
Emergency	Sudden unforeseen event needing immediate or prompt action.

Environment	Surroundings in which the Contractor operates, including air, water, land, natural resources, flora, fauna, humans and their interrelations.
Environmental Aspect	Element of an organization's activities or products or services that interacts or can interact with the environment
Environmental Authorisation (EA)	Environmental Authorisation is the authorisation granted by a competent authority of a listed activity or specified activity in terms of National Environmental Management Act 107 of 1998 (as amended).
Environmental Impact	Change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects
Environmental Management Plan (EMP)	A plan generated by the Contractor describing the relevant roles and responsibilities and how potential environmental risks will be assessed and managed including the monitoring and recording thereof.
Environmental Management Programme (EMPr)	A programme that has been approved by the Competent Authority in terms of NEMA, 107 of 1998 stipulating information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified
Environmental Risk	The product of the likelihood and severity of an unforeseen occurrence/incident/aspect and the impact it would have, if realised, on the environment

Incident/Occurrence	An undesired event occurring at work that results in physical harm to a person or death, or damage to the environment, plant and/or equipment, and/or loss of production.
Non-conformance	An action or situation that does not conform to Transnet's SHEQ standards, procedures or legislative requirement(s) and that can be, or lead to, an unacceptable SHEQ incident.
Non-compliance	Contravention to environmental legislative requirements.
Project Environmental Specification (PES)	Describes standards specific to a particular project. Variations and additions to the CESSG are set out in this PES. These would include the EA issued to the project or elements generally drawn from the EA or permits for that project or from specific requirements set by the Transnet Operating Divisions. The PES may also require a more stringent standard to that described in the CESSG if required by the EA or a particular industry code to which Transnet subscribes including any environmental constraints at a construction site.
Sub -Contractor	A person or organisation who has a contract with the contractor to - Construct or install part of the contractors work. - Provide a service necessary to provide the works; or - Supply plant and materials which the person or organisation has wholly or partly designed specifically for the works.

4.2 ABBREVIATIONS

Acronym	Meaning in Full
CESSG	Contractor Environmental and Sustainability Specification Guidelines
CM	Construction Manager
CV	Curriculum Vitae
CEM	Construction Environmental Management
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECO	Environmental Control Officer
EO	Environmental Officer
EMI	Environmental Management Inspectorate
NCR	Non-conformance Report
NEMA	National Environmental Management Act 107 of 1998 (as amended)
PER	Project Environmental Resource
PES	Project Environmental Specification
PLP	Project Life-cycle Process
PM	Project Manager

Acronym	Meaning in Full
SAHRA	South African Heritage Resources Agency
SOP	Standard Operating Procedure
SHEQ	Safety, Health, Environment and Quality
Transnet	Transnet SOC Ltd

5. ACCOUNTABILITY, RESPONSIBILITY AND AUTHORITY

5.1 Transnet Procurement Department

5.1.1 Ensures that this SOP (and relevant associated environmental specifications) is included in any construction-related request whether open market, quotation or confinement process.

5.1.2 The Procurement Department shall further ensure that the relevant environmental personnel are consulted during tender review, tender evaluation and contract award.

5. Transnet Project Manager (PM)

5.2.1 Takes overall accountability for the project including ensuring that this SOP is implemented by all relevant stakeholders.

5.2.2 The specific tasks during construction will include:

- Appointment of the Transnet Environmental Resource/s;
- Certifying site access to the Contractor;
- Giving instructions to the Contractor on recommendation from the Transnet Environmental Resource/s (e.g. defects, non-conformances etc.); and
- Certifying site closure to the Contractor.

5.3 Transnet Project Environmental Resource

5.3.1 The Transnet Project Environmental Resource (PER) will be responsible for ensuring that this SOP and associated specifications or requirements are complied with. The Transnet PER will report functionally to the relevant PM.

5.3.2 The specific tasks will include:

- Preparation of the PES;
- Tender evaluation, development of environmental criteria and adjudication thereof;
- Liaison with the relevant environmental Competent Authorities;

- Review and approve site layout plan including any subsequent revisions thereof;
- Environmental Induction of Contractor's staff;
- Generate an inspection checklist prior to construction commencement;
- Review and Sign off Method Statements prepared by Contractor;
- Prepare environmental monitoring protocols/checklists to be used during construction;
- Prepare monthly conformance audit reports, including sign-off on Monthly Inspection Reports;
- Conduct monthly observation & inspections of all work places based on the approved inspection checklist;
- Audit conformance to Method Statements;
- Monitor the Contractor's compliance with this SOP and any other environmental requirements relevant to the site;
- Develop an Audit Finding and Close out Register that documents all audit findings, close out actions and the time frame allowed for in order to close the finding/s;
- Ensure that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules;
- Measurement of completed work (e.g. areas top soiled, re-vegetated, stabilised etc.);
- Attendance at scheduled SHE meetings, as and when required, and project coordination meetings;
- Ensure that site documentation (permits, licenses, EA, EMP, SOP-CEM, method statements, audit reports, waste disposal slips etc.) related to environmental management is maintained on the relevant Document Control System;
- Inspect and report on environmental incidents and check corrective action;
- Keep a photographic record of all environmental incidents;

- Environmental incident management as required by Transnet policies and procedures;
- Implementation of environmental-related actions arising out of the minutes from scheduled meetings;
- Management of complaints register;
- Conduct any environmental incident investigations;
- Coordinate and/or facilitate any environmental monitoring programmes e.g. EMI Inspections, ECO Audits, Transnet Environmental Assurance Audits etc.
- Collate information received, including monitoring results into a monthly report that is supported with photographic records to the Transnet CM and Transnet PM showing progress against targets; and
- Report environmental performance of the project on a monthly basis through relevant governance channels.

5.3.3 The tasks stipulated above may be conducted by one or more Project Environmental Resource, depending on the scale, complexity and sensitivity of the environment. Discretion to be taken by the Environment Lead within the area of control of the project site.

5.4 Transnet Construction Manager (CM)

5.4.1 The Transnet Construction Manager (CM) has overall responsibility for environmental management on site and reports to the Transnet PM. The Transnet CM is supported by the Transnet PER.

5.4.2 The specific tasks during the construction stage will include:

- Reviewing the monthly reports compiled by the Transnet PER;
- Approving method statements prepared by the Contractor;
- Communicating directly with the Contractor on environmental issues observed on-site; and
- Escalating any relevant environmental matters to the Transnet PM.

5.6 Environmental Control Officer

5.6.1 The Environmental Control Officer is an independent person legally appointed to monitor compliance of construction related activities with the conditions of the Environmental Authorisation. The ECO fulfils an autonomous role and submits reports to the Competent Authority at timeframes specified in the Environmental Authorisation.

5.6.2 The Environmental Control Officer will conduct the following tasks:

- Monitors compliance to the conditions of the EA, Environmental Management Programme (EMPr) and can include permits and licences applicable to a project;
- Attends project meetings as and when required;
- Conducts audits at a frequency stipulated on the EA/EMPr; and
- Compiles audit reports and submits them to relevant authorities.

5.7 Contractor's Environmental Officer

5.7.1 The Contractor's Environmental Officer (EO) must ensure implementation of the requirements of this SOP on site.

5.7.2 The Contractor's EO will liaise with the Transnet PER on site. It will be the responsibility of the Contractor's EO to ensure that all work is conducted according to the approved Method Statements and that the Contractor team's roles and responsibilities as set out in this document are fulfilled.

5.7.3 The Contractor EO's tasks will include:

- Developing an appropriate environmental file for approval by the Transnet PER prior to site access, including but not necessarily limited to (the environmental file must always be available and up to date on the construction site):
 - All environmental documents provided by Transnet in the tender e.g. policies, SOPs, standards, environmental approvals;

- Contractors commitments to comply with this SOP and associated documents as signed during tender;
- The Contractor's EMP;
- His/her CV;
- An organogram indicating reporting lines of all Contractor's staff (with names included);
- Contact Information for: the overall responsible person acting on behalf of the Contractor to execute the construction works; Contractor's CM; Contractor's EO; all relevant emergency personnel;
- A list of the Contractor's plant and equipment indicating a description of the plant/equipment, its fuel capacity, any hazardous components (oils, greases etc.), individual service/maintenance cycles and noise levels;
- A list of hazardous substances to be used during construction indicating: official substance name from Material Safety Data Sheet (MSDS); quantity on site; storage method; transport method to site; period to be used on site (all substances listed must have an MSDS on site in the environmental file);
- Site Layout Plan indicating but not necessarily limited to, access roads, site offices, material laydown areas, stockpile areas and parking areas, waste and effluent storage and handling facilities, entire construction footprint, no-go-areas, sewage and sanitary facilities. The plan must be appropriately drawn on a computer and must be clearly visible and properly scaled;
- A site establishment method statement (for more details on what method statements should entail the Contractor must refer to the Minimum Requirements for Construction Environmental Management)
- Conducting an activity-based environmental risk assessment based on the Contractor's scope of work;
- Agreeing on an appropriate inspection schedule with the Transnet PER (either daily or weekly);

- Ensuring that all required Contractor staff attends the environmental induction to be given by the Transnet PER (any Contractor's staff, sub-contractors or visitors to site must subsequently be inducted by the Contractor's EO);
- Inspection of the work area(s) as per schedule or authorised through written instruction by Transnet PER;
- Preparing activity-based Method Statements that indicate how environmental risks will be managed on site OR ensuring that the necessary environmental information is included in the Contractor's method statements (all method statements must be maintained in the Contractor's Environmental File);
- Identify local, provincial and national environmental legislation that applies to the Contractor's activities;
- Conduct ongoing Environmental Awareness Training of the Contractor's site personnel;
- Reporting, investigating and recording of any environmental incidents caused by the Contractor or due to the Contractor's activities, including their sub-contractors and visitors;
- Close out of environmental incidents;
- Attendance at all SHE meetings and induction programmes, and toolbox talks where required
- Monitor Waste Management;
- Monitor Water Management;
- Monitor Energy Management;
- Ensure that environmental signage and barriers are correctly placed;
- Taking required corrective action within specified time frame and close out of non-conformances; and
- Maintain site documentation related to environmental management on site.

5.7.4 The Contractor's EO will be expected to submit reports to the Transnet PER on a daily/weekly basis.

5.8 The Contractor

- 5.8.1 The Contractor shall comply with the requirements of this SOP and abide by the Transnet PM's instructions regarding the implementation of this SOP.
- 5.8.2 The Contractor must confirm that he will conform to the requirements of this SOP and any other documents provided to him by Transnet during tender.
- 5.8.3 The Contractor must recommend a suitably qualified, competent person to fulfill the role of the Contractor's EO at tender and if accepted by Transnet this person must be appointed when the Contract is awarded for the duration of construction. Should this person be replaced for whatever reason, the Contractor shall ensure that a person of similar qualification and competency is appointed in his/her place before the previous incumbent vacates his/her position.
- 5.8.4 The Contractor must obtain any relevant environmental approvals required by his activities that have not been obtained by Transnet e.g. permits for the destruction of protected plant species; grave relocation permits etc.
- 5.8.5 The Contractor shall have overall accountability for environmental compliance on site and will be held liable for any non-compliance with environmental statutes or non-conformances with this SOP due to his negligence.

5.9 Reporting Lines

- 5.9.1 The organisational structure identifies and defines the responsibilities and authority of the various entities involved in the project. All instructions and official communications regarding environmental matters will follow the organisational structure shown in Figure 1.
- 5.9.2 All instructions that relate to the SOP will still be given to the Contractor via the Transnet PM. In an emergency situation, however, the Transnet PER may give an instruction directly to the Contractor. Environmental Management of the site will be an item on the agenda of the monthly site meetings, and the Transnet PER will attend these meetings on request by the contractor. If at any time the Transnet

PM is uncertain in any way with respect to an environmentally related issue or specification in the SOP, he will consult with the Transnet PER .

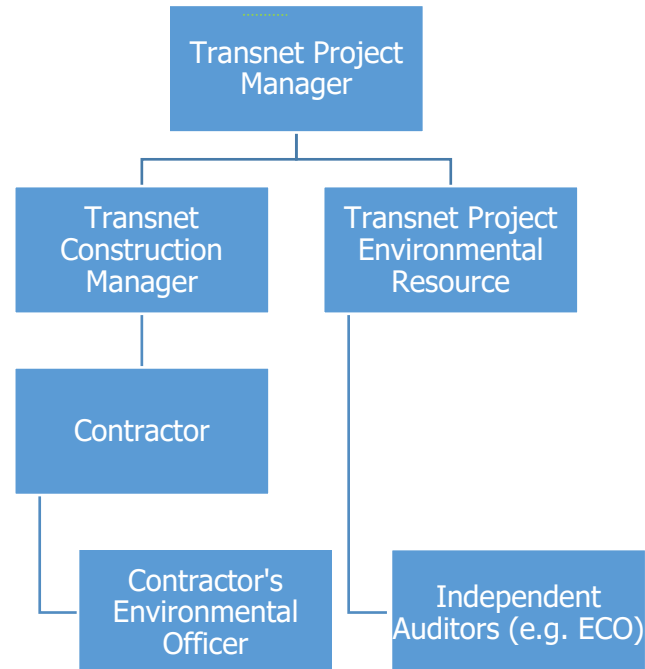


Figure 1: Typical Transnet Organogram for Construction Environmental Management²

6. STANDARD OPERATING PROCEDURE

6.1 Tender Stage (prior to Contract Award)

- The Transnet PM appoints or assign a Project Environmental Resource/s³.
- The Transnet PER requests the draft tender from the Transnet Procurement Department
- Transnet Procurement routes the draft tender to the Transnet PER

² Structure dependent on OD own structure and organizational operating model

³ Project complexity will determine the final environmental management structure on the project.

- The Transnet PER ensures the tender includes all relevant environmental documents and signs the routing slip.
- The Transnet Procurement Department issues the tender to prospective Contractor(s).
- The Contractor submits his bid which MUST include: a commitment to conform to this SOP signed by the duly delegated person; recommendation of a suitably qualified, competent person to fulfill the role of the Contractor's EO; Environmental Policy; and EMP
- After submission the Transnet Procurement Department will invite the Transnet PER to evaluate tender submissions (environmental section);
- The Transnet PER evaluates the prospective Contractor's environmental submission.
- The Contract is awarded to the successful bidder.

6.2 Construction Stage (prior to Site Access)

- The Contractor appoints the Contractor's Environmental Officer (EO) accepted by Transnet SOC Ltd.
- The Contractor provides his EO with all documents submitted during tender, including but not necessarily limited to:
 - All environmental documents provided by Transnet in the tender e.g. policies, SOPs, standards, environmental approvals etc;
 - commitment to conform to this SOP; and
 - The EMP.
- The Contractor's EO conducts an activity-based environmental risk assessment;
- The Contractor's EO develops an appropriate environmental file for approval by the Transnet PER, including but not necessarily limited to all the documents specified in Section 5.7 above (the environmental file must always be available and up to date on the construction site);
- The Contractor's EO submits the environmental file for acceptance to the Transnet PER;

- Once accepted, the Transnet PER recommends that site access be granted to the Transnet PM; and
- The Transnet PM issues the Contractor with a Site Access Certificate

6.3 Construction Stage (post Site Access)

- The Transnet PER inducts all Contractor's staff on the environmental requirements of the site;
- The Transnet PER has an inception meeting with the Contractor's EO on site where the following is agreed:
 - The contents of the contractor's environmental file (in addition to what was approved prior to granting site access). This will include but not necessarily be limited to: a list of interested and affected parties that may be impacted by construction e.g. surrounding landowners, nearby communities etc.; energy consumption information; water use information; environmental induction and awareness information; activity-based environmental method statements; complaints records; record of external communications; environmental incident reports; minutes of contractors environmental meetings.
 - The composition of the Project Environmental Specification (PES) and how it will be implemented. This will include but may not necessarily be limited to: Environmental Approvals (e.g. Environmental Authorisations, Water Use Licenses, Waste Management Licences, Atmospheric Emissions Licences etc.); Environmental Management Programmes/Plans approved by external parties/authorities; and any third party auditors/monitoring specialists (e.g. Environmental Control Officers; Independent Auditors; Transnet Environmental Assurance Specialists; Water Quality Monitoring experts etc.) that have a bearing on the contractor's scope of work.
 - The frequency of inspections to be conducted by the Contractor's EO (e.g. daily, weekly etc.)
 - The frequency of inspections to be conducted by the Transnet PER (e.g. daily, weekly and/or monthly). Notwithstanding that the frequency of

Transnet PER inspections will be agreed, the Contractor may never refuse the Transnet PER

- The format used and elements to be checked during Contractor's inspections
 - Reporting frequency and requirements
 - The process to be followed in handling Environmental Occurrences and – Non-conformances
- **Note:** All the aforementioned agreements will be formalized in the form of minutes which the Transnet - and Contractor's EO must sign and must subsequently be approved by the Transnet Project Environmental Resource.
 - The Transnet PER reviews the Contractor's activity-based environmental risk assessment and instructs the Contractor's EO to submit activity-based method statements for construction activities that may pose an environmental risk (for more details on what method statements should entail the Contractor must refer to the Minimum Environmental Requirements for Construction). Only once a method statement has been approved by the Transnet PER and Transnet CM and ECO (where relevant) may the Contractor execute the relevant activity.
 - The Contractor's EO submits the method statements to the Transnet PER for approval (these must also be approved by the Transnet CM);
 - The Transnet PER compiles a site audit checklist (covering all environmental compliance and conformance requirements) for approval by the Transnet Project Environmental Manager
 - Whilst the Contractor executes the work in terms of the requirements of the Contract, the Contractor's EO and Transnet PER execute their monitoring functions as per this SOP and other monitoring stakeholders/auditors as per the PES.
 - The Transnet PER shall submit monthly reports to the Transnet CM and PM indicating the following:
 - Date of the inspection(s);
 - Details and expertise of the Transnet PER;

- Scope and purpose for which the report was prepared;
- Description of the methodology used during the inspection and report compilation;
- Compliance and/or conformance status of all relevant/individual elements as per the inspection checklist culminating in an overall compliance/conformance percentage for the project;
- Assumptions;
- Description of consultation processes undertaken during the inspection(s) with a summary and associated records of such consultations;
- Environmental incidents and non-conformances;
- Photos of pertinent construction and environmental matters that occurred on site;
- Water abstracted/withdrawn during the month (in kiloliters) as well as an indication of the source;
- Water recycled and/or reused during the month (in kiloliters);
- Waste water discharged (in kiloliters);
- Waste (both general and hazardous) disposed (in tonnages) with an indication of waste type;
- Waste recycled (in tonnages);
- Alien invasive species eradicated (in hectares);
- Number of listed species safely relocated;
- Environmental Fines, Non-Compliances or Directives issues by authorities;
- Any NEMA Section 30 or NWA Section 19 incidents;
- Environmental Grievances;
- Rehabilitated Land (in hectares);
- Number of graves and/or heritage artifacts moved;
- Energy consumption for the project [Electricity(kWh); Gas (GJ); Oil(l); Diesel(l); Petrol(l); LPG(GJ)];
- Status of previous findings and/or observations; and
- Recommendations for improvement.

6.4 Post Construction

- The Contractor's EO submits a rehabilitation and site closure method statement for approval by the Transnet PER and Transnet CM.
- Once approved, the Contractor implements the rehabilitation method statement accordingly.
- The Contractor's EO submits a site close-out report for acceptance by the Transnet PER and CM.
- Post rehabilitation, the Transnet PER conducts a site closure inspection to ensure all requirements of the rehabilitation method statement have been met.
- Once rehabilitation has been accepted by the Transnet PER, the Contractor's EO sends the Transnet PER a copy of the entire environmental file (original to be handed over to Transnet as per document handover requirements of the Contract).
- On receipt of the environmental file, the Transnet PER recommends that a site closure certificate can be issued to the Transnet PM.
- The Transnet PM issues the Contractor with a Site Closure Certificate.

7. RECORDS

7.1 The responsibility for maintaining all records required by this SOP shall rest with the Contractor's EO; Transnet PER as specified below:

Record	Maintained By
1. Transnet PER Appointment Letter	Transnet PER
2. Signed Tender Routing Slip	Transnet PER
3. Contractor's Confirmation to conform to this CEM SOP	Transnet PER; Contractor's EO
4. Recommendation of Contractor's EO	Transnet PER

Record	Maintained By
5. Contractor's Environmental Policy	Transnet PER; Contractor's EO
6. Contractor's Environmental Management Plan	Transnet PER; Contractor's EO
7. Tender Evaluation Records from Transnet PER	Transnet PER
8. Contract	Transnet PER
9. Contractor EO's Appointment Letter and CV	Transnet PER
10. Activity-Based Environmental Risk Assessment	Transnet PER; Contractor's EO
11. Contractor's Organogram	Transnet PER; Contractor's EO
12. Contractor's Contact Information	Transnet PER; Contractor's EO
13. List of Contractor's Plant and Equipment	Contractor's EO
14. List of Hazardous Substances used by Contractor	Contractor's EO
15. Material Safety Data Sheets	Contractor's EO
16. Site Layout Plan	Transnet PER; Contractor's EO
17. Site Establishment Method Statement	Transnet PER; Contractor's EO
18. Minutes of Transnet PER – Contractor's EO Inception Meeting	Transnet PER; Contractor's EO
19. Environmental Induction Attendance Register (including material used during induction)	Transnet PER; Contractor's EO
20. Activity-based Method Statements	Transnet PER; Contractor's EO

Record	Maintained By
21. Contractor's Inspection Reports	Transnet PER; Contractor's EO
22. Transnet PER Inspection Reports	Transnet PER
23. List of Local, Provincial and National Environmental legislation applicable to the site	Contractor's EO
24. Environmental Awareness Attendance Registers (including material used)	Contractor's EO
25. Environmental Incident Reports	Transnet PER; Contractor's EO
26. Minutes of SHE Meetings	Transnet PER; Contractor's EO
27. Waste Records	Transnet PER; Contractor's EO
28. Water Records	Transnet PER; Contractor's EO
29. Energy Records	Transnet PER; Contractor's EO
30. Non-Conformance Records	Transnet PER; Contractor's EO
31. Approval of Contractor's Environmental File	Transnet PER
32. Site Access Certificate	Transnet PER
33. Approved Transnet PER Checklist	Transnet PER
34. Transnet Monthly PER Reports	Transnet PER
35. Rehabilitation Method Statement	Transnet PER; Contractor's EO
36. Contractor's Site Close-Out Report	Transnet PER; Contractor's EO
37. Transnet PER Site Closure Report	Transnet PER
38. Contractor's Environmental File Handover Transmittal	Transnet PER; Contractor's EO
39. Site Closure Certificate	Transnet PER

8. ANNEXURES

8.1 List of Construction Environmental Management Templates, Forms and Guidelines

8.2 009-TCC-CLO-SUS-TMP-11386.22 - Construction Environmental Management File Index

8.3 009-TCC-CLO-SUS-TMP-11386.23 - *Construction Environmental Management Process Flow*

Annexure 8.1 List of Construction Environmental Management Templates, Forms and Guidelines

No	Item Description	Document No
1.	Construction Environmental Management File Index	009-TCC-CLO-SUS-TMP-11386.1
2.	Project Environmental Specification (PES)	009-TCC-CLO-SUS-TMP-11386.2
3.	Declaration of Understanding (Signed)	009-TCC-CLO-SUS-TMP-11386.3
4.	Contractor's Information	009-TCC-CLO-SUS-TMP-11386.4
5.	Appointment of Contractors EO and Declaration of Understanding (Including CV and Job Profile)	009-TCC-CLO-SUS-TMP-11386.5
6.	Schedule of Contractor's Construction Plant and Equipment	009-TCC-CLO-SUS-TMP-11386.6
7.	Hazardous Substances Register	009-TCC-CLO-SUS-TMP-11386.7
8.	Emergency Contacts Register	009-TCC-CLO-SUS-TMP-11386.8
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10.	Water Usage Register	009-TCC-CLO-SUS-TMP-11386.10
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12.	Site Access Certificate	009-TCC-CLO-SUS-TMP-11386.12
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No	Item Description	Document No
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20.	Application for Exemption	009-TCC-CLO-SUS-TMP-11386.20
21.	Site Closure Certificate	009-TCC-CLO-SUS-TMP-11386.21
22.	Contractor's Environmental Management File Handover	009-TCC-CLO-SUS-TMP-11386.22
23.	Basic Environmental Rules for Visitors	009-TCC-CLO-SUS-GDL-11386.23
24.	Basic Environmental Rules for Contractors	009-TCC-CLO-SUS-GDL-11386.24
25.	Basic Site Procedure	009-TCC-CLO-SUS-GDL-11386.25
26.	Contractor Environmental and Sustainability Specification Guidelines (CESSG)	TRN-IMS-GRP-GDL-014.04

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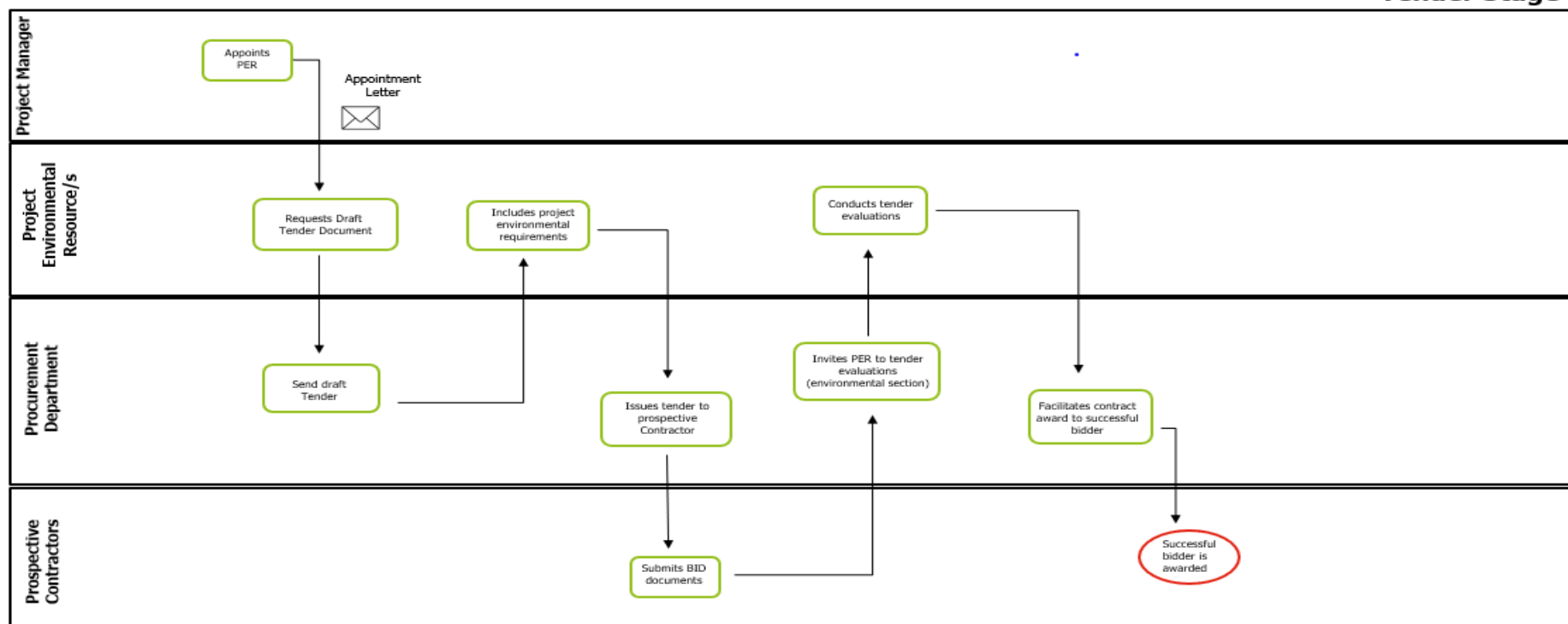
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1	Transnet Integrated management System (TIMS) Policy Statement	-
2.1	Standard Operating Procedure (SOP) - Construction Environmental Management (CEM)	009-TCC-CLO-SUS-11386
2.2	Environmental and Sustainability Specification Guidelines	TRN-IMS-GRP-GDL-014.04
3	Project Environmental Specification (PES)	009-TCC-CLO-SUS-TMP-11386.2
4	Declaration of Understanding (Signed)	009-TCC-CLO-SUS-TMP-11386.3
5.1	Contractor's Information	009-TCC-CLO-SUS-TMP-11386.4
5.2	Contractor's Environmental Policy	-
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5.5	Appointment of Contractors EO and Declaration of Understanding (Including CV and Job Profile)	009-TCC-CLO-SUS-TMP-11386.5
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11	Training Attendance Register	TIMS Procedure
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13	Site Access Certificate	009-TCC-CLO-SUS-TMP-11386.12
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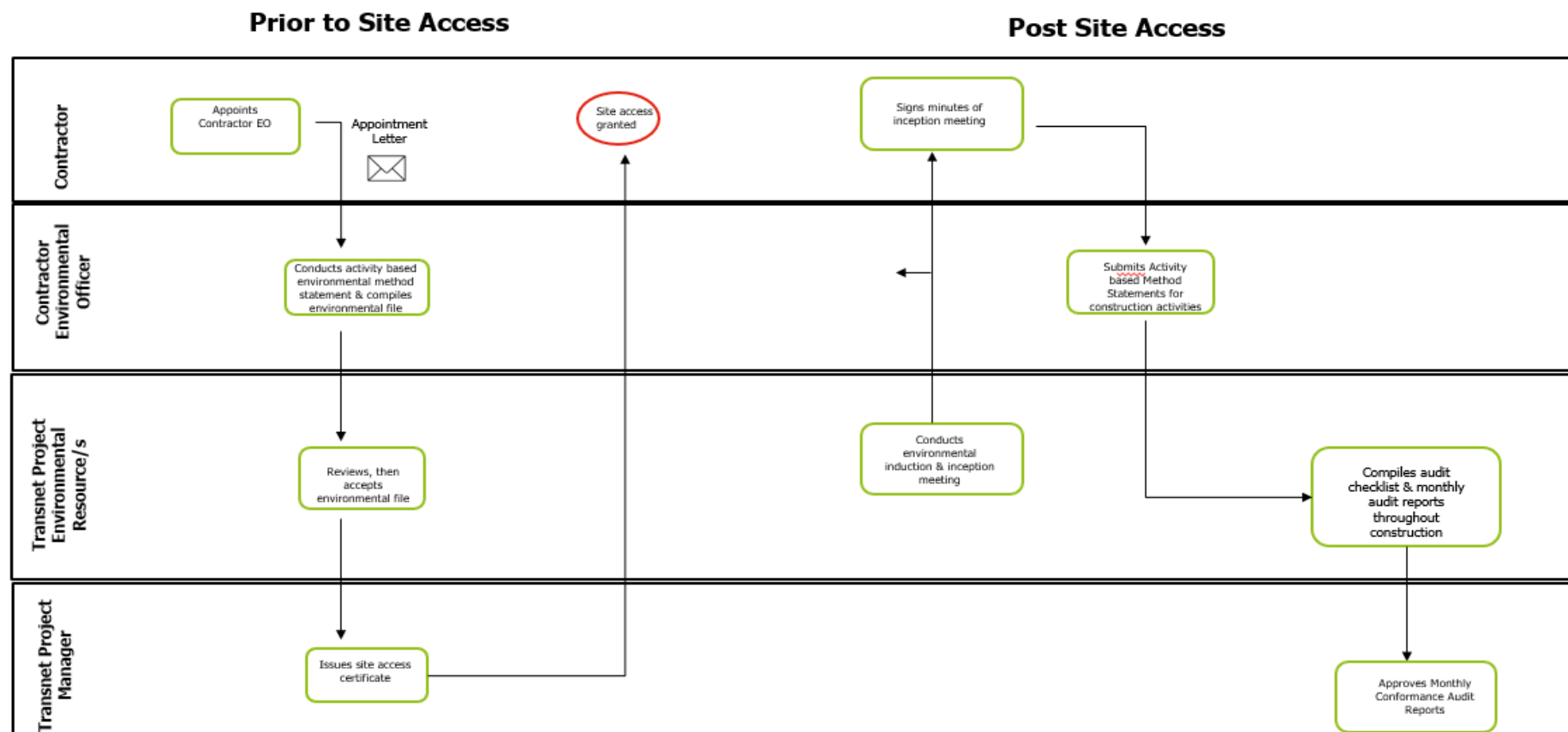
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15	Method Statements	009-TCC-CLO-SUS-TMP-11386.14
16	Waste Disposal Register	009-TCC-CLO-SUS-TMP-11386.15
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19	Occurrence Register	TIMS Procedure
20	Transnet Occurrence Notification Report	TIMS Procedure
21.1	Environmental Occurrence Technical Form	TIMS Procedure
21.2	On-site Investigation Form – Incident Commander Report	TIMS Procedure
21.3	Investigation Form Report for Level 3 & 4 Occurrences	TIMS Procedure
21.4	Incident Commander Appointment Letter	TIMS Procedure
22	Non-Conformance Register	TIMS Procedure
23	Non-Conformance Report Form	TIMS Procedure
24	Non-Compliance Stop Certificate	TIMS Procedure
25	Application for Exemption	009-TCC-CLO-SUS-TMP-11386.20
26.1	Site Closure Inspection Form	TIMS Procedure
26.2	Site Closure Certificate	009-TCC-CLO-SUS-TMP-11386.21
26	Contractor's Environmental Management File Handover	009-TCC-CLO-SUS-TMP-11386.22

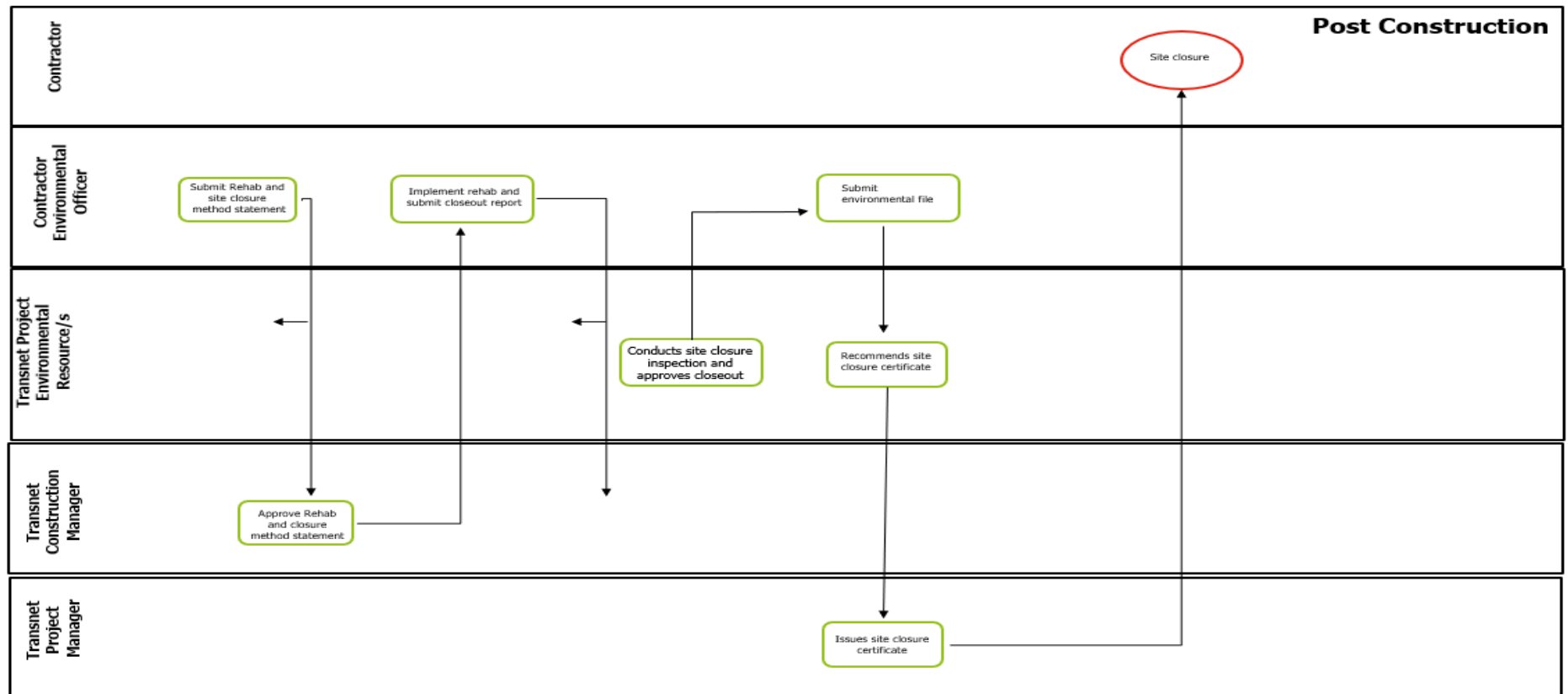
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27.1	Basic Environmental Rules for Visitors	009-TCC-CLO-SUS-GDL-11386.23
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Annexure 8.3 Construction Environmental Management Process Flow

Tender Stage







DECLARATION OF UNDERSTANDING

PROJECT NAME:		DOCUMENT NO:	
PROJECT NO:		DATE:	
CONTRACTOR:		CONTRACT NO:	

I,

(Name)

(Designation)

(Representing)

Declare that I have read and understood the contents of the Construction Environmental Management SOP (009-TCC-CLO-SUS-TMP-11386) and associated documents for the above mentioned Project and Contract.

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

Signed	Signature	Date
Place		
Witness 1:	Signature	Date
Witness 2:		

ENVIRONMENTAL METHOD STATEMENT

PROJECT NAME:

PROJECT NO:

DOCUMENT NO:

CONTRACTOR:

DATE:

PROPOSED ACTIVITY (give title of method statement and reference number from the CEMP):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:

End Date:

DESCRIPTION OF HOW POTENTIAL ENVIRONMENTAL IMPACTS WILL BE PREVENTED OR MANAGED (provide as much detail as possible, including annotated sketches and plans where possible):

ENVIRONMENTAL STANDARDS (list the applicable environmental standards to be met):

MONITORING AND RECORD KEEPING (Describe how the activity will be monitored to ensure that the environmental standards are met, as well as the records to be kept):

DECLARATIONS

CONTRACTOR'S ENVIRONMENTAL OFFICER (The work described in this Environmental Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm):

Print Name	Signature	Date

PERSON UNDERTAKING THE WORKS I understand the contents of this Environmental Method Statement and the scope of the works required of me. I further understand that this Environmental Method Statement may be amended on application to other signatories and that Transnet Environmental Manager

ENVIRONMENTAL METHOD STATEMENT

and Construction Manager will audit my compliance with the contents of this Environmental Method Statement

Print Name	Signature	Date

TRANSNET ENVIRONMENTAL OFFICER The work described in this Environmental Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm:

Print Name	Signature	Date

APPROVING AUTHORITY (i.e. the Employer's Construction Manager)

The works described in this Method Statement are approved.

Print Name	Signature	Date

ENVIRONMENTAL METHOD STATEMENT

Final Handover and Close-Out Inspection Checklist

FINAL HANDOVER AND CLOSE OUT INSPECTION CHECKLIST					
Contractor's Name:					
Date of Inspection:					
Contract Number:					
Contract Description:					
				YES	NO
					N/A
1. Has the site been left in an acceptable condition?					
Housekeeping:					
- Is the site clean?(free of all waste)					
- Are all materials removed / stacked correctly?					
- Is there any environmental pollution? (e.g. soil, water)					
- Is there a need for Environment Specialist to sign off?					
- Are any repairs necessary (fences, equipment etc.)?					
- Are drainage / culverts / level crossings, etc. clear?					
- Any missing Transnet equipment?					
2. Is the asset safe for normal operations?					
- Was a quality assurance audit conducted?					
- Was any audit findings signed off?					
- Was a defect list completed?					
- Was the defect list signed off with all defects corrected?					
- Is all equipment/assets safe for operations?					
- Safe for public access, etc.?					
3. Are all relevant documents on the Contractor Compliance File?					
4. Hand over Contractor Compliance file for archiving with contract documents.					
5. aspects?					
- Was all Transnet machinery and equipment used by the contractor been returned in good condition?					
- Was the commissioning test completed successfully?					
6. Has the contractor completed the close out requirements?					
- Was a post contract evaluation meeting conducted?					
- Was the contract register updated?					
- Was the completion certificate issued?					
- Was all keys and access permits handed over?					
7. If the response to any of the above questions was negative, what actions were taken to rectify it?					
8. Can final payment and release of retension money be arranged?					
- If the above answer is positive, final payment can be arranged					
Name:		Name:			
Signature:		Signature:			
Date:		Date:			
Transnet Contract Representative		Contractor Site Representative			
Contract Manager					

Project Health and Safety Specification

Fuel tanks and Bowsers (National)

Transnet Port Terminals

Project Number: Z.9000113

SIGNATORIES:

Prepared by:



Khethiwe Ndlovu

Health and Safety Practitioner

13/10/2023
Date

Reviewed by:



Bhekani Msebeni

Health and Safety Manager

13/10/2023
Date

Approved by:



Sphamandla Mathonsi

Senior Project Manager

13/10/2023

Date

00	AUGUST 2023	ISSUE FOR REVIEW
01	13 OCTOBER 2023	ISSUE FOR APPROVAL
Rev No.	Date	Revision Details

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1. Purpose

This health and safety specification identifies and outlines the working behaviours and safe work practices that are expected of the contractors, consultant, visitors and suppliers, that will be undertaking activities associated with the Upgrading of Fuel Storage Infrastructure project.

The specification has been developed in accordance with the requirements of the Occupational Health and Safety Act and its Regulations, mainly Construction Regulation 5(1)(b) as well as any other applicable legislation.

The Contractor must comply with this Client's health and safety specification and related legislation and address it in their site specific health and safety plan. It is the principal contractor's responsibility to ensure that all sub-contractors comply fully with all legal requirements as well as the requirements of this specification.

This Health and Safety Specification will be reviewed and updated periodically and/or as and when necessary) to address and / or include:

- Changes in legislation;
- Client requirements;
- Leading practices; and
- Lessons learnt from incidents.

2. Scope

Transnet Port Terminals currently uses diesel to support its operations, which includes dry bulk, and break bulk containers. The equipment that uses diesel includes; ship loader cranes, reach stackers, rail truck gantries (RTG), reefers, haulers, pay loaders, dumper trucks, back actors, brooms, sweepers, forklifts, transport buses, vans, cars, generators etc. The non-revenue vehicles that currently use petrol are being phased out, and are well below 10 % of fuel utilizing equipment.

All Transnet fuel depots were developed and managed by Transnet Fuel Solutions (TFS) in the past. During 2014/2015, there was a handover of the depots to each operating division of Transnet; TFS was then transferred to Transnet Freight Rail (TFR). Fast forward to 2018, TPT appointed energy managers with the focus on energy security and energy efficiency. It is in this regard that the energy managers coordinated a gap audit between; fleet, supply chain, SHEQ and TFS. The energy managers found gaps regarding; fuel management, maintenance and housekeeping & storage capacity.

There is a project currently aimed at addressing the management of fuel (FMS project), which is running concurrent with this project. The energy managers have coordinated findings from SHERQ with terminal fleet and maintenance to close the gaps identified by SHERQ for compliance purposes. This project then addresses the capacity issues, and missing infrastructure which will ensure that the depots are fully compliant

The requirements specified in this Health and Safety Specification are applicable to the Contractor as well as any contractors, suppliers, Consultant, Vendors and Visitors that may be appointed by or on behalf of Transnet as an Employer at the Upgrading of Fuel Storage Infrastructure Project. It is the Principal contractor's responsibility to ensure that all contractors and suppliers comply fully with all legal requirements as well as the requirements of this health and safety specification.

3. Definitions

Acceptable Risk

A risk that has been reduced to a level that can be tolerated having regard for the applicable legal requirements and the Health and Safety Policy adopted for the project.

ALARP (As Low As Reasonably Practicable)

The concept of weighing a risk against the sacrifice needed to implement the measures necessary to avoid the risk. With respect to health and safety, it is assumed that the measures should be implemented unless it can be shown that the sacrifice is grossly disproportionate to the benefit.

Applicant (Permit to Work)

A person requesting permission to perform work for which a Permit to Work is required. Applicants must be authorised (in writing) to receive (or accept) Permits to Work and must be competent to do so by virtue of their training, experience and knowledge of the area or plant in which the work is to be performed.

Authorised Person (Permit to Work)

A person (typically a Project employee or an employee of the client) who has been authorised (in writing) by the client representative to issue Permits to Work within the scope of his designation. A person may only be appointed to issue Permits to Work if he has undergone training and has been assessed and found competent in systems, plant and equipment operation within the scope of his designation.

Barricade

A temporary structure that is erected as a physical barrier to prevent persons from inadvertently coming into contact with an identified hazard.

Benching

The creation of a series of steps in the sides of an excavation to prevent collapse.

Consequence

The outcome of an event expressed qualitatively or quantitatively.

Principal contractor

An employer performing construction work, or providing related or supporting services, on a project site.

Competent Person

A person who has in respect of the work or task to be performed the required knowledge, training, experience and as per act cr2014.

Construction Supervisor

A competent person responsible for supervising construction activities on a construction site

Clearance Certificate

A signed declaration by an Isolation Officer that a specified hazardous energy source associated with a particular system, plant or item of equipment has been isolated in accordance with an approved Isolation and Lockout Procedure.

Electrical Officer

The person appointed in writing by the Project Manager in terms of this specification as the person who shall be consulted by the Contractor in all electrical matters to ensure that adequate safety precautions are taken by the Contractor.

Excavation

Any man-made cut, cavity, pit, trench, or depression in the earth's surface formed by removing rock, sand, soil or other material using tools, machinery, and / or explosives. Tunnels, caissons and cofferdams are specifically excluded and are not addressed in this standard.

First-Aid Injury (FA)

A first-aid injury is any one time treatment and any follow up visit for observation of minor scratches, cuts, burns, splinters and the like which do not normally require medical care. Such treatment is considered to be first aid even if administered or supervised by a medical practitioner.

First aid includes any hands on treatment given by a first aider. (E.g. Band-Aid, washing, cleansing, pain, relief). The following procedures are generally considered first aid treatment:

- Application of Antiseptics.
- Application of Butterfly adhesive dressing or sterile strips for cuts and lacerations.
- Administration of tetanus shot(s) or booster(s). However, these shots are often given in conjunction with more serious injuries, consequently injuries requiring these shots may be recordable for other reasons.
- Application of bandages during any visit to medical personnel.
- Application of ointments to abrasions to prevent drying or cracking.
- Inhalation of toxic or corrosive gas, limited to the removal of the employee to fresh air or the one time administration of oxygen for several minutes.
- Negative X-Ray diagnosis.
- Removal of foreign bodies not embedded in the eye if only irrigation is required.
- Removal of foreign bodies from a wound if procedure is uncomplicated, for example by tweezers or other simple technique.
- Treatment for first degree burns.
- Use of non-prescription medications and administration of single dose of prescription medication on first visit for any minor injury or discomfort.

Hazard

A source of potential harm in terms of human injury or ill health, or a combination of these.

Hierarchy of Controls

A sequence of control measures, arranged in order of decreasing effectiveness, used to eliminate or minimise exposure to workplace health and safety hazards:

- Elimination – Completely removing a hazard or risk scenario from the workplace.
- Substitution – Replacing an activity, process or substance with a less hazardous alternative.
- Isolation (Engineering) Controls – Isolating a hazard from persons through the provision of mechanical aids, barriers, machine guarding, interlocks, extraction, ventilation or insulation.
- Administrative Controls – Establishing appropriate policies, procedures and work practices to reduce the exposure of persons to a hazard. This may include the provision of specific training and supervision.

- Personal Protective Equipment – Providing suitable and properly maintained PPE to cover and protect persons from a hazard (i.e. Prevent contact with the hazard).

Incident (Occurrence)

An event (or a continuous or repetitive series of events) that results or has the potential to result in a negative impact on people (employees, Principal contractors and visitors), the environment, operational integrity, assets, community, process, product, legal liability and / or reputation.

Likelihood

A description of probability or frequency, in relation to the chance that an event will occur.

Lost Time Injury (LTI)

Any occurrence that resulted in a permanent disability or time lost from work of one day/shift or more.

If an employee is injured and cannot return to work in the next shift (will ordinarily miss one whole shift), and the department brings the employee in to only receive treatment by the Supervisor/ Return to Work Coordinator in that shift, this is still considered an LTI.

Lost Time Injury Frequency Rate (LTIFR) - Number of LTI's multiplied by 1 million or 200,000 and divided by labour hours worked.

Light Vehicle

A vehicle that:

- Can be licensed and registered for use on a public road;
- Has four or more wheels, and seats a maximum of 12 adults (including the driver);
- Requires the driver to hold only a standard civil driving licence; and
- Does not exceed 4.5 tonnes gross vehicle mass (GVM), which is the maximum loaded mass of the motor vehicle as specified by:
 - ♦ The vehicle's manufacturer; or
 - ♦ An approved and accredited automotive engineer, if the vehicle has been modified to the extent that the manufacturer's specification is no longer appropriate.

Examples of light vehicles include passenger cars, four-wheel drive vehicles, sports utility vehicles (suvs), pick-ups, minibuses, and light trucks.

Any vehicle falling outside of this definition must be considered mobile equipment.

Medical Treatment Injury (MTI)

A work injury requiring treatment by a Medical Practitioner and which is beyond the scope of normal first aid including initial treatment given for more serious injuries. The procedure is to be of an invasive nature (e.g. Stitches, removal of foreign body).

The following procedures are generally considered medical treatment:

- Application of sutures (stitches).
- Cutting away dead skin (surgical debridement).
- Loss of consciousness due to an injury or exposure in the work environment.
- Positive X-Ray diagnosis (fractures, broken bones etc.).

- Removal of foreign bodies embedded in the eye.
- Removal of foreign bodies from the wound by a physician due to the depth of embedment, size or shape of object or the location wound.
- Reaction to a preventative shot administered because of an occupational injury.
- Sprains and strains - series (more than one) of hot and cold soaks, use of whirlpools, diathermy treatment or other professional treatment.
- Treatment of infection.
- Treatment for second or third degree burns
- Use of prescription medications (except a single dose administered on first visit for minor injury or discomfort.)

Mobile Equipment

A vehicle (wheeled or tracked) that generally requires:

- The driver to hold a specific state or civil license; or
- The operator to hold a nationally recognized certificate of competency.

Examples of mobile equipment include, but are not limited to, dump trucks, water trucks, graders, dozers, loaders, excavators, forklifts, tractors, back-actors, bobcats, mobile cranes, tele-handlers, drill rigs, buses and road-going trucks.

Near Hit

An incident that has occurred that did not result in any injuries, illnesses, environmental or property damage but had the potential to cause an injury, illness, environmental or property damage.

Regulation

In the context of this guideline, 'Regulation(s)' refers to the Construction Regulations, 2014 required by Section 43 of the Occupational Health and Safety Act 85 of 1993, published under Government Notice R 84 in Government Gazette 37305 of February 2014.

Risk

A combination of the likelihood of an occurrence of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event or exposure.

Risk Assessment

A process of evaluating the risk arising from a hazard, taking into account the adequacy of any existing control measures, and deciding on whether or not the risk is acceptable.

Risk Management

The systematic application of management policies, processes and procedures to identifying hazards, analysing and evaluating the associated risks, determining whether the risks are acceptable, and controlling and monitoring the risks on an ongoing basis.

4. Abbreviations

DSTI - Daily Safety Task Instruction

CR – Construction Regulations, 2014

CWP – Construction Work Permit

EPC - Engineering Procurement and Construction

EPCM - Engineering Procurement and Construction Management

HIRA - Hazard Identification and Risk Assessment

IMS - Integrated Management System

MS - Management System

OHS Act - Occupational Health and Safety Act No.85 of 1993

PC – Principal Contractor

SOC - Safety Observation and Conversation

TPT – Transnet Port Terminals

VFL - Visible Felt Leadership

OHS - Occupational Health and Safety

DOEL- Department of Employment and Labour

SACPCMP - The South African Council for Project and Construction Management Professions.

MSDS – Material Safety Data Sheet

5. Project Scope of work

Transnet Port Terminals (TPT) plays a strategic role in the South African economy by enabling the efficient flow of imports, exports and transshipments through its cargo terminal operations. Through its strategic role in the management of these key trading hubs, TPT ensures year-round connectivity of the South African economy with other key trading partners in the region and the rest of the world. As a vital enabler of trade between South Africa and the global market, TPT continuously strives to improve the reliability and efficiency of its operations through holistic business innovation to reduce business costs.

The aim of this project is to:

- Ensure that TPT operations that rely on petrochemical fuel (diesel) as a source of energy, has a sustainable source and service for the continuity of operations.
- Ensure that the current TPT diesel depots comply with NEMA for storage of petrochemicals.
- Ensure terminals will have to contain adequate capacity that is able to sustain the current and projected diesel demand.

The Scope of Work for this Contract includes the following:

This scope of work includes mechanical work which includes but not limited to the listed activities below:

1. Fuel Tank Isolation, lockout and tagging

- Discharge, drain and bleed the tank and lines to zero energy state (Contractor to supply empty tank).
- Transportation of temporary fuel storage

- Determine the isolating device, then close and lockout/tagout.
- Isolate all piping, drainage system and valves connecting to the tank, and in case of manual valves (inlet/outlets) the handles are to be removed and blank flanges to ensure isolation then lockout/tagout.
- In case where the systems has electrically controlled valves, they must be isolate and locked/tagged out.
- Open all manholes to vent the tank.
- Clean sludge inside tank and tank walls, sludge to be disposed in accordance with hazardous disposal requirements and provide disposal certificate.
- Continuously monitor gas levels and ensure safety at all times.
- Obtain confined space permit from TNPA.
- Issue work permit to the AIA.

2. Fuel Tank Restoration

- Inspect the tank and ensure the work is completed and remove all tools and materials used.
- Re-fill the fuel tank.
- Remove all guards and tags.
- All controls should be in their safest position.
- The work area shall be checked to ensure that all employees have been safely positioned or removed and
- notified that the lockout/tagout will be removed.
- Ensure it is safe to operate the tank and cancel work permit

6. Location

The proposed construction work will take place at the following terminals:

- Richards Bay;
- Durban Point Terminal;
- Durban Pier 1;
- Durban Pier 2;
- Durban Maydon Wharf;
- East London;
- Port Elizabeth Container Terminal (PECT);
- Ngqura Container Terminal (NCT);
- Cape Town Container Terminal, MPT and;
- Saldanha Terminal.

7. Contractor Health and Safety Management Plan

The Contractor must comply to Construction Regulation, 7(1)(a).

The contractor must prepare, implement and maintain a project specific health and safety management plan. The plan must be based on the requirements set out in this specification as well as all applicable legislation. It must cover all activities that will be carried out on the project site(s), from mobilisation and set-up through to rehabilitation and decommissioning

The plan must demonstrate the Principal contractor's commitment to health and safety and must, as a minimum, include the following:

- A copy of the contractor's **Health and Safety Policy**; in terms of the OHS Act section 7
- Procedures concerning **Hazard Identification and Risk Assessment**, including both Baseline and Task-Based Risk Assessments;
- Arrangements concerning the identification of applicable **Legal and Other Requirements**, measures to ensure compliance with these requirements, and measures to ensure that this information is accessible to relevant personnel;
- Details concerning **Health and Safety Objectives** – a process must be in place for setting objectives (and developing associated action plans) to drive continual improvement;
- Details concerning **Resources, Accountabilities and Responsibilities** – this includes the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements, including the appointment of a Project Manager, Health and Safety Officers, Supervisors, Health and Safety Representatives, and First Aiders;
- Details concerning **Competence, Training and Awareness** – a system must be in place to ensure that each employee is suitably trained and competent, and procedures must be in place for identifying training needs and providing the necessary training;
- **Communication, Participation and Consultation** arrangements concerning health and safety, including Safety Observations and Coaching, Toolbox Talks, Daily Safe Task Instructions, project health and safety meetings, and notice boards;
- **Documentation and Document Control** – project-specific documentation required for the effective management of health and safety on the project must be developed and maintained, and processes must be in place for the control of these documents;
- Processes and procedures for maintaining **Operational Control**, including rules and requirements (typically contained in Safe Work Procedures) for effectively managing health and safety risks, particularly critical risks associated with working at heights, confined spaces, mobile equipment and light vehicles, lifting operations, hazardous chemical substances, etc.;
- **Emergency Preparedness and Response** procedures;
- **Management of Change** – a process must be in place to ensure that health and safety risks are considered before changes are implemented;
- **Contractor Alignment** procedures – a process must be in place for the assessment of contractors and suppliers with regard to health and safety requirements and performance (before any contract or purchase order is awarded);
- **Measuring and Monitoring** plans, including a plan for the measuring and monitoring of employee exposure to hazardous substances or agents (e.g. Noise, dust, etc.) In order to determine the effectiveness of control measures;
- **Incident Reporting and Investigation** procedures describing the protocols to be followed with regard to incident reporting, recording, investigation and analysis;
- **Non-conformance and Action Management** procedures concerning the management of corrective actions;

- **Performance Assessment and Auditing** procedures concerning health and safety performance reporting, monthly internal audits to assess compliance with the project health and safety requirements, and daily site health and safety inspections; and
- Details concerning the **Management Review** process followed to assess the effectiveness of health and safety management efforts.

Prior to mobilisation, the Contractor Project Specific Health and Safety Management Plan must be forwarded electronically, and as a hard copy, to the Client's Health and Safety personnel for review and approval. The plan will be audited for completeness and, if found to be adequate, will be accepted and approved. Work may not commence until the plan has been accepted and approved.

Should it be identified that the contractor has overlooked a high risk activity, and as a result has omitted the activity and associated control measures from the Project Specific Health and Safety Management Plan, the plan will not be approved by Transnet health and safety personnel.

8. Contractor Health and Safety Policy

The contractor must develop, display and communicate a Health and Safety Policy that clearly states the contractor's values and objectives for the effective management of health and safety. These values and objectives must be endorsed by the contractor's management representatives (OHS Act 16.2 Appointee) and must be consistent with those adopted for the project.

The policy must be signed and dated, and must be reviewed annually.

The policy must commit to:

- Compliance with all applicable legal requirements;
- The effective management of health and safety risks;
- The establishment of measurable objectives for improving performance, and the provision of the necessary resources to meet these objectives;
- The prevention of incidents, and
- Achieving continual improvement with regard to health and safety performance.

All employees of the contractor as well as the employees of any sub-contractor that may be appointed by the contractor must be made aware of the policy. This must be done through Health and Safety Induction Training and Toolbox Talks .

A copy of the policy must be displayed in each meeting room and on each notice board.

9. Hazard Identification and Risk Assessment (OHS Act, Constr. Regulations 9)

The Contractor must comply to Construction Regulations, clause 9.

Detailed hazard identification and risk assessment processes must be followed for all work to be performed as well as for all associated equipment and facilities.

The client will provide a baseline risk assessment informing Contractor on the hazards and risks on site. Contractor must ensure that effective procedures and risk assessment systems are in place to control hazards and to mitigate risks to levels that are as low as is reasonably practicable.

9.1 Task-Based Risk Assessments

The contractor must carry out detailed project-specific Task-Based Risk Assessments which must be reviewed and approved by the Client's Health and Safety Agent and Project Construction Manager prior to the commencement of any work. The risk assessment process must be facilitated by a competent person (Risk Assessor) who has been appointed in writing. The contractor's site management representatives, supervisory personnel, technical experts (as required) and workforce personnel directly involved with the task being examined must participate in the risk assessment process. An attendance register must be completed and retained.

Please Note: Under no circumstances may a Contractor Health and Safety Officer (CHSO) perform a risk assessment in isolation. The active participation of all persons referred to above is mandatory.

A Task-Based Risk Assessment must at least:

- Be accompanied by a Work Method Statement (describing in sufficient detail how the specific job or task is to be performed in a logical and sequential manner) and Safe Working Procedure;
- Provide a breakdown of the job or task into specific steps;
- Identify the hazards and potential risk scenarios associated with each step;
- Include consideration of possible exposure to noise, heat, dust, fumes, vapours, gases, chemicals, radiation, vibration, ergonomic stressors, or any other occupational health hazard or stressor;
- Describe the control measures that will be implemented to ensure that the risks are managed to levels that are as low as is reasonably practicable; and
- Assign an initial risk rating (without taking any control measures into consideration) and a residual risk rating (taking the identified control measures into consideration) to each risk scenario.

A Task-Based Risk Assessment must be reviewed and, if necessary, updated:

- On an annual basis (as a minimum);
- When changes are made to the associated Work Method Statement; and
- Following an incident.

10. Legal and Other Requirements

The Contractor must comply with the requirements of all applicable health and safety legislation as well as Transnet Port Terminals, project-specific standards and procedures as amended from time to time.

The Contractor must compile and maintain a register of all legal and other requirements applicable to the work that will be carried out and / or services that will be provided. This register must be updated regularly to ensure that it remains relevant.

Applicable laws and standards must be appropriately communicated to all employees of the Contractor (as well as the employees of any contractors that may be appointed by the Principal contractor) through training, Toolbox Talks, and Daily Safe Task Instructions.

11. Health and Safety Objectives

In order to drive continual improvement, the Contractor must set project-specific health and safety objectives, and must develop improvement action plans to achieve these objectives. The Principal contractor's objectives

must be aligned with the objectives set for the project as a whole as required by the Construction Regulations 7.

Eliminating health and safety hazards, minimising health and safety risks, preventing incidents, injuries and illnesses, and ensuring legal compliance must be the primary considerations for setting objectives.

When setting objectives, consideration must be given to the following:

- Leading indicators such as inspection findings, audit findings, hazard reporting, and observations;
- Lagging indicators (i.e. Incidents including Near Hits);
- Leading practices and lessons learnt; and
- Injury frequency rates with due understanding that the goal is “no harm”.

The objectives must be specific and measurable. The improvement action plans must specify the resources (both human and financial) required to achieve the objectives, the person’s responsible, and realistic timeframes for completion. The Contractor must ensure that adequate resources are allocated and that progress towards meeting the objectives is monitored regularly.

The objectives and associated improvement action plans must be documented and must be communicated to all Contractor employees. Furthermore, to ensure that the objectives remain relevant, they must be reviewed on a quarterly basis and whenever significant change has taken place on the project (i.e. Changes to activities, scope of work, operating conditions, etc.).

12. Resources, Accountabilities and Responsibilities

The Contractor must adequately allocate resources, responsibility and accountability to ensure the effective implementation, maintenance and continual improvement of the Principal contractor’s health and safety management system on the project.

For each role that carries health and safety accountability and / or responsibilities (including legislative requirements), a role description detailing the accountability and / or responsibilities must be documented.

All health and safety appointments (i.e. the assignment of specific health and safety responsibilities to individuals in accordance with legal or project requirements) must be done in writing. Documented proof of each appointment (i.e. a signed appointment letter) must be retained.

Contractor should not discharge any legal responsibilities to employees who are not legally appointed.

The Contractor must comply with the requirements of all applicable legislation concerning health and safety related appointments and delegations for the project.

A health and safety organisational chart specific to the project must be documented and maintained. All roles that carry health and safety accountability and / or responsibilities must be included, and all individuals that carry health and safety legal appointments must be clearly identified.

The provision of dedicated health and safety professionals registered on the project must be appropriate for the nature and scale of the work to be carried out.

The Contractors solely responsible for carrying out the work under the contract whilst having the highest regard for the health and safety of all persons on the project site.

Health and safety is the responsibility of each and every individual on the project, but in particular, it is the responsibility of the Principal contractor’s management team who must set the tone.

Visible commitment is essential to providing and maintaining a safe workplace. The Contractor managers and supervisors at all levels must demonstrate their commitment and support by adopting a risk management approach to all health and safety issues. These individuals must consistently take immediate and firm action to address violations of health and safety rules, and must actively participate in day to day activities with the objective of preventing harm.

The contractor's management representatives are responsible and accountable for health and safety performance on the project. Key responsibilities include the following:

- Preparing, implementing and maintaining a risk-based Health and Safety Management Plan specific to the work that will be carried out;
- Establishing, implementing and maintaining health and safety programmes and procedures to ensure that all work is carried out in compliance with the requirements of this specification, the contract, and all applicable legislation;
- Establishing, implementing and maintaining effective hazard identification and risk management processes and procedures to ensure that all reasonably foreseeable hazards are controlled in order to minimise risk;
- Providing the resources necessary to meet the requirements of this specification;
- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety, and that these responsibilities are clearly communicated and understood;

All costs associated with meeting these responsibilities shall be borne by the contractor.

Any cost associated with any work stoppage due to non-compliance with a health and safety requirement shall be for the contractor's account.

12.1 Construction Manager

The Contractor must comply with Construction Regulations, clause 8(1).

The Principal Contractor must appoint a competent full time Construction Manager who is registered with the professional body with the duty of managing construction work on a single site, including ensuring health and safety compliance.

Competency/ Training

- Registered with SACPCMP as a Professional Construction Manager or ECSA
- IRCON
- Legal Liability
- Hazard Identification and Risk Assessment(HIRA)

The Construction Manager shall be responsible for:

- Ensuring that all applicable legal and project health and safety requirements are identified and complied with at all times;
- Participating in (and approving) all Task-Based Risk Assessments conducted for the work to be carried out by the contractor;
- Ensuring that the necessary resources are made available for the effective implementation of the principal contractor's Health and Safety Management Plan;

- Ensuring that all work is adequately and competently supervised;
- Ensuring that all contractor employees have clearly defined responsibilities with regard to health and safety (assigned in writing), and that these responsibilities are clearly communicated and understood;
- Ensuring as far as is reasonably practicable that each contractor and sub-contractor employee is competent to perform his role, and has received appropriate workplace health and safety training and instruction;
- Establishing and maintaining effective communication and consultative processes to ensure that all contractor and sub-contractor employees are kept up to date with regard to health and safety information (e.g. Incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.) And that feedback is provided promptly regarding issues and / or concerns raised;
- Participating in the project's Visible Felt Leadership (VFL) programme;
- Providing the necessary resources for regular health and safety audits and inspections, and ensuring that corrective actions (arising from incident investigations, audits, inspections, etc.) Are implemented, and
- Participating in an annual review of the contractor's Health and Safety Management System.

12.2 Contractor Health and Safety officer(s)

The Contractor must comply with Construction Regulations, clause 8(5).

The contractor must appoint a full-time Construction Health and Safety Officer (s) (CHSO) for the duration of the contract who is registered with the SACPCMP.

The CHSO must be on site when work commences at the start of the day and must remain on site until all activities for that day. A CHSO must be present during all shifts, so if work is carried out over more than one shift per day, the contractor must make provision for an additional CHSO.

The CHSO shall be responsible for:

- Reviewing all applicable legal and project health and safety requirements and providing guidance to contractor and sub-contractor personnel (particularly the contractor's Project / Construction Manager) to help ensure compliance at all times;
- Assisting with the implementation of effective hazard identification and risk management processes for all work to be carried out by the contractor;
- Participating in the Baseline Risk Assessment for the contractor's scope of work (prior to site establishment) and ensuring that identified control measures are implemented;
- Participating in all Task-Based Risk Assessments conducted for the work to be carried out by the contractor and ensuring that identified control measures are implemented;
- Conducting contractor health and safety induction training for all contractor and sub-contractor personnel;
- Compiling and maintaining all health and safety related documents and records required of the contractor;
- Communicating relevant health and safety information to contractor and sub-contractor personnel (e.g. incidents and lessons learnt, leading practices, hazards, risks and control measures, etc.);
- Carrying out Safety Observations and Coaching (one per day);

- Evaluating (on a daily basis) the content of the Daily Safe Task Instructions (DSTI's) conducted by the contractor's appointed supervisors, and attending at least one DSTI each day;
- Attending monthly Contractor and Site Health and Safety Meetings;
- Assisting with the implementation of the contractor's Health and Safety Management Plan and associated Safe Work Procedures;
- Carrying out Planned Task Observations on an ad hoc basis;
- Assisting with the implementation, testing and maintenance of an effective Emergency Response Plan for all contractor and sub-contractor activities;
- Responding to workplace incidents (as appropriate);
- Participating in incident investigations;
- Maintaining accurate health and safety statistics (for the contractor and all sub-contractor), and compiling health and safety performance reports as required;
- Auditing the health and safety management system and workplace activities of the contractor and each sub-contractor on a monthly basis to assess compliance with the project health and safety requirements; and
- Tracking and reporting on the implementation of corrective actions (arising from incident investigations, audits, inspections, etc.).

The contractor must ensure that CHSO is adequately equipped to enable him to perform his duties effectively. Each CHSO must be provided with the following:

- A computer with access to all necessary systems, including access to e-mail and the internet;
- A mobile telephone on contract or with adequate pre-paid airtime; and
- A vehicle where required or instructed by a nominated project management representative (depending on the size and location of the project site(s)).

A CHSO must be computer literate, fluent in English, and must have the following minimum qualifications, training and experience:

- At least 5 years' experience as a CHSO on construction projects;
- SAMTRAC or NEBOSH or an equivalent training course with accredited health and safety service provider as a minimum qualification;
- Experience and appropriate training with regard to implementing and maintaining a health and safety management system compliant with national legislation or an international standard;
- Experience and appropriate training with regard to construction related hazard identification and risk management processes;
- Competence, experience and relevant training with regard to incident investigation procedures and causation analysis;
- Health and safety auditing experience and training;
- A valid First Aid certificate of competency;
- Fire prevention and protection training; and

- A valid Driving Licence (light motor vehicle).

Before placing a registered Construction Health and Safety Officer on the project site(s), the contractor must forward a copy of the person's CV to the Clients Construction Health and Safety Agent for review and acceptance. A proposed candidate may be rejected should he not meet competence level required (i.e. the experience and / or qualification requirements), or due to poor work performance on previous projects.

12.3 Construction Supervisors

The Contractor must comply with Construction Regulations, clause 8(7).

The contractor must ensure that all construction works are supervised at all times by an adequate number of qualified, competent and appointed supervisors who have experience in the type of work being carried out.

No work may be carried out without an appointed construction supervisor being physically present in the work area and daily safety task instruction (DSTI) has been conducted and signed.

Each Construction Supervisor shall be responsible for:

- Ensuring that all work carried out under his supervision is done so in accordance with the requirements of all applicable legislation, rules, standards, specifications, plans and procedures;
- Participating in Task-Based Risk Assessments;
- Ensuring that all employees under his supervision are made aware of the hazards, risk scenarios and control measures identified in relevant risk assessments;
- Ensuring that the control measures stipulated in all relevant risk assessments are in place and are implemented fully for all work carried out under his supervision;
- Ensuring that all employees under his supervision conduct pre-task hazard assessments when necessary;
- Driving the achievement of health and safety objectives set for his team;
- Ensuring that the necessary written appointments are in place for each employee under his supervision (e.g. first aider, mobile crane operator, etc.);
- Ensuring that all employees under his supervision attend all required training;
- Ensuring that no employee carries out any work that he is not competent to perform or has not been appointed to perform;
- Identifying training needs within his team;
- Carrying out Safety Observations and Coaching (eight per month);
- Conducting a weekly Toolbox Talk with his team;
- Leading a Daily Safe Task Instruction discussion with his team;
- Attending Health and Safety Meetings as required;
- Maintaining a Health and Safety Management Information Notice Board in the work area for which he is responsible;
- Recording, on a daily basis, a description of the day's activities as well as a breakdown (by occupation) of the personnel on site under his supervision;
- Ensuring that all Safe Work Procedures applicable to the work carried out under his supervision are adhered to and are fully implemented;

- Carrying out Planned Task Observations (four per week);
- Ensuring that emergency response procedures are understood by all employees under his supervision and that these procedures are followed in the event of an emergency;
- Reporting all incidents immediately, participating in incident investigations, communicating the lessons learnt to all employees under his supervision, and implementing corrective actions where required; and
- Carrying out workplace health and safety inspections.

Each construction supervisor must accept these responsibilities in writing as part of his appointment.

Each construction supervisor must be equipped with a mobile telephone to ensure that effective communication can be maintained for the duration of the contract.

12.4 Other obligatory legal appointments to ensure compliance if applicable

OHS Act Section/Regulation	Subject	Responsibilities
Section 16(2)	Assigned duties (Managers)	Responsibility of complying with the OHS Act assigned to other person/s by the CEO
Section 19(3)	Health and Safety Committee member/s	Responsibilities as outlined in Section 20 of the OHS Act.
GAR 9(2)	Incident Investigator	Responsibilities of investigating incidents as outlined in GAR 8 & 9, and section 24.
GSR 9(1)	Welding, flame cutting operator	To ensure compliance with requirements of GAR 9.
GSR 13A(1)	Ladder Inspector	To ensure compliance with requirements of GSR 13A
Construction Reg 12(1)	Temporary works designer	To design, inspect and approve temporary works prior use.
Construction Reg 12(2)	Temporary works supervisor	To ensure temporary works operations are carried out under supervision.
Construction Reg 23(1)(d)(i)	Construction vehicle and mobile plant operator	Operate vehicles and mobile plant.
Construction Reg 24(1)(c)	Temporary electrical installations controller	Control temporary installations on construction site.
Construction Reg 24(1)(d)	Temporary electrical installations inspector	Inspect temporary electrical installations at least weekly.
Construction Reg 28(a)	Stacking and storage supervisor	Supervise stacking and storage on site.

13. Competence, Training and Awareness

Each employee (including contractor employees) must be suitably trained, competent, and must understand the health and safety hazards, risks and control measures associated with his work as required by the OHS Act 85 of 1993

The Contractor must implement systems and procedures to ensure that:

- The necessary competencies required by employees are identified (by occupation), along with selection, placement and any training requirements;

Please Note: Specific competency profiles and selection criteria (fitness for work) must be developed for all roles where significant health or safety risk exists.

Please Note: A formal training needs analysis must be carried out based on the competency profiles and a training matrix must be developed for the project.

Roles requiring technical certification, registration or licensing are identified and documented, and these roles are filled only by suitably qualified personnel;

- Minimum core health and safety skills required by employees in leadership and supervisory roles are identified and suitable training is provided including hazard identification and risk assessment, incident investigation, and health and safety interactions (i.e. Observation and coaching techniques);
- Competency-based training is provided and it includes operational controls (procedures and work instructions), management of change, and emergency response;
- All employees hold and maintain the required competencies (including appropriate qualifications, certificates and licences) and are under competent supervision;
- A site-specific induction and orientation programme that highlights health and safety requirements, procedures, and significant hazards, risks and associated control measures is in place for all new employees and visitors (understanding must be assessed);
- Personnel are trained and / or briefed on new or amended standards, rules, safe work procedures, risk assessments, etc.;
- Refresher training is carried out as required (e.g. Re-induction following an absence from site);
- Records of education, qualifications, training, experience and competency assessments are maintained on site for all employees; and
- The effectiveness of training is reviewed and evaluated.

Prior to the commencement of any work, including mobilisation and site set-up activities, the Contractor must provide, to the satisfaction of the client representative, current documentation verifying that the Principal contractor's employees, as well as the employees of any appointed sub-Principal contractors, are competent and have the necessary qualifications, certificates, licences, job skills, training and experience (as required by this specification and applicable legislation) to safely carry out the work that is to be performed.

The Contractor and contractor must ensure that the following training takes place:

- health and safety induction training pertaining to the hazards prevalent on the site at the time of entry
- training for all persons required to erect, move or dismantle temporary works structures and instruction to perform those operations safely
- training of employees working from a fall risk position
- training to work or to be suspended on a platform which includes at least:

- how to access and egress the suspended platform safely;
- how to correctly operate the controls and safety devices of the equipment;
- information on the dangers related to the misuse of safety devices; and
- information on the procedures to be followed in the case of-
 - o an emergency;
 - o the malfunctioning of equipment; and
 - o the discovery of a suspected defect in the equipment;
 - o an instructions on the proper use of body harnesses.
- Training for all operators of construction vehicles and mobile plant.

A Contractor must at all times keep on his or her construction site records of the health and safety induction training and such records must be made available on request to an inspector, the client, the client's agent or the contractor;.

Please Note: Only certified copies of certificates, licences, etc. Will be accepted.

13.1 Health and Safety Induction Training

Each employee must attend all mandatory Health and Safety Induction Training applicable to the project. No employee will be permitted to enter any project work site until he has attended this training. Each employee must carry proof that he has completed the induction training and may be removed from a site if such proof cannot be produced on request, this as required by the Construction Regulations 7(5).

Furthermore, employees must attend (where applicable) Area-Specific Health and Safety Induction Training pertaining to the particular hazards identified in the area(s) where the employees will be working. No employee will be permitted to enter a work area until he has attended the relevant area-specific training.

All visitors must receive a visitor induction briefing before entering any project work site. However, this induction does not permit a visitor to enter a site unescorted. Visitors must be accompanied at all times by an appropriately senior employee who has been fully inducted.

13.2 Specific Training and Competency Requirements

The following specific training and competency requirements must be complied with.

Please Note: An employee must be trained, assessed and found competent before he will be given authorisation to perform certain tasks or fill certain roles.

Table 13-1: Specific Training and Competency Requirements

Training	Applicable To
Health and Safety Induction	All employees, Managers and visitors
Safety Observations and Coaching (Safety Interactions)	All employees
Risk Assessment	All managers, supervisors and Safety personnel
Incident Investigation	All managers and supervisors
Safety Leadership	All managers and supervisors
Legal Liability	All managers and supervisors

Training	Applicable To
Health and Safety Rep	All elected Health and Safety Representatives
First Aid Levels 2 and 3	All nominated First Aiders
Fire Fighting (Fire Extinguisher Use)*	All employees
Flag personnel	All appointed flag personnel
Permit to Work	All Authorised Persons (i.e. Permit issuers) and all Applicants (i.e. Employees who will be applying for permits)
Isolation and Lockout	All Authorised Persons (i.e. Persons who authorise work that requires Isolation and Lockout), all Isolation Officers, and all Applicants (i.e. Persons who request permission to work on systems or equipment requiring Isolation and Lockout)
Defensive Driving	All drivers of light motor vehicles (for work purposes)
Gravel Road Driving	All drivers of light motor vehicles driven on gravel roads (for work purposes)
Off Road Driving	All drivers of four-wheel drive vehicles driven off road (for work purposes)
Mobile Equipment Site Licence	All mobile equipment operators

Training must be arranged through accredited external training institutions by the Principal contractor.

14. Communication, Participation and Consultation

The Contractor must develop and maintain effective communication and consultative processes (allowing for a two-way dialogue) for the duration of the project to ensure that:

- All personnel are kept up to date with regard to health and safety matters (e.g. Hazards and risks, incidents and lessons learnt, leading practices, performance against objectives, etc.);
- General health and safety awareness levels are kept high;
- Prompt feedback is given to personnel with regard to health and safety issues or concerns that they raise; and
- Relevant, and often critical, health and safety related information (e.g. Design changes, instructions, reporting of hazardous conditions or situations, etc.) Is effectively disseminated.

This must be achieved as follows:

14.1 Toolbox Talks

The Contractor must prepare a Toolbox Talk on a weekly basis and must share it with all personnel for which the Contractor is responsible (including all sub-Principal contractors). Toolbox Talks must address health and safety issues that are relevant to the work performed on the project site(s) and must include information and / or knowledge sharing, lessons learnt from incidents that have occurred, information concerning specific hazards and / or risks and control measures to prevent injury, etc.

Attendance records must be kept and maintained in the Principal contractor's health and safety file.

14.2 Daily Safe Task Instructions (DSTI's)

A Daily Safe Task Instruction (DSTI) is a pre-start discussion amongst the members of a work team, led by the appointed supervisor, aimed at anticipating hazards and potential risks associated with the

activities planned for the day or shift, and ensuring that the necessary control measures are in place to prevent incidents.

At the start of each day or shift, prior to the start of any work, each appointed supervisor must inspect the work area for which he is responsible and ensure that it is safe. He must then conduct a DSTI with his work team specifically concerning the tasks that they will be performing during the course of the day or shift. The relevant Task-Based Risk Assessment for the activity must be used as the basis for the discussion. The correct work method must be reiterated and the identified hazards, risks and control measures must be discussed with the team (each team member must be given the opportunity to contribute and participate in the discussion).

Any team member arriving late must first be taken through the information that was discussed (work method, hazards, risks and control measures) before being permitted to start working. If the work method changes after activities have already begun, the DSTI must be revisited and updated with the team, and the changes must be signed off by the relevant Contractor Health and Safety Officer.

Every member of the work team must sign the DSTI attendance register. The attendance records must be kept and maintained in the Principal contractor's health and safety file.

The Principal contractor's Construction Health and Safety officer must evaluate the content of the DSTI's daily to ensure that they are task-specific. Furthermore, the Construction Health and Safety officer must attend at least one DSTI per day prior to the start of work. The Construction Health and Safety officer may not lead the DSTI discussions, as this is the responsibility of the appointed supervisor.

14.3 Health and Safety Meetings

14.3.1 Health and Safety Meetings

The contractor must schedule and consistently hold monthly health and safety meetings. These meetings must be chaired by the contractor's Construction / Project Manager and all project team must be in attendance.

The contractor must compile minutes of each meeting and attendance records must be kept. These records must be maintained in the contractor's health and safety file.

Note: Where there are other Contractors working in the same construction site, an interface meeting must be held every morning by all contractor's Construction Managers, CHSOs, Construction Supervisors and Health and Safety Representatives.

15. Documentation and Document Control

The Contractor must develop and maintain project-specific documentation required for the effective management of health and safety on the project.

All documents related to the Principal contractor's health and safety management system must be effectively controlled.

The Contractor must establish a process for the systematic control of health and safety records and related data. Controls must be in place for the creation, receipt, secure storage, maintenance, accessing, use and disposal of such records and data.

The confidentiality and security of records and data must be maintained in a manner that is appropriate for the nature of the records and data, and in accordance with any applicable data or privacy protection legislation.

15.1 Contractor Health and Safety File Requirements

The contractor must compile and maintain a file containing all necessary health and safety related documentation. The client should provide construction work permit to be displayed and kept on site at all times. The contents of the file will be audited by Client's Health and Safety Agent / Representative on a monthly basis.

Required documentation includes, but is not limited to, the following:

- Letter of Good Standing from the Workman's Compensation Commissioner (where applicable) must have DoL stamp;
 - Proof of Public Liability Insurance;
 - Scope of Work under the contract;
 - List of Contacts and their Telephone Numbers;
 - Health and Safety Policy;
- Approved Contractor Health and Safety Management Plan;
- Organisational Chart for the project;
- Appointment Letters (appointment of the contracting company, and appointments for all persons with health and safety related responsibilities);
- Notifications to the relevant authorities that construction work is in progress e.g. CWP;
- Baseline and Task-Based Risk Assessments;
- Health and Safety Objectives, and associated Improvement Action Plans;
- Safe Work Procedures, Work Instructions and Work Method Statements;
- Planned Task Observations;
- A dossier (Equipment Profile) for each fuel-driven vehicle or machine;
- Inspection Registers, Forms and Checklists (e.g. for portable electrical tools, ladders, safety harnesses, light vehicles, mobile equipment, lifting equipment and lifting tackle, first aid boxes, fire extinguishers, etc.);
- PPE Issue Registers;
- Material Safety Data Sheets;
- Emergency Response Procedures;
- Incident Records;
- A dossier (Employee Profile) for each employee containing:
 - A copy of the employee's Identity Document or Passport;
 - Certificate of Fitness (Pre-Employment Medical Examination);
 - Proof of Induction Training;
 - Other Training Records;
 - Copies of Qualification Certificates and / or Certificates of Competency; and
 - Copies of Licences;

The contractor must ensure that an equivalent file is compiled and maintained by each appointed sub-contractor.

16. Construction Work Permit

Where applicable the client will apply and issue the contractor with Construction Work Permit (CWP) from the Department of Employment and Labour. The contractor must comply with all the requirements of the Construction Work Permit. The CWP site specific number must be conspicuously displayed at the main entrance To the site for which the number is assigned.

17. Operational Control

For project operations and activities, the Contractor shall implement and maintain:

- Operational controls, as applicable to the organization and its activities;
- The organization shall integrate those operational controls into its overall OH&S Management System;
- Controls related to purchased goods, equipment and services;
- Controls related to Principal contractors and other visitors to the workplace;
- Documented procedures, to cover situations where their absence could lead to deviations from the OH&S policy and the objectives;
- Stipulated operating criteria where their absence could lead to deviations from the OH&S policy and objectives.

17.1 Safe Work Procedures

The Contractor must develop, document and implement Safe Work Procedures for all activities involving significant health or safety risk. These procedures must detail the control measures required to effectively manage the health and safety risks associated with the work activities.

Each Safe Work Procedure must be consistent with the Task-Based Risk Assessment completed for the activity.

Every person engaged in an activity for which a Safe Work Procedure has been developed must receive suitable training on the procedure.

17.2 Management Participation and involvement CR 8

17.2.1 Visible Felt Leadership (VFL) and Safety Observations and Coaching (SOC's)

The Principal contractor's supervisory personnel (i.e. Managers and supervisors) must participate in the project's Visible Felt Leadership (VFL) programme. Each manager and each supervisor must, as part of his normal duties, perform Safety Observations and Coaching (SOC's). The intention of this programme is to encourage interaction between supervisors and workers concerning health and safety matters in order to:

- Reinforce behaviours consistent with standards, procedures and management system requirements;
- Correct behaviours inconsistent with standards, procedures and management system requirements; and
- Verify whether employees have the necessary training, certification, equipment, etc.

17.2.2 Planned Task Observations

All Principal contractor, management supervisors must perform Planned Task Observations (PTO's) to verify that the control measures that have been identified in Safe Work Procedures (and associated Risk Assessments) are being adhered to and are being properly implemented, and to provide guidance where deviations are noted.

Each supervisor must complete at least one PTO per week involving one or more employees in his work team.

17.3 General Rules of Conduct

All persons are required to conform to the following rules of conduct while on the site.

The following acts are prohibited:

- Engaging in practical jokes, horseplay, scuffling, wrestling, fighting, or gambling;
- Assault, intimidation, or abuse of any person;
- Insubordination towards any supervisor or manager;
- Refusing to carry out a reasonable and lawful instruction concerning health and safety;
- Entry into any restricted area (including barricaded areas), unless authorised to do so by the responsible person;
- Unauthorised use / operation of any equipment or machinery;
- Negligently, carelessly or wilfully causing damage to any property;
- Destroying or tampering with safety devices, signs, or signals;
- The use of water from fire hydrants or hose reels for any purpose other than extinguishing a fire;
- The wilful and unnecessary discharging of fire extinguishers;
- Refusing to give evidence or deliberately making false statements during incident investigations;
- Bringing alcohol, drugs, or any other intoxicating substance onto site;
- Bringing a firearm, ammunition, or any other offensive weapon onto site;
- Bringing animals onto site;
- Running, except in an emergency;
- The use of an ipod (or similar) whilst working on site;
- Sleeping on the job;
- Building fires on site, unless in a suitably constructed barbequing facility; and
- Pouring / pumping / flushing any substance (chemical / hydrocarbon / waste water) into a storm water drain, onto bare soil, or into any area where the substance is not effectively contained.

Any of the above actions may result in the temporary or permanent removal of the offending person(s) from site, as well as possible prosecution. The decision of the client representative shall be final and binding in respect of any dispute that may arise from the interpretation of these requirements.

17.3.1 Alcohol, Drugs and Other Intoxicating Substances

The Contractor must ensure that all personnel under his authority do not at any time enter the site or perform any work whilst under the influence of alcohol, a drug, or any other intoxicating substance.

A drugs and alcohol testing program will be implemented. Persons entering the site will be tested. Any person who tests positive for alcohol or drug consumption will be subject to disciplinary action and shall be permanently removed from the site.

Any person have the opportunity to rather report that he/she is under the influence before accessing the project site – in these case the employee may only be send home for the day by the responsible project manager representative but will then be tested for the following five days (each day) on his return to the project site. If it is found that the same person is frequently reporting that he/she is under the influence before even accessing the project site. It shall be the responsibility of the client representative to take disciplinary action and remove such a person's form the project site.

Note: All personnel involved in an incident / accident must immediately be subjected to an alcohol test and a drug test as part of the investigation.

17.4 Site Establishment and Rehabilitation

The contractor shall ensure that all Risk Assessment including method statements should be submitted to the TPT Health and Safety Representation before work can commence and aligned themselves with Environmental requirements.

17.5 Signs and Notices

The Contractor must ensure that all required safety signs and notices are prominently displayed in accordance with the applicable legislation and good safety practice.

Signs and notices must be in English as well as any other language(s) commonly spoken on the project site.

All symbolic signs must comply with the applicable national standards.

No person may deface or damage any safety sign or notice. No person may remove or alter any safety sign or notice unless authorised to do so.

17.6 Machinery

The Contractor must ensure that all plant and equipment brought onto the site is:

- Appropriate for the type of work to be performed
- Approved, inspected, tested, numbered and tagged (if appropriate) before being brought onto site
- Properly maintained in accordance with the manufacturer's recommendations; and
- Placed on a register and checked at least once per month or as required by the applicable legislation.

The Contractor must supply, at his cost, all items of plant and equipment necessary to perform the work and must maintain all items in good working order.

Should any plant or equipment become inoperable for a period that is having or will have a significant impact on the work schedule, the Contractor must, on instruction from the client representative, remove the out of service plant or equipment and replace it with similar fully operational plant or equipment at no additional cost.

No item of plant or equipment delivered to site for use on the contract may be removed from the site prior to the completion of the contract without approval in writing from the client representative.

17.7 Cranes and Lifting Equipment

Should there be a need for the utilisation of the lifting equipment, the contractor must comply with Construction Regulations 22 and all other legislations that are applicable to cranes and lifting equipment.

17.8 Permit to Work

All personnel must comply with the Permit to Work system applicable to the project.

A Permit to Work must be obtained before carrying out any work that involves:

- A hazardous energy source or system, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic) – isolation and lockout may be required;
- Confined space entry;
- Working at height;
- Hot work outside of designated workshops;
- Excavation; or
- A service (e.g. water supply, fire suppression systems, etc.).

17.9 Isolation and Lockout

Isolation and lockout procedures that make it impossible to inadvertently energise any system, plant or equipment so isolated, must be in place for all work where hazardous energy sources exist, including electricity, compressed fluids (e.g. hydraulics and pneumatics), chemical substances (e.g. toxic, corrosive, flammable or explosive gases and liquids), heat (e.g. steam), radiation, and machinery or materials with potential energy (gravitational and elastic). These procedures must be strictly enforced. All personnel must comply with the isolation and lockout system and procedures applicable to the project.

All Isolation and Lockout Procedures must incorporate the following basic requirements:

- The issuing of a formal Permit to Work for any work that requires the isolation of any system, plant or equipment;
- The use of defined Equipment, Discipline and Personal Locks and multiple lockout systems (i.e. Isolation Bars and lockout hasps);
- Clear identification of all isolation and lockout points ensuring there is no duplication;
- Isolation of the main energy source;
- The use of slip plates or the blanking off of pipelines or ducting, in addition to the chaining and locking of valves, as determined by a risk assessment;
- Suitable methods of preventing the movement of equipment; and
- Methods to test the effectiveness or completeness of the isolation.

Note: In the case of electrical isolation, a test for voltage must be carried out, after the switching device, to ensure the absence of voltage.

- The Isolation Officer must place the key to the Equipment Locks on an Isolation Bar (at a Lockout Station) and must then attach a Discipline Lock (to prevent the key from being removed) before issuing a Clearance Certificate;
- The Discipline Lock must remain in place when handing over to subsequent shifts. All Discipline Locks for a particular discipline (e.g. low voltage electricity) must be keyed-alike so that any Isolation Officer appointed for that discipline (and issued with a key) can open any of the Discipline Locks used for that discipline.

This enables an Isolation Officer to de-isolate equipment that may have been isolated by another Isolation Officer during an earlier shift. Appointed Isolation Officers for a particular discipline are the only persons permitted to hold keys to the Discipline Locks used for that discipline.

17.10 Electrical Safety

All electrical work must be carried out by competent personnel in accordance with all legal requirements, codes, design criteria and safety standards applicable to the project.

Each Contractor carrying out electrical work on the project site(s) must develop, document and implement Safe Work Procedures that are aligned with the requirements of this standard.

All persons who will be carrying out electrical work must be certified against the requirements of job and equipment-specific electrical competency standards for the project, which must address job and equipment-specific Safe Work Procedures.

Each person potentially exposed to electrical hazards must receive electrical hazard training at the commencement of his employment on site and thereafter on an annual basis. The training must address the equipment and conditions specific to the area where the individual will be working. The training material must be documented and training records must be kept.

17.10.1 High Voltage Power Lines

Before any mobile equipment (such as a crane, bulldozer, back-actor, boom truck or drill rig) is mobilised to a work site, an assessment must be carried out (including a thorough inspection of the work site and the access route) in order to clearly identify any overhead or underground power lines.

A system must be in place to mitigate the risks associated with working in close proximity to power lines and suitable measures must be taken to prevent personnel or equipment from coming into contact with power lines. Extreme caution must be exercised.

Where possible, exclusion zones (based on minimum clearance distances specified by the electrical power utility or the client representative) must be created with rigid barriers and warning signs.

Only in exceptional circumstances, and then only after a detailed method statement and risk assessment has been approved, all necessary mitigation or control measures are in place (including the use of a spotter), and a Permit to Work has been issued by the client representative, may equipment be operated within one boom length of energised overhead power lines. Suitable protective insulating barriers may need to be used.

If possible, the power lines must be de-energised and isolated while the work is carried out. All equipment operators and rigging personnel must be trained in the hazards and the applicable safe approach distances (exclusions zones) associated with overhead power lines.

A procedure must be in place for the evacuation of mobile equipment or a vehicle in the event of accidental contact with power lines. All operators must be trained in this procedure and must follow it implicitly.

Note: Works on, over, under or adjacent to Railway Lines and near High Voltage Equipment must comply with Transnet E7/1 Specification.

17.10.2 Welding

The contractor shall comply with General Safety Regulations 9.

17.10.3 Compressed Gas Cylinders

The contractor must establish a suitable storage area for oxygen, acetylene, LPG and argon cylinders in compliance with the following requirements:

- Compressed gas cylinders must always stand upright (i.e. when being used, stored or transported) and must be properly and individually secured to prevent them from falling over.
- Cylinders must be protected from flame, heat and from being struck by moving equipment and falling objects.
- When handling gas cylinders (whether full or empty), care must be taken to prevent sudden impacts.
- Whenever a cylinder is not in use, the protective cap must be in place to prevent the valve from being damaged.
- Gas cylinders may not be carried, dragged, rolled or slid across a floor or surface.
- When gas cylinders are to be moved / used, they must be placed in a proper cylinder trolley fitted with a 1.5kg dry chemical powder fire extinguisher.

- Gas cylinders may not, under any circumstances, be used as rollers or work supports.
- If transported by crane, hoist or derrick, compressed gas cylinders must be placed in a suitable cradle, net or skip box. Cylinders may NEVER be lifted using wire rope, fibre rope, a web sling or a chain sling. Before moving / transporting a gas cylinder, the regulator must be removed and the protective valve cap must be replaced. Gas cylinders may not be taken into a confined space. Gas hoses that are run into a confined space must be removed during breaks.
- Cylinder valve keys must be in place. If no suitable valve key is available then the cylinder may not be used. Nothing but the manufacturer-supplied key may be used to open the valve.
- A flashback arrestor and a check valve (non-return valve) must be installed between the regulator and the hose and between the hose and the torch on the oxygen line and on the fuel (acetylene) line.
 - Connection fittings may not be forced and safety devices associated with cylinder valves or regulators may not be altered / tampered with.
 - Gas hoses may not be joined. Only approved hose connectors of the crimp type are permitted. Wire and jubilee clamps are prohibited.
 - Only high quality ancillary equipment may be used. This includes flashback arrestors, hoses, clamps, spindle keys, nozzles and torches.
 - Only trained and competent personnel may operate gas welding / cutting equipment and appliances.
 - When an employee opens the valve to a cylinder, he must stand to one side and open it slowly. Valves may never be left partly open – they must either be closed or be opened fully.
 - Leaking cylinders must immediately be removed from service and the workplace (if it is safe to do so). Suitable firefighting equipment must be at hand wherever gas cylinders containing oxygen and / or fuel gas are being used.
 - Gas cylinders must be prevented from coming into contact with electrical circuits, e.g. welding leads. Never strike an arc on a cylinder.
 - Oxygen may only be used for the purpose for which it is provided. Do not use oxygen in pneumatic tools or tyres, as an explosion may occur.
 - Empty cylinders must immediately be marked as such and must be removed to the cylinder storage area at the end of each day / shift.

17.10.4 Portable Electrical Equipment

The contractor shall comply with Electrical Machinery Regulation 10.

17.11 Electrically Powered Tools and Equipment

All powered hand tools, such as circular saws, drills, chainsaws, percussion tools, jigsaws etc., must be equipped with a constant pressure switch that will shut off the power when the pressure is released. (Exception: this requirement does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, and similar hand operated power tools).

Electrical power tools must be of the approved double-insulated type. The electric cord, pneumatic or hydraulic supply line of powered tools must not be used for hoisting or lowering of the tool. Loose clothing, jewellery or gloves that could get caught in the tool must not be worn when operating powered tools. Operators of powered tools who have long hair must keep their hair tied up.

The power source must be disconnected from the tool before making any repairs, servicing, adjustments, or replacing attachments such as drill bits.

17.12 Pneumatically Powered Tools and Equipment

Pneumatic powered tools must only be driven by filtered compressed air with an in-line lubrication system, or be lubricated prior to use if there is no in-line lubrication system. When using pneumatic powered tools the designated tool pressure must be attained by the use of a regulator.

Pneumatic powered tools must be disconnected when not in use. They must not be disconnected from the air supply until all the residual pressure has been released or contained by a shut-off device. Hoses must not be kinked as a means of containment.

Employees operating pneumatic powered tools, and any potentially affected employee in the vicinity of use, must wear suitable personal protective equipment.

All rotary compressed air tools (e.g. drills) must have the rated revolution per minute (RPM) permanently marked on the casing. Only attachments of compatible RPM must be used with these machines.

The actual RPM of the tool must be checked every three months to ensure that the speed is as rated to manufacture specifications.

Pneumatic powered tools must be secured to the air supply hose by an approved positive means to prevent the tool from becoming accidentally disconnected. Safety clips or retainers must be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

All pneumatically driven nailers, staplers, and other similar equipment provided with automatic fastener feed, which operate at more than 100 kPa pressure at the tool, must have a safety device on the muzzle to prevent the tool from ejecting fasteners unless the muzzle is in contact with the work surface.

Compressed air must not be used for cleaning purposes except where reduced to less than 30 kPa, and then only with effective chip guarding and personal protective equipment in place. The 30 kPa requirement does not apply to concrete form, mill scale and similar cleaning purposes. The use of compressed air for cleaning purposes must be approved by the client representative. Compressed air must not be pointed at any part of the body or used for cleaning clothing.

Airless spray guns of the type which atomize paints and fluids at high pressures must be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released. A diffuser nut which will prevent high pressure, high velocity release while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection must be provided in lieu of the above.

Abrasive cleaning nozzles must be equipped with an operating valve, which must be held open manually to enable operation. A support must be provided on which the nozzle may be mounted when it is not in use.

17.13 Fuel Powered Tools and Equipment

Fuel powered tools must be shut down and allowed to cool before being refuelled, serviced, or maintained. Fuel must be transported, handled, and stored in approved fuel containers. Where possible, diesel driven engines must be used in preference to petrol driven engines. All fuel powered tools must be included on the Principal contractor's Equipment Register and the register must be submitted to the client representative prior to the relevant work commencing.

When fuel powered tools are used in enclosed spaces, the space must be ventilated and the atmosphere monitored to measure toxic gas concentrations. Persons in the space must wear the necessary personal protective equipment. Confined Space Entry clearance may apply. This type of activity must only be undertaken in exceptional circumstances and requires the approval of the client representative.

17.14 Hydraulically Powered Tools and Equipment

Hydraulic powered tools must use only approved fluid that retains its operating characteristics at the most extreme temperatures to which it will be exposed. The manufacturer's stated safe operating pressures for hoses, valves, pipes, filters and fittings must not be exceeded.

Only manufacturer approved hoses, valves, pipes, filters and fittings must be used.

17.15 Hand Tools

Employees required to use hand tools must receive training relevant to the tool and have their competency assessed in the operation, inspection and maintenance of the tool. Where necessary, additional applicable personal protective equipment must be worn when using hand tools.

Wrenches, including adjustable, pipe, end, and socket wrenches, must not be used when the jaws are sprung to a point where slippage occurs. Impact tools such as drift pins, wedges and chisels, must be kept free of mushroomed heads. The wooden handles of tools must be kept free of splinters or cracks.

Adjustable wrenches must not be used in lieu of ring or open-end type spanners, unless a risk assessment has been conducted and the use of the adjustable wrench is approved by the client representative.

Wherever possible, ring spanners must be used in preference to open end spanners.

Correct hand tools for the job must be used, e.g. screwdrivers must not be used as chisels, and pliers must not be used as hammers.

All wedges and drifts that may spring, fly or fall to lower levels upon impact must be fitted with an attachment which attaches a safety "lanyard" to a solid structure to restrain the impact tool from becoming a projectile.

Purpose built tools and equipment may not be used unless a risk assessment has been conducted and authorised by the client representative.

17.16 Angle Grinders

The following personal protective equipment must be worn when using angle grinders:

- Safety helmet;
- Gloves;
- Safety glasses (or safety goggles) and a full face shield (i.e. double eye protection);
- Overalls with long sleeves and long pants, avoid any form of loose clothing;
- Safety boots with steel toe protection;
- Hearing protection;
- Breathing apparatus where dust or fumes may be generated;
- Where grinding machines are used, a face shield is to be worn as extra protection to the safety glasses; and
- Certain tasks may require the use of a leather apron as determined by a risk assessment.

17.17 Inspection of Equipment and Tools

All tools must be inspected by the user before, during and after use. If any faults are identified, the tool must be taken out of service and not used until repaired. Faulty tools that are not able to be repaired must be tagged "out of service" and removed from site.

17.18 Manual Handling and Vibration

Any handling or lifting task that can only be done manually must be planned and rehearsed before the task is done.

If more than one person is involved in a task a communication procedure must be agreed in advance. Lowering the load must be done in a controlled manner. Dropping a load is dangerous and must be avoided.

As a guideline 25 kg is considered to be the limit of what a person can safely handle. Where there are loads exceeding 25 kg the risk of handling the load must be mitigated to assure minimal potential for any injury.

When mechanical lifting aids are provided, they should be used.

Extra care should be taken when lifting awkwardly shaped objects.

Position the feet correctly. The feet should be placed hip-width apart to provide a large base. One foot should be put forward and to the side of the object, which gives better balance.

Bend or 'unlock' the knees and crouch to the load. The weight will then be safely taken down the spine and the strong leg muscles will do the work.

Get a firm grip. The roots of the fingers and the palm of the hand should grip the load. This keeps the load under control and permits it to be distributed more evenly.

17.19 Personal Protective Equipment

The contractor shall comply with General Safety Regulation 2.

17.20 Sun Protection

The Contractor must ensure that all personnel are protected in sunlight through the use of long sleeve shirts, long trousers, brims to safety helmets and UV factored sunscreen. Shade structures must also be made available to all employees.

The Contractor must conduct training and awareness sessions with his employees, advising on the risks associated with working in the heat (including dehydration) and the precautions to be taken (e.g. ensuring adequate fluid intake).

17.21 Fuel / Flammable Liquid Storage and Refuelling

The Contractor must comply to the General Safety regulations 4.

17.22 Fire Protection and Prevention

The Contractor must compile a Fire Protection and Prevention Plan for the work that will be carried out on site.

The Contractor must comply with Construction Regulations 29 and in addition must comply with environmental regulation for workplaces 1987 .

Over and above the following should be complied to:

All fire extinguishers (and any other firefighting equipment) placed on site must be:

- Conspicuously numbered;

- Recorded in a register;
- Visually inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register and the competent person must sign off on the entries made); and Inspected and serviced by an accredited service provider every year.

Any fire extinguisher that has a broken seal, has depressurised, or shows any sign of damage must be sent to an accredited service provider for repair and / or recharging. Details must be recorded in the register.

The Contractor must compile an emergency response procedure detailing the actions that must be taken in the event of a fire or a fire / evacuation alarm.

Each vehicle used on site for work purposes and each item of mobile equipment with a diesel or petrol engine must be fitted with a permanently mounted fire extinguisher.

Whenever any work is carried out involving the use of a flammable substance / material, the area must be cordoned off and appropriate warning signage (i.e. "No Unauthorised Entry", "No Smoking" and "No Naked Flames") must be displayed.

17.23 Smoking

The Contractor must not permit smoking on site except within designated smoking areas selected in accordance with the applicable legislation. Such an area must be clearly demarcated and the required signage must be displayed.

In all designated smoking areas, adequate non-combustible commercial ashtrays and / or cigarette butt receptacles (butt cans) must be provided.

Ashtrays and other receptacles provided for the disposal of smoking materials must not be emptied into rubbish bins or any other container holding combustible materials.

"No Smoking" signs must be strictly observed.

17.24 Housekeeping

The Contractor must comply to Construction Regulations 27 and in addition must comply with Environmental Regulation for Workplaces 1987.

The Contractor must carry out housekeeping inspections on a weekly basis to ensure maintenance of satisfactory standards. The Contractor must document the results of each inspection. These records must be maintained and must be made available to the client representative on request.

Where the Contractor fails to maintain housekeeping standards, the client representative may instruct the Contractor to appoint a dedicated housekeeping team for the duration of the project at the Principal contractor's expense.

17.25 Stacking and Storage

The Contractor must comply to Construction Regulations 28 and in addition must comply with the provisions for the Stacking of Articles in the General Safety Regulations, 2003.

No equipment, tools, files or documents may be stored or stacked on top of cupboards which are higher than 1.5 metres in height.

17.26 Ladders

All ladders used on site must be of sound construction and adequate strength.

Only non-conductive ladders made of wood or fibreglass may be used for electrical work or work being performed in proximity to energised electrical equipment. Metal ladders and ladders with metal reinforcing may not be used.

All ladders must be numbered, listed in a register, and inspected by a competent person on a monthly basis (the results of each inspection must be recorded in the register).

Before using a ladder, the user must inspect it for damage.

Ladders with missing, broken, cracked or loose rungs, split stiles, missing or broken spreaders (stepladders) or any other form of damage or defect may not be used.

A damaged ladder must be removed from service (and tagged, "Out of Service") without delay and must then either be repaired (if possible) or destroyed to prevent further use.

Persons must receive instruction in the correct use and proper care of ladders.

Ladders may only be used as a means of access and egress. The use of ladders as working platforms is prohibited, except for inspection and carrying out minor tasks (i.e. light work and short duration) such as changing a light bulb.

Ladders may not be positioned horizontally and used as walkways or runways or as scaffolding.

All portable ladders must be fitted with non-skid safety feet (or some other means to prevent the base of the ladder from slipping) and the feet must always be placed (stand) on a firm level surface.

The use of bricks, stones, wood or any other material to level the stiles of a ladder is prohibited.

Ladders may not be placed on movable bases such as boxes, tables, trucks, etc.

The base or foot of a ladder must always be secured to prevent it from slipping. The ladder must be held by an assistant if the base cannot be secured in any other way (e.g. tied off).

A straight ladder must extend at least one metre above its support (or above the working platform that it is providing access to). The top of the ladder must be tied off (or otherwise secured to its support) to prevent accidental movement.

A straight ladder must be placed at a safe angle, i.e. tilted at a ratio of approximately 4:1, meaning that the base of the ladder must be one metre away from the wall (or other vertical surface) for every four metres of height to the point of support.

A stepladder may never be used as a straight ladder. A stepladder must be opened fully and the spreaders must be locked securely.

When using an extension ladder, at least four rungs must always overlap at the centre of the ladder.

Ladders may not be joined together unless they have been specifically designed and manufactured for that purpose.

A suspended ladder (i.e. not standing on a base) must be attached in a secure manner to prevent undue swinging or swaying, and to ensure that it cannot be displaced.

A ladder may not be placed against a window, glass or any other material which is unlikely to withstand the force exerted on it by the top of the ladder.

A ladder may not be placed in front of a door or window that opens towards the ladder unless the door or window has been locked or barricaded.

When a ladder is used near an entrance or exit, the base of the ladder must be barricaded.

Materials and / or equipment may not be placed in close proximity to the base or landing of any ladder.

When ascending or descending a ladder, a person must always face the ladder and use both hands (i.e. maintain three points of contact).

Nothing may be carried up or down a ladder if it prevents the person from holding on to the ladder with both hands. Tools must always be properly secured. This can be achieved by attaching them to the wrist

using lanyards or placing them in a tool belt around the waist. Tools and materials may also be carried in a bag over the shoulder or hoisted to the landing using a tool bag and rope.

Only one person at a time may use (i.e. be positioned on) a ladder.

No person may stand or step above the third rung from the top of a straight ladder or above the second highest step of a stepladder.

Overreaching from a ladder is prohibited. If the target is not within comfortable reach, the person must climb down and reposition the ladder.

No person may run up or down a ladder, or jump from the lower rungs or steps to the ground.

All ladders must be properly maintained and cared for.

Ladders must be stored under cover and should be hung in a horizontal position from several brackets.

No ladder may be left lying on the ground or be left exposed to the weather. A ladder left lying on the ground presents a tripping hazard and it may be damaged by vehicles running over it.

No ladder may be left in such a position where it may fall over, be accidentally knocked over, or be blown over by the wind.

Ladders may not be painted, as the paint may conceal damage, defects, labels or other markings.

Instead of paint, clear varnish or wood oil may be used to preserve wooden ladders.

Ladders must be kept clean, as dirt may conceal damage or defects. Oil or grease accumulation on the rungs of a ladder may cause a person to slip.

Before making use of a ladder, each person must make an effort to remove mud, oil, grease, etc. from his boots.

17.27 Facilities

The Contractor must comply to Construction Regulations 30 and in addition must comply with the provisions in the Facilities Regulations, 2004

17.28 Hazardous Chemical Substances

The Contractor must comply to Hazardous Chemical Substances Regulations

17.29 Fitness for Work

The Contractor must comply to General Safety Regulation 2A.(Intoxication)

The Contractor must develop and implement a programme to manage employee fitness for work. All employees working on site for whom the Contractor is responsible (i.e. direct employees of the Contractor as well as the employees of any appointed contractors) must be subject to this programme.

All safety critical jobs (i.e. roles where fatigue or other causes of reduced fitness for work could lead to serious injury, illness or death to employees, significant equipment / plant damage, or significant environmental impact) must be identified and the risks associated with reduced fitness for work in these roles must be assessed.

Sleep deprivation during shift work or from excessive working hours is a known cause of fatigue. Fatigued employees are at increased risk of accidents. Shift system design must consider:

- The effect on worker fatigue;
- The effects of activities carried out during scheduled and overtime hours;
- The impact on sleep cycles of activities such as commuting to and from site; and

- The monitoring and control of working hours.

All employees engaged in safety critical jobs must undergo fitness assessments (medical examinations) which must be carried out prior to the commencement of employment on the project, prior to a change in role, periodically based on an employee's individual risk profile, and on termination of employment on the project by a registered occupational medical practitioner:

- Pre-Employment Medical Examination – to assess the physical suitability of the person for the role and environment in which he will work (carried out prior to the commencement of employment on the project and prior to induction);
- Periodic (Surveillance) Medical Examination – to assess the ongoing physical condition of an employee to determine if his role is impacting on his health and whether the employee's fitness level is still adequate for the role he holds (these medical examinations are "risk driven" – the specific protocol followed and the frequency of the examinations will depend on the applicable legal requirements and the employee's individual risk profile as determined by his personal fitness, the nature of his role / duties, and the environment in which he works / occupational health hazards to which he is exposed). The periodic medical assessment programme must include:

- ♦ The identification of modifiable risk factors that may impact fitness for work;
- ♦ Education and support to maintain health or address identified risk factors; and
- ♦ Education and support to help employees regain their fitness for work.
- ♦ Role Change Medical Examination – to assess an employee's physical suitability for a different role and work environment (carried out prior to a change in role / duties);

Exit (Post-Employment) Medical Examination – to determine the total physical impact of the work the employee performed (carried out on termination of employment on the project if the employee worked on the project site for more than three months).

Note: The medical examinations described above may only be carried out by an occupational medical practitioner (i.e. a medical doctor who holds a qualification in occupational medicine).

17.30 HIV / AIDS

The Contractor must assess the risks posed by HIV. Appropriate mitigation strategies must be implemented as required.

Discrimination towards employees on the basis of actual or perceived HIV status is forbidden.

All information on the HIV status and condition of employees and community members, including that relating to counselling, care and treatment and receipt of benefits, must be maintained in medical confidence.

HIV / AIDS screening may not be a requirement for recruitment or a condition of employment.

18. Occupational Hygiene

TPT Occupational health must provide the Contractor with the health risk assessment in respect of existing Occupational Health Risk on Sites. Additionally an Occupational Health Program for monitoring the existing Occupational health Risk will be given to the Contractor

The Contractor must conduct an Occupational Health Risk Assessment in respect of their trade.

18.1 Thermal Stress

The Contractor must comply to Environmental Regulations for workplaces 2 and in addition to the following:

When a risk of thermal stress is identified, the following exposure controls must be implemented:

- An acclimatization period for new workers and those returning from extended leave or sickness;
- Training in the recognition of signs and symptoms of heat or cold stress, emergency procedures and preventative measures;
- Protective observation (buddy system or supervision); and
- A requirement for self-paced working.

The following exposure controls must be considered by a competent person:

- Work / rest regimes and job rotation based on measurements conducted;
- Suitable rest areas with a provision of cool drinking water and cool conditions for high temperatures, or provision of warm drinks and warm conditions for cold temperatures;
- Selection of appropriate clothing or other PPE for extreme temperature conditions;
- The use of engineering controls; and
- Undertake hot / cold tasks during a cooler / warmer time of the day.

Where thermal stress is assessed to be a risk, the operation must develop a suitable emergency response plan.

18.2 Measuring and Monitoring

The Contractor must comply to Hazardous Biological Agents Regulations 7 and Hazardous Chemical Substance Regulations 5

A plan for measuring and monitoring occupational exposure must be developed and it must include:

- Detail of what must be measured and monitored, based on a risk assessment and / or identified legal or other requirements;
- The frequency of measurement and monitoring;
- A description of the necessary equipment;
- Data quality requirements and controls (including details on the sample size for statistical validation and any rejection criteria);
- The sampling and analysis method(s) including any laboratory certification requirements; and
- The competency requirements for persons carrying out workplace monitoring.

Each instrument and item of equipment used for occupational exposure measurement and / or monitoring must be:

- Properly maintained to ensure compliance with legislative requirements;
- Controlled and safeguarded from unintentional adjustments;
- Suitably stored and protected from damage; and
- Calibrated or verified against a traceable standard at specific intervals (calibration records must be retained).

Each analytical laboratory service that is used must have implemented a credible quality assurance or quality control program.

All monitoring results obtained must be analyzed on a regular basis to:

- Identify trends and potential exceedances of legal or other requirements (such as Occupational Exposure Limits);
- Identify inconsistent or unusual results;
- Evaluate the effectiveness of existing control measures;
- Measure performance against stated objectives; and Identify continual improvement opportunities.

Each exceedance of a specified requirement or limit must be recorded, investigated and reported. Appropriate corrective actions must be identified and implemented.

19. Structure

A Contractor must ensure that, all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;

No structure or part of a structure is loaded in a manner which would render it unsafe; and all drawings pertaining to the design of the relevant structure are kept on site and are available on request to an inspector, other Principal contractors, the client and the client's agent or employee.

An owner of a structure must ensure that;

- Inspections of that structure are carried out periodically by competent persons in order to render the structure safe for continued use;
 - That the inspections contemplated in paragraph (a) are carried out at least once every six months for the first two years and thereafter yearly;
 - The structure is maintained in such a manner that it remains safe for continued use;
 - The records of inspections and maintenance are kept and made available on request to an inspector.

20. Emergency Preparedness and Response

The Contractor must develop, implement, test and maintain an Emergency Response Plan (incorporating emergency evacuation procedures) that focuses specifically on the Principal contractor's team and work activities. The plan must be risk-based and must detail the procedures that must be followed when responding to all potential emergency scenarios such as a medical emergency (including first aid response), a fire, an explosion, a hazardous substance spill, flooding, rescue from height, rescue from a confined space, etc.

The Principal contractor's Emergency Response Plan must be aligned with the Emergency Response Plan developed for the project.

Potential off-site emergency scenarios must be included (e.g. emergency scenarios related to the transport of personnel, the transport of hazardous materials, and personnel performing work in remote locations).

Consideration must be given to neighbours, and to the availability and capability of local emergency services. Details of any arrangements with external emergency response service providers must be included.

The Emergency Response Plan must satisfy and comply with all applicable legal requirements. The plan must be adequately resourced to ensure effective implementation. These resources must include appropriate personnel, external emergency response service providers, emergency response equipment, and warning devices. All equipment and warning devices must be identified, maintained and tested to ensure availability at all times.

Accountability for the Emergency Response Plan must be clearly defined. An Emergency Response Team (ERT) responsible for the implementation, management and execution of the Emergency Response Plan must be established. The roles and responsibilities of each team member must be clearly defined in the plan. Each team member must receive appropriate training to ensure that each role is performed competently.

The process for managing incident communication, notification, and reporting must be incorporated into the Emergency Response Plan. The responsible person(s) must be clearly identified, and the protocols for communicating with internal and external stakeholders must be defined.

Emergency evacuation procedures must be developed and included in the Emergency Response Plan. A copy of the plan must be provided to the client representative for approval prior to site establishment. The Emergency Response Plan must be formally reviewed (and amended if necessary) at least on an annual basis, to ensure that it remains appropriate and effective on emergency situations.

The Contractor must ensure that:

- A suitable evacuation alarm (siren) must be provided. If work is to be carried out in proximity to an existing operational plant, the alarm provided by the Contractor must be distinctly different (in terms of the sound that it generates) to any alarm installed in the operational plant. All persons working in an area where an evacuation alarm is sounded must respond to it immediately.
- Suitable fire-fighting equipment must be provided and maintained, and personnel must be trained in fire-fighting procedures and the use of fire-fighting equipment.
- Suitable first aid equipment and supplies must be provided and maintained, and an adequate number of appropriately trained First Aiders must be in place.
- Emergency assembly points positioned in safe locations away from buildings, plant and equipment must be designated (and conspicuously signposted). In the event of an evacuation, all persons (i.e. personnel and visitors) must assemble and be accounted for at these emergency assembly points.
- All personnel must receive awareness training on the applicable emergency response procedures, and all visitors entering the site must be properly instructed in these procedures.
- The emergency response procedures must be displayed on each notice board.
- A diagram (site plan) indicating evacuation routes, emergency assembly point locations, and the positioning of emergency equipment (fire extinguishers, first aid boxes, etc.) must be prominently displayed in all buildings and plants, in all offices, on all notice boards, and in other locations on the site as may be required.
- An up-to-date list of emergency telephone numbers must be compiled and maintained. A copy of this list must be posted at each site entrance, in each office, near each telephone, and on every notice board.
- Emergency response drills must be conducted to test the effectiveness of the emergency procedures and equipment, as well as the knowledge and proficiency of the response personnel. Where appropriate, drills must include liaison with and the involvement of external emergency response service providers. A variety of emergency scenarios must be tested

including, but not limited to, medical emergencies, fires, rescues, and hazardous substance spills. A drill must be carried out one month after site establishment and six-monthly thereafter.

Each drill must be monitored and the outcomes (highlights and shortcomings) must be documented. Corrective actions must be identified and implemented to address the shortcomings, and the Emergency Response Plan and associated procedures must be amended as required.

20.1.1 First Aid Kits

The contractor shall comply with General Safety Regulations 3.

21. Management Review

A review of the Principal contractor's Health and Safety Management System must be completed annually to ensure that the system continues to be effective in managing health and safety performance and meeting project requirements.

The review must evaluate if there is any need for change and must identify actions to improve the system.

The review must be led by senior management and the following must be considered:

- The suitability of the policy adopted for the project;
- The impact of changing legislation;
- The management of risk;
- Health and safety objectives and performance indicators;
- Changing expectations and requirements of relevant stakeholders;
- Changes to the Principal contractor's scope, schedule, designs, etc.;
- Changes to the Principal contractor's organisational structure;
- Communication and feedback (particularly from employees, Project representatives, and client representatives);
- The effectiveness of the management of change process;
- Workplace exposure monitoring and medical surveillance;
- The status of corrective actions;
- Performance statistics, including an annual summary of safety statistics, and occupational hygiene monitoring and medical surveillance results;
- Non-conformances (findings) from completed audits;
- Follow up on actions from previous management reviews; and
- Recommendations and opportunities for improving the effectiveness of the management system.

A record of each completed management review must be retained and it must include all decisions and identified actions concerning alterations, modifications or improvements to the management system that demonstrate a commitment to continual improvement.

For occupational hygiene: Approved Inspection Authority (AIA) for Occupational Hygiene

22. Management of Change

To ensure that proposed changes do not give rise to unacceptable health or safety risk, the Contractor must develop and implement a process for identifying and managing change in the workplace (e.g. changes to scope, schedule, procedures, work methods, site conditions, designs, plans, plant and equipment, materials, processes, etc.) that may impact on health or safety performance.

The management of change process must take into consideration that changes may be planned or unplanned, sudden or gradual, temporary or permanent.

The process must aim to ensure that:

- Changes are identified and assessed before they are implemented;
- Careful consideration is given to managing the risks associated with any change;
- Due diligence can be shown to have taken place;
- The number of unsatisfactory or unnecessary changes is minimised;
- The right people are involved in the change process; and
- All statutory requirements are met.

All risks associated with a proposed change must be evaluated and ranked. The risks that are ranked as moderate or higher must be managed to prevent serious injury or illness.

It must not simply be assumed that a change will not result in significant risks. All proposed changes must be formally evaluated. The evaluation or review must include:

- An appropriate level of technical expertise;
- The involvement of the workforce potentially affected by the proposed change; and
- Approval of the change by a person with at least the same level of authority as those who control the existing process or item being changed.

23. Contractor Alignment

Processes must be in place to ensure that the health and safety risks associated with the procurement of materials, equipment, services and labour are identified, evaluated and effectively managed.

A process for evaluating a sub-Principal contractor's (or supplier's) ability to provide materials, equipment, services and labour that meet defined specifications must be in place. A prospective sub-Principal contractor's health and safety management expertise, experience and capability (including previous health and safety performance) must be formally assessed prior to any contract or purchase order being awarded.

Each appointed contractor must develop and implement a detailed Health and Safety Management Plan based on the requirements of the Principal contractor's Health and Safety Management Plan and the Health and Safety Specification for the project. This plan must be reviewed and approved by the Contractor prior to the commencement of any work.

The properties of all materials provided to the project must be adequately understood, documented and integrated into operating procedures where exposure to these materials presents a significant health or safety risk.

Procedures, commensurate with the evaluated risk, must be in place for the receiving, storing, dispatching and transporting of all equipment and materials.

Before work commences on any contract, all contractor personnel must receive comprehensive orientation and induction training (refer to clause 14).

All work carried out by a contractor must be managed (activity supervised) throughout the contract period and performance must be reviewed (audited) on a regular basis.

24. Incident Reporting and Investigation

The Contractor must establish a procedure for the management of all health and safety incidents. This procedure must define the responsibilities, methodologies and processes that must be followed for:

- Reporting an incident;
- Investigating an incident;
- Analysing an incident to determine the root cause;
- Identifying and implementing corrective actions to prevent a recurrence; and
- Communicating information concerning an incident to relevant persons and / or groups.

Please Note: Arrangements must be in place to ensure that proper medical care is provided to any Contractor or contractor employee that suffers an occupational injury or illness. These arrangements must be described in the Principal contractor's Health and Safety Management Plan.

An incident may have multiple impacts. For each impact, the Actual Consequence and the Maximum Reasonable Outcome must be evaluated. Each impact must be evaluated independently, with the most significant classification forming the primary rating of the incident. A Near Miss is an incident, therefore must be reported.

An incident must be reported on the same work day or shift on which it occurs and preliminary details must be recorded and a TPT Incident Flash Report must be completed within 24 hours.

Depending on the Actual Consequence and Maximum Reasonable Potential Outcome of the impact(s), the relevant internal and external parties must be notified in accordance with specified protocols and timeframes, and legislative requirements.

In the event of a significant incident (i.e. an incident with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Potential Outcome of High or Extreme, work must cease and must only resume once the necessary actions (including the re-evaluation of any relevant risk assessments) have been taken to eliminate or reduce the risk of recurrence. Work must only be permitted to recommence once formal authorisation has been granted by the Project Construction Manager. In the case of incidents with an Actual Consequence of Major or Catastrophic, work must not be permitted to recommence until authorisation has been granted by the relevant government authorities (i.e. the South African Police, the Department of Labour or the Department of Mineral Resources).

The Project Construction Manager must ensure that an investigation is completed for each incident that occurs, and that appropriately senior personnel participate in, and authorise the outcomes of, each investigation. Incident investigations must be facilitated by competent and experienced persons who have been trained in the appropriate methodology. (i.e. TCAM – Transnet Causal Analysis Methodology).

All significant incidents (i.e. incidents with an Actual Consequence of Moderate, Major or Catastrophic, or a Maximum Reasonable Outcome of High or Extreme must be investigated using the approved Transnet investigation methodology. Such an investigation must be facilitated by a trained project representative within 7 calendar days.

For all other incidents (i.e. incidents with an Actual Consequence of Insignificant or Minor, or a Maximum Reasonable Outcome of Low or Moderate other methodologies approved by the Project Health and Safety Manager must be used.

Each incident (including Near Hits) must be investigated to a level of detail that is appropriate for the Maximum Reasonable Potential Outcome of the incident.

Each incident must be analysed to determine the root cause, and corrective actions must be identified and prioritised for implementation to eliminate or reduce the risk(s) in order to prevent recurrence of the incident.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing incidents) must be monitored and reported on. The implementation of corrective actions must be verified during monthly audits by the Project Health and Safety Advisors but also no later than 30 calendar days after the conclusion of the incident investigation.

The Contractor must document the results of each investigation and a report must be submitted to the client representative within five working days of the incident occurring.

As a minimum, each incident report must include:

- The date, time and location of the incident;
- A detailed description of the incident, including photographs;
- The names of any injured persons;
- Injury details (if applicable);
- A summary of the first aid and / or medical treatment provided (if applicable);
- The current status of any injured persons;
- The root causes of the incident; and
- Detailed corrective actions, including responsible persons and target dates for implementation.

Each significant incident must be summarised for its lessons learnt following the investigation. This information must be reviewed by the Principal contractor's Project Manager to assure completeness, accuracy and relevance before it is shared with (communicated to) all project personnel.

Refer to the Transnet port terminals health and Safety Management Occurrence Reporting and Investigation HAS-P-0002.

25. Non-conformance and Action Management

The Contractor must establish a process for identifying and recording corrective actions arising from:

- Incident investigations;
- Hazard identification and risk assessment;
- Measurement and monitoring;
- Improvement plans and suggestions;
- Managing change;
- Audits and inspections; and
- Safety observations and coaching (safety interactions).

The Contractor must establish a procedure for managing actions that addresses:

- Identification, categorisation and prioritisation of actions;
- Formal evaluation and approval of actions (management of change process);
- Assignment of responsibilities, resources and schedules for implementation;
- Implementation of actions;
- Tracking and reporting on implementation status; and
- Monitoring and verifying the effectiveness of the actions.

26. Performance Assessment and Auditing

The Contractor must establish and maintain programmes for measuring and monitoring health and safety performance on a regular basis. Metrics must include leading and lagging indicators, and be based on qualitative and quantitative data.

26.1 Reporting on Performance

Reports summarising the Principal contractor's health and safety performance on the project must be compiled on a weekly and a monthly basis.

The Contractor must be prepared to discuss the content of these reports at scheduled health and safety meetings. The reports must contain the following information:

- Number of Contractor and contractor employees on site;
- Total hours worked on site by Contractor and contractor employees (by company);
- Number of incidents by category (i.e. Near Hit, FAI, MTI and LTI);
- Lost Time Injury Frequency Rate (LTIFR) (project to date and 12-month rolling);
- Details of all new incidents for the reporting period and the corrective actions taken or to be taken;
- Feedback (progress updates) on all open incidents and outstanding corrective actions;
- Status and feedback on any employee that may have been injured and has not yet returned to work;
- Details of all health and safety training carried out during the reporting period;
- Number of SOC's (Safety Observations and Coaching) carried out during the reporting period;
- SOC trends identified and proposed action for the coming week or month to maintain positive trends and / or address negative trends;
- Details of all audits, inspections and site visits carried out during the reporting period, and the corrective actions taken (or to be taken) to address all non-conformances;
- Feedback (progress updates) on all open non-conformances and outstanding corrective actions;
- Number of Toolbox Talks conducted during the reporting period (monthly);
- Number of Planned Task Observations (PTO's) carried out during the reporting period (monthly);
- Details of all active risk assessments and Safe Work Procedures highlighting those that are due for review in the coming month (monthly);
- A look ahead (to the coming week, month or quarter) to ensure that appropriate health and safety planning and preparation is done for upcoming work;
- Challenges faced with regard to health and safety; and
- Any other health and safety related information specific to the project that may be required.

Leading indicators (e.g. audit findings, observations, etc.) must be analysed, and any negative trends identified with regard to unsafe behaviour or conditions must be appropriately addressed to prevent incidents.

Lagging indicators (e.g. injuries, illnesses, near hits, etc.) must be investigated in detail to determine the root causes. Corrective actions must be identified, implemented and integrated into Safe Work Procedures to prevent recurrences.

26.2 Audits and Inspections

On a monthly basis, the health and safety management system and workplace activities of the Contractor will be audited by a Project Health and Safety Advisor to assess compliance with the project health and

safety requirements. Any deviation from these requirements (i.e. non-conformance) that places the health or safety of any person in immediate danger will result in the specific activity being stopped until the non-conformance is corrected.

For each non-conformance determined during any audit, the Contractor must identify and implement appropriate corrective actions.

For each corrective action, a responsible person must be designated and an appropriate timeframe (target date) for completion of the corrective action must be specified. Progress on implementing corrective actions (i.e. closing non-conformances) must be monitored and reported on. The implementation of corrective actions will be verified during the monthly audits.

The Contractor Audit conformance will be assessed as a percentage and where conformance is better than 90% it will be considered satisfactory and the Principal contractors must develop and implement an Action Plan within 4 weeks, to be reviewed at the next scheduled Audit. Where the level of conformance is between 80-90%, a corrective action plan will be required to be developed and implemented within 2 weeks, and a follow-up Audit will be carried out. Where the conformance is less than 80%, the Contractor must stop work until an investigation of the cause/s has been completed and corrective action have been developed and implemented by the Principal contractor. Actions required from the audit result are risk based, e.g. An audit result with a critical element scored low may still result in an NCR being issued, or even a work stoppage.

Should it be determined that the Principal contractor's level of compliance is unsatisfactory, all work being performed by the Contractor on the project site may be stopped (at the Principal contractor's expense) until an investigation into the reasons for the poor performance has been carried out, a corrective action plan has been developed, and corrective actions have been implemented.

In addition to the audit carried out by the Project Health and Safety Advisor, the Contractor must carry out an internal audit on a monthly basis to assess compliance with the project health and safety requirements (including the requirements of this specification and the Principal contractor's Health and Safety Management Plan). Furthermore, the Contractor must ensure that each appointed contractor is audited and measured to the same standard. Copies of these audit reports must be submitted to the Project Health and Safety Advisor on a monthly basis.

The Contractor must carry out internal health and safety inspections as follows:

- General site health and safety inspections on a daily basis; and
- Inspections of plant, tools and equipment prior to establishment or use on site, and at least monthly thereafter.

All audits and inspections must be carried out by competent persons who have been appointed in writing.

A schedule of planned audits and inspections must be compiled and maintained ensuring that:

- All work areas and all activities are covered at regular intervals;
- All applicable legal requirements are complied with; and
- Areas or activities with significant associated hazards or risks receive greater attention.

27. COVID-19

The contractor shall comply to the COVID-19 code of practice: managing exposure to sars – cov 2 in the workplace.

28. Reference Documents

Table 29-1: Reference Documents

Document Title
Contractor Health and Safety Specification Guideline TRN-IMS-GRP-GDL-014.3
TIMS Contractor Management Procedure TRN-IMS-GRP-PROC-014
TIMS Policy Commitment Statement – TRN-IMS-GRP-GDL-002-1
Occurrence And Non-Conformance Management Procedure TRN-IMS-GRP-PROC-013
Occupational Health and Safety Act, 85 of 1993 and Regulations and code of practice
Compensation for Occupational Injuries and Diseases Act, 1993

General Quality Requirements for Contractors and Suppliers

22 April 2016

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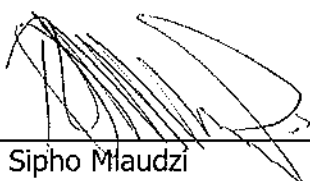
Transnet Capital Projects
Quality Management
General Quality Requirements for Contractors and Suppliers
QAL-STD-0001

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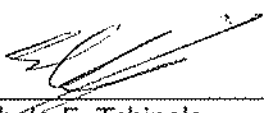
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25/04/2016
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1. Purpose

This Standard outlines the minimum requirements to ensure that products and services supplied to Transnet Capital Projects (TCP) are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in the Contract, all associated specifications, drawings, codes and standards.

2. Definitions / Abbreviations

Term, Abbreviation	Meaning
<i>Contract:</i>	Formal document evidencing agreement between <i>Employer</i> and <i>Contractor</i> for supply of on site or off site services (generic term used for Purchase Orders, Contracts and Service Orders in this Standard).
<i>Contractor:</i>	The party to a <i>contract</i> that provides services to the <i>Employer</i> (generic term used for Vendors, Suppliers, Contractors, Consultants, etc.).
<i>Concession:</i>	A request to deviate from the requirements of the <i>Contract</i> or specified requirements. The <i>Concession</i> request shall clearly identify all elements of the proposed deviation together with any resultant technical, commercial and/or schedule impacts.
Data:	All drawings / documents / data / information / Data Packs and Installation and Operating Manuals required to be supplied under the <i>Contract</i> .
Data Pack (DP):	A compilation of manufacturing data, certification, inspection and testing records prepared by the <i>Contractor</i> to verify compliance with the Contractual requirements.
<i>Employer:</i>	The party to a <i>Contract</i> or Purchase Order to whom the goods are supplied or for whom the work or services are performed. In the context of this document, Transnet Capital Projects is the <i>Employer</i> .
Field Inspection Checklist (FIC):	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.



General Quality Requirements for Contractors and Suppliers

22 April 2016

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Inspection Release Report (IRR):	A document issued to the <i>Contractor</i> by TCP advising release of materials for shipment. This does not relieve the <i>Contractor</i> of its obligations in accordance with the Terms and Conditions of the <i>Contract</i> .
Inspection Waiver Report (IWR):	A document issued to the <i>Contractor</i> by TCP advising that TCP has waived final inspection for the materials listed in this document. The issue of this report does not preclude further inspections by TCP. It is issued without prejudice and does not relieve the <i>Contractor</i> from the guarantees and obligations included in the <i>Contract</i> .
Installation and Operating Manual (IOM):	A document prepared by the <i>Contractor</i> providing relevant information applicable to the installation, operation and maintenance of the specific equipment, including data relating to consumables (eg. oils, etc.)
Non Conformance (NC):	Material, product or workmanship which is not in accordance with the requirements of the <i>Contract</i> .
Non-Conformance Report (NCR):	A document initiated by either TCP or the <i>Contractor</i> advising that certain materials/products/workmanship provided by the <i>Contractor</i> do not conform to the required standards and specifications.
Project Quality Plan (PQP):	A document that outlines the <i>Contractor's</i> strategy, methodology, resources allocation, Quality Assurance and Quality Control coordination activities to ensure that Goods and Services supplied meet or exceed the requirements defined in the <i>Contract</i> drawings, codes and standards.
Quality Assurance (QA):	A formal methodology designed to assess the quality of products or services provided.
Quality Control (QC):	A set of activities intended to ensure that quality requirements are actually being met.
Quality Control Plan (QCP):	A document outlining specific manufacturing/construction inspection and testing requirements, including responsibilities, test acceptance criteria, nomination of witness and hold points.



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Technical Query Note (TQN):	A document used by the <i>Contractor</i> to formally clarify a Technical Query related to the scope of supply. This should not be used where a Non-Conformance Report has already been initiated
TCP:	Transnet Capital Projects – a division of Transnet SOC Limited.
<i>Works Information:</i>	Refers to the <i>Works Information</i> as defined in the <i>Contract (NEC3)</i>

3. Applicable Documents

3.1 General

All work performed shall comply with the requirements of this Standard, the documentation referenced in the *Contract* and the latest revision/edition of the relevant Codes and Standards referenced herein, except works which are specifically excluded by the TCP Principal Project Manager or higher delegated authority.

3.2 Statutory Regulations

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

3.3 Codes and Standards

Document No.	Title
ISO 9001:2015	International Organization for Standardization: Quality Systems

4. Quality System

4.1 General

The *Contractor* / Supplier is responsible for all quality activities necessary to ensure the Work meets the requirements specified in the Contract, and shall manage and coordinate all Quality aspects of the Work in accordance with the requirements of this Standard, together with the *Contractor's* / Supplier's PQP and QCPs once reviewed and accepted by TCP.

4.2 *Contractor* / Supplier Quality System Requirements

The *Contractor* / Supplier shall have and maintain a documented Quality Management System. The *Contractor* / Supplier may be required to demonstrate its use to TCP. The *Contractor's* / Supplier's Quality Management System should be in accordance with the requirements of International Standard ISO 9001.



Note: If hardcopy, check electronic system for latest revision

The *Contractor / Supplier* submits the following Quality System documentation to TCP at the time of tender and at Contract Phases as detailed below:

- Project Quality Plan (Provisional at tender)
- Typical Quality Control Plan (Provisional at tender)
- Schedule/List of QCP's envisaged for the Works
- Quality Policy
- Copy of ISO 9001 certificate (if certified)
- Quality Manual
- Organogram showing clearly the staffing arrangements for Quality (HO and Site)
- Quality Management personnel CVs
- Schedule/List/Index of Quality Management and Project Procedures to be used for the project/contract/works
- Programme of internal and external audits
- Procedure for the evaluation of Suppliers and Sub-contractors
- Typical Data Pack Indices
- Approved Supplier/Contractor List
- Quality Management System Questionnaire (refer to Annexure 4)

The *Contractor / Supplier* will make formal submission of this Quality Documentation on award of the *Contract* and included in the *Works Information* for the *Contract*.

4.3 **Contractor / Supplier Documentation Submittal Requirements**

The Contractor's / Supplier's responsibilities are defined in terms of *DOC-STD-0001* which outlines the standard requirements for preparation, submission, receipt, review, and collection of Technical and (or) Deliverable Documentation.

The *Contractor / Supplier* develops and maintains a comprehensive Register of Documents that will be generated throughout the project. The Register includes all quality related documents. The Register is a 'live' document and is submitted to TCP for review following each revision by the *Contractor / Supplier*. The Register indicates the dates of issue of the documents taking into account sufficient time to allow for the TCP review/acceptance cycle prior to the document being required for use.

4.4 **Project Quality Plan**

Where specified, the *Contractor / Supplier* submits a PQP to TCP within the period stated and in any event not later than 28 days after the *Contract* start date. The PQP details

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how the *Contractor's / Supplier's* Quality System will be applied to the Scope of Work specified in the *Contract*, and shall address the following:

- Satisfying the technical and quality requirements of the *Contractor's / Supplier's* Scope of Work, and relevant elements of the applicable ISO 9001 standard,
- Include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls and records used to control and verify compliance with the specified Contractual requirements.
- Include a listing of all special processes (eg. welding and non-destructive testing, cube testing, etc.) envisaged for use, including confirmation of personnel certification as required,
- Include all proposed method statements (for site based work activities),
- Include a description of the *Contractor's / Supplier's* project organisation, with key positions and responsibilities identified and individuals named. The organisation structure shall also indicate the resources committed to the management and coordination of QA / QC activities,
- Include a listing of all Quality Control Plans (QCPs), and associated Field Inspection Checklists (FICs), as applicable,
- Identify in the PQP any Sub-Contractor/Sub-Supplier work. Sub-Contractor/Sub-Supplier plans are approved by the *Contractor*, and a copy forwarded to TCP for information,
- Include the proposed Authorised Inspection Authority (where applicable - for pressurised equipment and systems),
- Include a schedule of proposed quality records.

The PQP shall be controlled and re-submitted for approval when required to incorporate any change necessary during the *Contract* duration to ensure that the document is maintained for effective control, change management and records. The change management will be done to an agreed policy or procedure.

Note: Where the *Contractor / Supplier* is required to provide a PQP, no work shall commence until the PQP is accepted by TCP. The *Contractor / Supplier* can consult the sample PQP, Annexure 1, in order to assess the typical requirements that should be addressed.

4.5 Procedures

The *Contractor's / Supplier's* PQP and procedures shall address the system elements and activities appropriate to the Scope of Work, in compliance with the specified Quality Standard.



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Where specified, the *Contractor / Supplier* submits copies of Quality Procedures for review. In addition, the *Contractor / Supplier* ensures that copies of all Procedures relevant to the Scope of Work are available for reference by TCP at each work location.

These will include, as applicable, the following:-

4.5.1 Document Control

The *Contractor's / Supplier's* PQP shall provide a description of how documents provided by TCP, Sub-Supplier/Sub-Contractor to the *Contractor* are to be managed. The description shall address as a minimum:

- Management tools and databases
- Receipt, registration and maintenance
- Internal and external distribution to *Employer*, third parties and Sub-Contractors
- Management of Codes, Standards and Specifications
- Internal review and approval routines and authorities
- How it is ensured that the correct revisions of documents are available at the point of use including retention periods for all documentation.

4.5.2 Design Control

Where the *Contractor / Supplier* is responsible for any aspect of design related to the Scope of Work, the Quality Plan shall describe the *Contractor's / Supplier's* methods and procedures for the control of these design activities. The Works Information also addresses *Contractor's / Supplier's* Design Responsibilities, etc.

4.5.3 Procurement

Where the *Contractor / Supplier* is responsible for any aspect of procurement related to the Scope of Work, the Quality Plan shall describe the *Contractor's / Supplier's* methods and procedures for the control of these activities.

4.6 *Contractor / Supplier Audits*

The *Contractor / Supplier* shall:

- Carry out audits in accordance with its Quality System at its own and Sub-Supplier/Sub-Contractor's facilities to ensure project quality requirements are being achieved.
- Include a QA Audit Schedule in the *Contractor's / Supplier's* PQP submitted to TCP prior to commencement of the Scope of Work. The Audit Schedule shall include all audits to be implemented by the *Contractor / Supplier* and Sub-Supplier/Sub-Contractor during the execution of the *Contract*.
- Where stipulated in the *Contract*, perform an audit within three months after the *Contract* start date and thereafter at a minimum frequency of three months. Audit reports are submitted to TCP at the completion of each Audit. Where unsatisfactory



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performance is evident, TCP will direct the *Contractor / Supplier* to perform additional audits.

4.7 TCP Audit

TCP reserves the right to perform quality audits or participate as an observer in *Contractor / Supplier* audits to verify compliance with the Contractual requirements. The *Contractor / Supplier* shall within a time frame as agreed upon, correct any adverse audit findings advised by TCP. TCP will use the attached Audit Notification (Annexure 8) and Audit Checklist (Annexure 5) to conduct the audit.

5. Inspection and Testing

5.1 General

TCP may, at its discretion, perform surveillance inspections at the *Contractor's / Supplier's* premises, the premises of any Sub-Supplier/Sub-Contractor or at the location of the Scope of Work.

Dependent on the nature of the Scope of Work and the frequency of inspections, TCP may elect to have inspection personnel resident at the place of manufacture, fabrication, or assembly.

The *Contractor / Supplier* ensures free entry and access is given to TCP, certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and quality records at all parts of the *Contractor's / Supplier's* and Sub-Supplier/Sub-Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

The *Contractor / Supplier* provides TCP  with all necessary tools, calibrated measuring equipment, safety equipment and workspace to verify or witness tests in progress.

While TCP is at the *Contractor's / Supplier's* premises, the *Contractor / Supplier* provides, free of charge, reasonable facilities including office facilities and reasonable access to a telephone, facsimile machine and computer connection point.

The *Contractor / Supplier* provides written notice within a time frame as agreed upon, to allow the attendance of TCP and other representatives at nominated witness and hold points.

5.2 Quality Control Plans

The *Contractor / Supplier* prepares and submits QCPs to TCP  for review in accordance with the requirements of the *Contract* and PQP.

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QCPs must clearly identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, witness and hold points.

The *Contractor / Supplier* shall not commence fabrication or manufacture prior to review and approval of the applicable QCP by TCP.

QCPs shall include reference to all tests specified in the *Works Information*.

A typical format for a QCP is shown in Annexure 2. The *Contractor / Supplier* may use its own format providing all information shown in the sample in Annexure 2 is included.

5.3 Inspection Points

The QCP identifies points in the fabrication, manufacturing and/or installation process that are selected for inspection. These points are denoted by the following inspection codes:

- Hold Point (H) Inspection points in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed and signed off. Hold points require written notification to TCP.
- Witness Point (W) An inspection point in the manufacturing cycle that will be witnessed or verified. If TCP confirms it is unable to attend after being provided with the written notification then manufacture may proceed. Witness points require written notification to TCP.
- Review Point (R) A point at which products and quality records are verified and endorsed. Review points are not points that require notification to TCP.
- Surveillance (S) An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.

The *Contractor / Supplier* maintains the status of testing and inspection by progressively having the QCP's signed off.

5.4 Revision to Quality Control Plans

Revision of the QCP is subject to the same submission, review and acceptance routines as described for the original QCP issued.

5.5 Kick Off Meeting

After the *Contract* start date, and prior to manufacture or construction activities, TCP will require a Kick-Off Meeting with the *Contractor / Supplier* to discuss fully the implications of meeting TCP's quality requirements. This meeting may be held as part of the *Contract*



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kick-off meeting for each package or may be a separate meeting, subject to the critical or complex nature of the work. This requirement for a pre-inspection meeting may be repeated when Sub-Suppliers/Sub-Contractors of key equipment are engaged.

5.6 **Schedule of Inspection**

The *Contractor* / Supplier shall submit a Schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The Schedule shall be regularly updated with progress and issued to TCP to show the current inspection and test status.

5.7 **Field Inspection Checklists**

For site installation and construction activities, the *Contractor* / Supplier prepares Field Inspection Checklists (FICs) to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCP's.

FIC's are submitted to TCP for initial review. FICs are used to record the results of inspection and testing (where applicable). On completion, FICs are submitted to TCP to confirm satisfactory completion of the tests and inspections at nominated QCP witness and hold points.

5.8 **Inspection Notification**

The *Contractor* / Supplier notifies TCP in writing at least two calendar weeks prior to the advent of inspections or tests that require witnessing.

For inspections or tests within the country, arrangements are confirmed at least three working days before the event. For inspection and tests outside of the country, arrangements are confirmed at least seven working days before the event.

Inspection notifications include the following essential information:

- Contract Number
- Location of Inspection or Test
- Nature of Inspection or Test
- Date and Time of Inspection or Test
- Name and telephone number of the *Contractor's* / Supplier's Representative

5.9 **Inspection and Testing**

The *Contractor* is responsible for the conduct of all *Contractor* / Supplier inspections and tests. This responsibility includes:

- Documenting inspection and test results in the QCP's and relevant FICs
- Progressively inspecting the quality of the Scope of Work performed, including that of all Sub-Supplier/Sub-Contractors
- Inspecting to meet all Contractual requirements, in number, type and form

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- Inspecting day to day activities, material receipts, issue of materials for manufacture/installation, in-process inspections, and final inspections.
- The template for an Inspection Report is given in Annexure 9.

Completed original QCP's and FICs are included in the Data Pack that the *Contractor / Supplier* submits to TCP.

5.10 **Inspection Release**



At completion of the Scope of Work, either in total or in phases, TCP may issue an Inspection Release Report (IRR) or an Inspection Waiver Report (IWR).

The issue of either an inspection release or waiver of inspection does not relieve the *Contractor / Supplier* of its obligations under the *Contract*. The *Contractor / Supplier* ensures that a copy of the release note and final expediting release note for transport, where appropriate, is attached to the delivery docket and accompanies the Work to the designated destination indicated in the *Contract*. Items delivered to TCP without a copy of these documents may not be accepted.

A copy of the inspection release or waiver of inspection is included in the Data Pack.

5.11 **Special Processes**

It is the *Contractor's / Supplier's* responsibility to ensure that all processes which require pre-qualified procedures and/or work methods are tested and qualified before work begins. This typically covers such activities as welding, non-destructive testing, special fabrication techniques and painting. Unless specified such procedures are the *Contractor's / Supplier's* responsibility and do not require submission to TCP before work begins. When such procedures are requested, no work shall commence until procedures are approved by TCP.

It is the *Contractor's / Supplier's* responsibility to ensure all operators are qualified for the processes in accordance with the procedure and/or applicable standards. Records of qualification of operators shall be maintained by the *Contractor / Supplier* and made available to TCP when requested.

Records of qualification of procedures and processes shall be maintained by the *Contractor / Supplier* in accordance with the applicable procedure or code.

5.12 **Welding Procedures**

Where the *Contractor's / Supplier's* Scope of Work includes fabricated weldments, Welding Procedure Specifications (WPS) defining the method, preparation and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of the *Contractor's / Supplier's* Scope of Work. The procedure shall only be submitted to TCP when requested in the *Contract*.

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WPS include all welding essential and non-essential variables for each process used, including appropriate test results. WPS comply fully with the standard or code pertaining to welding required in the execution of the *Contractor's / Supplier's* Scope of Work.

When requested in the *Contract*, a suitably marked "weld map" is completed by the *Contractor / Supplier* for all items to be fabricated. A summary of WPS is prepared and, when used, is identified on the weld map.

Where TCP approval is required, fabrication is not to commence until written approval of WPS and Welding Procedure Qualification Records (WPQR) is received by the *Contractor / Supplier*. No welding fabrication will be accepted that is not covered by a TCP approved WPS/WPQR.

Welding Procedure Qualification (WPQ) tests may be witnessed by TCP and/or an independent inspection authority. Testing of the specimens prepared during the WPQ Tests is carried out by an approved testing laboratory, independent of both TCP and the *Contractor / Supplier*. In certain instances, a certificate to EN 10204 3.1 B may be required, which will be clarified at Tender review and clarification stage.

Where actual weld deposit analysis and weld metal physical properties are required for procedure qualification, the information is taken from the procedure qualification tests. Data listed in the catalogues of the manufacturer of welding consumables is not acceptable.

Welders/welding operators are qualified in accordance with the relevant welding code prior to commencing production fabrication. Specific Welder Qualification (WQ) records will be reviewed by TCP in the *Contractor's / Supplier's* works and should NOT be submitted for review.

A register of welders qualified to work shall be maintained by the *Contractor / Supplier*.

5.13 Material Traceability

Where, and to the extent that material traceability is required, the *Contractor / Supplier* shall provide its procedures for the maintenance of material identification throughout all phases of manufacture. Methods of identification, routines for re-stamping or stencilling as appropriate shall be defined and agreed with TCP.

Adequate records shall be maintained throughout construction enabling traceability of key materials from final product back to original material certificates. The material traceability records shall form part of the Data Pack.

The *Contractor / Supplier* shall prepare a schedule of materials and equipment that are subject to traceability requirements.



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5.14 Material Certification

Where specified in the *Contract* the following certificates shall be provided to TCP and included in the Data Pack:

- Type A: A *Contractor's* / Supplier's certificate of compliance with the *Contract*. This certifies that the goods or services are supplied in compliance with the *Contract* without mention of any test results (EN10204 certificate 2.1).
- Type B: A certificate issued by a laboratory or test facility independent of the *Contractor's* / Supplier's works. It shall quote test results carried out on the product supplied and state whether compliance with the relevant technical standard, code, etc., has been complied with. (EN10204 certificate 3.1B).
- Type C: The same as Type B, the tests are to be witnessed by a third party (EN10204 certificate 3.1C).

6. Non-Conforming Products

6.1 General

The *Contractor* / Supplier shall establish and maintain procedures to control materials or products that do not meet the specified requirements.

All *Contractor's* / Supplier's products and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- If the *Contractor* / Supplier discovers materials or products which are not in accordance with the requirements of the *Contract*, i.e. a non-conformance, the *Contractor* / Supplier shall immediately initiate the non-conformance procedure in terms of the Supplier/*Contractor's* Quality Management System, advise TCP promptly, and provide a copy of the non-conformance report (NCR) (Annexure 6) to TCP.
- If TCP or its agent/s identifies a non-conformance, a TCP NCR may be raised.
- The *Contractor* / Supplier shall maintain an updated Non Conformance Register as per Annexure 7.

Originals of all closed out NCRs shall be included in the Data Pack.

6.2 Corrective and Preventative Action

If the *Contractor* / Supplier proposes a disposition of any non-conforming materials or products which varies from the requirements of the Specification or *Contract*, such a proposal shall be submitted in writing to TCP whose decision on the proposal shall be



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obtained in writing before the non-conforming material or product is covered up or incorporated into the Works, or is the subject of any other disposition.

The disposition of non-conformances which do not vary the requirements of the *Contract*, specifications or drawings may be approved by the *Contractor* / Supplier following discussion and agreement with TCP.

7. Concession Requests and Technical Queries

7.1 Concession Requests

Where a *Contractor* / Supplier requests a Concession to deviate from the requirements of the *Contract* or specified requirements, the *Contractor* / Supplier raises the request with TCP using the format as shown in Annexure 3.

The Concession Requests shall clearly identify all elements of the proposed deviation together with any resulting technical, commercial and/or schedule impacts.

Completed original Concession Requests shall be included in the Data Pack.

7.2 Technical Queries

For clarification of technical issues (only), the *Contractor* / Supplier may submit a Field Engineering Query (FEQ) to TCP in accordance with the *Contract*.

The FEQ shall clearly identify all elements of the query, and all supporting documentation and/or drawings shall be attached where appropriate.

Completed original FEQ's shall be included in the Data Pack.

8. Inspection, Measuring and Test Equipment

8.1 Calibration

The *Contractor* / Supplier, including its Sub-Suppliers/Sub-Contractors, shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant *Contractor* / Supplier procedures and/or the equipment manufacturer's specifications.

Where calibration is required by an external laboratory, the *Contractor* / Supplier shall ensure that the facility selected for calibration possesses current certification. Calibration certificates shall contain a statement that the test equipment is accurate to within specified tolerances.

The *Contractor* / Supplier should establish the frequency of calibration for each item of equipment (including jigs, fixtures or templates) and record the details in a 'Measuring and Test Equipment Register' (or similar).



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8.2 Use of Inspection, Measuring and Test Equipment

The *Contractor* / Supplier shall ensure that authorised equipment users:

- Use the equipment in accordance with manufacturer's instructions, and accepted industry practices
- Ensure the equipment is covered by a current calibration certificate
- Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
- Prior to commencement of each inspection or test activities:
 - Identify the measurements to be made
 - Determine the accuracy required
 - Select the appropriate inspection, measuring or test equipment for the scope of work.

8.3 Verification of Previous Test Results

Where the calibration status of the equipment is unknown, expired or has doubtful accuracy, the equipment shall immediately be quarantined, and tagged according to *Contractor* / Supplier's Quality System procedures. The *Contractor* / Supplier shall then arrange for either in-house or external calibration, and:

- review all previous test results associated with the suspect equipment;
- identify the inspections, measurements or tests required to re-validate the results;
- ensure that suitable re-testing is performed with calibrated equipment;
- record the results of the re-testing on the respective inspection and test documentation.

9. Quality Personnel Qualifications

It is preferable that *Contractor* / Supplier's personnel engaged in Quality Assurance and Quality Control are members of one or more of the following organisations:

South African Quality Institute

Southern African Society for Quality



It is mandatory that personnel undertaking testing of rail-associated infrastructure are qualified as follows:

For signalling:

- The *Contractor* / Supplier is not allowed to do the commissioning but only a Transnet representative (Transnet employed Test Engineer)



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- The *Contractor / Supplier* should supply a Certificate of Compliance signed by a registered engineer/technologist
- This person should have a minimum of 5 years' experience as a professional
- The CV confirming that his/her experience is in line with the scope of work to be overseen as Quality Assurance or Control Officer

For OHTE and Perway:

- The *Contractor / Supplier* should supply a Certificate of Compliance signed by a registered engineer/technologist
- This person should have a minimum of 5 years' experience as a professional
- The CV confirming that his/her experience is in line with the scope of work to be overseen as Quality Assurance or Control Officer.

10. Quality Records

The *Contractor / Supplier* shall maintain Quality Records necessary to provide objective evidence that demonstrates and verifies achievement of the QA / QC requirements associated with the Scope of Work. All Quality Records, including original source material test certificates and non-destructive test reports, shall be retained by the *Contractor / Supplier* during the project, and be provided to TCP at the times, and in the quantities specified in the *Contract*.

The *Contractor / Supplier* shall collate all quality records in the Data Pack and submit the Data Pack to TCP in accordance with the *Contract* and all referenced standards and specifications. This DP shall be compiled progressively, and shall be available for review at all phases of manufacture or construction activities.

The Scope of Work shall not be complete until the *Contractor's / Supplier's* Data Pack, including the quality records from Sub-Supplier/Sub-Contractors, has been reviewed and accepted by TCP.

The *Contractor / Supplier* shall retain a copy of all Quality documentation generated during the *Contract*, including a copy of the complete Data Pack, for his own records for a minimum period of five (5) years after the completion of the Scope of Work, including Design Work.

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ANNEXURE 1 – Sample Project Quality Plan

Pages 19 to 23



PROJECT QUALITY PLAN

PROJECT:		PROJECT CODE:		ITEMS DESCRIPTION:			
ORDER NO.:							
CLIENT:		CLIENT CONTRACT NO.:		DRAWING/SPECIFICATION NO.:			
COST CODE SERIAL NO.:							
GENERAL DESCRIPTION:							
RESPONSIBILITY LEGEND		APPROVALS					
H	= HOLD POINT	AUTHORITY		SIGNATURE		DATE	
W	= WITNESS	1. Project Quality Manager					
S	= SURVEILLANCE	2. Project Manager					
V	= VERIFY	3. Client Project Manager					
R	= REVIEW	4. Project Director					
A	= APPROVE						
ACT NO.:	ACTIVITY DESCRIPTION	(ACCEPTANCE CRITERIA) REFERENCE DOCS		1		2	
1.1	MANAGEMENT AND SERVICES	R	SIGNATURE	DATE	R	SIGNATURE	DATE
1.1	Contract Agreement and Acceptance.	H			H		
1.2	Project Schedule and WBS Acceptance.	H			H		
1.3	Project PEP.	H			H		
1.4	Quality Policy & Project Procedures.	H			H		
1.5	Project Quality Plan.	H			V		
1.6	Safety & Health Management Plan.	V			V		
1.7	Environmental Management Plan.	V			V		
1.8	Engineering Management Plan.	V			V		

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1.9	Document Management Plan.	Accepted Documentation Management Plan.	H			V				H							
1.10	Procurement Management Plan	Accepted Procurement Management Plan	H			V				H							
1.11	Project Controls Management Plan	Accepted Project Controls Management Plan	V			V				V							
1.12	Acceptance of Functional Specifications.	Signed Functional Specification.	H			V				H							
1.13	Acceptance Specification.	Signed Acceptance Specification.	H			V				H							
2	BASIC DESIGN AND DEVELOPMENT																
2.1	Engineering Planning and Control	Accepted Engineering Management Plan	V			V				V							
2.2	Basic Design reviews completed	Minutes of Design Review	H			V				H							
2.3	Basic Design Documentation completed	Approved Documentation List	H			V				H							
2.4	Finalisation of Detail Design Baseline	Approved Detailed Design Baseline	H			V				H							
3	DETAIL DESIGN AND DEVELOPMENT																
3.1	Mechanical Design of Main Systems.	Approved Drawings Inc. Code Requirements.	H			V				H							
3.2	Main Facility Pipe design completed.	Approved Drawings Inc. Code Requirements.	H			V				H							
3.3	Test Set-up pipe design completed.	Approved Drawings Inc. Code Requirements.	H			V				H							
3.4	Civil and Structural design completed.	Approved Drawings Inc. Standards Requirements. (SABS 1200)	H			V				H							
3.5	C&I design completed.	Approved C&I Datasheets	H			V				H							
3.6	Electrical design completed.	Approved Drawings and Specifications	H			V				H							
3.7	Conduct Detail Design Reviews.	Design Review Minutes	H			V				H							
3.8	Conduct HAZOP (PFD, P&ID, GA Drawings, Data Sheets, Design	HAZOP Review Minutes and Close Out Report	H			V				H							

PROJECT QUALITY PLAN

[illegible]

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[illegible]

ANNEXURE 2 – Sample Quality Control Plan

Pages 24 to 25

QUALITY CONTROL PLAN



Quality Control Plan No.		Revision:		Date Issued:	
Contract No.		Description:		Item No.	
Contractor		Location:			

Activity No.	Activity Description	Procedure Reference / Code Specification	Specification Acceptance Criteria	Verifying Document / Report / Certificate	Verification/Witness						
					Contractor		AIA		TCP		
					Action	Sign	Action	Sign	Action	Sign	

Rev	Date	Reason for Revision	Drawn	Checked

ACTION

H – Hold. Mandatory Hold Point
W – Witness
R – Review (Verify) only
S - Surveillance

NOTE: H & W points require formal notification to TCP

ANNEXURE 3 – Concession Request

Pages 26 to 29

CONCESSION FORM



Request for Concession No:															
Project Name:						Project Number:									
A. SUPPLIER/CONTRACTOR SUPPLIED INFORMATION															
SUPPLIER/CONTRACTOR NAME:						P/O /CONTRACT NO.:									
SUPPLIER/CONTRACTOR CONCESSION NO:						DATE:									
Required concession applicable to: (Item/Material/Equipment/Area)															
Quantity Affected:															
Original Requirements:															
Description of Concession – Revised Requirements:															
Justification:															
Cause :															
Consequence :															
References:															
Original Requirements reference:															
Drawing No.:				Rev.:				Specification No.:				Rev.:			
Drawing No.:				Rev.:				Specification No.:				Rev.:			
Drawing No.:				Rev.:				Specification No.:				Rev.:			
Attached applicable documentation:															

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CONCESSION FORM

A. SUPPLIER/CONTRACTOR SUPPLIED INFORMATION continued						
(NOTE: This concession will be rejected if the following information is not provided):						
(i) VALUE OF BENEFIT TO CLIENT \$/R.....	(ii) AGREE TO AN EXTENSION OF THE WARRANTY IF "YES" WHAT PERIOD?	YES ☐	NO ☐	(iii) ANY IMPACT ON SCHEDULE? IF "YES" WHAT PERIOD?	NO ☐	YES ☐
Requested by: (Supplier/Contractor)						
Name:	Title:	Signature:		Date:		
B. SITE ADMINISTERED CONTRACT?		☐ Yes		☐ No		
Possible QC implications:						
Recommended	☐	Rejected		☐		
Recommendations with the following Conditions:						
Area Manager:		Signature:		Date:		
Site Engineer:		Signature:		Date:		
C. RECOMMENDATION BY CONTRACT ADMINISTRATOR:						
Name:		Signature:		Date:		
D. RECOMMENDATION BY ENGINEERING:						
Recommended	☐	Rejected	☐	Conditional	☐	
Recommendations:						
PR Engineer:		Signature		Date		
Lead Discipline Engineer:		Signature		Date		
Engineering Manager:		Signature		Date		
Comments:						

CONCESSION FORM

E. AREA MANAGER:		Accepted	☐	Rejected	☐
Name:		Signature		Date	
F. Transnet Capital Projects :		Accepted	☐	Rejected	☐
Name:		Signature		Date	

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ANNEXURE 4 – Tender Returnable Quality Management System

Pages 30 to 36

TENDER RETURNABLE'S REVIEW - QUALITY



Tender Returnable – Quality Management System

Tender Information Required

The following documents shall be attached to this returnable and submitted with the tender. Failure to submit the documents may result in the tender being declared non responsive and subsequently rejected.

Item	Document to be submitted	Attached? (Y/N) (Tenderer to complete)
1	Quality Management Questionnaire	
2	ISO 9001 Certification	
3	Quality Policy	
4	Quality Manual	
5	Schedule / List Quality Management System Procedures	
6	Typical Project Quality Plan	
7	Schedule / List of Quality Control Plans (QCPs)	
8	Typical QCP	
9	Quality Management Representatives C.V.	
10	Quality Staffing (Organogram)	
11	Programme of Internal / External Audits	
12	Procedure for Evaluation of Suppliers / Contractors	
13	Approved Supplier / Contractors List	
14	Typical Data Pack Indices	

TENDER RETURNABLE'S REVIEW - QUALITY



Quality Management System Questionnaire

1. Quality Management System			
Is the tenderer certified to ISO 9001 – Quality Management System Requirements?			☐ Yes ☐ No
If yes	Certificate No.:	Certification Body:	Expiry Date:
Are there any exclusions specified?		If yes provide Details of Exclusions:	
☐ Yes ☐ No			
If no, is the tenderer Quality Management System ISO 9001 compliant due to?			
Expired certificate	☐ Yes ☐ No	Comments:	
Independent verification	☐ Yes ☐ No	Comments:	
Other	☐ Yes ☐ No	Provide Details:	
Does the Tenderer have an approved Quality Manual that complies with ISO 9001 requirements? <i>(If yes, please submit a copy)</i>	☐ Yes ☐ No	Document No.:	
Has your Quality Manual been reviewed?	☐ Yes ☐ No	Has it been reviewed in the last: ☐ 6 months ☐ 12 months ☐ more than 12 months	
Does the Tenderer have an approved Quality Policy that complies with ISO 9001 requirements in place? <i>(If yes, please submit a copy)</i>	☐ Yes ☐ No	Document No.:	
Has your Quality Policy been reviewed in the last:	☐ Yes ☐ No	Has it been reviewed in the last: ☐ 6 months ☐ 12 months ☐ more than 12 months	
Does the Tenderer have an Index of Management System Procedures? <i>(If yes, please submit a copy)</i>	☐ Yes ☐ No	Document No.:	
Does the Procedures cover the full Scope of the Quality Management System	☐ Yes ☐ No	Comments:	
Has Project Specific Procedures been compiled and approved	☐ Yes ☐ No	Comments:	

TENDER RETURNABLE'S REVIEW - QUALITY



Has your Quality Management System procedures been reviewed in the last:	☐ Yes	☐ No	Has it been reviewed in the last:	☐ 6 months	☐ 12 months	☐ more than 12 months
Typical Project Quality Plan (If yes, please submit a copy)	☐ Yes	☐ No	Document No.:			
Does the Project Quality Plan specify the Management System arrangements in relation to:						
Project Initiation and Planning	☐ Yes	☐ No	Organization, Staff allocation and Teams	☐ Yes	☐ No	
Interaction Management	☐ Yes	☐ No	Communication Planning and Control	☐ Yes	☐ No	
Change Management	☐ Yes	☐ No	Information Management	☐ Yes	☐ No	
Project Handover and Closure	☐ Yes	☐ No	Risk Management	☐ Yes	☐ No	
Scope and Activity Control	☐ Yes	☐ No	Purchasing Planning and Control	☐ Yes	☐ No	
Schedule Development and Control	☐ Yes	☐ No	Documentation Requirements	☐ Yes	☐ No	
Cost Estimation	☐ Yes	☐ No	Record Requirements	☐ Yes	☐ No	
Budgeting	☐ Yes	☐ No	Evaluation of Sub Contractors	☐ Yes	☐ No	
Cost Control	☐ Yes	☐ No	Subcontractors	☐ Yes	☐ No	
Resource Planning and Control	☐ Yes	☐ No	Contract Control and Administration	☐ Yes	☐ No	
Engineering Management	☐ Yes	☐ No	Health and Safety Management	☐ Yes	☐ No	
Environmental Management	☐ Yes	☐ No	Quality Management (QA & QC)	☐ Yes	☐ No	

TENDER RETURNABLE'S REVIEW - QUALITY



Project / Scope Specific Requirements	☐ Yes	☐ No	Provide Details of Project/Scope Specific Requirements:	
Typical Quality Control Plan (If yes, please submit a copy)	☐ Yes	☐ No	Document No:	
Does your Quality Control Plans specify the following?				
Document and Revision No.	☐ Yes	☐ No	Legend for Interventions	☐ Yes ☐ No
Project, Contract and PO No.	☐ Yes	☐ No	Hold interventions as applicable	☐ Yes ☐ No
Reviews Required	☐ Yes	☐ No	Standards/Specifications/Procedures applicable to Action Item/s.	☐ Yes ☐ No
Approvals Required	☐ Yes	☐ No	Acceptance Criteria as applicable	☐ Yes ☐ No
Approvals by Responsible Engineer	☐ Yes	☐ No	Record Requirements for Actions	☐ Yes ☐ No
Distribution Requirements	☐ Yes	☐ No	Check Sheets included as Addendums	☐ Yes ☐ No
Logical Flow of Actions and Action no's	☐ Yes	☐ No	Release Criteria as final Action	☐ Yes ☐ No
Interventions Required by Fabricator / Erector, Client	☐ Yes	☐ No	Any other Project or Scope Specific Criteria	☐ Yes ☐ No
Provide details of Project/Scope Specific Criteria:				
Provisional Schedule or list of WCP's (If yes, please submit a copy)	☐ Yes	☐ No	Document No.:	
Does the QCP schedule or list cover the full Scope Expected Works?				☐ Yes ☐ No
Do you employ a QCP Register for control of all QCP's?				☐ Yes ☐ No



TENDER RETURNABLE'S REVIEW - QUALITY

2. Quality Management Organization			
Has a Quality Management representative been appointed? (If yes, please submit a copy of the CV.)	☐ Yes	☐ No	Document No.:
Does the Quality representative have relevant experience specific to the nature of the Project/Scope of Works/ Technology/Industry?			☐ Yes ☐ No
If yes, how many years of experience?	☐ Less than 5 yrs	☐ 5-10 yrs	☐ More than 10 yrs
What qualifications does he/she have?	☐ M and Industry related qualification	☐ M +3 and Industry related qualification	☐ M +4 and Industry related qualification
Project Organogram (If yes, please submit a copy)	☐ Yes	☐ No	Document No.:
Has critical positions for quality Management been identified? (HO/Site/Fabricators/Suppliers)	☐ Yes	☐ No	If yes, please supply details:
Does staff numbers and allocation take into account staff utilization?	☐ Yes	☐ No	What is the expected level of staff utilization? ☐ 70% ☐ 80% ☐ 90% ☐ 100%
3. Supplier and Contractor Quality Assurance			
Is an approved audit schedule covering all suppliers and contractors in place?	☐ Yes	☐ No	Document No.:
Have audits been conducted according to the schedule? (proof to be supplied on contract award)	☐ Yes	☐ No	Comments
Are audits conducted by qualified auditors and/or subject matter experts?	☐ Yes	☐ No	Comments
Are audit reports factual and available on request?	☐ Yes	☐ No	Comments
Is the audit programme managed in accordance with requirements of ISO 9001?	☐ Yes	☐ No	Comments
Has a documented procedure for evaluation and selection of supplier and contractors been established? (If yes, please submit a copy)	☐ Yes	☐ No	Document No.:
Does this procedure provide for quality / performance criteria and categorization of Suppliers/ Contractors based on ability to meet quality / performance requirements?	☐ Yes	☐ No	Comments
Have Suppliers / Contractors been selected and categorized based on this procedure?	☐ Yes	☐ No	Comments
Are Supplier / Contractors continuously monitored /	☐	☐	Comments

TENDER RETURNABLE'S REVIEW - QUALITY



measured in terms of their quality performance?	Yes	No	
Has an Approved Supplier/ Contractors List been implemented and maintained <i>(If yes, please submit a copy)</i>	☐ Yes	☐ No	Comments
Does the list indicate the category of Suppliers/ Contractors and are they ranked for preference in terms of performance?	☐ Yes	☐ No	
Has the Approved Supplier / Contractors List been updated and is it current?	☐ Yes	☐ No	Updated in the last: ☐ 6 months ☐ 12 months ☐ 18 months ☐ 24 or more months
Note: Transnet Capital Projects shall approve the list and reserves the right to remove any Supplier/Contractors from the list. Any additions to the List shall be submitted to Transnet Capital Projects for approval.			
Have Typical Data packs Indices been compiled (Fabrication, Construction)? <i>(If yes, please submit copies)</i>	☐ Yes	☐ No	Document No/s:
Does Data Packs indices taking into account Industry Practice and Client Requirements?	☐ Yes	☐ No	Comments
Does indices provide for Discipline/Area Specific deliverables in line with Scope of project/Works?	☐ Yes	☐ No	Comments
Have indices been reviewed against the Contractor Deliverables Schedule (CDS) to ensure compliance with requirements of the Project?	☐ Yes	☐ No	Comments

Tenderer should note that information shall be subjected to verification prior to *contract* award.

ANNEXURE 5 – Generic Quality Management System Compliance Checklist

Pages 37 to 41

A handwritten signature in black ink, located in the bottom right corner of the page. The signature is stylized and appears to be a cursive representation of a name.



GENERIC QUALITY MANAGEMENT SYSTEM COMPLIANCE CHECKLIST

1. Scope and Objectives			
1.1 Owner's requirements Specifications detailing the Project Goals and Objectives	☐ Yes	☐ No	Comments:
1.2 Project Quality Objectives defined?	☐ Yes	☐ No	Comments:
2. Planning			
2.1 Project Execution Plan (PEP)	☐ Yes	☐ No	Comments:
2.2 Project Approval Matrix	☐ Yes	☐ No	Comments:
2.3 Kick off minutes (Client and Contractor / Supplier)	☐ Yes	☐ No	Comments:
2.4 Project Quality Plan	☐ Yes	☐ No	Comments:
2.5 Are Project Specific Quality Control Plans (QCPs) in place?	☐ Yes	☐ No	Comments:
3. Quality Organisation and People			
3.1 Is there a Quality Organogram for the Project and have the Quality staff been mobilised in line with the Project Schedule?	☐ Yes	☐ No	Comments:
3.2 Have the QA / QC Roles and Responsibilities and Activities been documented?	☐ Yes	☐ No	Comments:
3.3 Is the Project QA / QC team in place and do the resource capacity and competence match the workload?	☐ Yes	☐ No	Comments:
4. Quality Policy and Procedures			
4.1 Is the SHEQ Policy displayed at the workplace?	☐ Yes	☐ No	Comments:
4.2 Is there a Register of Standards and Procedures for the Project?	☐ Yes	☐ No	Comments:
4.3 Are the Standards and Procedures adequate for the scope of work of the Project?	☐ Yes	☐ No	Comments:
4.4 Are Procedures and Task Instructions available at the place of work? Do employees perform work in accordance with Procedures, Work Instructions and other relevant requirements?	☐ Yes	☐ No	Comments:



GENERIC QUALITY MANAGEMENT SYSTEM COMPLIANCE CHECKLIST

4.5 Has Project Specific Procedures been compiled and approved?	☐ Yes	☐ No	Comments:
5. Execution			
5.1 Are the PQP and QCPs implemented effectively with the necessary sign-offs at Hold Points before proceeding?	☐ Yes	☐ No	Comments:
5.2 Are FATs and SATs being conducted, documented and reported on?	☐ Yes	☐ No	Comments:
5.3 Is the Engineer signing off construction / installation in compliance to the design on completion?	☐ Yes	☐ No	Comments:
5.4 Are punch lists being prepared and punch items classified and closed out accordingly?	☐ Yes	☐ No	Comments:
6. Defects and Non-conformance			
6.1 Is there a Defect and Non-conformance Management procedure and is it being applied to the Project?	☐ Yes	☐ No	Comments:
6.2 Are Non-conformances adequately closed out and the Non-conformance Register updated?	☐ Yes	☐ No	Comments:
6.3 Is there adequate Quality Performance tracking?	☐ Yes	☐ No	Comments:
6.4 Are product on hold and recall / rework procedures and instructions used in the event that the supplier's process parameters are found to be outside of specified requirements?	☐ Yes	☐ No	Comments:
7. Quality Audits			
7.1 Is there an approved quality audit schedule?	☐ Yes	☐ No	Comments:
7.2 Have audits been conducted according to the schedule? (<i>proof to be supplied on contract award</i>)	☐ Yes	☐ No	Comments:
7.3 Are audits conducted by qualified auditors and/or subject matter experts?	☐ Yes	☐ No	Comments:
8. Inspections and Tests			
8.1 Are all inspections indicated in sequence (inspection planning done)? Are characteristics to be inspected identified?	☐ Yes	☐ No	Comments:



GENERIC QUALITY MANAGEMENT SYSTEM COMPLIANCE CHECKLIST

8.2 Are inspections and tests performed at defined stages with clear indication of inspection and test status?	☐ Yes	☐ No	Comments:
8.3 Is contract requirements incorporated?	☐ Yes	☐ No	Comments:
8.4 Is there evidence that product conforms to specified requirements and do these documents contain proper authorisations? Verify release notes and certificates.	☐ Yes	☐ No	Comments:
8.5 Is Inspection and Test Equipment stored in acceptable conditions?	☐ Yes	☐ No	Comments:
8.6 Are all equipment calibrated (verify serial number on instrument against certificate)?	☐ Yes	☐ No	Comments:
8.7 Have calibration intervals been identified? Verify compliance against due date.	☐ Yes	☐ No	Comments:
8.8 Have calibration accuracy requirements and environmental acceptance criteria been defined (tolerances)?	☐ Yes	☐ No	Comments:
8.9 Are non-conforming instruments removed from work area?	☐ Yes	☐ No	Comments:
9. Transportation, Receipt, Storage and Release of Goods			
9.1 Have transportation and storage protection for goods been provided for?	☐ Yes	☐ No	Comments:
9.2 Are packing & marking in accordance with client specifications?	☐ Yes	☐ No	Comments:
9.3 Are goods received checked against the specifications on receipt and signed off?	☐ Yes	☐ No	Comments:
9.4 Are there records that all products has passed the inspections and test as defined by the acceptance criteria and is the authority identified who is responsible for the release of the product?	☐ Yes	☐ No	Comments:
9.5 Have rejected items been isolated?	☐ Yes	☐ No	Comments:

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GENERIC QUALITY MANAGEMENT SYSTEM COMPLIANCE CHECKLIST

Note: Compliance against relevant standard requirements pertaining to the relevant inspection and testing activity/goods supplied should be assessed. For instance, % NDE to be done in accordance with code, stress testing requirements, load testing to be done, etc.

10. Change Control

10.1 Are there Change Control Procedures (Engineering, Scope and Project Changes)?	☐ Yes ☐ No	Comments:
10.2 Are changes managed in line with the Procedures?	☐ Yes ☐ No	Comments:
10.3 Is approval given at the appropriate level for each change?	☐ Yes ☐ No	Comments:
10.4 Are Project Plans regularly updated to reflect agreed changes?	☐ Yes ☐ No	Comments:

11. Concessions and Queries

11.1 Is there a procedure for concessions and a concession register in place?	☐ Yes ☐ No	Comments:
11.2 Are Technical and Field Engineering Queries being addressed timeously and adequately?	☐ Yes ☐ No	Comments:

12. Documentation

12.1 Are the issuing of documentation/drawings/specifications controlled and are there Registers for these?	☐ Yes ☐ No	Comments:
12.2 Do all Documentation including Data Packs, Operating and Maintenance Manuals meet the requirements of the Document Handover Matrix?	☐ Yes ☐ No	Comments:
12.3 Does a procedure exist for As-built documents and is it complied with?	☐ Yes ☐ No	Comments

13. Risks

13.1 Are Quality risks included in the Risk Register?	☐ Yes ☐ No	Comments:
13.2 Are Quality Risks been allowed for in the Risk Allowance?	☐ Yes ☐ No	Comments

Please note that further Project Specific Quality Checklists may need to be developed in line with the scope of work of the Project.

ANNEXURE 6 – Non Conformance Report

Pages 42 to 43



NON-CONFORMANCE REPORT

Project Name:		NCR Number:	
Project Number:		Date:	
Section A – Initiating a Non Conformance Report			
PO/Contract No:		Sub-Contract No:	(If applicable)
Supplier/Contractor:			
Description of Non Conformance:			
Non Conformance Classification			
☐ Construction	☐ Commissioning	☐ Eng/Design	☐ Documentation
☐ HSE	☐ Manufacture	☐ Materials	☐ Systems/Procedure
☐ Complaint			
☐ Other			
Originator			
Name:	Signature:		Date:
Section B – Supplier/Contractor Proposed Corrective Action			
Cause :			
Corrective Action :			
Action to Prevent Recurrence:			
Acknowledgement of Receipt by Supplier/Contractor			
Name:		Signature:	
		Date:	

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NON-CONFORMANCE REPORT

[illegible]

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ANNEXURE 7 – Non Conformance Register

Pages 44 to 45

[illegible]

ANNEXURE 8 – Audit Notification

Pages 46 to 48



AUDIT NOTIFICATION

AUDIT DATE: from _____ to _____
Opening meeting: date _____ time _____
Closing meeting: date _____ time _____

Detail Audit Plan Attached: Yes ☐ No ☐

TYPE OF AUDIT: System ☐ Process ☐ Product ☐

AUDIT OBJECTIVES:

1. To confirm the effective implementation of planned arrangements
 2. To confirm that the management system is capable of achieving policy objectives
-

SCOPE:

Department: _____

Reference Documents:

1. ISO 9001:2015
 2. QAL-STD-0001
 3. _____
-

AUDITOR(S): _____

TCP Quality Department
Name _____

_____ *Date*

CONFIRMATION:

Name: _____

 Date: _____



Day 1: Day ddmmyyyy

Auditors:

Time	Description	Reference	Area/Process/Function	Auditor
08:00				
08:30	Opening meeting			
09:00				
09:30				
10:00				
10:30				
11:00				
11:30				
12:00				
12:30	BREAK			
13:00				
13:30				
14:00				
14:30				
15:00				
15:30				
16:00				
16:30	Feedback meeting			Auditors
17:00	END			

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ANNEXURE 9 – Inspection Report - A

Pages 49 to 50

Inspection Report (A) Number :					
Contract Name:				Project No:	
Contractor:				PO No:	
Subcontractor:				Equipment:	
Revision/Drawing No:				Location:	
ACTIVITY					
☐ Inspection to QCP		☐ Material/Machinery Inspection		☐ Pressure Test	
☐ Inspection to Drawing		☐ Welding Inspection/NDT Progress		☐ Performance Test	
☐ Documentation Review		☐ Initial/Final		☐ Site Inspection	
Status: ☐ REJECTION ☐ APPROVED/RELEASED					
ITEM NO	COMMENTS/ACTION				STATUS
Subcontractor Signature					Date:
Contractor Signature					Date:
Transnet Capital Projects Representative					Date:

ANNEXURE 10 – Punch List

Pages 51 to 52

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PUNCH LIST

Punch List ID.		Contract No:		Package No:		Sequential No:		Date:		Page			
Area Inspected.		Area No:		System/Area:		Subsystem:		Punch List Originator:					
Item No.	Equip No.	Defects Description	Disc	Cat	Priority	Cause	Due Date	Completion					
								Contractor		TCP		Client	
								Date	Sign	Date	Sign	Date	Sign
1													
2													
3													
4													
5													
6													
7													
8													
9													
Discipline	Category		Priority		Cause								
C	Civil	A	1		Complete before Commissioning		H		Design inadequate				
M	Mechanical	B	2		Complete before Trial Operation		J		Installation incorrect				
E	Electrical	C	3		Complete before Operations Handover		K		Work remaining				
I	Instrumentation		4		Complete before Performance Acceptance		L		Additional item				
P	Piping												

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