Transnet Pipelines

an Operating Division **TRANSNET SOC LTD**

[Registration Number 1990/000900/30]

REQUEST FOR PROPOSAL (RFP)

FOR THE: SUPPLY AND REPLACEMENT OF CRUDE BOOSTER STATIONS, AIRCOOLED MEDIUM VOLTAGE VARIABLE SPEED DRIVES AT THE FIVE CRUDE PIPELINE BOOSTER STATIONS

RFP NUMBER	**: TPL/2024/01/0004/54731/RFP**
ISSUE DATE	**: 08 March 2024**
COMPULSORY BRIEFING	**: 19 March 2024**
CLOSING DATE	**: 08 April 2024**
CLOSING TIME	**: 15h00pm**
TENDER VALIDITY PERIOD	**: 180 working days from closing date**

Eligibility:

- **Attendance of compulsory briefing session to be held at Umgeni Depot:**
  (Longitude 30.80995373, Latitude -29.82260542), 6 Stockville Rd, Mahogany Ridge, Westmead, 3610

- **Compliance to specifications**

Contents

Number Heading

T1.1 TENDER NOTICE AND INVITATION TO TENDER

SECTION 1: NOTICE TO TENDERERS

1. INVITATION TO TENDER

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

DESCRIPTION	**SUPPLY AND REPLACEMENT OF CRUDE BOOSTER STATIONS, AIRCOOLED MEDIUM VOLTAGE VARIABLE SPEED DRIVES AT THE FIVE CRUDE PIPELINE BOOSTER STATIONS**
TENDER DOWNLOADING	**This Tender may be downloaded directly from the National Treasury eTender Publication Portal at www.etenders.gov.za and the Transnet website at https://transnetetenders.azurewebsites.net (please use Google Chrome to access Transnet link) FREE OF CHARGE.**

COMPULSORY TENDER CLARIFICATION MEETING	A **Compulsory** Tender Clarification Meeting will be conducted at **Umgeni Depot** (Longitude 30.80995373, Latitude -29.82260542), 6 Stockville Rd, Mahogany Ridge, Westmead**,** 3610 on the **19th of March 2024,** at **10:00am [10 O'clock]** for a period of ± 2 (two) hours. [Tenderers to provide own transportation and accommodation]. The Compulsory Tender Clarification Meeting will start punctually and information will not be repeated for the benefit of Tenderers arriving late. **A Site visit/walk will take place, tenderers are to note**: • Tenderers are required to wear safety shoes, goggles, long sleeve shirts, long pants, 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 T2.2-06** 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 T2.2-06 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	**15:00pm on** (2024/04/08) 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 T2.2-15], [**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 TPL/2024/01/0004/54731/RFP (Tender Data)

Transnet urges its clients, suppliers and the general public

to report any fraud or corruption to

TIP-OFFS ANONYMOUS: 0800 003 056 OR Transnet@tip-offs.com

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 *Employer* is	**Transnet SOC Ltd** **(Reg No. 1990/000900/30)**
C.1.2	The tender documents issued by the *Employer* 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
	Part C3: Scope of work	C3 Works Information / Specification
	Part C4: Site information	C4 Site information
C.1.4	The Employer's agent is:	Strategic Sourcing Specialist
	Name:	Mbalenhle maBhengu Petersen
	Address:	202 Anton Lembede Street, Durban
	Tel No.	TBA
	E – mail	Mbalenhle.bhengu@transnet.net

C.2.1 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:** Compliance to Specifications

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

3. **Stage Three - Functionality:** Only those tenderers who obtain the minimum qualifying score for functionality will be evaluated further in terms of price and the applicable preference point system. The minimum qualifying for score for functionality is **70** points.

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

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

C.2.7 The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. **Tenderers must complete and sign the attendance register.** Addenda will be issued to and tenders will only be received

	from those tendering entities including those entities that intends forming a joint venture appearing on the attendance register. Tenderers are also **required to bring their RFP document to the briefing session and have their returnable document T2.2-06 certificate of attendance** signed off by the Employer's authorised representative.
C.2.12	No alternative tender offers will be considered.
C.2.13.3	Each tender offer shall be in the **English Language.**
C.2.13.5 C2.15.1	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: ▪ The Tender Description Documents must be marked for the attention of: ***Employer*'s Agent:**
C.2.13.9	Telephonic, telegraphic, facsimile or e-mailed tender offers will not be accepted.
C.2.15	The closing time for submission of tender offers is: Time: **15:00pm** on the **08th April 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 **180 working days** 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. **Tenderers to provide Transnet with a TCS PIN issued by the South African Revenue Services 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. Proof of registration on the Central Supplier Database;
4. Letter of Good Standing with the Workmen's compensation fund by the tendering entity or separate Letters of Good Standing from all members of a newly constituted JV.

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

C3.11 The minimum number of evaluation points for functionality is: **70**

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:

Functionality criteria	Sub-criteria	Sub-criteria points	Maximum number of points
T2.2-02 Organisational Chart & CVs of Key persons	Years experience – Project Manager	10	**30**
	Years experience – Project Engineer	10	
	Qualifications – Project Manager	5	
	Qualifications – Project Engineer	5	
T2.2-03 Previous experience			**40**
T2.2-04 Quality Management			**20**
T2.2-05 Programme			**10**
Maximum possible score for Functionality			**100**

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

- T2.2-02 Organisational Chart & CVs of Key Persons
- T2.2-03 Previous Experience
- T2.2-04 Quality Management
- T2.2-05 Programme

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

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

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

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

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

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 BBBEE rating not be provided, tenderers with no verification will score zero points for preferencing.**

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.

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 This schedule to be used for pre-qualification and eligibility purposes:

T2.2-01 **Eligibility Schedule:** Compliance to Specifications

2.1.2 These schedules will be utilised for evaluation purposes:

T2.2-02 **Evaluation Schedule:** Organisational Chart and & CV's of key persons

T2.2-03 **Evaluation Schedule:** Previous experience

T2.2-04 **Evaluation Schedule:** Quality Management

T2.2-05 **Evaluation Schedule:** Programme

2.1.3 Returnable Schedules:

General:

T2.2-06 **Eligibility Criteria Schedule -** Certificate of attendance at `Compulsory Tender Clarification Meeting

T2.2-07 Authority to submit tender

T2.2-08 Record of addenda to tender documents

T2.2-09 Letter of Good Standing

T2.2-10 Site Establishment requirements

T2.2-11 ANNEX G Compulsory Enterprise Questionnaire

T2.2-12 Job-Creation Schedule

Agreement and Commitment by Tenderer:

T2.2-13 Non-Disclosure Agreement

T2.2-14 RFP Declaration Form

T2.2-15 RFP – Breach of Law

T2.2-16 Certificate of Acquaintance with Tender Document

T2.2-17 Service Provider Integrity Pact

T2.2-18 Supplier Code of Conduct

1.3.2 Bonds/Guarantees/Financial/Insurance:

T2.2-19 Insurance provided by the Contractor

T2.2-20 Form of Intent to provide a Performance Guarantee

T2.2-21 Three (3) years audited financial statements

1.3.3 Transnet Vendor Registration Form:

T2.2-22 Transnet Vendor Registration Form

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

2.3 C1.2 Contract Data

2.4 C1.3 Form of securities

2.5 C2.1 Pricing Instructions (Activity Schedule)

2.6 C2.2 Activity Schedule

2.7 C3 Scope of Works

2.8 C4 Site information

T2.2-01: Eligibility Schedule: Technical Data Sheets

Note: The tenderer will be evaluated on the compliance and completeness of the Technical Data sheets.

The following Data Sheets are included and shall be completed by the tenderer:

NO	TITLE	COMPLIANCE TO SPECIFICATIONS (Y/N)
1	Datasheets for Medium Voltage VSD's for Booster Pump Motors	

TERMINAL 2	Technical Data Sheet 1	NMPP Doc. No.		
		NMPP Old Doc. No.		
		Page No. 8	Revision	00

Item No. : =38VSD01; =39VSD01; =40VSD01; =41VSD01; =42VSD01

Description : Variable Speed Drives

1	Equipment Tag No.	
2	Variable Speed Drive for Booster Pump P01	38-VSD01
3	Variable Speed Drive for Booster Pump P01	39-VSD01
4	Variable Speed Drive for Booster Pump P01	40-VSD01
5	Variable Speed Drive for Booster Pump P01	41-VSD01
6	Variable Speed Drive for Booster Pump P01	42-VSD01
7		
8	Equipment Service	Variable Speed Drive for 3,3KV Squirrel Cage Induction Motor
9	Site Conditions	
10	Ambient Temperature	≤5°C to ≥ 40°C
11	Altitude	1000 masl (provide derating factors where applicable)
12	Power Supply Details	
13	Supply Voltage	Trfr secondary two windings @ 1,9kV each
14	Supply Frequency	50 Hz ± 2%
15	System Fault level	25 kA
16	Upstream Circuit Breaker	Vacuum Circuit Breaker
17	Power Factor at full load	>0,95
18	Total Harmonic Distortion	
20	Internal Control Supply	Supplied from UPS
21	Supply Cable Size	4 x 95mm², 3-core XLPE
22	Load Characteristics	
23	Motor Rated Power	1290kW Duzi, Mngeni, Mooi River, Fort Mistake; 1560kW Wilge
24	Motor Type	Squirrel Cage Induction Motor
25	Rated Voltage	3300 V
26	Rated Speed of Motor	3150 rpm
27	Rated Full load Current of Motor	308A
28	Application	Centrifugal Pump
29	External Braking Resistor	No
30	Motor Ex Protection	Ex de IIB T4 (IEC 60079-1)
31	Motor Cable Size	2x 120mm², 3-core XLPE
32	Motor Cable Length	140 metres (max)
33	VSD Manufacturer	
34	Type of VSD	
35	VSD Model	
36	VSD Rating (input)	
37	VSD Rating (output)	
38	Efficiency	≥95%
39	Power dissipation	
40	Module Cooling	Air-cooled
41	Nr Converter Pulses	
42	Total Harmonic Distortion	
43	Voltage	
44	Current	
45	Location	Indoors - temperature controlled room
46	Type of Rectifier	
47	Type of Inverter	Voltage Source
48	Power Switching Technology	
49	Power Switching Control Method	
50	Switching Frequency	
51	Overload Capacity	110% - 1 in 10 minutes
61	Starting Torque	2 x Nomimal
62	Torque Boost	0-250%

Notes:- Mandatory

1. All blank items are to be furnished by vendor. Vendor adds any and all remarks in columns provided.
2. All SANS, IEC and other International Standards referred in listed Transnet Specifications are applicable.

T2.2-02: Evaluation Schedule - Organisational Chart and CV's of key persons

Organisational Chart and & CV's of key persons

Essential Returnable

Submit the following documents with your tender document:

1. A clear organisation chart showing relevant personnel for the successful execution of the SOW's.

2. Details of the qualifications and relevant experience in managing, executing and commissioning for successful completion of the SOW's of the proposed key personnel that will be working on the project.

3. **Only the Project manager and Project engineer identified on the organisational chart will be evaluated. Should the organisational chart not be submitted, key personnel will not be evaluated.**

Attached submissions to this schedule:

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Signed ..... Date .....

Name ..... Position .....

Tenderer .....

The scoring of the Organisational Chart and CV's of key persons will be as follows:

JUDGEMENT PROMPTS FOR SCORING ON KEY PERSONNEL EXPERIENCE

1. **Project Manager Experience in Electrical projects of similar nature to the SOW's**

Key for Experience (10 points)	0%	No info submitted or Less than 2 years' experience	0
	20%	2 years and less than 3 years' experience	2
	40%	3 years and less than 4 years' experience	4
	60%	4 years and less than 5 years' experience	6
	80%	5 years and less than 7 years' experience	8
	100%	7 years' experience or more	10

2. **Engineer Experience in installations and commissioning of medium voltage VSD's**

Key for Experience (10 points)	0%	No info submitted or Less than 2 years' experience	0
	20%	2 years and less than 3 years' experience	2
	40%	3 years and less than 4 years' experience	4
	60%	4 years and less than 5 years' experience	6
	80%	5 years and less than 7 years' experience	8
	100%	7 years' experience or more	10

JUDGEMENT PROMPTS FOR SCORING ON QUALIFICATIONS OF KEY PERSONNEL:

1. **Project Manager qualification**

Key for Qualification (5 points)	0%	No qualifications or irrelevant qualification provided	0
	60%	Diploma in project management	3
	80%	Degree or higher in project management	4
	100%	Degree or higher qualification in project management and PMP certification	5

2. **Project Engineer qualification**

Key for Qualification (5 points)	0%	No qualifications provided	0
	40%	Diploma in Electrical Engineering	2
	80%	Degree in Electrical Engineering	4
	100%	Degree in Electrical Engineering and ECSA professional registration	5

T2.2-03: Evaluation Schedule: Previous Experience

Company's Previous Experience

Essential Returnable

Tenderers are required to demonstrate experience in successfully completed projects in the delivery of similar Works of similar nature of SOW's. Supply detailed and traceable reference list of clients serviced.

- Name of Project
- Details/ Description of Works
- Cost of Project
- Name of Employer
- Contact Details of References

Index of documentation attached to this schedule:

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The scoring of the Company's Previous Experience will be as follows:

Experience in similar projects works of manufacture, supply, installation, testing and commissioning of Medium Voltage VSD's with detailed traceable references. Bidders to get consent from client to share contract details and contact details before submitting of the bid.

Experience and Number of Completed Projects:

Key for Tenderers Experience (40 points)	0%	The tenderer has no completed projects.	0
	20%	Tenderer has up to 2 relevant completed projects in manufacturing, supply, installation and commissioning of MV VSD's	8
	40%	Tenderer has 3 relevant completed projects in manufacturing, supply, installation and commissioning of MV VSD's	16
	60%	Tenderer has more than 3 but less than 5 relevant completed projects in manufacturing, supply, installation and commissioning of MV VSD's	24
	80%	Tenderer has 5 to 7 relevant completed projects in manufacturing, supply, installation and commissioning of MV VSD's	32
	100%	Tenderer has more than 7 relevant completed projects in manufacturing, supply, installation and commissioning of MV VSD's	40

T2.2-04: Evaluation Schedule – Quality Management

Quality Control Plan

Essential Returnable

Due consideration must be given to the deliverables required to execute and complete the contract as per the Quality Management Standard and should include but not be limited to:

a. Project Quality Plan for the contract.

b. The Contractor's Quality Policy.

c. Clearly defined Method Statement - The tenderers must sufficiently demonstrate the approach/methodology that will be employed to cover the scope of the project ie. Manufacturing Process, FAT, Installation of VSD's, SAT, Commissioning Procedure.

d. Valid ISO 9001 certification.

The scoring of the Quality Plan will be as follows:

Key for Quality Control Plan (20 points)	0 %	The tenderer has not submitted any information to determine a score.	0
	40 %	The tenderer's Quality Management Plan complies with only one of the stated above requirements.	8
	60%	The tenderer's Quality Management Plan complies with two of the stated above requirements.	12
	80 %	The tenderer's Quality Management Plan complies with three of the stated above requirements.	16
	100 %	The tenderer's Quality Management Plan complies with four of the stated above requirements.	20

T2.2-05: Evaluation Schedule: Programme

Essential Returnable

Note to tenderers:

The programme must adequately cover the following milestones:

- Kick off,
- safety file approval,
- design acceptance,
- long lead items,
- Start and end of manufacturing,
- FAT,
- Close out FAT punch list,
- Release from factory,
- transport to site,
- Decommissioning and removing exiting equipment
- installation,
- SAT,
- commissioning,
- handover
- training completed.

The scoring of the Programme will be as follows:

Key for Programme (10 points)	0	The tenderer has not submitted any information to determine a score or the program adequately covers less than 10 of the above milestones	0
	20 %	The programme adequately covers 10 of above milestones	2
	40 %	The programme adequately covers 11 of the above milestones	4
	60 %	The programme adequately covers 12 of the above milestones	6
	80 %	The programme adequately covers 13 of the above milestones	8
	100 %	The programme adequately covers 14 or all of the above milestones	10

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

T2.2-06: Eligibility Criteria Schedule: - Certificate of Attendance at Tender Clarification Meeting

This is to certify that

..... (Company Name)

Represented by: ..... (Name and Surname)

Was represented at the compulsory tender clarification meeting

Held at:		
On (date)		Starting time:

Particulars of person(s) attending the meeting:

Name ..... Signature .....

Capacity .....

Attendance of the above company at the meeting was confirmed:

Name ..... Signature .....

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

T2.2-07: 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

T2.2-08: 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		

T2.2-09 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:

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

T2.2-10: Site Establishment Requirements

Tenderers to indicate their Site establishment area requirements:

T2.2-11: 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 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable. Despite the stipulated preference point system, Transnet shall use the lowest acceptable bid to determine the applicable preference point system in a situation where all received acceptable bids are received outside the stated preference point system.

1.3 Preference points for this bid shall be awarded for:

(a) Price;

(b) B-BBEE Status Level of Contribution; and

(c) Any other specific goal determined in the Transnet preferential procurement policy

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

	POINTS
PRICE	**80**
B-BBEE STATUS LEVEL OF CONTRIBUTION Level 1 or 2	**20**
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 80/20 PREFERENCE POINT SYSTEMS

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

80/20

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where

Ps = Points scored for comparative price of bid under consideration

Pt = Comparative price of bid under consideration

Pmin = Comparative price of lowest acceptable bid

Selected Specific Goal	**Number of points allocated (80/20)**
B-BBEE Level of contributor – Level 1	20
B-BBEE Level of contributor - Level 2	20
Non-Compliant or B-BBEE Level 3-8 contributors	0

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

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.]
EME[1]	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 Treasury or the DTI. It is the Bidder's responsibility to ensure that his/her bid complies fully with all B-BBEE requirements at the time of the submission of the bid.

5. BID DECLARATION

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

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

6.1 B-BBEE Status Level of Contribution: . = ……(maximum of 20 points)

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

7. SUB-CONTRACTING

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

(***Tick applicable box***)

YES		NO	

7.1.1 If yes, indicate:

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

(Tick applicable box)

YES		NO	

8. DECLARATION WITH REGARD TO COMPANY/FIRM

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

8.2 VAT registration number:.....

8.3 Company registration number:.....

8.4 TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

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

8.6 COMPANY CLASSIFICATION

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

[*TICK APPLICABLE BOX*]

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

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

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If a bidder submitted false information regarding its B-BBEE status level of contributor,, which will affect or has affected the evaluation of a bid, or where a bidder has failed to declare any subcontracting arrangements or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have

(a) disqualify the person from the bidding process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) if the successful bidder subcontracted a portion of the bid to another person without disclosing it, Transnet reserves the right to penalise the bidder up to 10 percent of the value of the contract;

(e) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the audi alteram partem (hear the other side) rule has been applied; and

(f) forward the matter for criminal prosecution.

WITNESSES 1. …….. 2. ……	…… SIGNATURE(S) OF BIDDERS(S) DATE: ……..

SBD 4: BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

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

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

2. Bidder's declaration

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

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

Full Name	**Identity Number**	**Name of State institution**

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

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

YES/NO

2.3.1 If so, furnish particulars:

.....

.....

3 DECLARATION

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

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

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

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

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

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

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

3.6 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

[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.

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

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

T2.2-12: JOB-CREATION SCHEDULE

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

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

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

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

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

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

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

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

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

Black People with Disabilities			
Other			

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

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

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

T2.2-13 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 Information [**RFI**] Request for Proposal [**RFP**] or Request for Quotation [**RFQ**], as the case may be;

1.3 **Confidential Information** means any information or other data relating to one party [the **Disclosing Party**] and/or the business carried on or proposed or intended to be carried on by that party and which is made available for the purposes of the Bid to the other party [the **Receiving Party**] or its Agents by the Disclosing Party or its Agents or recorded in agreed minutes following oral disclosure and any other information otherwise made available by the Disclosing Party or its Agents to the Receiving Party or its Agents, whether before, on or after the date of this Agreement, and whether in writing or otherwise, including any information, analysis or specifications derived from, containing or reflecting such information but excluding information which:

1.3.1 is publicly available at the time of its disclosure or becomes publicly available [other than as a result of disclosure by the Receiving Party or any of its Agents contrary to the terms of this Agreement]; or

1.3.2 was lawfully in the possession of the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] free of any restriction as to its use or disclosure prior to its being so disclosed; or

1.3.3 following such disclosure, becomes available to the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] from a source other than the Disclosing Party or its Agents, which source is not bound by any duty of confidentiality owed, directly or indirectly, to the Disclosing Party in relation to such information;

1.4 **Group** means any subsidiary, any holding company and any subsidiary of any holding company of either party; and

1.5 **Information** means all information in whatever form including, without limitation, any information relating to systems, operations, plans, intentions, market opportunities, know-how, trade secrets and business affairs whether in writing, conveyed orally or by machine-readable medium.

2. CONFIDENTIAL INFORMATION

2.1 All Confidential Information given by one party to this Agreement [the **Disclosing Party**] to the other party [the **Receiving Party**] will be treated by the Receiving Party as secret and confidential and will not, without the Disclosing Party's written consent, directly or indirectly communicate or disclose [whether in writing or orally or in any other manner] Confidential Information to any other person other than in accordance with the terms of this Agreement.

2.2 The Receiving Party will only use the Confidential Information for the sole purpose of technical and commercial discussions between the parties in relation to the Tender or for the subsequent performance of any contract between the parties in relation to the Tender.

2.3 Notwithstanding clause 2.1 above, the Receiving Party may disclose Confidential Information:

2.3.1 to those of its Agents who strictly need to know the Confidential Information for the sole purpose set out in clause 2.2 above, provided that the Receiving Party shall ensure that such Agents are made aware prior to the disclosure of any part of the Confidential Information that the same is confidential and that they owe a duty of confidence to the Disclosing Party. The Receiving Party shall at all times remain liable for any actions of such Agents that would constitute a breach of this Agreement; or

2.3.2 to the extent required by law or the rules of any applicable regulatory authority, subject to clause 2.4 below.

2.4 In the event that the Receiving Party is required to disclose any Confidential Information in accordance with clause 2.3.2 above, it shall promptly notify the Disclosing Party and cooperate with the Disclosing Party regarding the form, nature, content and purpose of such disclosure or any action which the Disclosing Party may reasonably take to challenge the validity of such requirement.

2.5 In the event that any Confidential Information shall be copied, disclosed or used otherwise than as permitted under this Agreement then, upon becoming aware of the same, without prejudice to any rights or remedies of the Disclosing Party, the Receiving Party shall as soon as practicable notify the Disclosing Party of such event and if requested take such steps [including the institution of legal proceedings] as shall be necessary to remedy [if capable of remedy] the default and/or to prevent further unauthorised copying, disclosure or use.

2.6 All Confidential Information shall remain the property of the Disclosing Party and its disclosure shall not confer on the Receiving Party any rights, including intellectual property rights over the Confidential Information whatsoever, beyond those contained in this Agreement.

3. RECORDS AND RETURN OF INFORMATION

3.1 The Receiving Party agrees to ensure proper and secure storage of all Information and any copies thereof.

3.2 The Receiving Party shall keep a written record, to be supplied to the Disclosing Party upon request, of the Confidential Information provided and any copies made thereof and, so far as is reasonably practicable, of the location of such Confidential Information and any copies thereof.

3.3 The Company shall, within 7 [seven] days of receipt of a written demand from Transnet:

3.3.1 return all written Confidential Information [including all copies]; and

3.3.2 expunge or destroy any Confidential Information from any computer, word processor or other device whatsoever into which it was copied, read or programmed by the Company or on its behalf.

3.4 The Company shall on request supply a certificate signed by a director as to its full compliance with the requirements of clause 3.3.2 above.

4. ANNOUNCEMENTS

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

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

5. DURATION

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

6. PRINCIPAL

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

7. ADEQUACY OF DAMAGES

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

8. PRIVACY AND DATA PROTECTION

8.1 The Receiving Party undertakes to comply with South Africa's general privacy protection in terms Section 14 of the Bill of Rights in connection with this Tender and shall procure that its personnel shall observe the provisions of such Act [as applicable] or any amendments and re-enactments thereof and any regulations made pursuant thereto.

8.2 The Receiving Party warrants that it and its Agents have the appropriate technical and organisational measures in place against unauthorised or unlawful processing of data relating to the Tender and against accidental loss or destruction of, or damage to such data held or processed by them.

9. GENERAL

9.1 Neither party may assign the benefit of this Agreement, or any interest hereunder, except with the prior written consent of the other, save that Transnet may assign this Agreement at any time to any member of the Transnet Group.

9.2 No failure or delay in exercising any right, power or privilege under this Agreement will operate as a waiver of it, nor will any single or partial exercise of it preclude any further exercise or the exercise of any right, power or privilege under this Agreement or otherwise.

9.3 The provisions of this Agreement shall be severable in the event that any of its provisions are held by a court of competent jurisdiction or other applicable authority to be invalid, void or otherwise unenforceable, and the remaining provisions shall remain enforceable to the fullest extent permitted by law.

9.4 This Agreement may only be modified by a written agreement duly signed by persons authorised on behalf of each party.

9.5 Nothing in this Agreement shall constitute the creation of a partnership, joint venture or agency between the parties.

9.6 This Agreement will be governed by and construed in accordance with South African law and the parties irrevocably submit to the exclusive jurisdiction of the South African courts.

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

T2.2-14: 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 T2.2-19 "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.

- 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.

T2.2-15: 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

T2.2-16 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

T2.2-17 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 ……..

T2.2-18 : 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

T2.2-19: 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 *Contractor* 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.			
Where the contract requires that the design of any part of the works shall be provided by the *Contractor* the *Contractor* shall satisfy the *Employer* that professional indemnity insurance cover in connection therewith has been affected			
Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the works at premises other than the site, the *Contractor* shall satisfy the *Employer* that such plant & materials, components or other goods for incorporation in the works are adequately insured during manufacture and/or fabrication and transportation to the site.			
Should the *Employer* have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the *Contractor's* policies of insurance as well as those of any sub-contractor			

T2.2-20: 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 .....

T2.2-21: 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:

.....

.....

.....

.....

.....

.....

.....

T2.2-22 SUPPLIER DECLARATION FORM

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

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

General Terms and Conditions:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SUPPLIER DECLARATION FORM

Supplier Declaration Form

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

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

Did your company previously operate under another name?	Yes		No	
If **YES** state the previous details below:				
Trading Name				
Registered Name				
Company Registration No Or ID No If a Sole Proprietor				

Form of Entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
	Non-profit (NPO's or NPC)	Personal Liability Co	State Owned Co	National Govt	Provincial Govt	Local Govt
	Education al Institution	Specialise d Profession	Financial Institution	Joint Venture	Foreign International	Foreign Branch Office

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

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

Company Banking Details		Bank Name	
Universal Branch Code		Bank Account Number	

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

Company Contact Person Name	
Designation	
Telephone	
Email	

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

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

Does your company have a valid proof of B-BBEE status?	Yes		No						
Please indicate your Broad Based BEE status (Level 1 to 9)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Majority Race of Ownership									

% Black Ownership		% Black Women Ownership		% Black Disabled person(s) Ownership		% Black Youth Ownership	
% Black Unemployed		% Black People Living in Rural Areas		% Black Military Veterans			

Please Note: Please provide proof of B-BBEE status as per Appendix C and D:

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

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

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

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

APPENDIX B

Affidavit or Solemn Declaration as to VAT registration status

Affidavit or Solemn Declaration

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

Signature: _____

Designation: _____

Date: _____

Commissioner of Oaths

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

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

_____
Commissioner of Oaths

APPENDIX C

SWORN AFFIDAVIT – B-BBEE QUALIFYING SMALL ENTERPRISE – GENERAL

I, the undersigned,

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.

2. I am a Member / Director / Owner of the following enterprise and am duly authorised to act on its behalf:

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

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

3. I hereby declare under Oath that:

- The Enterprise is _____% Black Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Female Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Designated Group Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- Black Designated Group Owned % Breakdown as per the definition stated above:
- Black Youth % = _____%
- Black Disabled % =_____%
- Black Unemployed % =_____%
- Black People living in Rural areas % = _____%
- Black Military Veterans % =_____%

- Based on the Financial Statements/Management Accounts and other information available on

the latest financial year-end of _____, the annual Total Revenue was between

R10,000,000.00 (Ten Million Rands) and R50,000,000.00 (Fifty Million Rands),

- Please confirm on the table below the B-BBEE level contributor, **by ticking the applicable box.**

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

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

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

Deponent Signature .....

Date .....

_____

Commissioner of Oaths
Signature & stamp

APPENDIX D

SWORN AFFIDAVIT – B-BBEE EXEMPTED MICRO ENTERPRISE – GENERAL

I, the undersigned,

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.

2. I am a Member / Director / Owner of the following enterprise and am duly authorised to act on its behalf:

Enterprise Name:	
Trading Name (If Applicable):	
Registration Number:	
Enterprise Physical Address:	
Type of Entity (CC, (Pty) Ltd, Sole Prop etc.):	
Nature of Business:	

Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds and Indians – (a) who are citizens of the Republic of South Africa by birth or descent; or (b) who became citizens of the Republic of South Africa by naturalisationi- i. before 27 April 1994; or ii. on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date;"
Definition of "Black Designated Groups"	"Black Designated Groups means: (a) unemployed black people not attending and not required by law to attend an educational institution and not awaiting admission to an educational institution; (b) Black people who are youth as defined in the National Youth Commission Act of 1996; (c) Black people who are persons with disabilities as defined in the Code of Good Practice on employment of people with disabilities issued under the Employment Equity Act; (d) Black people living in rural and under developed areas; (e) Black military veterans who qualifies to be called a military veteran in terms of the Military Veterans Act 18 of 2011;"

3. I hereby declare under Oath that:

- The Enterprise is _____% Black Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Female Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The Enterprise is _____% Black Designated Group Owned as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- Black Designated Group Owned % Breakdown as per the definition stated above:
- Black Youth % = _____%
- Black Disabled % =_____%
- Black Unemployed % =_____%
- Black People living in Rural areas % = _____%
- Black Military Veterans % =_____%

- Based on the Financial Statements/Management Accounts and other information available on the latest financial year-end of _____, the annual Total Revenue was R10,000,000.00 (Ten Million Rands) or less

- Please Confirm on the below table the B-BBEE Level Contributor, **by ticking the applicable box.**

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

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

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

Deponent Signature .....

Date .....

_____

Commissioner of Oaths

Signature & stamp

VENDOR REGISTRATION DOCUMENTS CHECKLIST

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

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

C1.1: Form of Offer & Acceptance

Offer

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

SUPPLY AND REPLACEMENT OF CRUDE BOOSTER STATIONS, AIRCOOLED MEDIUM VOLTAGE VARIABLE SPEED DRIVES AT THE FIVE CRUDE PIPELINE BOOSTER STATIONS

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto as listed in the Returnable Schedules, and by submitting this Offer has accepted the Conditions of Tender.

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

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

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

Signature(s)

Name(s)

Capacity

For the tenderer:

(Insert name and address of organisation)

Name & signature of witness

Date

Tenderer's CIDB registration number:

Acceptance

By signing this part of this Form of Offer and Acceptance, the *Employer* identified below accepts the tenderer's Offer. In consideration thereof, the *Employer* shall pay the *Contractor* the amount duein 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 C3.1	Scope of Work
Part C4	Site information

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

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

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

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

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

Signature(s)			
Name(s)	.....		
Capacity	.....		
for the *Employer*	..... Transnet SOC Ltd		
	..... (Insert name and address of organisation)		
Name & signature of witness	.....	Date	.....

Schedule of Deviations

Note:

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

No.	Subject	Details
1		
2		
3		
4		
5		

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

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

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

C1.2 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	**General**	
	The *conditions of contract* 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	**X2: Changes in the law** **X7: Delay damages** **X13: Performance Bond** **X16: Retention** **X18: Limitation of liability** **Z: *Additional conditions of contract*** **Z1: Additional Clause relating to Performance Bond and/or Guarantee** **Z2: Additional obligations relating to Termination** **Z3: SSA vetting** **Z4: Additional Clause relating to collusion in the Construction industry** **Z5: Protection of Personal Information Act** **Z6: Contract Hedging**

	of the NEC3 Engineering and Construction Contract June 2005 (amended June 2006 and April 2013)	
10.1	The *Employer* is:	**Transnet SOC Ltd (Registration No. 1990/000900/30)**
	Address	Registered address: **Transnet Corporate Centre** **138 Eloff Street** **Braamfontein** **Johannesburg** **2000**
	Having elected its Contractual Address for the purposes of this contract as:	**Transnet Pipelines** **202 Anton Lembede Street** **Durban** **4000**
10.1	The *Project Manager* is: (Name)	**TBA**
	Address	**TBA**
	Tel	**TBA**
	e-mail	**TBA**
10.1	The *Supervisor* is: (Name)	**TBA**
	Address	**TBA**
	Tel No.	**TBA**
	e-mail	**TBA**
11.2(13)	The *works* are	**Supply And Replacement Of Crude Booster Stations, Aircooled Medium Voltage Variable Speed Drives At The Five Crude Pipeline Booster Stations**
11.2(14)	The following matters will be included in the Risk Register	**None**
11.2(15)	The *boundaries of the site* are	**Part C4.1**
11.2(16)	The Site Information is in	**Part C4.1**

11.2(19)	The Works Information is in	**Part C3.1.**
12.2	The *law of the contract* is the law of	**the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.**
13.1	The *language of this contract* is	**English**
13.3	The *period for reply* is	**2 weeks**
2	**The *Contractor*'s main responsibilities**	**No additional data is required for this section of the *conditions of contract*.**
3	**Time**	
11.2(3)	The *completion date* for the whole of the *works* is	**31 May 2026**
30.1	The *access dates* are	**Part of the Site** **Date** **Site 1** **access dates to be derived** **Site 2** **from contractors** **site 3** **programme** **site 4** **site 5**
31.1	The *Contractor* is to submit a first programme for acceptance within	**2 weeks of the Contract Date.**
31.2	The *starting date* is	**1 June 2024**
32.2	The *Contractor* submits revised programmes at intervals no longer than	**4 weeks.**
4	**Testing and Defects**	
42.2	The *defects date* is	**52 (fifty-two) weeks after Completion of the whole of the *works*.**
43.2	The *defect correction period* is	**2 weeks**
5	**Payment**	
50.1	The *assessment interval* is monthly on the	**18th (eighteenth) day of each successive month.**
51.1	The *currency of this contract* 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 *interest rate* is	**the prime lending rate of Rand Merchant Bank of South Africa.**
6	**Compensation events**	
60.1(13)	The *weather measurements* to be recorded for each calendar month are,	**the cumulative rainfall (mm)**
		the number of days with rainfall more than 10 mm
	The place where weather is to be recorded (on the Site) is:	**At each depot where the installation is to take place.**
	The *weather data* are the records of past *weather measurements* for each calendar month which were recorded at:	**The closest weather station closest to the depot where the installation is to take place.**
	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 *conditions of contract*.**
8	**Risks and insurance**	
80.1	These are additional *Employer*'s risks	**None**
84.1	The *Employer* provides these insurances from the Insurance Table	
	1 Insurance against:	**Loss of or damage to the *works*, 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 *works*, Plant and Materials & Equipment) and liability for bodily injury to or death of a person (not an employee of the *Contractor)* arising out of or in connection with the performance of the Contract as stated in the insurance policy for Contract Works / Public Liability**
	Cover / indemnity	**Is to the extent as stated in the insurance policy for Contract Works / Public Liability**
	The deductibles are	**as stated in the insurance policy for Contract Works / Public Liability**
3	Insurance against:	**Loss of or damage to Equipment (Temporary Works only) as stated in the insurance policy for contract Works and Public Liability**
	Cover / indemnity	**Is to the extent as stated in the insurance policy for Contract Works / Public Liability**
	The deductibles are:	**As stated in the insurance policy for Contract Works / Public Liability**
4	Insurance against:	**Contract Works SASRIA insurance subject to the terms, exceptions, and conditions of the SASRIA coupon**
	Cover / indemnity	**Cover / indemnity is to the extent provided by the SASRIA coupon**
	The deductibles are	**The deductibles are, in respect of each and every theft claim, 0,1% of the contract value subject to a minimum of R2,500 and a maximum of R25,000.**
	Note:	**The deductibles for the insurance as stated above are listed in the document titled "Certificate of Insurance: Transnet (SOC) Limited Principal Controlled Insurance."**

84.1	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract for any one event is	**The *Contractor* must comply at a minimum with the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 as amended.**
	The *Contractor* provides these additional Insurances	**1 Where the contract requires that the design of any part of the *works* shall be provided by the *Contractor* the *Contractor* shall satisfy the *Employer* that professional indemnity insurance cover in connection therewith has been affected** **2 Where the contract involves manufacture, and/or fabrication of Plant & Materials, components or other goods to be incorporated into the *works* at premises other than the site, the *Contractor* shall satisfy the *Employer* that such plant & materials, components or other goods for incorporation in the *works* are adequately insured during manufacture and/or fabrication and transportation to the site.** **3 Should the *Employer* have an insurable interest in such items during manufacture, and/or fabrication, such interest shall be noted by endorsement to the *Contractor's* policies of insurance as well as those of any sub-contractor** **4 Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000.**

		5 The insurance coverage referred to in 1, 2, 3, 4, above shall be obtained from an insurer(s) in terms of an insurance policy approved by the *Employer*. The *Contractor* shall arrange with the insurer to submit to the *Project Manager* the original and the duplicate original of the policy or policies of insurance and the receipts for payment of current premiums, together with a certificate from the insurer or insurance broker concerned, confirming that the policy or policies provide the full coverage as required. The original policy will be returned to the *Contractor.*
84.2	The minimum limit of indemnity for insurance in respect of loss of or damage to property (except the works, Plant, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the *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**
9	**Termination**	**There is no additional Contract Data required for this section of the *conditions of contract*.**
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 *Adjudicator* is	**Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the *Adjudicator*, the Chairman of the Association of Arbitrators will appoint an *Adjudicator.***
W1.2(3)	The *Adjudicator nominating body* is:	**The Chairman of the Association of Arbitrators (Southern Africa)**
	If no *Adjudicator nominating body* is entered, it is:	**the Association of Arbitrators (Southern Africa)**
W1.4(2)	The *tribunal* is:	**Arbitration**
W1.4(5)	The *arbitration procedure* is	**The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)**
	The place where arbitration is to be held is	**Durban, South Africa**
	The person or organisation who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	**The Chairman of the Association of Arbitrators (Southern Africa)**
12	**Data for secondary Option clauses**	
X2	**Changes in the law**	**No additional data is required for this Option**
X7	**Delay damages**	
X7.1	Delay damages for Completion of the whole of the *works* are	**R 25 000 per day**
X13	**Performance bond**	
X13.1	The amount of the performance bond is	**5% of the total of the Prices**
X16	**Retention**	
X16.1	The retention free amount is	**NIL**
	The retention percentage is	**10% of the total of Prices**

X18	**Limitation of liability**	
X18.1	The *Contractor*'s liability to the *Employer* for indirect or consequential loss is limited to:	**Nil**
X18.2	For any one event, the *Contractor's* liability to the *Employer* for loss of or damage to the *Employer's* property is limited to:	**The deductible of the relevant insurance policy**
X18.3	The *Contractor's* 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 *Contractor's* total liability to the *Employer* 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 *end of liability date* is	**5 years after Completion of the whole of the works**

Z	***Additional conditions of contract* are*:***	
Z1	**Additional clause relating to Performance Bonds and/or Guarantees**	
Z1		**The Performance Guarantee under X13 above shall be an irrevocable, on-demand performance guarantee, to be issued exactly in the form of the Pro Forma documents provided for this purpose under C1.3 (Forms of Securities), in favour of the *Employer* by a financial institution reasonably acceptable to the *Employer.***
Z2	**Additional obligations in respect of Termination**	

Z2.1		**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)**
Z2.2	**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"**
Z2.3		**Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."**
Z3	**Right Reserved by the *Employer* to Conduct Vetting through SSA**	
Z3.1		**The *Employer* reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any *Contractor* 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.**
Z4	**Additional Clause Relating to Collusion in the Construction Industry**	
Z4.1		**The contract award is made without prejudice to any rights the *Employer* may have to take appropriate action later with regard to any declared tender rigging including blacklisting.**
Z5	**Protection of Personal Information Act**	
Z5.1		**The *Employer* and the *Contractor* are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act.**
Z6	**Contract Hedging**	
Z6.1		**The *Contractor* to provide a Commercial Bank quotation for the cost of forward cover pertaining to this contract within 14 days of contract award. The quotation is to be submitted to Transnet Group Treasury for approval. The accepted quotation shall be implemented as a Compensation Event.**

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

		CV's (and further key persons data including CVs) are appended to Tender Schedule entitled.		
11.2(14)	The following matters will be included in the Risk Register			
31.1	The programme identified in the Contract Data is			
A	**Priced contract with activity schedule**			
11.2(20)	The *activity schedule* is in	C2.1		
11.2(30)	The tendered total of the Prices is	**(in figures)** **(in words), excluding VAT**		
	Data for Schedules of Cost Components	*Note "SCC" means Schedule of Cost Components starting on page 60 of ECC, and "SSCC" means Shorter Schedule of Cost Components starting on page 63 of ECC.*		
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**	

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

C1.3 Forms of Securities

Pro forma Performance Guarantee

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

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

Option X13: Performance bond

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

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

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

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

Pro-forma 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 Pipelines
Transnet Corporate Centre
138 Eloff Street
Braamfontein
Johannesburg
2000

Date:

Dear Sirs,

Performance Bond for Contract No. TPL/2024/01/0004/54731/RFP

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

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

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

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

I/We the undersigned .....

on behalf of the Guarantor .....

of physical address .....

.....

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

1. The terms *Employer*, *Contractor*, *Project Manager*, *works* and Completion Certificate have the meaning as assigned to them by the *conditions of contract* stated in the Contract Data for the aforesaid Contract.

2. We renounce all benefits from the legal exceptions "Benefit of Excussion and Division", "No value received" and all other exceptions which might or could be pleaded against the validity of this bond, with the meaning and effect of which exceptions we declare ourselves to be fully acquainted.

3. The *Employer* has the absolute right to arrange his affairs with the *Contractor* in any manner which the *Employer* deems fit and without being advised thereof the Guarantor shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the Guarantor. Without derogating from the foregoing compromise, extension of the construction period, indulgence, release or variation of the *Contractor's* obligation shall not affect the validity of this performance bond.

4. This bond will lapse on the earlier of

   - the date that the Guarantor receives a notice from the *Project Manager* stating that the Completion Certificate for the whole of the *works* has been issued, that all amounts due from the *Contractor* as certified in terms of the contract have been received by the *Employer* and that the *Contractor* has fulfilled all his obligations under the Contract, or

   - the date that the Surety issues a replacement Performance Bond for such lesser or higher amount as may be required by the *Project Manager*.

5. Always provided that this bond will not lapse in the event the Guarantor is notified by the *Project Manager*, (before the dates above), of the *Employer's* intention to institute claims and the particulars thereof, in which event this bond shall remain in force until all such claims are paid and settled.

6. The amount of the bond shall be payable to the *Employer* upon the *Employer's* demand and no later than 7 days following the submission to the Guarantor of a certificate signed by the *Project Manager* stating the amount of the *Employer's* losses, damages and expenses incurred as a result of the non-performance aforesaid. The signed certificate shall be deemed to be conclusive proof of the extent of the *Employer's* loss, damage and expense.

7. Our total liability hereunder shall not exceed the sum of:

   (say) _____

   R _____

8. This Performance Bond is neither negotiable nor transferable and is governed by the laws of the Republic of South Africa, subject to the jurisdiction of the courts of the Republic of South Africa

Signed at _____ on this _____ day of _____ 201_

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

PART 2: PRICING DATA

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

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, (with amendments June 2006 and April 2013) (ECC) Option A states:

Identified and defined terms	11 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, payments in multiple currencies, price adjustments for inflation and general progress monitoring.

1.2.2 The amount due at each assessment date is based on **completed activities and/or milestones** 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 Prices, Accepted Programme and where required the forecast rate of payment schedule.

1.2.7 Activities in multiple currencies are separately identified on both the Activity Schedule and the Accepted Programme for each currency.

1.2.8 The tendered total of the prices as stated in the Contract Data is obtained from the Activity Schedule summary. The tendered total of the prices includes for all direct and indirect costs, overheads, profits, risks, liabilities and obligations relative to the Contract.

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 below serve as guidelines only and the Tenderer may split or combine the activities to suit his particular methods.

TRANSNET PIELINE
TENDER NUMBER: TPL/2024/01/0004/54731/RFP
DESCRIPTION OF THE WORKS: SUPPLY AND REPLACEMENT OF CRUDE BOOSTER STATIONS, AIRCOOLED MEDIUM VOLTAGE VARIABLE SPEED DRIVES AT THE FIVE CRUDE PIPELINE BOOSTER STATIONS

ACTIVITY SCHEDULE

ACTIVITY NUMBER	ACTIVITY DESCRIPTION	UNIT	QUANTITY	RATE	ACTIVITY AMOUNT
	SECTION 1				
1.01	**MNGENI DEPOT**				
1.01.01	Variable Speed Drive, 1600KW, 3.3KV,including commissioning spares, Factory Acceptance Tests, Delivery to Site	Sum	1	R	
1.01.02	Decommission and remove existing ABB VSD	Sum	1	R	
1.01.03	Site installation,Site acceptance testing & commissioning	Sum	1	R	
1.01.04	Data books & drawings and hand over documentation	Sum	1	R	
	Sub Total Section 1.01				
1.02	**DUZI DEPOT**				
1.02.01	Variable Speed Drive, 1600KW, 3.3KV,including commissioning spares, Factory Acceptance Tests, Delivery to Site	Sum	1	R	
1.02.02	Decommission and remove existing ABB VSD	Sum	1	R	
1.02.03	Site installation,Site acceptance testing & commissioning	Sum	1	R	
1.02.04	Data books & drawings and hand over documentation	Sum	1	R	
	Sub Total Section 1.02				
1.03	**MOOI RIVER DEPOT**				
1.03.01	Variable Speed Drive, 1600KW, 3.3KV,including commissioning spares, Factory Acceptance Tests, Delivery to Site	Sum	1	R	
1.03.02	Decommission and remove existing ABB VSD	Sum	1	R	
1.03.03	Site installation,Site acceptance testing & commissioning	Sum	1	R	
1.03.04	Data books & drawings and hand over documentation	Sum	1	R	
	Sub Total Section 1.03				
1.04	**FORT MISTAKE DEPOT**				
1.04.01	Variable Speed Drive, 1600KW, 3.3KV,including commissioning spares, Factory Acceptance Tests, Delivery to Site	Sum	1	R	
1.04.02	Transformer, Factory Acceptance Tests, Delivery to Site	Sum	1	R	
1.04.03	Decommission and remove existing ABB VSD	Sum	1	R	
1.04.04	Site installation,Site acceptance testing & commissioning	Sum	1	R	
1.04.05	Data books & drawings and hand over documentation	Sum	1	R	
	Sub Total Section 1.04				
1.05	**WILGE DEPOT**				
1.05.01	Variable Speed Drive, 1600KW, 3.3KV,including commissioning spares, Factory Acceptance Tests, Delivery to Site	Sum	1	R	
1.05.02	Transformer, Factory Acceptance Tests, Delivery to Site	Sum	1	R	
1.05.03	Decommission and remove existing ABB VSD	Sum	1	R	
1.05.04	Site installation,Site acceptance testing & commissioning	Sum	1	R	
1.05.05	Data books & drawings and hand over documentation	Sum	1	R	
	Sub Total Section 1.05				
1.06	**TRAINING**				
1.06.01	Training of 10 people at Pinetown Training Center	Sum	1	R	
	Sub Total Section 1.06				
1.07	**HSE FILE**				
1.07.01	Safety, Health and Environment Compliance File	Sum	1	R	
	Sub Total Section 1.07				
			TOTAL CARRIED TO OFFER		
				VAT	

PART C3.1: SCOPE OF WORK

TRANSNET pipelines

TRANSNET

ELECTRICAL SPECIFICATION-PL693

FOR THE SUPPLY AND REPLACEMENT OF CRUDE BOOSTER STATIONS, AIRCOOLED MEDIUM VOLTAGE VARIABLE SPEED DRIVES AT THE FIVE CRUDE PIPELINE BOOSTER STATIONS

SUMMARY VERSION CONTROL

VERSION NO.	NATURE OF AMENDMENT	PAGE NO.	DATE REVISED
00	New Specification		

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 specification.

ROLE	CAPACITY/ FUNCTION	SIGNATURE	DATE
Project Manager:			
Accepts document for adequacy and practicability. Comments:			
Approver:			
Accepts document for adequacy and practicability. Comments:			

TABLE OF CONTENTS

SECTION 1 - GENERAL

1.1 ABBREVIATIONS & DEFINITIONS

1.1.1 Definition, Interpretation and General Provisions as stipulated within the NEC-3 Engineering and Construction Contract set of documents shall apply to this specification in its entirety.

1.2 GENERAL NOTES

1.2.1 All work as described in this specification represents work on existing facilities that will be in operation during the course of this Contract and all necessary precautions are to be taken to ensure that the normal pipeline operations is not disrupted in any way. The Contractors are thus required to note that access to the sites will be limited and dependent on operational constraints. The Contractor will therefore be required to co-operate responsibly with operational staff, and to schedule their work programmes so as to achieve the earliest completion date of the project possible.

1.2.2 The Contractors are to note that Work shutdown periods shall be scheduled according to the Transnet Pipelines Operational constraints and may fall over weekends/public holidays.

1.2.3 The Contractor shall supply adequate and competent labour, supervision, tools, equipment, services and testing devices for each and every item necessary to complete the Work.

1.2.4 The Contractors are to note that the responsibility for the Selection, Design, Manufacture, Supply and Commissioning of all elements of the Equipment, Hardware and Software as included in the Contractor offer shall remain with the Contractor. In this regard, the Contractor is required to satisfy himself that all elements of the Equipment, Hardware and Software as offered are capable of complying with all specifications provided by the employer. Failure to meet specifications shall render the successful The Contractor is liable to rectify the problem at no additional cost to Transnet Pipelines.

1.2.5 The Contractor shall only utilise testing devices and measuring equipment that are certified and carries a valid calibration certificate issued by an approved calibration authority.

1.2.6 The Contractor shall adhere to the Transnet Pipelines High Voltage Electrical Safety instructions for the duration of this project.

1.2.7 The Contractor shall only be allowed to submit claims on completion of milestones as agreed with the Transnet Pipelines Project Manager and documented on the Contractor work plan.

1.3 SAFETY, HEALTH AND ENVIRONMENT

The Contractor shall ensure at all times compliance with SHE requirements prescribed by applicable legislation and best practice standards. The scope of work includes disposal of waste generated as a result of the project in a permitted landfill site and submission of proof of disposal to Transnet Pipelines. The Contractor will be responsible for the SHE rules that Transnet Pipelines may require to be implemented. The Contractor shall ensure that no person or employees are allowed to enter the affected Transnet Pipelines sites on their behalf, unless that employee or person has undergone SHE induction pertaining to the hazards prevalent to the site at the time of entry.

1.3.1 **Personal Protective Equipment**

The Contractor shall also ensure that the correct PPE is worn at all times.

1.3.2 **HSE Compliance File**

An HSE Compliance File shall be compiled and submitted for review and approval by the relevant Transnet Pipelines representative. Site access shall not be permitted until such relevant approval has been given. The submission shall include as a minimum:

a. Signed 37(2) Agreement

b. Valid Letter of Good Standing with the Compensation Fund

c. Risk Assessment

d. Method Statement

e. ID copies and police clearance (NKP requirement)

f. Any professional/legal registrations (e.g. Electrical Installation registration)

1.4 ACCESS CONTROL TO SITE

1.4.1 **Security Screening**

1.4.1.1 The Contractor will be expected to go through security screening prior to be given access to Transnet premises.

1.4.1.2 The following documents are needed from the company: -

a) Company registration number.
b) CIPC registration.
c) Company TAX clearance TCS Pin.
d) Copies of ID of directors.
e) Fingerprints of directors (Use SAP 91) to be found at local SAPS. Original fingerprints must be submitted.
f) Copies of ID of employees who will be working on site.
g) Fingerprint of employees who will be working on site (Use SAP 91) to be found at local SAPS. Original fingerprints must be submitted.

h) The Contractor must make a copy of the extra Departmental documents and take it to SAPS which prevents them from paying.

Note: Please take note that SSA takes 2 weeks for screening to take place once all required documentation has been submitted.

The Contractor, his personnel and sub-Contractor shall conduct the compulsory Transnet Pipelines induction training, before commencement of the Work. Allow 2 to 3 hours for induction.

1.5 REFERENCE DOCUMENTATION

1.5.1 The requirements of the materials, design, installation, commissioning, examination, inspection and testing of equipment and facilities on site shall be in accordance with the relevant sections of the below mentioned codes.

1.5.2 Where Government, Local authorities and other statutory body's regulations, laws and requirements are more stringent than those specified hereunder, the aforementioned regulations, laws and requirements shall take precedence.

1.5.3 Where no specific rules, regulations, codes or requirements are contained in this specification nor covered by the below mentioned codes, the Contractor shall, in consultation with Transnet Pipelines, adhere to internationally accepted engineering practices or original manufacturers specification.

1.5.4 For the purpose of understanding these Standards, the following abbreviations apply.

- SANS - South African National Standards
- IEC - International Electrotechnical Commission
- PL - Transnet Pipelines Specification

GENERAL:

TITLE	SANS	IEC
Code of Practice for Wiring of Premises	SANS 10142-1 and 2	
Quality management systems	ISO 9000	

EQUIPMENT:

TITLE	SANS	OTHER
Adjustable speed electrical power drive systems Part 4: General requirements — Rating specifications for a.c. power drive systems above 1 000 V a.c. and not exceeding 35 kV	SANS/IEC 61800-4	
Degrees of protection provided by enclosures (IP Code)	SANS 60529	IEC 60529

TITLE	SANS	OTHER
Low-voltage switchgear and controlgear Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units	SANS 60947-3	
Busbar and busbar connections	SANS 1195	
Insulated bushings for alternating voltages above 1000 V		IEC 60137
National Colour standards for paint	SANS 1091	
Recommended practices and requirements for harmonic control in electrical power systems		IEEE 519

1.6 SPECIFICATIONS

1.6.1 The latest revision of the following standard Transnet Pipelines Specifications, where applicable, shall be read in conjunction with this document and need to be noted by The Contractor in order to signify familiarity and compliance with requirements. It is a requirement of this Contract that all applicable clauses are complied with in the execution of the Works.

- PL 101 Plant & equipment Tag numbering Standards
- PL 102 Equipment, Instrument & Electrical Symbology Standard
- PL 103 General Drawing Standards
- PL666 Electrical Design Criteria

1.6.2 The following standards also have reference

- Safety regulations for the Contractor
- Technical Instructions - work permit procedures

SECTION 2 - GENERAL OPERATING CONDITIONS

2.1 CLIMATIC CONDITIONS

2.1.1 Unless otherwise specified, all control equipment, peripherals and auxiliary equipment shall be capable of operating in an uncontrolled environment, and at ambient temperatures, which vary between ≤5 degrees Celsius and ≥40 degrees Celsius.

2.1.2 The Contractor must state the heat, power and environment requirements for all equipment offered in the RFP.

2.1.3 The equipment must operate satisfactorily between sea level and 1000 metres above sea level.

2.1.4 The equipment must be capable of operating in a relative humidity range from 5% RH to 95% RH.

2.1.5 Severe lightning occurs in certain areas in which the equipment will operate.

2.1.6 The Contractors are requested to include full particulars of lightning and surge protection to be provided, in the RFP.

2.1.7 Transnet Pipelines will not regard damage to equipment resulting from a lightning strike or a power surge as unavoidable except where such a strike is a "direct strike".

2.1.8 There is a presence of electrical and RF noise circuits. Systems are to be designed so as to prevent interference from this noise.

2.2 SITE CONDITIONS

2.2.1 Site Safety to be strictly administered at all times.

2.2.2 Site Facilities

2.2.2.1 The Contractor shall maintain this site in a neat and tidy condition to the satisfaction of the Project Manager.

2.2.2.2 The employer facilities are secure, however the Contractor is responsible for the safe keeping of their property.

2.2.3 Electricity

The electrical power supplied on site, for construction purposes, is as follows: - 400 Volt A.C. / 20 Amp (three phase) and 230v 15 Amp.

There will be no charge for the use of this power supply, provided the usage is deemed reasonable by the Project Manager.

Transnet Pipelines will not be responsible for any claims whatsoever brought about by any disruption or fluctuations in the supply of any such electric power supplied to the Contractor. During a power failure or substation isolation periods the Contractor will supply his own power by means of a portable generator.

2.2.4 Telephones

The Contractor shall make his own arrangements for a telephone at his Works site for use during the construction period.

2.3 INSPECTION RIGHTS

Transnet Pipelines reserves the right to inspect, examine and test any machinery, equipment, materials or methods, employed in expediting the works. Transnet shall utilise their own personnel or employ a 3rd party to carry out the said inspections, examinations or tests. The Project Manager or his deputy must have access to the manufacturer's works at all times, for the purpose of inspecting the work during manufacture.

2.4 HOURS OF WORK

2.4.1 Normal working hours are Monday to Friday, 07:00 to 16:00

2.4.2 These hours may however be extended, as required, by prior agreement with Transnet Pipelines.

2.5 SITE MEETINGS

The Contractor shall attend site meetings when convened by the Project Manager. Such meetings will be for the purpose of discussing progress, delays, materials, conditions and specifications, as well as the co-ordination of site activities. The meetings will be chaired by the Project Manager or his Deputy and the proceedings shall be minuted and circulated by the Project Manager.

SECTION 3 – SPECIFICATION

3.1 SCOPE OF WORKS

This scope of work details the design, engineering, manufacture, supply, delivery, handling, hauling, unloading, installation, system testing, quality assurance and commissioning of five VSD's to replace the existing 1600kW Medium Voltage, ABB ACS1000, Air Cooled, Variable Speed Drives (VSD) and associated works at Transnet Pipelines crude booster stations, located at Hillcrest (Mngeni), Pietermaritzburg (Duzi) and Mooi River, Fort Mistake and Wilge herein after referred to as the Works.

3.1.1 The Contractor shall be responsible for the complete works for the five 1600kW VSD's as indicated in this specification and on the attached datasheets.

3.1.2 The existing five ABB Aircooled VSD's and associated equipment must be decommissioned and removed by the Contractor.

3.1.3 The Works will be executed over a maximum period of 2 years. The first year will comprise of 3 sites and the remaining 2 sites in the following year.

3.1.4 The Works program shall allow for one VSD at a site, at a time, to ensure minimum downtime of pipeline operations.

3.1.5 The attached HV distribution drawing is for information purposes.

3.1.6 The Contractor shall be responsible for providing all commissioning spares.

3.1.7 The Contractor shall be responsible for developing and supplying the required documents and drawings for the VSD's as specified in this specification. All drawings shall be submitted in accordance with Transnet Pipeline's drawing standard and practices PL 101, 102, 103. Three soft copies in AutoCad format is also required.

3.1.8 Prior to commencement of manufacture, design acceptance shall be obtained from the Project Manager. Design approval shall entail as a minimum, the submission of the following documentation:

- Detailed Circuit schematics of power, control, alarm and indication circuits.
- Detailed Protection and Interlocking schemes.
- General Arrangement Drawings of equipment in or on panels, boards and cubicles.
- Internal wiring diagrams of panels, boards and cubicles showing cable connections to associated equipment.
- Equipment and material lists.
- Detailed Quality Assurance Plan

3.1.9 The Contractor should take note that acceptance by the Project Manager of submitted drawings does not relieve the Contractor of responsibility for errors in design documents or drawings issued.

3.1.10 The Contractors are required to note that all documentation and drawings issued by Transnet Pipelines have been supplied in good faith and are not complete in every detail. The Contractor shall be responsible for ascertaining the validity and correctness of all

drawings issued.

3.1.11 The Contractor shall be responsible for providing all as-built detailed documentation and compliance certificates.

3.1.12 The Contractor shall provide all training to ensure troubleshooting, maintenance, repairs, programming and operational requirements are fully understood. A full set of Training Manuals must be provided in hard and electronic copies.

3.1.13 The Contractor shall be responsible for all Factory and Site acceptance testing.

3.1.14 The Contractor shall provide detailed instruction and maintenance and operating manuals including spare part catalogues and programming software.

3.1.15 Where The Contractor intends to use a different external transformer to the existing on the various sites, there must be full compliance to SANS 780 and SANS 60076. Comprehensive transformer data sheets, drawings, FAT and commissioning plans thereof must also be submitted as part of the compulsory returnables.

3.2 VARIABLE SPEED DRIVES

3.2.1 The following info is for compliance to Transnet Pipelines standard spec

3.2.2 The VSD shall be in accordance with SANS/IEC 61800-4 for use on a MV, 3-phase, 50 Hz system with ratings and other requirements as indicated in this specification and on the attached datasheets. The VSD shall be connected to a supply system with characteristics as detailed on the datasheets. The equipment shall have a minimum design life of 15 years, and the Manufacturer shall provide MTBF (mean time between failures) and MTTR (mean time to repair) figures for the equipment.

3.2.3 The converter shall consist of the converter and all auxiliary equipment and accessories as specified herein and listed on the attached datasheets.

3.2.4 The VSD system shall be capable of operating with 30% voltage sag on the input power line. The motor shall not be allowed to reach a pull-out condition.

3.2.5 Power dips in excess of 50% lasting for periods of up to 2 seconds have been experienced. Manufacturer to provide details in the RFP on the performance of the converter under the following conditions and options to overcome these conditions:

- Loss of a single phase for a duration of 2 seconds
- ARC (auto re-closes) of the incoming supply lasting 600ms

3.2.6 The drive design shall comply with the harmonics guidelines according to IEEE 519, and preference shall be given to systems that meet these requirements with the lowest possible design complexity. The VSD supplier shall detail the rectifier pulse configuration, i.e. the number of main power components supplied in the VSD.

3.2.7 The converter shall include a protection temperature controller (PTC) for RTD inputs from the motor stator winding RTDs; and shall shut down the motor when the PTC resistance value increases above its safe operating value. On trip, the converter shall indicate that the fault is a motor thermal trip.

3.2.8 The converter shall start, stop, accelerate, and decelerate under independent adjustable controlled speed ramps using either linear or "S" curve profiles After ramp-down, STOP shall remove power to the motor, not simply provide a zero speed setting.

3.2.9 The converter shall provide motor current limit, adjustable from 20% to 135% of rated current.

3.2.10 The power factor as seen by the supply system shall be as close as possible to unity, but shall not be less than 0,95 lagging.

3.2.11 Audible noise level of the system equipment shall not exceed a sound pressure level of 70 dB, measured at 1 meter from the nearest surface of the adjustable speed equipment. The Drive shall have an option for carrier frequency selection to reduce noise to acceptable levels.

3.2.12 The converter shall be equipped with a power and control circuit suitable for connection to the anti-condensation heater of the motor.

3.3 PROTECTION

3.3.1 The converter shall be self-protecting and isolate the power feed to itself under the following fault conditions:

- Input overcurrent
- Converter overload
- Output open circuit
- Input over voltage
- Input surge protection
- Input earth fault
- Converter over temperature
- CPU Error

3.3.2 The converter shall trip, but not isolate the power feed to itself, for an under-voltage condition. The converter shall automatically reset after the under-voltage trip without the need for local / manual resetting. The under-voltage fault shall be logged.

3.3.3 The converter shall provide the following minimum motor protection, and under a fault condition the converter shall trip the motor:

- Motor overcurrent
- Motor undercurrent / under power
- Output short circuit

- Motor thermal overload
- Over voltage
- Under voltage
- Motor stall
- Motor phase unbalance
- Negative phase sequencing
- Earth fault

3.3.4 Each drive shall be suitably protected by means of surge protection devices.

3.4 Control and Indication

3.4.1 Potential-free changeover contacts shall be provided and wired to terminals, to provide feedback on the following conditions:

- Converter running (initiated only when the frequency output is greater than 0,5 Hz)
- Converter ready
- Converter fault condition or trip. For safety reasons the converter must have a trip lock function preventing an operator resetting the converter under extreme condition. (Shall incorporate the following trip signals: Input overcurrent, input over and under voltage, component over temperature, input earth fault).
- Motor running
- Motor stopped
- Remote emergency stop trip
- Motor thermal overload trip. (Shall incorporate the following trip signals: overcurrent and short circuit trip, motor thermal overload, over and under voltage, motor stall, motor phase unbalance, negative phase sequencing, under current).
- Earth overload trip
- Loss of control voltage
- Local / remote / off selected
- Fuse blown (where applicable)

3.4.2 The converter shall be capable of accepting potential-free changeover contacts, wired to terminals, to provide control for the following:

- Motor start request
- Motor stop request
- Pressure trip request
- Mechanical trip request

3.4.3 A selector switch shall be provided at the converter to change the speed control mode from LOCAL (manual) to REMOTE (auto).

3.4.4 Control of speed when in the REMOTE mode shall be affected by an external system that shall provide to the converter with a Modbus TCP.

3.4.5 Control of speed when in the LOCAL mode shall be manually affected by an operator from the control panel, which is an integral part of the converter

3.4.6 The converter shall provide feedback signals via the Modbus TCP as well as by analog output (4 - 20 mA) proportional to the output frequency and current.

3.4.7 The converter shall have an alphanumeric display and shall provide comprehensive information on the converter and motor condition. The following is considered as minimum requirements:

- Reference percentage of control signal
- Frequency in Hz
- Display of feedback signal
- Current in amperes
- Percentage torque
- Energy in kWh
- Output voltage
- Protection settings

3.4.8 Protection settings shall be easily adjustable by means of a small integral LCD screen and keypad.

3.4.9 The converter shall be programmable via the integral screen and keypad which shall include the following features - Selection and adjustment of:

- Minimum and maximum frequency
- Acceleration time
- Deceleration time
- Constant speed
- Automatic bypass

3.4.10 Security shall be provided by means of a password to prevent unauthorised changes on the local keypad.

3.4.11 The input and output control signals and converter circuits shall be galvanically isolated from each other and from the main supply.

3.4.12 Minimum signal input or setting shall result in running at a pre-set minimum speed, adjustable over the range 10% - 50%.

3.4.13 Speed holding (with constant input signal) over the range of 10% to 110% of full load output shall be within, (100% speed= 50 Hz speed at rated motor kW output):

- 1% of the set speed, at any speed over the range of 25% to 100%
- 5% of the set speed, at any speed over the range of 5% to 25%

3.4.14 The following conditions shall be permanently displayed on the converter's control panel:

- Drive running

- Drive ready
- Fault condition or trip
- Mode Indicator - for indication if unit is in program or set-up mode.
- Display of the current operating status including set-point and actual value of speed.

3.4.15 Should at any time, a fault, alarm or diagnostic message be generated by the unit, these shall be displayed on the converter's control panel; and shall be stored, whether reset or not. It shall be possible to recall them from the control panel. Stored records shall be time stamped.

3.4.16 All items for local display shall also be displayed remotely by means of the control and monitoring system. Remote digital signal transmission shall be by means of potential free contacts and analogue signal transmission shall be by means of individually galvanically isolated 4-20mA signals.

3.4.17 The converter shall be capable of an operational frequency range of 5 - 60 Hz. It shall have adjustable minimum and maximum operational speed limit set-points, by means of which the operational speed range can be set, (5 - 50Hz for an operational speed range of 40% to 100% of uncontrolled full speed).

3.5 REMOTE CONDITION MONITORING

3.5.1 Full remote programming, control and monitoring functionality shall be possible via industrial networks, preferably without the use of serial communications interfaces. The VSD's shall have the capabilities of interfacing to the existing PCS system, with Modbus TCP communications for Process Control, i.e. speed reference setting and feedback from/to the Control Network.

3.5.2 The process control overview consists of A single OASyS DNA Process Control System comprising a single OASyS Server and redundant Schneider PLC's on each booster pump station. The PCN wide area network (PCN WAN) facilitates the communication of the Process Control system to the MCC.

3.5.3 Each VSD shall have the capability for remote monitoring.

3.6 IDENTIFICATION AND TAGGING

3.6.1 The converter shall be supplied with a label indicating the equipment's tag number, which will be mounted on the converter's enclosure. All components (internal and external) will be labeled in accordance with the approved schematics and wiring diagrams.

3.6.2 The label shall be made from trafolite, with black text on a white background.

3.6.3 In addition, the converter shall have a permanent nameplate indicating at least the following information:

- Manufacturer's name

- Converter model number
- Power rating
- Nominal input and output voltage
- Nominal input current (RMS)
- Continuous output current (RMS)
- Certifying agency markings

3.6.4 The language used on nameplates, instruction signs, and instrument scales shall be English.

3.7 FACTORY TESTING

3.7.1 The Contractor shall perform Factory Acceptance Tests (FAT) at the supplier's manufacturing facility under their supervision, in accordance with standard specifications. This testing shall be witnessed by Transnet Pipelines.

3.7.2 The Contractor shall provide a comprehensive FAT test schedule, which shall include all aspects of the equipment to be tested.

3.7.3 The Contractor shall notify the Purchaser of all tests, at least 10 weeks in advance.

3.7.4 Transnet Pipelines reserves the right to add or delete any item or test on the test schedule, in order to verify that the supplied equipment complies with the required specification.

3.7.5 The Contractor is responsible for providing approved and calibrated test instruments in order to facilitate the testing.

3.7.6 The Contractor shall provide records of all FAT testing, punch lists and the original manufacturer routine and type test certificates.

3.7.7 Should the Factory Acceptance Tests be suspended due to the failure of a test or as a result of equipment failure, re-scheduling of the test shall be at the discretion of Transnet Pipelines. Failure of tests may result in the Contractor being back charged for the man hours expended by the Transnet Pipelines representatives.

3.7.8 Equipment shall not be dispatched unless Transnet Pipelines has approved the test certificates and issued a Release Note.

3.7.9 The Manufacturer shall include in the quotation any additional costs for witnessing complete or abbreviated tests.

3.7.10 The following tests shall be carried out, as a minimum, on the VSD:

- Demonstration of speed control from 0% to 100%, and stability thereof with load variation at steps of 25 %, 50 %, 75 %, 100 % and 125 % of rated motor output.
- Demonstration of operation of protective devices and indications.
- Determination of individual and total harmonic content and distortion at 50 %, 75 % and 100 % of rated motor output.
- 'Heat run' test at 100% rated motor output and speed for 24 hours, followed by a 10 minute run at 125% load.
- Demonstration of communications with external devices in accordance with functional specifications.

3.7.11 The following parameters shall be recorded at the commencement of the test and at 30-minute intervals thereafter:

- Input and output frequency
- Input and output power
- Input and output line currents
- Input voltage
- Ambient temperature
- Temperature of critical components

3.8 PRODUCT DELIVERY AND HANDLING

3.8.1 Upon successful completion of testing and inspection requirements described, delivery shall be made according to the following:

3.8.1.1 The site receiver shall be advised of space required for storage, equipment recommended for unloading, and measures needed for preventing damage during unloading and during storage before installation.

3.8.1.2 Protect the equipment from damage, dirt, and weather during transportation.

3.8.1.3 Provide touch-up paint for field use.

3.8.1.4 Each shipping section shall be provided with removable lifting angles and plates or devices suitable for hooks, slings, or fork lifting as necessary.

3.8.1.5 In addition to required Manufacturer's nameplate, each section shall be tagged with weatherproof tag showing equipment number as indicated on the requisition.

3.9 SITE ACCEPTANCE TESTING, CERTIFICATION AND COMMISSIONING

3.9.1 The Contractor shall compile a comprehensive Site Acceptance Test (SAT) and Commissioning Schedule to be used for site acceptance testing, certification and commissioning of the equipment to be installed by the Contractor .

3.9.2 The Contractor shall perform the site acceptance testing, certification and commissioning of the supplied / installed equipment using approved and calibrated test instruments.

3.9.3 The Contractor shall provide records of all SAT testing

3.9.4 The Contractor shall, at his own expense, rectify all defects. Should a defect result in time delays and additional material / labour cost, such cost incurred shall be for the Contractor account.

3.10 ACCEPTANCE AND HANDOVER

3.10.1 The Contractor shall perform the commissioning of the total integrated Variable speed drive in conjunction with Transnet Pipelines as detailed in this specification.

3.10.2 Site Acceptance and Handover of all elements of the equipment shall be concluded once site acceptance testing, certification and commissioning of all supplied / installed equipment has been completed, all punch list items have been completed and the following documentation has been submitted to and accepted by the TRANSNET Project Manager:

a) Complete factory acceptance testing (FAT) and site acceptance testing (SAT) documentation, comprising of test schedules, punch lists and commissioning reports.
b) Final Contract Documentation, inclusive of Design Documentation, Accepted Data books, Operating, Maintenance Manuals, Spares Lists and As Built Drawings.

3.10.3 Documentation format and number of copies shall be in accordance with Transnet Pipeline's Specifications PL 101, 102, 103.

3.11 TOOLS

3.11.1 The Contractor shall furnish any special tools required for commissioning.

3.11.2 The VSD shall be supplied complete with 3 sets of software applicable to de-bugging/ fault finding for the system as well as interface hardware, Desktop and Notebook as required.

3.11.3 The Contractor shall provide in the tender a detailed list of all the tools required along with pricing.

3.12 SPARE PARTS

3.12.1 Spare parts shall comply with the original specification and be suitable for replacing the relevant parts as originally fitted.

3.12.2 The VSD supplier manufacturer shall guarantee product support, spare parts and software for 15 years after phase out of the product. A life cycle document shall be provided by the manufacturer.

3.12.3 Spare parts for commissioning / start-up shall be provided with the equipment in accordance with the Spare Parts and Interchangeability Records form. A priced list of the Manufacturer's recommended spare parts for 2 years normal operation shall be provided.

3.12.4 The Supplier shall furnish detail on the strategic spares and stock levels of spares kept locally by him.

3.13 HOUSE KEEPING/SITE CLEARING

3.13.1 The Contractor shall maintain the work sites always clean and tidy.

3.13.2 The Contractor shall remove all debris, packing material, old parts, etc. from the applicable pump station, generated as a result of the work.

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.

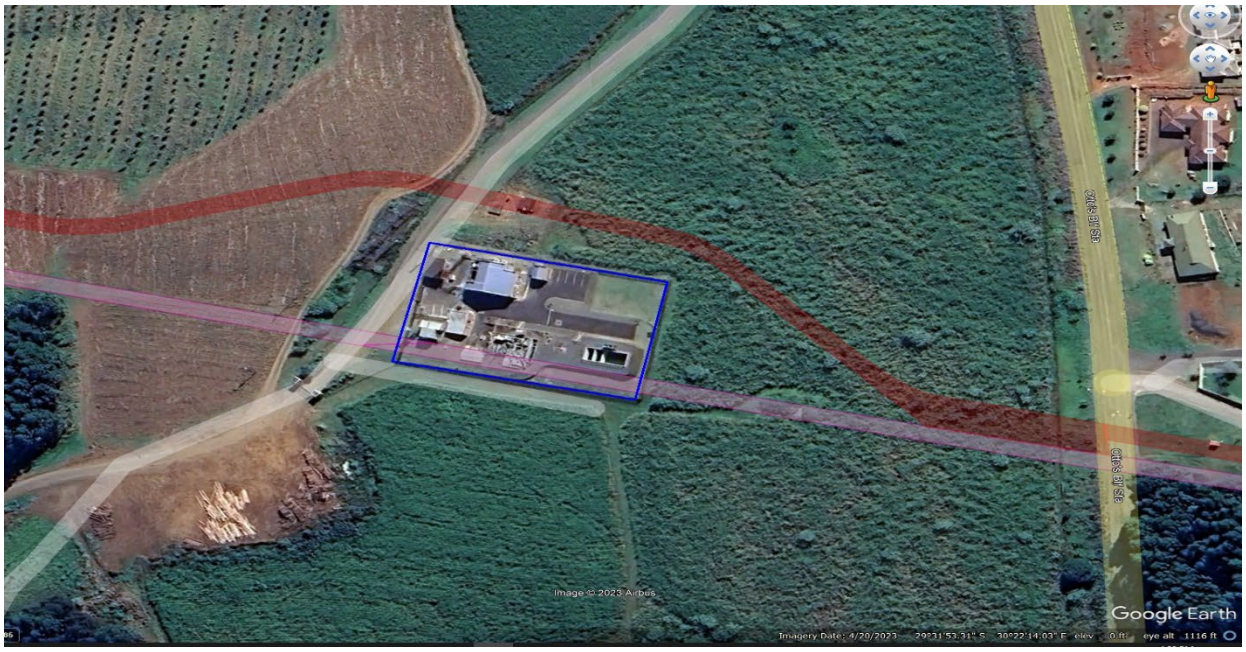
1. Description of the Site and its surroundings

1.1. General description

Below are the aerial photos of the five crude booster stations. The Contractor will enter and exit the sites from the "Main Gate".

Address

Mngeni Pump Station	6 Stockville Road, Mahogany Ridge, Westmead
Site Coordinates	Long: 30.80995373 Lat: -29.82260542



Address

Duzi Pump Station	Ottos Bluff Rd, Dunimarle, Pietermaritzburg,3201
Site Coordinates	Long: 30.37169394 Lat: -29.53273097

Address

Mooi River Pump Station	Middlerust District Road (D54), Mooi River,3300
Site Coordinates	Long: 30.02593506 Lat: -29.15797273

Address

Fort Mistake Pump Station	off N11 Ladysmith-Newcastle
Site Coordinates	Long: 29.96273960 Lat: -28.18590814

Address

Wilge Pump Station	Road S159, Frankfort-Tweefort, Substation
Site Coordinates	Long: 28.39002936 Lat: -27.22942872

1.2. Existing buildings, structures, and plant & machinery on the Site

The five Crude booster stations consist of Substation, VSD room, manifold piping and spill dam. ABB ACS1000 aircooled VSD. 3 winding VSD transformers with 11kV or 22kV primary and two windings @ 1,9kV each on the secondary

1.3. Subsoil information

No earthworks will be required

1.4. Hidden services

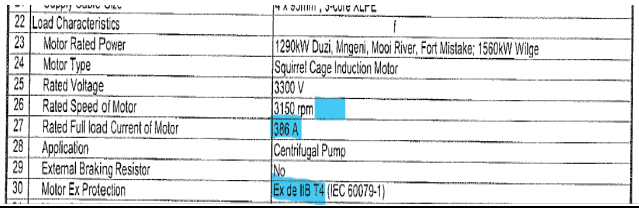
No hidden details for the contractor to take note of

1.5. Other reports and publicly available information

No other reports required

SCHEDULE OF TENDER CLARIFICATIONS

NO.	QUESTION	RESPONSE
1.	Please kindly assist us on the tender document where we have to attach a last three years audited financial statements. As our company is still developing, we are not in possession of audited financial statements however we do have unaudited financial statements. We therefore would like to find out if the unaudited financial statements and management accounts are acceptable as our company is an EME (Emerging Micro Enterprise) and we not required by law to have audited financial statements given the size of our company.	Yes, can submit unaudited if the law does not require that size of the company to audit their financial statements.
2	Dimensioned layout drawing of VSD substations, including elevations and sections OR confirmation of the ceiling height and dimension of equipment doors.	VSD room door opening: 1,56m(width) 2,4m(height) Ceiling height 2,9m
3	Layout drawing of the individual sites for purposes of determining the distances between MV switchgear, transformer and VSD's, should we need to replace the cables	Approx. Cable run lenghts: MV switchgear to trfr: 65m Trfr to VSD: 20m VSD to motor: 70m
4	Datasheets of the existing 3-winding transformers supplying the VSD, specifically with confirmation of the voltage of each of the secondary windings	Mngeni, Duzi, Mooi River: 11000V - 1902V/1902V Fort Mistake, Wilge: 22000V - 1902V/1902V
5	Confirmation of the power and battery capacity ratings for the 400V auxiliary supply UPS feeding the VSD	30kVA, 3 phase UPS.

NO.	QUESTION	RESPONSE
6	With regards to the single line drawings, 12-pulse transformers are used together with a 12 pulse drives on both 11kV and 22kV lines, is Transnet willing to change the transformers (to use normal distribution transformers) or the same transformers will be used with the new MV drives.	We will consider the various proposals and evaluate to find the most suitable option for the business. The bidders will have to povide detail designs of equipment on the options proposed
7	Will Transnet consider using 18 Pulse,24 Pulse , active front end drives?	Yes
8	Would it be possible to get the actual name plate of the motor? Motor Rated Power 1290kW Duzi, Mngeni, Mooi River, Fort Mistake; 1560kW Wilge Rated Full load Current of Motor 386 A Just wanted to confirm that 1560kW Wilge is 368A, Can you please confirm the full load amps of 1290kW Duzi, Mngeni and Mooi River.	Motor information is on the data sheets. What additional info is required? Mngeni, Duzi, Mooi River, Fort Mistake – motor current is 251A Wilge – motor current is 306A
9	Thank you for the clarification regarding the voltage of each of the transformer secondary windings being 1902V. Would you kindly confirm what transformer tap settings are available on these transformers? We would like to reduce the voltage to as close to 1700V as possible.	Tap changer settings + - 5%.
10	12-Pulse Drives and transformer are not IEEE compliant, is Transnet willing to accept a 12 Pulse solution as shown on the drawing? From the scope of work and specification I did not see any mention of avoiding a 12-pulse solution, as we do not provide a 12 Pulse solution as it is not IEEE compliant.	TPL will consider a 12 pulse Drive.
11	regarding the full load current, motor speed and the Ex-protection. • How many poles are these motors? • The current seems to be too high for the given power rating, what is the motor power factor? We cannot have the same current for two different power sizes either. • Motor Ex protection is it an indication only as this specify the motor type? 	2 pole motor. Mngeni, Duzi, Mooi River and Fort Mistake. **251A** Wilge. **306A** The motor is Ex rated.
12	In the tender document - **Technical Data Sheet 1**, reference is made to the Medium Voltage motors currently used. It is referenced that the motors have Ex Protection = Ex de IIB T4 (IEC 60079-1)	Stator temperature RTD sensors. Wiring box mounted on the motor.

22	Load Characteristics	
23	Motor Rated Power	1290kW Duzi, Mngeni, Mooi River, Fort Mistake; 1560kW Wilge
24	Motor Type	Squirrel Cage Induction Motor
25	Rated Voltage	3300 V
26	Rated Speed of Motor	3150 rpm
27	Rated Full load Current of Motor	386 A
28	Application	Centrifugal Pump
29	External Braking Resistor	No
30	Motor Ex Protection	Ex de IIB T4 (IEC 60079-1)

NO.	QUESTION	RESPONSE
	- Can you please help with additional information regarding all 5x MV motors for: o Are all 5x MV motors equipped with temperature sensors? If yes: ▪ what type, ▪ what location in the motor ▪ what qty? May we please get a copy of all 5x MV motor's ATEX certificate(s)	3 per motor.
13	If company has a CSD number, is a new registration to be done specific to the Tender Reference number?	No. Only one CSD number is issued by National Treasury.
14	T2.2-01, Technical Data Sheets Are these Data Sheets the only required for completing and submission	Please complete the data sheets and submit
15	T2.2-02, Organisational Charts and CV's of Key Persons Is this only required for Tenderer or is this required for the Tenderer's sub-contractor	At this stage the tenderer's details required.
16	SBD 6 Confirm that this is the full SBD 6 form required for completion and returnable.	Yes
17	T2.2-20, Form of Intent to Provide a Performance Guarantee Please clarify as to what the Performance Guarantee is for/against	this will be for non-performance linked to the terms of the contract that will have to be honoured
18	X13, Performance Bond Please clarify as to what the Performance Bond is for/against	this will be for **non-performance** linked to the terms of the contract that will have to be honoured
19	Ordering Process Kindly confirm if a single purchase order will be placed for the entire project with delivery milestones, i.e. 2024 and 2025. Will separate task orders be provided per site.	There will be separate task orders and payments per site. Yes.
20	Installation Certification Requirement Kindly confirm if the Installation of the new drives needs to be certified for the Hazardous location.	VSD's are in safe area.

DRAWING OFFICE STANDARD GENERAL DRAWING (PL103)

DOCUMENT APPROVAL PROCESS

NAME		POSITION/MEETING NO.	SIGNATURE	DATE
Originator:				
Approver:				
Original date: 15 June 2016				
Effective date:				

TABLE OF CONTENT

1. INTRODUCTION

The objective of this General Drawing Standards Document is to establish a set of approved drawing standards and codes of practise that shall be required to be adhered to by both Contractor and Client in the preparation of Engineering Documentation for and on behalf of Transnet Pipelines, a Division of Transnet Ltd. By ensuring comprehensive, consistent and uniform means of presentation of information, these Standards and Codes of Practise are intended to facilitate rapid comprehension by the users of the information, and thus assist in the maintenance and fault finding of installed technology.

2. SCOPE

2.1. GENERAL

This document defines as a minimum, the general responsibilities for the provision of all Engineering Documentation, whether it be by the Client or Contractor, for and on behalf of Transnet Pipelines. In this regard, providers of Engineering Documentation are required to familiarise themselves with all applicable Standards and Codes of Practise listed herein, and to ensure compliance in the execution of any work in terms of this document. Failure to comply may render the provider liable for corrections at his own cost.

These Standards and Codes of Practise 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 Pipelines 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 Schedule of Contract Documents) and this document, the former shall prevail.

2.2. APPLICATION TO WORK ACTIVITIES

The Standards and Codes of Practise contained herein are suitable for use whenever Engineering Documentation is required to be produced and includes amongst others the following:

- Design Sketches
- Technical Papers and literature
- Equipment Identification and Tagging
- Construction Drawings
- Specifications, both Functional and Technical
- Installation, operating and maintenance instructions, drawings and records

3. REFERENCE DOCUMENTATION

The following standard specifications are to be used for reference purposes. It is expected of Tenderers 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.

A. Standards and Recommended Practices for Instrumentation and Control, 11th Edition, Instrument Society of America.

ANSI/ISA-S5.1-2009	Instrument Symbols and Identification
ANSI/ISA - S 5.2-1992	Binary Logic Diagrams for Process Operations
ANSI/ISA-S5.3-1983	Graphic Symbols for Distributed Control, Shared Display Instrumentation, Logic and Computer Systems
ANSI/ISA - S 5.5-1985	Graphic Symbols for Process Displays

B. Graphical Symbols for Electrical Diagrams NRS 002-2000 second edition.

C. International Electrotechnical Commission Standards for Electrical Drawings

IEC Publication 60027	Letter Symbols to be used in Electrical Technology
IEC Publication 60050	International Electrotechnical Vocabulary
IEC Publication 60617	Graphical Symbols for Diagrams

D. American Society of Mechanical Engineers (ASME)

ASME Y32.11 - 1961	Graphical Symbols for Process Flow Diagrams
ASME Y32.2.3 - 1994	Graphical Symbols for Pipe Fittings, Valves & Piping.

E.	TPL-TECH-I-POL-001	Measurement Policy
F.	TPL-TECH-I-POL-002	Control Policy
G.	TPL-TECH-I-POL-003	Instrumentation Policy
H.	SANS-10111-1-2011	Engineering Standards

4. ABBREVIATION

For the purpose of understanding these Standards, the following abbreviations apply.

ANSI	:	American National Standards Institute
C & I	:	Control and Instrumentation
IEC	:	International Electrotechnical Commission
ISA	:	Instrument Society of America
SABS	:	South African Bureau of Standards
ASA	:	American Standards Association

5. EQUIPMENT & INSTRUMENT SYMBOLOGY STANDARD

This specification details general drawing standards to be adhered to in the production of Engineering Documentation for and on behalf of Transnet Pipelines.

5.1. UNITS AND LANGUAGE

5.1.1. All drawings shall conform to SI (System International) units.

5.2.1. All notes, comments and text shall be in the English language.

5.2. SIZES

5.2.1 . All drawings shall be supplied on standard sized media as listed in Table 1 below:

Table 1. Sizes of Drawing Sheets (SABS 0111-1990 Table 1).

DESIGNATION	TRIMMED SIZE (mm)	WIDTH OF BORDER (mm)
A0	841 X 1189	20
A1	594 X 841	20
A2	420 X 594	15
A3	297 X 420	15
A4	210 X 297	15

5.2.2 . Media exceeding A0 length may be used only where absolutely necessary e.g. Long sections / pipe profiles etc, but with prior approval from Transnet Pipelines.

5.2.3. Where possible, the following drawing sizes shall be adhered to in the production of Engineering Documentation. Where undecided, the smallest of the recommended sizes that is consistent with clarity should be used where ever possible. Deviations from the under mentioned drawing sizes shall require prior approval from Transnet Pipelines.

DOCUMENTATION TYPE	DRAWING SIZE
Process Drawings	
Piping & Instrumentation Diagrams	A1
Process Flow Diagrams	A1
Heating Ventilation & Air Conditioning (HVAC)	A1
Hazardous Area Classification Diagrams	A1
Metering & Instrumentation	
Instrument Schedules/ Data Sheets	A4
Instrument Hookup Diagrams	A4
Instrument Location Diagrams	A1
Loop Drawings	A4
Panel GA / Layout Diagrams – Internal & External	A1
Panel Wiring Diagrams	A1/A4

Cable Schedules	A1/A4
Cable Block/ Routing/ Interconnection Diagrams	A1
Safety Integrity Levels (SILs) Report	A4
HAZOP Report	A4

Software Documentation

Engineering Design / Functional Design Spec (EDS/FDS)	A4
Plant Input/ Output (I/O) Schedules	A4
Metering Configuration Documentation	A4
Metering Detailed Design Spec (DDS)	A4
Site Acceptance Test (SAT)	A4

Electrical Documentation

Electrical Load & Fault Calculations	A4
Single Line Diagrams	A1/A4
Panel GA / Layout Diagrams – Internal & External	A1
Electrical Schematic & Wiring Diagrams	A1
Cable Schedules	A1/A4
Cable Block/ Routing/ Interconnection Diagrams	A1
Protection settings schedule and curves	A4
Cable schedule to include – de-rating factor Philosophy / calculations, cable lengths, voltdrop calculations	A2
Earthing Single line diagrams	A1
Electrical equipment data sheets	A4
Hazardous area equipment certification	A4
Site and manifold Hazardous area classification drawings	A1
High Voltage yards structural equipment design and foundation drawings	A3

Mechanical Documentation

General Arrangement Diagrams	As required
3D CAD views of Piping, Structural Steel & Mechanical	As required
3D model Isometric views	As required
Underground Drawings	As required

Civil/Site Layout Drawings

Site Layout Diagrams	A0/A1
Cable, Racking & Trenching Layout Diagrams	A0/A1
Survey Drawings	A0/A1
Earthing Reticulation Diagrams	A0/A1
Location Drawings (Plot Plans)/ 3D CAD views	A0/A1
Structural Arrangement Drawings	A0/A1
Structural Fire Protection Drawings	A0/A1
Structural Steel Detail Drawings	A0/A1
Foundation Drawings	A0/A1
Pipe/ Ducting Support Drawings	A0/A1
Weight/ Structural Analysis Design Reports	A4/A3

5.3. TEXT SIZES & CORRESPONDING LINE THICKNESSES

5.3.1. One of the following sets of standard text sizes and corresponding line thickness' shall be used:

Table 2. Text Size & Line Thickness (SABS 0111 1990 Table 2).

SET 1	
Text Size	Line Thickness
1.8 mm	0.18 mm
2.5 mm	0.25 mm
3.5 mm	0.35 mm
5 mm	0.5 mm
7 mm	0.7 mm
10 mm	1.0 mm

SET 2	
Text Size	Line Thickness
2.0 mm	0.2 mm
3.0 mm	0.3 mm
5.0 mm	0.5 mm
7.0 mm	0.7 mm
10.0 mm	1.0 mm
14.0 mm	1.4 mm

5.4. LINE TYPES

5.4.1. MECHANICAL DIAGRAMS

5.4.1.1. The following line types shall be adhered to in the production of Mechanical manufacturing drawings:

Table 3. Types of Lines (SABS 0111 1990 Table 3)

LINE	DESCRIPTION APPLICATION
A	Visible outlines/edges
B	Dimension, projection and leader lines cross hatching, short centre lines, imaginary lines of intersection, outlines of revolved sections
C	Break lines
D	Hidden features
E	Centre lines and lines of symetry, pitch circles, paths of motion, repeated details
F	Cutting planes
G	Limit of maximum or final maching
H	Existing or adjacent parts, alternative and extreme positions of movable parts, developed views and bend lines, feature located in front of a cutting plane, portions to be removed

5.4.2. PROCESS DIAGRAMS

5.4.2.1. Line Types to be adhered to in the production of Process Diagrams (e.g. Piping & Instrumentation Diagrams, Flow Diagrams) are defined in Transnet Pipelines Specification PL 102 Equipment, Instrument and Electrical Symbology Standards Document, Table 3.

5.5. SCALES

5.5.1. All engineering drawings shall be produced to one of the standard scales defined below, or should the need arise, a multiple of ten thereof:

10:1	1:2	1:50	1:1000
5:1	1:5	1:100	1:2000
2:1	1:10	1:200	1:2500
1:1	1:20	1:250	1:5000

5.2.2. Conceptual drawings not drawn to scale shall be marked as "NTS" in the box provided in the title block. Plot scales shall be noted elsewhere on the drawing in these cases.

5.5.3. Where details (either enlarged or reduced), are drawn on the same sheet as the subject, the scale shall be indicated on the drawing, directly under the title of the detail.

5.5.4. Metric Reference Scale

All original drawings shall be marked with a metric reference scale at the bottom of the drawing, placed symmetrically about a centring mark near the frame of the border. The scale shall be 100 mm in length, with a maximum width of 5 mm and marked off in units of 10 mm.

Metric Reference Scale. (SABS 0111 Drg 10759/E)

5.6. TOLERANCES

5.6.1. Tolerances shall be indicated on all manufacturing drawings, whether as a general note, or on specific dimensions.

5.7. DIMENSIONS/NOTES

5.7.1. All manufacturing drawings shall be comprehensively dimensioned and annotated, to ensure that manufacturing methods, sizes and materials etc are clear to the manufacturer.

5.8. TITLE BLOCK

5.8.1. All drawings are to bear the Transnet Pipelines title block (ANNEXURE A), with the space allocated for the drawing number left blank.

5.8.2. A space of either 25 mm high may be added to the top or 40 mm high may be added to the left hand side of the Transnet Pipelines title block, in which space the Contractor's details and title block may be added.

5.8.3. A further space of not more than 8 mm high may be added in the same area for the Contractor's drawing number.

5.8.4. The Contractor shall indicate the persons responsible for producing the drawing, the title, scale, project name, date, revision etc. in the spaces provided for in the Transnet Pipelines title block. (ANNEXURE A hereof)

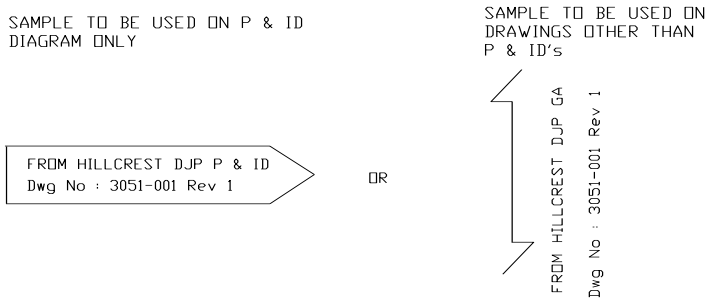
5.8.5. On application, Transnet Pipelines will supply, free of charge, one "soft copy AutoCAD version" of their title block.

5.9. REFERENCE DRAWINGS

5.9.1. Where applicable, all reference drawings shall be noted in an appropriate place, on all drawings.

5.9.2. Smaller series drawing (A4 and A3) may bear reference drawing numbers as a note, in an appropriate position, on the drawing.

5.9.3. Where a drawing is of sufficient complexity and size that warrants being split over several pages, continuation lines shall be conveyed by means of either of the under mentioned symbols. Note that the direction of the arrow shall indicate the direction of information flow.



5.10. CONTRACTOR'S AMENDMENT BLOCKS

5.10.1. All amendments made to existing drawings shall be indicated by the placement of the following information within a Revision Block included as part of the Drawing Border:

-	Drawing Revision Number	Marked as the next consecutive alpha character.
-	Revision Date	Date on which the amendment was made.
-	Name	Name of Draughtsman responsible
-	Description	Description of the amendment made.

5.10.2. Revision Numbers ascribed to Engineering Design Drawings (prior to completion of a project and production of AS BUILTS) shall be placed in the Contractor's Amendment Block and shall be numbered numerically commencing with the numerals 001. AS BUILT

Drawings shall be indicated by the last revision number contained in the Contractor's Amendment Block.

5.10.3. In order to indicate the most recent amendments made to a drawing, all amendments relating to the most recent revision number shall be highlighted by means of a "cloud" symbol placed around the modification with the Revision Number inserted within. Only the most recent amendments shall be highlighted on a drawing in this manner.

5.11. LAYOUT

5.11.1. All drawings shall be laid out in a logical and legible manner and shall comply fully with all provisions as detailed in the Drawing Standards Document PL 100. Where Typical Drawing Layouts have been included in the Drawing Standards Document, Contractors shall be required to ensure compliance to such standards. Where Typical Drawing Layouts have not been defined, all proposed layouts shall be required to be approved by the nominated Transnet Pipelines representative prior to commencement of draughting work.

5.11.2. All orthographic projections are to be in the first angle.

5.11.3. Typical Drawing Layout Standards have been defined for the following documentation types and are required to be complied within the compilation of Engineering Documentation:

(PL 100 APPENDIX B Documentation Layout Standards/Typicals)

Process Drawings
Piping & Instrumentation Diagrams (P&IDs)
Process Flow Diagrams (PFDs)
Heating Ventilation & Air Conditioning (HVAC)
Hazardous Area Classification Diagrams
Hazop Studies

Metering & Instrumentation
Instrument Schedules
Instrument Data Sheets
Instrument Hook-up Diagrams
Loop Reports/ Drawings
Panel Layout and General Arrangements
Panel Wiring Diagrams
Cable Schedules (Refer to Electrical Typicals)
Cable Block Diagrams (Refer to Electrical Typicals)
Cable Interface Wiring Diagrams

Electrical Documentation
Single Line Diagrams
Electrical Schematic & Wiring Diagrams
Panel Layout and General Arrangements
Cable Schedules

Cable Block Diagrams
Cable Interface Wiring Diagrams
Connection/ Hook-up Diagrams

Mechanical Documentation

General Arrangement/ 3D CAD views of Piping, Structural Steel & Mechanical, Installations.
Layout Drawings/ 3D model Isometric views
Underground Drawings

Civil/Site Layout & Survey Documentation

Trenching and Services Layout Diagrams
Earthing Reticulation Diagrams
Cable Routing Reticulation Diagrams
Structural Arrangement Drawings
Structural Fire Protection Drawings
Structural Steel Detail Drawings
Foundation Drawings
Pipe/ Ducting Support Drawings

5.12. SYMBOLOGY

5.12.1. PROCESS DIAGRAMS, METERING AND INSTRUMENT DRAWINGS

All Process Diagram and Metering & Instrument Diagram symbols shall comply with those stipulated in the Equipment, Instrument and Electrical Symbology Standards Document PL 102 Tables 1 to 10. Symbols defined in this Standard cover production of the following Document types:

Process Drawings

Piping & Instrumentation Diagrams
Process Flow Diagrams

Metering & Instrumentation

Instrument Schedules
Instrument Data Sheets
Instrument Hookup Diagrams
Instrument Location Diagrams
Loop Drawings
Panel GA / Layout Diagrams – Internal & External
Panel Wiring Diagrams
Cable Schedules
Cable Block Diagrams
Cable Interconnection Diagrams
Cable Routing Diagrams

Software Documentation

Engineering Design / Functional Design Specs
Plant I/O Schedules

Flow Charts
Software Listing

Graphical instrument/equipment symbols have been based on compliance with ISA Standards 11th Edition Vol 1. Standards and Recommended Practices for Instrumentation and Control, and American Society of Mechanical Engineers Standards ASA 732.11 / 232.2.3.:

5.12.2. MANUFACTURING / MACHINING DRAWINGS

5.12.2.1. MACHINING SYMBOLS / ROUGHNESS VALUES

5.12.2.1.1. Machining and surface finish symbols and roughness values shall comply with the Code of Practice for Engineering Drawing SABS 0111/1990 as amended.

5.12.2.2. WELDING SYMBOLS

5.12.2.2.1. All welding symbols used shall comply with the Code of Practice for Welding, SABS 044 parts I and II, as amended.

5.12.3. ELECTRICAL DRAWINGS

5.12.3.1. All cable and wire sizes, values of resistance, breaking capacity of switches and ratings of equipment shall be clearly specified on a drawing.

5.12.3.2. ELECTRICAL SYMBOLS

All Electrical Diagram symbols shall comply with those stipulated in the Equipment, Instrument and Electrical Symbology Standards Document PL 102 Section 5. Symbols defined in this Standard covers production of the following Document types:

Electrical Documentation
Single Line Diagrams
Panel GA / Layout Diagrams – Internal & External
Electrical Schematic & Wiring Diagrams
Cable Schedules
Cable Block Diagrams
Cable Interconnection Diagrams
Cable Routing Diagrams

5.12.3.3. Graphical Symbols for Electrical Diagrams NRS 002-2000 second edition

5.12.4. OTHER DRAWINGS

5.12.4.1. All other drawings using symbols, must state the standard used, or else have a key as to the meaning of such symbols.

5.13. DRAWING LAYER CONTROL

5.13.1. The following Layer structures shall be utilised by the Contractor in the provision of all Engineering Design Drawings. All Layer Descriptors shall comprise of alphanumeric characters and shall be descriptive in nature.

5.13.2. PROCESS DIAGRAMS

All Process Diagrams shall comply with the following Layer structure:

0	General
ALCOHOL	Alcohol Manifold Piping
AUX	Auxiliary Manifold Piping
BORDER	Border
CDRAIN	Closed Drain System
CDRAINHID	Closed Drain System - below ground
DEFPOINTS	
DIESEL	Diesel Manifold Piping
EFFLUENT	Effluent System
FIRE	Fire System
FUTURE	Future Equipment, Piping
INSTR-ATTR	Instrument Attributes
INSTR-LINE	Instrument Piping
MAIN	Main Manifold Piping
NEW	
ODRAIN	Open Drain System
ODRAINHID	Open Drain System - below ground
PETROL	Petrol Manifold Piping
PIPE-ATTR	Pipe Attributes
TEXT	
TITLE	Title Block
ULP	Unleaded Manifold Piping

Layers defined in this Standard cover production of the following Document types:

Process Drawings
Piping & Instrumentation Diagrams
Process Flow Diagrams
Hazardous Area Classification Diagrams

5.13.3. METERING & INSTRUMENTATION DIAGRAMS

All Metering & Instrumentation Diagrams shall comply with the following Layer structure:

0	General
BORDER	Border
DEFPOINTS	
DIM	Dimensions

FUTURE	Future Installations
INSTR-ATTR	Instrument Attributes
INSTR-LINE	Instrument Piping
NEW	
PROCESS	Process Connections
PNEU	Pneumatics
TEXT	
TITLE	Title Block

Layers defined in this Standard cover production of the following Document types:

Metering & Instrumentation
Instrument Schedules
Instrument Data Sheets
Instrument Hookup Diagrams
Instrument Location Diagrams
Loop Drawings
Panel GA / Layout Diagrams – Internal & External
Panel Wiring Diagrams
Cable Schedules
Cable Block Diagrams
Cable Interconnection Diagrams
Cable Routing Diagrams

5.13.4. ELECTRICAL SWITCHGEAR DIAGRAMS

All Electrical Diagrams shall comply with the following Layer structure:

0	General
BORDER	Border
C1	Control Circuitry 1
C2	Control Circuitry 2
C3	Control Circuitry 3
C4	Control Circuitry 4
DEFPOINTS	
ELEC-ATTR	Electrical Attributes
FUTURE	Future Installations
MAIN	
NEW	
T1	Power Circuitry 1
T2	Power Circuitry 2
T3	Power Circuitry 3
T4	Power Circuitry 4
TEXT	
TITLE	Title Block

Layers defined in this Standard cover production of the following Document types:

Electrical Documentation
Single Line Diagrams
Panel GA / Layout Diagrams – Internal & External
Electrical Schematic & Wiring Diagrams
Cable Schedules
Cable Block Diagrams
Cable Interconnection Diagrams
Cable Routing Diagrams

5.13.5. Mechanical Diagrams, Manifold Piping and General Arrangements

All Mechanical Diagrams shall comply with the following Layer structure:

0	General
BORDER	Border
CDRAIN	Closed Drain System
CDRAINHID	Closed Drain System - below ground
DEFPOINTS	
DIMENSION	Dimensions
FUTURE	Future Equipment, Piping
HIDDEN	Hidden - underground
MAIN	
NEW	
ODRAIN	Open Drain System
ODRAINHID	Open Drain System - below ground
PLINTH	Plinth Details
PIPE-ATTR	Pipe Attributes
TEXT	
TITLE	Title Block

Layers defined in this Standard cover production of the following Document types:

Mechanical Documentation
General Arrangement/ 3D CAD views of Piping, Structural Steel & Mechanical, Installations.
Layout Drawings/ 3D model Isometric views
Underground Drawings

5.13.6. CIVIL / SITE LAYOUT DIAGRAMS

All Civil/Site Layout Diagrams shall comply with the following Layer structure:

0	General
AUX	Auxiliary Manifold Piping
BORDER	Border
BUND	Bund
BUNDW	Bund Wall
CABLE	Cable Reticulation

CDRAIN	Closed Drain System
CDRAINHID	Closed Drain System - below ground
DEFPOINTS	
DRAIN	Drainage
EARTH	Earthing System
EFFLUENT	Effluent System
FENCE	Fencing
FIRE	Fire System
FUTURE	Future Equipment, Piping
INSTR-ATTR	Instrument Attributes
INSTR-LINE	Instrument Piping
MAIN	Main Manifold Piping
NEW	
ODRAIN	Open Drain System
ODRAINHID	Open Drain System - below ground
PIPE-ATTR	Pipe Attributes
RACK	Racking Reticulation
TEXT	
TITLE	Title Block
TRENCH	Trenching Reticulation
ZONE0	Hazardous Area Classification Zone 0
ZONE1	Hazardous Area Classification Zone 1
ZONE2	Hazardous Area Classification Zone 2

Layers defined in this Standard cover production of the following Document types:

Civil/Site Layout Drawings
Trenching and Services Layout Diagrams
Earthing Reticulation Diagrams
Cable Routing Reticulation Diagrams
Structural Arrangement Drawings
Structural Fire Protection Drawings
Structural Steel Detail Drawings
Foundation Drawings
Pipe/ Ducting Support Drawings

5.14. SCOPE OF SUPPLY

5.14.1. PRESENTATION

5.14.1.1. All documentation shall be professionally reproduced and bound to the satisfaction of the nominated Transnet Pipelines representative. At least one set of documentation shall be marked as a "MASTER" set, and shall be presented in electronic medium suitable for reproduction. All binders and binding methods used, shall be approved by Transnet Pipelines prior to the documentation being bound.

5.14.2. SUPPLY REQUIREMENTS

Unless stipulated elsewhere in a Contract Document, the Contractor shall be required to provide the following Documentation:

5.14.2.1. ENGINEERING DESIGN DOCUMENTATION (PRIOR TO CONSTRUCTION)
The Contractor shall be required to prepare and submit to the Engineer three prints of each working drawing/design specification for approval. One print/copy of each drawing/specification shall be returned to the Contractor once approved. Notwithstanding any approval of design or working drawings by Transnet Pipelines or a nominated representative, the responsibility for the correct functioning of the system shall rest entirely with the Contractor.

As a minimum, the following documentation is required to be approved by Transnet Pipelines prior to commencement of construction activities:

Process Drawings
Piping & Instrumentation Diagrams
Process Flow Diagrams
Hazardous Area Classification Diagrams

Metering & Instrumentation
Instrument Schedules
Instrument Data Sheets (if different from Transnet Pipelines standard Data Sheets)
Instrument Hookup Diagrams (if different from Transnet Pipelines standard Hookups)
Loop Drawings (if different from Transnet Pipelines standard Loop Drawings)
Panel GA / Layout Diagrams – Internal & External
Panel 220V/24V Power Distribution and Barrier Layout schedules
Control System Architecture Diagrams
Communication Architecture & Interconnection Diagrams
Instrument Junction Box Layout Diagrams
Cable Block Diagrams

Software Documentation
Engineering Design Specification (Software Functional Design Specification)
Plant I/O Schedules
Flow Charts

Electrical Documentation
Electrical Load & Fault Calculations
Single Line Diagrams
Panel GA / Layout Diagrams – Internal & External
Electrical Schematic & Wiring Diagrams
Cable Block Diagrams

Mechanical Documentation
General Arrangement/ 3D CAD views of Piping, Structural Steel & Mechanical.
Layout Drawings/ 3D model Isometric views
Underground Drawings

Civil/Site Layout & Survey Documentation
Site Layout Diagrams
Cable, Racking & Trenching Layout Diagrams
Earthing Reticulation Diagrams
Structural Arrangement Drawings
Foundation Drawings

5.14.2.2. FINAL CONTRACT DOCUMENTATION

Unless stipulated elsewhere in a Contract Document, the Contractor shall provide as a Minimum the following Final Contract Documentation:

5.14.2.2.1. MAINTENANCE AND OPERATING LITERATURE

Maintenance and Operating Literature is deemed to form an integral part of all equipment supplied and shall require to be supplied along with all equipment installed on Transnet Pipelines sites. Supply shall include comprehensive data on servicing, faultfinding, repairs, procedures and full particulars with diagrams of how the equipment functions. All technical literature, calculations and drawings, which will enable Engineering Staff to be fully informed on electrical, control and mechanical aspects, shall be included.

5.14.2.2.2. AS BUILT DOCUMENTATION

Process Drawings
Piping & Instrumentation Diagrams (P&IDs)
Process Flow Diagrams (PFDs)
Heating Ventilation & Air Conditioning (HVAC)
Hazardous Area Classification Diagrams
Hazop Studies

Metering & Instrumentation
Instrument Schedules/ Data Sheets
Instrument Hook-up/ Location Diagrams
Loop Drawings
Panel GA / Layout Diagrams – Internal & External
Panel Wiring Diagrams

Panel 220V/24V Power Distribution and Barrier Layout schedules
Control System Architecture Diagrams
Communication Architecture & Interconnection Diagrams
Instrument Junction Box Layout Diagrams
Cable Schedules
Cable Block/ Interconnection/ Routing Diagrams
Safety Integrity Levels (SILs) Report

Software Documentation
Engineering Design Specification (Software Functional Design Specification)
Plant I/O Schedules
Flow Charts
Detail Software Listings

Electrical Documentation
Electrical Load & Fault Calculations
Single Line Diagrams
Panel GA / Layout Diagrams – Internal & External
Electrical Schematic & Wiring Diagrams
Cable Schedules
Cable Block/ Interconnection/ Routing Diagrams
Protection settings schedule and curves.
Cable schedule to include – de-rating factor philosophy / calculations, cable lengths, volt drop calculations.
Earthing Single line diagrams.
Electrical equipment data sheets.
Hazardous area equipment certification.
Site and manifold Hazardous area classification drawings.
High Voltage yards structural equipment design and foundation drawings.

Mechanical Documentation
General Arrangement/ 3D CAD views of Piping, Structural Steel & Mechanical.
Layout Drawings/ 3D model Isometric views
Underground Drawings
Piping – Analysis, Calculations, Studies, Reports

Civil/Site Layout & Survey Documentation
Trenching and Services Layout Diagrams
Earthing Reticulation Diagrams
Cable Routing Reticulation Diagrams
Structural Arrangement Drawings
Structural Fire Protection Drawings
Structural Steel Detail Drawings
Foundation Drawings
Pipe/ Ducting Support Drawings
Weight Reports
Structural Analysis Design Reports

5.14.2.2.3. SPECIAL DOCUMENTATION

- Operators Manual/s describing the equipment, system or plant from an operational viewpoint. This shall include any special or supervisory facilities.

- Technical Manual/s which describe the overall configuration of the system, capabilities of the system, how changes are to be made to the configuration of the system and all maintenance and special procedures necessary for Transnet Pipelines to maintain the equipment installed. This manual/s shall encompass both software and hardware requirements and shall be project orientated. Drawings (i.e. Wiring diagrams, dimensioned mechanical components/equipment etc.), excluding basic illustrations contained in manuals – Copies of these drawings are to be supplied separately with the "As-built" drawings and registered in the appropriate drawing index.

5.14.2.3. FINAL CONTRACT DOCUMENTATION COPIES. (See also 5.16 for specific requirements for the supply of "As-built" documentation.

Unless stipulated elsewhere in a Contract Document, the Contractor shall provide as a minimum the following number of copies of Final Contract Documentation:

- Master Control Centre – one full set in soft format (CD, DVD, Hard Drive)
- Drawing Office/Library – one MASTER set in soft format (CD, DVD, Hard Drive)
- Workshops – one full set in soft format each (CD, DVD, Hard Drive)
- Depot – one full set in soft format (CD, DVD, Hard Drive)
- Project Manager and those designated - one full set in soft format (CD, DVD, Hard Drive)

5.14.2.4. Before being submitted to Transnet Pipelines, all Final Contract Documentation and in particular AS BUILT Drawings shall be examined for compliance with onsite detail by the Contractor and signed as such.

5.14.2.5. All documentation (inclusive of hard copies and software) shall be supplied with a comprehensive Indexing system, to enable ease of access to drawing files. This index shall include as a minimum, the file names, drawing title, brief description, Contractor's/consultant's name and Drawing number, pipeline name etc. Transnet Pipelines shall provide a Microsoft Excel spreadsheet with the correct headings within the appropriate columns. Where possible, indexes shall be integral to the packages used; where not possible, indexes shall be presented in a Microsoft compatible database format.

5.14.2.6. Final Contract Documentation shall be submitted to the Engineer within eight weeks of the Contract completion date.

5.14.3. SOFTWARE PLATFORMS.

5.14.3.1. The following Software Platforms are used by Transnet Pipelines and are required to be utilised by the Contractor for compilation of all Engineering Documentation as follows:

Word Processing	Microsoft Word for Microsoft Windows XP.
Spreadsheets	Microsoft Excel for Microsoft Windows XP.
Database	Microsoft Access for Microsoft Windows XP.
Draughting	AutoCAD 2016 or Later.
Survey	ESRI ArcGIS.

5.14.3.2. The following Engineering Design Documentation types are currently installed on software platforms as detailed below, within Transnet Pipelines. Contractors will be required to provide the under mentioned documentation on the same software platforms.

Process Drawings

Piping & Instrumentation Diagrams	AutoCAD
Process Flow Diagrams	AutoCAD
Hazardous Area Classification Diagrams	AutoCAD

Metering & Instrumentation

Instrument Schedules	MS Excel
Instrument Data Sheets	MS Excel
Instrument Hook-up Diagrams	MS Excel (Embedded AutoCAD)
Instrument Location Diagrams	AutoCAD
Loop Drawings	AutoCAD
Panel GA / Layout Diagrams – Internal & External	AutoCAD
Panel Wiring Diagrams	AutoCAD
Cable Schedules	AutoCAD
Cable Block Diagrams	AutoCAD
Cable Routing Diagrams	AutoCAD
Cable Interface Wiring Diagrams	AutoCAD

Electrical Documentation

Electrical Load & Fault Calculations	MS Excel
Single Line Diagrams	AutoCAD
Panel GA / Layout Diagrams – Internal & External	AutoCAD
Electrical Schematic & Wiring Diagrams	AutoCAD
Cable Schedules	AutoCAD
Cable Block Diagrams	AutoCAD
Cable Routing Diagrams	AutoCAD
Cable Interface Wiring Diagrams	AutoCAD
Protection settings schedule and curves	MS Excel
Cable schedule to include – de-rating factor philosophy / Calculations, cable lengths, voltdrop calculations	MS Excel

Earthing Single line diagrams	AutoCAD
Electrical equipment data sheets	MS Excel
Hazardous area equipment certification	AutoCAD
Site and manifold Hazardous area classification Drawings	AutoCAD
High Voltage yards structural equipment design and foundation drawings	AutoCAD

Mechanical Documentation

General Arrangement/ 3D CAD views of piping	AutoCAD
Layout Drawings/ 3D model Isometric views	AutoCAD
Underground Drawings	AutoCAD
Piping – Analysis, Calculations, Studies, Reports	As required

Civil/Site Layout Drawings

Trenching and Services Layout Diagrams	AutoCAD
Earthing Reticulation Diagrams	AutoCAD
Cable Routing Reticulation Diagrams	AutoCAD
Structural Arrangement Drawings	AutoCAD
Structural Fire Protection Drawings	AutoCAD
Structural Steel Detail Drawings	AutoCAD
Foundation Drawings	AutoCAD
Pipe/ Ducting Support Drawings	AutoCAD
Weight Reports	As required
Structural Analysis Design Reports	As required

Survey Drawings/Diagrams	ESRI ArcGIS / AutoCAD
Drawing Index	Microsoft Excel

5.14.4. OWNERSHIP AND COPYRIGHT

5.14.4.1. The Contractor shall be required to grant to Transnet Pipelines a non-exclusive copyright, in accordance with the provisions of Section 22 of the Copyright Act 1978:

To copy any plan, diagram, drawing, specification, bill of quantities, design calculation, application software or similar document generated for and on behalf of Transnet Pipelines

- To make free and unrestricted use thereof for its own purposes, modify the same or have it modified by a third party for any reason
- To provide copies thereof to a third party (contractors or consultants) of Transnet Pipelines for the purposes of Tendering or Consultancy
- No separate or extra payment shall be due by Transnet Pipelines in respect of any non-exclusive licence granted in terms of this clause.

5.14.4.2. The Transnet Pipelines emblem included in the title block is subject to copyright law, and therefore, must in no way be altered, distributed, defaced or tampered with, or handled in any way that will be an infringement on the copyright thereof.

5.15. ALIGNMENT SHEETS

5.15.1. TYPE

5.15.1.1. Aerial Photo strip type alignment sheets shall be supplied

5.15.1.2. A minimum of 500 m of photographed area is to be recorded on either side of the pipeline

5.15.2. SCALE

5.15.2.1. Horizontal 1:5000

5.15.2.2. Vertical 1:500 (Profile / long section)

5.15.3. MEDIA

5.15.3.1. Hardcopy: Paper Minimum size A2 – 2 copies.

5.15.3.2. Electronic: 1 copy "PDF" Format

1 Copy in AutoCAD

1 Copy in Native format. (Where applicable)

5.15.3.3. Paper - Bond or similar – Min 80 gsm

5.15.3.4. Max size A0 (841 mm x 1189 mm)

5.15.4. CONTOURS

5.15.4.1. Contours at 2 m intervals are to be marked up on the alignment sheets

5.15.5. L.O. SYSTEM

5.15.5.1. Relevant co ordinate grids must be marked up on all alignment sheets

5.15.5.2. L.O. systems used must correspond with those used on the servitude diagrams produced by the Land Survey Office.

5.15.5.3. L.O. systems used must be noted in the title block or on the grid lines

5.15.5.4. Each alignment sheet shall bear an accurately determined North indicating arrow

5.15.6. PROFILE (LONG SECTION)

5.15.6.1. Each alignment sheet shall have a relevant land and piping profile drawn at the bottom of the sheet.

5.15.7. BOUNDARIES

5.15.7.1. All boundaries are to be recorded on alignment sheets, including, cadastral and municipal boundaries, and property boundaries adjoining the pipe servitude.

5.15.7.2. All farm names and numbers, lots, subs, erfs etc. are to be recorded on alignment sheets

5.15.8. CROSSINGS

5.15.8.1. All crossings of existing services are to be recorded on the alignment sheets, indicating the type of service e.g. road, 22 kV overhead power lines, rivers, etc. (roads must be identified by name and/or number).

5.15.8.2. Existing services crossed, are to be reference coded as ES1, ES2, ES3 etc.

5.15.8.3. Copies of all documentation with regard, to the crossing of existing services, such as, deeds, agreements, and way leaves etc., are to be bound into book form and indexed to correspond with the reference codes on the alignment sheets

5.15.8.4. Lengths and diameters of sleeves or culverts are to be indicated on the alignment sheets.

5.15.8.5. Any crossing reference drawing numbers are to be recorded in the space provided

5.15.9. MARKERS

5.15.9.1. The exact position of all route, distance, offset and street markers are to be recorded on alignment sheets

5.15.9.2. Route markers are to be numbered from the preceding distance marker e.g. between the origin of the pipeline and the first distance marker (km1) the route markers shall be numbered M0/1, M0/2, M0/3 etc. and between distance markers km13 and km14, the route markers shall be numbered M13/1, M13/2 etc.

5.15.9.3. Distance markers are to be placed so as to indicate the actual length of pipe

5.15.9.4. Distance markers are to be numbered sequentially from the origin, with the origin being 0 km

5.15.9.5. Offset markers are to be clearly marked as such, and their actual position, with relation to the centre line of the pipe, indicated.

5.15.10. PIPE PROTECTION

5.15.10.1. All pipe protection measures are to be indicated on the alignment sheets (e.g. wrappings, rock shield etc.), as to the full extent of such pipe protection

5.15.11. WALL THICKNESS

5.15.11.1. The pipe wall thickness is to be marked on each alignment sheet.

5.15.11.2. Changes in pipe wall thickness shall be clearly and accurately marked on the alignment sheets

5.15.12. BLOCK VALVES

5.15.12.1. Block valves will be numbered sequentially starting with BV1.

5.15.13. CATHODIC PROTECTION EQUIPMENT

5.15.13.1. The position of all cathodic protection equipment shall be clearly and accurately recorded on alignment sheets (e.g. rectifiers, test points, cross bonds, cable routes, anode beds etc.)

5.15.13.2. Rectifiers are to be numbered sequentially as, R1, R2, R3 etc., with R1 being the closest rectifier to the origin

5.15.13.3. Test points are to be numbered sequentially from the block valves e.g. the test point at block valve 3 shall be numbered 3/1 and the next test point between block valves 3 and 4 shall be numbered 3/2 etc.

5.15.14. GENERAL

5.15.14.1. Any reference drawings shall be noted in the space allocated on the alignment sheets

5.15.14.2. The type and position of all pipefittings is to be accurately recorded on the alignment sheets e.g. thread o rings, pig signals, stopple fittings etc.

5.15.14.3. Any cable routes (e.g. pig signal cables etc.) are to be accurately recorded on the alignment sheets

5.15.14.4. Each alignment sheet shall have a key to the symbols used on it

5.15.14.5. All road and river names, where affected by the pipeline, are to be recorded on the alignment sheets

5.15.14.6. All alignment sheets shall have "cut lines" at both ends, to enable the matching up of consecutive alignment sheets

5.15.14.7. Key plans of the pipe route shall be supplied on 1:50 000 scale topo cadastral maps. (Transparencies)

5.16. SPECIFIC REQUIREMENTS "AS-BUILT" DOCUMENTATION

5.16.1. SPECIFIC REQUIREMENTS

5.16.2. General: All Manuals (technical, operating etc.), Standards and Specifications:

ELECTRONIC COPY REQUIREMENTS:

One Electronic copy of the "As-built"/ Final in PDF Format (must be able to print copies), plus one Electronic copy in the Native original format (where applicable) in which it was produced. Both copies to be accessible (with the necessary controls) from the Electronic Document Management System provided for the specific project. E.g. SAP, Aconex etc.

5.16.3. ALL DRAWINGS AND DIAGRAMS:

ELECTRONIC COPY REQUIREMENTS:

One Electronic copy of the "As-built"/Final in PDF Format (must be able to print copies), plus one Electronic copy in "AutoCAD 2016 or earlier" (where applicable) and one Electronic copy in the Native original format (e.g., MS Office formats, AutoCAD drawings, etc.) in which it was produced. All copies to be accessible (with the necessary controls) from the

Electronic Document Management System provided for the specific project. `E.g. SAP, Aconnex etc.

5.16.4. MECHANICAL ENGINEERING DOCUMENTS:

Certificates, tests and data packs

The original signed document of Conformance certificates, Test certificates, Material certificates and Data packs must be supplied together with one scanned copy in PDF format.

Manuals

Any Technical, Operating, Equipment or Maintenance Manuals received from Vendors in original Hardcopy (published, not scanned) format must be supplied in that format (4 originals) together with a scanned copy in PDF Format.

Any Technical, Operating, Equipment or Maintenance Manuals received from Vendors in original electronic format (i.e. published in electronic format) must be supplied as one electronic format copy and one printed copy. (Suitably bound and referenced

5.16.5. ELECTRICAL ENGINEERING DOCUMENTS:

Certificates

The original signed documents of "Certificate of Compliance" and "Hazardous area equipment certification" must be supplied together with one scanned copy in PDF format.

Manuals

Any Technical, Operating, Equipment or Maintenance Manuals received from Vendors in original Hardcopy (published, not scanned) format must be supplied in that format (4 originals) together with a scanned copy in PDF Format.

Any Technical, Operating, Equipment or Maintenance Manuals received from Vendors in original electronic format (i.e. published in electronic format) must be supplied as one electronic format copy and one printed copy. (Suitably bound and referenced).

Drawings and Diagrams

In addition to 5.16.3, the following site / pump station specific documentation must be supplied (2 As-Built Hardcopy Prints).

1. Single Line Diagrams.
2. Panel GA / Layout Diagrams – Internal & External.
3. Electrical Schematic & Wiring Diagrams.
4. Cable Block Diagrams.
5. Cable Routing Diagrams.
6. Earthing Single line diagrams.
7. Site and manifold Hazardous area classification drawings.

5.16.6. Handover of As-Built and Other Documents from Transnet Pipelines Technical Projects to Transnet Pipelines Drawing Office must be as per TPL-TECH-DO-WI-001. (See Appendices C).

6. DOCUMENT CHANGE HISTORY:

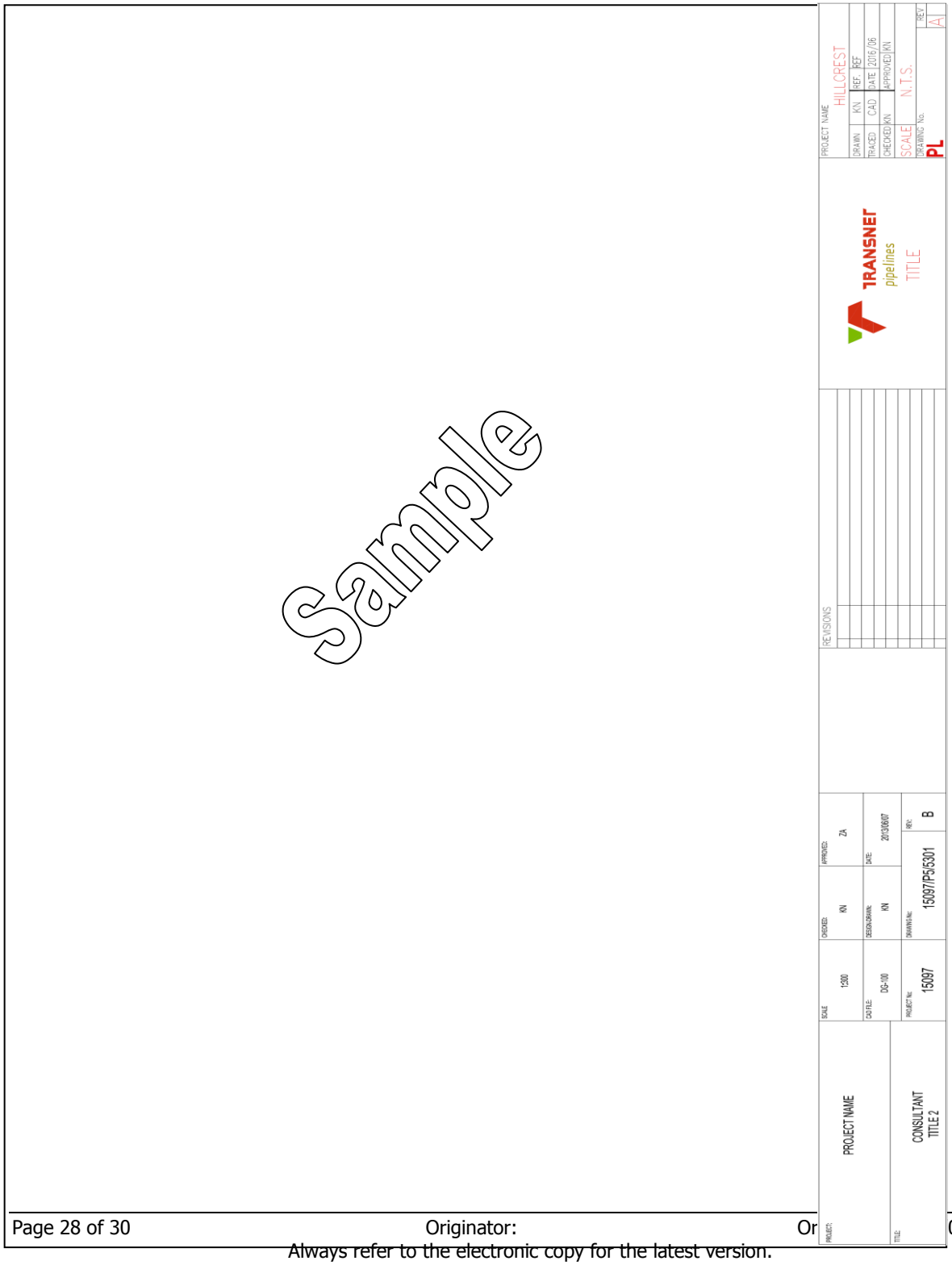
The owner of this document is responsible for the revision and control of the document, including updating of the table below, which contains the history of the document with details of each revision.

Date	Previous Rev No.	New Rev No.	Details of Revision
15.01.99	00	01	Document approved for distribution.
30.07.99	01	02	Additions made to Scope of Supply.
01.08.07	02	03	Additions made to Scope of Supply & deliverables. Transnet Pipelines logo added.
22.07.10	03	04	Additions made to Scope of Supply & deliverables. Specific requirements added.
12.06.2012	04	05	New Transnet Standard Template Adopted
07.06.2016	05	06	Document review & New Template

This table summarises what has been changed in the document so that it is easy to keep track of the effected changes.

7. APPENDICES

A Sample Title Block



APPENDICES B:
DRAWING OFFICE STANDARD PL100

APPENDICES C:
HANDOVER OF AS-BUILT
AND
OTHER DOCUMENTS FROM
TECHNICAL PROJECTS TO DRAWING OFFICE

Electrical Design Criteria
PL666

Rev.002

AMENDMENT RECORD

REV	REV DATE	CHG REQ NO.	CHANGE SUMMARY	PAGES AFFECTED
001	16.05.2016		Small power wiring requirements in buildings.	34
002	21.10.2019		Updated lighting lux levels	

Contents

1 General

1.1 Summary

1.1.1 Scope of Specification

This specification prescribes the basic minimum requirements and principles for the electrical design, selection, and protection of electrical equipment, materials and installation of electrical facilities on the Transnet Pipelines projects.

All designs shall ensure continuous and reliable service, the safety of personnel and equipment during operation, ease of maintenance, energy efficiency, interchange ability of equipment, reasonable spare capacity for the addition of future loads, safe starting, safe operation, minimum power losses, and safe shutdown of units under all circumstances.

1.1.2 Scope of Facilities

The electrical facilities shall include power, lighting, earthing and supplies to electricity consuming apparatus throughout the installations.

This document will not completely specify the details of the equipment and the services that will form part of an Engineering Contractors scope of supply. As part of the engineering services, Contractors shall make Employer aware of available equipment type options that will be beneficial when considering cost performance, maintainability, quality and energy efficiency. Such options shall be considered for installation by evaluating the suitability and benefits offered.

1.2 Reference Documents

Where reference is made to a specification, standard or code, the reference shall be taken to mean the latest edition of such specification, standard or code, including addenda, supplements and revisions thereto, current at the date of award of contract.

The following lists of specifications standards, as well as all associated references, shall be applied on any project as the basis of design, manufacture and construction, as appropriate.

1.2.1 Transnet Pipelines Specifications

Wherever Transnet Pipelines specifications cannot be made available, the engineering contractor shall supplement with an applicable specification. *Employer* approval of Equipment and Materials specifications is required prior to the same being applied to the Works.

PL 100	Drawings Standards Document
PL 101	Plant and Equipment Tag Numbering Standard
PL 102	Equipment, Instrument and Electrical Symbology Standards
PL 103	General Drawing Standards
PL 145A	Transnet Pipelines's Requirements for the Supply of Power Factor Correction Modules
PL 619C	Specification for Three Phase Electric Actuators
PL 622H	Standby Plant Specification
PL 627G	Routine Protection Testing and Refurbishment of Selected Protection Equipment at Transnet Pipelines's Distribution Substations / MV Switchgear Facilities

PL 630A Transnet Pipelines's Requirements for the Re-design and Alterations to Existing HV Substation Layouts and protection Configurations

PL 631 Specification for Low Voltage Switchgear and Distribution Boards

PL 632 Specification for Medium Voltage Switchgear

PL 647 Requirements for the Supply of 110VDC Battery Charger

PL 648 Requirements for the Supply of 50VDC Battery Charger

PL 720 Specification for a small Uninterruptible Power Supply

PL 727 Cabling, Racking, Trenching and Earthing Installation codes of Practice

Explolabs report no XPS/1015/13013Rev2- TPL Hazardous Areas Classification guidelines

1.2.2 South African Regulations

The Occupational Health and Safety Act (Act No 85 of 1993)

1.2.3 South African National Standards (SANS) Codes of Practices

SANS 10083 The measurement and assessment of occupational noise for hearing conservation purposes

SANS 10086 Installation and maintenance of electrical equipment used in explosive atmospheres

SANS 10089 The Petroleum Industry

Part 1: The Handling, Storage and Distribution of Petroleum Products
Part 2: Electrical Code

SANS 10108 The Classification of Hazardous Locations and the Selection of Apparatus for Use in Such Locations

SANS 10114 Interior Lighting

Part 1: Artificial Lighting

SANS 10119 Reduction of explosive hazards presented by electrical equipment - Segregation, ventilation and pressurisation

SANS 10121 Cathodic protection of buried and submerged structures

SANS 10123 The Control of Undesirable Static Electricity

SANS 10131 Above-Ground Storage Tanks for Petroleum Products

SANS 10142 The wiring of premises

SANS 10191 Acoustics - determination of sound power levels of noise sources

SANS 10198 The selection, handling and installation of electric power cables of rating not exceeding 33 kV

SANS 10199 The Design and Installation of an Earth Electrode

SANS 10200 Neutral earthing in medium voltage industrial power systems

SANS 10292 Earthing of Low Voltage (LV) Distribution Systems

SANS 10313 The protection of structures against lightning

1.2.4 South African National Standards (SANS)

SANS 97 Electric cables - Impregnated-paper-insulated metal sheathed cables for rated voltages 3.3/3.3 kV up to 19/33 kV

SANS 1339 Electric Cables –Cross-linked Polyethelene (XLPE) insulated cables for rated voltages 3.8/6.6 to 19/33kV

SANS 156 Moulded Case Circuit Breakers

SANS 342 Automotive diesel fuel

SANS 767	Earth leakage protection units
SANS 780	Distribution transformers
SANS 808	Cable glands for use on flameproof enclosures (Ex 'd')
SANS 950	Unplasticised polyvinyl chloride rigid conduit and fittings for use in electrical installations
SANS 1019	Standard voltages, currents and insulation levels for electricity
SANS 1029	Miniature Substations
SANS 1063	Earth Rods and Couplers
SANS 1091	National colours standards for paints
SANS 1213	Mechanical cable glands
SANS 1339	Electric cables - Cross linked polyethylene (XPLE) insulated cables for voltages from 3.8/6.6 kV to 19/33 kV
SANS 1411	Materials of Insulated Electric Cables and Flexible Cords
SANS 1473	Low voltage switchgear and control gear assemblies
SANS 1474	Uninterruptible Power Systems
SANS 1507	Electric cables with extruded solid dielectric insulation for fixed installations
SANS 1574	Electric cables – Flexible Cords and Flexible Cables
SANS 1632	Batteries
SANS 1652	Battery Chargers – Industrial Type
SANS 1804	Induction motors
SANS 1874	Metal Enclosed Ring Main Units for Rated Voltages above 1kV Up To and Including 24kV

1.2.5 South African National Rationalized User Specifications (NRS)

NRS 042	Guide for the Protection of Electronic Equipment against Damaging Transients
NRS 048	Electrical Supply – Quality of Supply Standards
Part 4:	Voltage characteristics, compatibility levels, limits and assessment methods
Part 8:	Application guidelines for utilities

1.2.6 SANS / International Electrotechnical Commission (IEC) Standards

SANS IEC 60034	Rotating electrical machines
SANS IEC 60034-25	Rotating electrical machines Part 25: Guide for the design and Performance of Cage Induction Motors Specifically Designed for Converter Supply.
SANS IEC 60044-1	Current Transformers
SANS IEC 60044-2	Voltage Transformers
SANS IEC 60050	International Electrotechnical vocabulary - Switchgear, control gear and fuses
SANS IEC 60056	High voltage alternating current circuit breakers
SANS IEC 60060	High Voltage Test Techniques
SANS IEC 60072	Dimensions and output series for rotating electrical machines
SANS IEC 60076	Power transformers
SANS IEC 60079	Electrical apparatus for explosive gas atmospheres
SANS IEC 60099	Surge arresters
SANS IEC 60129	Alternating current disconnectors (Isolators) and earthing switches
SANS IEC 60137	Insulated Bushings for Alternating Currents above 1000V
SANS IEC 60227	PVC Cables

SANS IEC 60265-1	High voltage switches for Rated Voltages above 1kV and up to and less than 52kV
SANS IEC 60269	Low voltage fuses
SANS IEC 60282	High voltage fuses
SANS IEC 60298	AC metal enclosed switchgear and controlgear for rated voltages between 1 kV and 52 kV
SANS IEC 60331	Tests for Electrical Cables under Fire Conditions
SANS IEC 60423	Conduits and fittings for electrical purposes
SANS IEC 60470	High Voltage Alternating Current Contactors and Contactor Based Motor Starters
SANS IEC 60478	Stabilised power supplies, dc output
SANS IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)
SANS IEC 60686	Stabilised power supplies, ac output
SANS IEC 60614	Specification for Conduits for Electrical Installations
SANS IEC 60694	Common clauses for high voltage switchgear and controlgear standards
SANS IEC 60793	Optical Fibres
SANS IEC 60794	Optical Fibre Cables
SANS IEC 60871	Shunt Capacitors for ac Power Systems having a rated voltage above 660V
SANS IEC 60896-1	Stationary Lead-acid Batteries General Requirements and Methods of Test
SANS IEC 60934	Circuit breakers for Equipment
SANS IEC 60947-3	Low voltage switchgear and control gear Part 3: Switches, Disconnectors, Switch Disconnectors and Fuse Combination Units,
SANS IEC 61000	Electromagnetic compatibility
SANS IEC 61024	Protection of Structures against Lightning
SANS IEC 61084-1	Cable trunking and ducting systems for electrical installations Part 1: General Requirements
SANS IEC 61241	Electrical apparatus for use in the presence of combustible dusts.
SANS IEC 61312	Protection Against Lightning Electromagnetic Impulse
SANS IEC 61558	Safety of Power Transformers, Power Supply Units and Similar
SANS IEC 62271-100	High-Voltage Switchgear and Control Gear Part 100 : High-Voltage Alternating Current Circuit Breakers
SANS IEC 62271-102	High-Voltage Switchgear and Control Gear Part 102 : High-Voltage Disconnectors and Earth Switches

1.2.7 IEC Standards

IEC 60038	IEC Standard Voltages
IEC 60059	IEC Standard Current Ratings
IEC 60060	High Voltage Test Techniques
IEC 60071	Insulation Coordination (Application Guide)
IEC 60073	Basic and Safety Principles for Man-machine Interface, Marking and Identification – Coding Principles for Indicators and Actuators
IEC 60146-2	Semiconductor Convertors – Part 2 : Self-commutated Semiconductor Convertors Including Direct dc Convertors
IEC 60214-2	Tap Changers – Part 2 : Application Guide
IEC 60255	Electrical Relays

IEC 60289	Reactors
IEC 60296	Unused Mineral Insulating oils for Transformers and Switchgear
IEC 60358	Coupling capacitors and capacitor dividers
IEC 60376	Specification of Technical grade Sulphur Hexafloride (SF_6) for use in Electrical Equipment
IEC 60439	Low voltage Switchboards and Control Assemblies
IEC 60445	Basic and Safety Principals for Man-machine Interface, marking and identification. Identification of Equipment Terminals and of Terminations of Certain Designated Conductors, Including General Rules for an Alphanumeric System.
IEC 60466	Insulation-enclosed Switchgear and Control Gear for Rated Voltages Above 1kV and up to and Including 38kV
IEC 60593	Internal Fuse and Internal Overpressure Disconnectors for Shunt Capacitors
IEC 60664	Insulation Coordination for Equipment within LV Systems
IEC 60686	Stabilised power supplies, ac output
IEC 60614	Specification for Conduits for Electrical Installations
IEC 60632	High Voltage Motor Starters – Direct-On-Line Full Voltage Starters
IEC 60722	Guide to the Lightning Impulse and Switching Impulse Testing of Power Transformers and Reactors
IEC 60831-2	Shunt power capacitors of the self-healing type for AC power systems having a rated voltage up to and including 660 V
IEC 60931	Shunt power capacitors of the non healing type for ac systems up to 1000 V
IEC 61073-1	Mechanical and Fusion Splices Protectors for Optical Fibres and Cables
IEC 61140	Protection Against electric Shocks – Common Aspects for Installation and Equipment
IEC 61800	Adjustable Speed Electrical Power Drive Systems
IEC 62040	Uninteruptible Power Supplies (UPS)
IEC TR 61641	Enclosed LV Switchgear and Control Gear Assemblies – Guide for Testing Under Conditions of Arcing Due to an Internal Fault
IEC TR 62063	The Use of Electronic and Associated Technologies in Auxiliary Equipment of Switchgear and Control Gear

1.2.8 British Standards

BS 115	Metalic Resistance Materials for Electrical Purposes
BS 159	High Voltage Busbars and Busbar Connections
BS 381C	Specification for Colours for Identification, Coding and Special Purposes
BS 4999	General requirements for rotating electrical machinery
BS 5514	Reciprocating internal-combustion engines
BS 6133	Safe Operation of Lead-Acid Stationary Cells and Batteries
BS 6351	Electric Surface Heating
	Part 1 Specification for Electric Surface Heating
	Part 2 Guide to the Design of Electric Surface Heating Systems

	Part 3 Code of practice for the Installation, Testing and maintenance of Electric Surface Heating Systems
BS 6387	Performance Requirements for Cables required to Maintain Circuit Integrity Under Fire Conditions
BS 7361	Cathodic Protection
	Part 1: Code of Practice for Land and Marine Applications

1.2.9 Institute Of Petroleum Model Code Of Safe Practices

IP Code Part 1	Electrical safety code
IP Code Part 15	Area classification code for petroleum installations

1.2.10 International Organisation For Standardisation (ISO) Standards

ISO 3722	Determination of Sound Power levels of Noise Sources
ISO 1461767	Hot dipped galvanized coatings on fabricated iron & steel articles
EN ISO 9001	Quality Management Systems Requirements

1.2.11 National Association of Corrosion Engineers (NACE) Recommended Practices

NACE RP0169	Control of External Corrosion on Underground or Submerged, Metallic Piping Systems
NACE RP0193	External Cathodic Protection of On-grade Carbon Steel Storage Tank Bottoms
NACE RP0286	Electrical Isolation of Cathodically Protected Pipelines
NACE RP0572	Design Installation, Operation and Maintenance of Impressed Current Deep Groundbeds

1.2.12 RAL Deutsches Institut Fur Gutesicherung Und Kennzeichung – RAL – Farben RAL Specification for Colours for Identification, Coding and Special Purposes

1.2.13 Electrical equipment and the installation thereof shall as a minimum satisfy the requirements of relevant internationally recognised specifications and codes of practice.

1.2.14 Where applicable, equipment items shall carry an internationally recognised mark to demonstrate compliance with the directives of codes of practice. Copies of the manufacturer's Declaration of Conformity' certificates and test reports shall be provided by equipment Suppliers.

1.2.15 Suppliers may at their discretion, elect to provide marking for the complete equipment assembly. In which case, the Suppliers shall describe the procedure to be followed and / or details of the documentary evidence that will be provided for each component item of the complete assembly, for which is necessary to demonstrate compliance with the relevant directives / regulations.

1.2.16 Hierarchy

The hierarchy determines which standard is to be followed if there is a dispute or difference .Transnet Pipelines standards and specifications shall take precedence over general industrial recommended practices and guides.

If a conflict exists between the codes or standards, the most stringent interpretation shall apply. Where reference is made to a specification, standard or code, the reference shall be taken to mean the latest edition of such specification, standard or code, including addenda, supplements and revisions thereto, current at the date of award of contract. In general, the order of precedence shall be:

- Transnet Pipelines Standards
- Statutory Requirements and issued directives
- The purchase order for an item of equipment of work package
- South African National Standards
- International Codes and Standards
- Industry Publications.

In the case of conflicting requirements, the most stringent or conservative approach shall be followed. Where there is any doubt as to the above order of precedence, the matter shall be referred to the Responsible Engineer for resolution.

1.2.17 Energy Efficiency

The electrical system will be designed to comply with Transnet Pipelines' energy efficiency strategy.

The following will be focused on but not be limited to include the energy efficiency design:

- Sizing of cables and busbars to limit copper losses and improve power usage
- Power factor correction to improve Measured Maximum Demand
- Optimal lighting design and use of LED / low power light fittings
- Use of high efficiency equipment throughout the project.
- Use of occupancy sensors or day/night switches
- Use of VSD’s for motor applications
- Timers and blankets on geysers
- Limiting circuit breaker capacity in predefined areas
- Design for optimal minimum volt drop to the main distribution board.

1.3 Deliverables

Engineering technical services and the design deliverables that are to be provided by an Engineering Contractor shall be in general accordance with Transnet Pipelines’s specified requirements.

Prior to manufacturing/procurement of panels all designs must be accepted by Transnet Pipelines. This includes internal and external general arrangements(GA’s) and component layout inspections as a minimum.

It's the Project Manager function to ensure all process are included in the schedule eg. FAT, release of equipment, SAT, commissioning phases,etc.

Docs to be submitted for acceptance prior procurement process or manufacturing:

- Installation specification
- SLD's, Internal and External General Arrangement drawings
- Floor plan layouts
- Cable racking layouts
- Component lists
- Equipment Data Sheets
- Cable schedules including volt drop and de-rating factors
- FAT and SAT procedures

At the close out of projects the CoC is must be completed. The CoC will be a comprehensive document with an index and supporting documentation to be included. The index shall be has per typical of Transnet Pipelines CoC's and must be submitted at the early stages for acceptance.

1.4 Site Conditions

Site specific environmental conditions shall be provided to Contractors with the relevant datasheets issued with enquiries for equipment.

Pests normally encountered are rats, birds and snakes. All installations should be designed to prevent them from accessing equipment and cabling.

Some sites have specific pests such as termites, venomous snakes, spiders, scorpions, snakes, bats, and burrowing animals. These should be identified and the specific preventative and curative measures should be made available

1.5 Area Classification

1.5.1 Installations shall be classified in accordance with SANS 10108 Annexure G and IP Model Code of Safe Practice in the Petroleum Industry - Part 15: Area Classification Code for Petroleum Installations.

1.5.2 The selection of the correct type of classified electrical equipment and the installations within each area that has been classified as hazardous shall be in accordance with the IP Model Code of Safe Practice in the Petroleum Industry - Part 15: Area Classification Code for Petroleum Installations.

1.5.3 All electrical equipment and each component utilised in the installation of such equipment shall be selected to be entirely suitable for the area classification in which it is to be located and shall as an absolute minimum be certified for the classification as reflected in the associated area classification schedules and / or on the plant Hazardous Area layout drawings. Certificates shall be issued by an authorised **local** laboratory.

1.5.4 The installation of certified equipment shall fully comply with any conditions and restrictions of installation and use imposed by the respective equipment certificate.

2 Power Supply

2.1 Main Supply

In general local Power Supply Authorities provide the required power supplies to the Transnet Pipelines installations. When necessary, Transnet Pipelines will supply contact details for the specific supply authority.

2.2 Standby Supply

2.2.1 The standby power supply at the installations shall be provided from a diesel engine driven generator set. The set will be arranged for automatic start-up and connection to the respective 400V switchboard / MCC following a mains supply failure.

2.2.2 The standby generator set shall generate power at 400V, 3 phase, 50 Hz and shall be rated to supply emergency power only to the installation, taking into account the starting duty of the largest connected motor load. In addition, the selected rating of diesel generators shall ensure that the continuous running load on the generator will not be less than 50% of the engine rated output power in order to avoid problems associated with engine choking and resultant loss of reliability. The acceptable minimum rating of a diesel generator set shall be 60kVA per Transnet Pipelines specification PL622H.

2.2.3 The generator set shall be provided with the necessary change-over control and electrical protection facilities to permit slow transfer of the load for regular routine on-load test and maintenance.

3 Design Criteria

3.1 Load Evaluation

3.1.1 An electrical Power User Schedule and load profiles shall be prepared for each installation. The Power User Schedule shall be generated from the

'Approved for Design (AFD)' Mechanical equipment list and shall thereafter be maintained throughout the design phase of the project to include all power consumers on the plant.

3.1.2 The load list may provide a breakdown of plant loads sorted by:

- Substation
- main distribution switchboards
- main or standby or emergency service
- motor drives and static loads
- voltage levels

3.1.3 The Power User Schedule shall tabulate the required loading for each installation on the basis of the highest loaded operating scenario. Consumer duties shall be defined as continuous, intermittent or standby as follows:

- Continuous:Loads that is normally running / energised during operating times.
- Intermittent:Loads in service on an intermittent basis e.g. motorised valves, or spares of continuously running consumers.
- Standby:Loads connected but not normally energised e.g. operational spares.
- Total loads shall be calculated for each duty category and each distribution switchboard. A summary sheet shall total loads for each installation.

3.1.4 When determining the rating of new power supply requirements and the continuous current rating of major electrical equipment (e.g. transformers), design margins shall be applied to the calculated maximum running load values so as to facilitate a minimum of 25% spare capacity.

3.1.5 When adding load to existing systems, the dual redundant rating of the existing power supply transformers shall not be exceeded.

3.1.6 Power System Studies

System studies shall be provided in support of the design. Depending on the type, size and complexity of the installation, such studies may comprise the following:

- Rating of major equipment
- Load assessment and load flow studies
- Fault level studies
- Harmonic and PFC studies on completion of installation

The scope of the system studies, drawings and documentation for each stage of the development shall be defined and agreed before their commencement.

The Electrical Design Criteria ensures uniformity and consistency of the design by describing:

- Technical documentation referred to during Electrical Design
- Electrical tools , software and procedures used in preparing the design
- Specific requirements for system design
- Requirements for protection and control systems
- Equipment sizing and selection methods
- Equipment specifications
- Definition of detail for all Electrical deliverables

While this document provides general guidance it shall not be a substitute for good engineering judgement which should be applied as appropriate with the approval of the respective Design Engineer.

The electrical equipment shall be designed and engineered to:

- Provide a safe working environment for personnel
- Minimise the environmental impact
- Operate with low maintenance for at least the 25 years lifetime of the facility
- Provide a reliable electrical system, by supplying critical equipment from alternative sources
- Integrate with the existing electrical infrastructure
- Provide standardisation to rationalise spares kept in stores.

3.2 Voltage Levels

3.2.1 Distribution

The following distribution voltage levels shall be used:

- Utility Supply (Various) 3 Phase; 3 Wire; 50 Hz
- 3,300V 3 Phase 3 Wire 50 Hz Resistance earth system or
- 6,600V 3 Phase 3 Wire 50 Hz Resistance earth system or
- 11,000V 3 Phase 3 Wire 50 Hz Resistance earth system.
- 400 V 3 Phase 4 Wire 50 Hz Solid earth system
- 230 V Phase and Neutral 50 Hz Unearthed UPS – control supplies

3.2.2 Utilisation

Equipment shall generally be suitable for operation at the following utilisation voltages:

- Medium Voltage Motors 3,300V or 6,600V or 11,000V, 3 Phase, 50 Hz, Resistance earthed system
- Motors 0.18 kW - 149 kW, 400 V, 3 Phase, 50 Hz, Solidly earthed system
- Motors below 0.18 kW, 230 V, 50 Hz, Phase & Neutral
- Lighting supply,400 V / 230 V, 3 Phase, 4 Wire, 50 Hz

- Lighting, 230 V, 50 Hz, Phase & Neutral
- Instruments, 220V, 50 Hz, Phase & Neutral UPS
- Welding outlets, 400 V , 3 Phase + earth, 4 Wire, 50 Hz
- Convenience outlets, 230 V, 50 Hz, Phase & Neutral
- Switchgear closing and tripping, 110 V DC unearthed
- Control circuits, 220 V AC

3.3 Short Circuit Levels

3.3.1 Major electrical equipment and power distribution system design duties shall, as a minimum requirement, exceed the calculated peak and the steady state short circuit fault levels as calculated from the reactance parameters of the power supply network transformers and / or generator(s), and where appropriate the contribution from induction motors.

3.3.2 400V MCC secondary distribution design to allow for MCB ratings determined by cascading tables as per SANS 10142.

3.3.3 On sites with both transformer and standby generator incoming supplies, maximum prospective fault level calculations shall include contributions from the transformer or the generator. The generator will not run in parallel with the transformer on the “Normal” busbar.

Worst case calculation for switchgear rating:

- Maximum Source Voltage
- Minimum Source Impedance
- Minimum Transformer Impedance (tolerance)
- All motors running
- Margin (minimum 5%)

Short Circuit Calculations shall be carried out using the guidelines of IEC 60909 - The calculation of short-circuit currents in three-phase AC systems. Minimum fault level calculations will be required for protection co-ordination.

3.4 Voltage Regulation

3.4.1 Steady State

The power distribution system and connected electrical equipment shall be designed for a steady state voltage regulation of + 5% / - 5% and a frequency variation of +/- 2%.

3.4.2 Motor Starting

The maximum voltage depression, on the nominal voltage, measured during motor starting at any distribution system busbar down-stream of the 'point of common coupling', shall be limited to 15%.

In addition, the minimum acceptable voltage at a running motor's terminals during the transient period of another motor starting shall be limited to 80% of the nominal voltage. Where system study calculations indicate that the transient voltage depression at the starting motor's terminals will exceed 20% of nominal, then the minimum voltage limits shall be co-ordinated with the motor manufacturer / driven equipment manufacturer/switchgear manufacturer.

3.4.3 Normal Operation

The allowable steady state voltage drop in cables, based on circuit full load current values, shall not exceed the following. To prevent over sizing of cables, volt-drop and de-rating calculations will be based on SANS 10142:

Primary distribution feeder cables (3.3 kV)	2%
Secondary distribution feeder cables (400 V)	2%
Motor feeder cables (400 V) between the Motor controller and the motor terminals	2%
Distribution board feeder cables	2.5%
Lighting and small power circuits between the distribution board and the most remote luminaire or outlet	4%

3.5 Power Factor Correction and Harmonic Filtration

3.5.1 Because of various operating scenarios, the power factor at Transnet Pipelines installations is normally controlled by adding power factor correction to the individual MV induction Direct On line motor starter circuits.

3.5.2 Power factor correction equipment shall be sized to maintain the operational power factor of its respective motor to not more than 0.96

3.5.3 PFC equipment is not required wherever Variable Speed Drive units are employed to control the operation of MV induction motors.

3.5.4 A harmonic study may be required to assess the harmonic distortion of the supply system for the 12 or 18 pulse VSDs. Should the harmonic study indicate the 12 or 18 pulse VSDs cannot comply with the harmonic values as required by NRS048, harmonic filters will be used to prevent resonance from occurring.

3.6 Sparing Philosophy

3.6.1 The electrical distribution system shall be designed to provide a dual redundant system with high reliability and availability, and to ensure continuous operation of the installation between planned maintenance shutdowns.

3.6.2 The distribution system of installations shall be configured on the radial feeder and not ring feeder principle with the main distribution busbar having duplex, 100% load rated, incoming supplies. 2x incomers with a split bus and bus section should be more reliable and flexible than the “radial” feed system.

3.6.3 Main LV distribution switchboard busbars shall comprise of two single bus sections: a “Normal” and an “Emergency” bus.

3.6.4 Automatic transfer facilities between the two incoming MV supplies shall be provided.

3.6.5 Automatic transfer between the normal and standby generator supplies shall be provided.

3.7 Operating Philosophy

3.7.1 The electrical operating philosophy will generally be as follows: If any individual supply to a switchboard is lost due to a primary distribution fault and if the primary Incomer protection has not operated, then if the primary supply voltage is available on the standby Incomer, the supply shall automatically transfer to the standby incomer.

A primary incomer Master trip operation is to block the automatic transfer to prevent the standby incomer closing onto a fault.

The Automatic Change-Over (ACO) shall be conducted within 500ms to 1.5sec to accommodate ride through on a VSD/pump motor combination. The transfer will be slow; in that the standby Incomer will only close after the primary Incomer opens to prevent back-feeding currents.

Operating motor drives affected by the temporary loss of power will be re-accelerated by Transnet Pipelines when power has been seen to be restored. VSD auxiliary control circuit power shall be sourced from the UPS to facilitate ride through and reacceleration. During normal operation, the VSD ride through function caters for re-acceleration.

At such time as the primary supply has been re-established, the affected switchboard will be reinstated to its normal operating scenario. This process will be executed manually.

The final Operating Philosophy at each facility will be determined once the supply configurations are finalised.

3.8 System Analysis and Calculations

3.8.1 The following system analysis studies or calculations shall be carried out during the detail design of the power distribution system:

- Load Flow
- Short circuit analysis - confirm switchgear ratings and provide information for protection studies
- Motor starting and acceleration analysis (only for large drives)
- Harmonic analysis
- Protective relay setting and co-ordination

- Earthing and lightning Protection Study

The following documentation will be created and used during the detailed design phase:

- Electrical Load List
- Electrical Equipment List
- Equipment Datasheets
- HVAC where applicable will require HVAC design criteria, heat load schedules, Layout plans, System flow diagrams, Control philosophy.
- Cable Calculation and Schedule
- Main Incomer Fault Level Calculation
- Single line diagrams
- Room site layout
- Earthing and Lightning Protection Drawing
- Components lists- signed off prior to purchase
- QA/QC plan indicating milestones reflecting client witness of tests, FAT, SAT and Commissioning and Handover processes.

Data Validation

All calculations and spreadsheets / lists / drawings / documentation will be reviewed and validated according to the relevant specifications and engineering principles. All documentation must be presented to Transnet Pipelines for review and acceptance .

4 Equipment Design Requirements

4.1 Switchgear

4.1.1 General

a. MV and LV switchgear shall consist of grouped assemblies of free-standing, vertical, metal clad enclosures containing single main busbar systems, removable circuit breakers/switching devices, necessary auxiliary control devices, instrument transformers, relays and metering equipment.

b. MV Switchgear (LV incomers) shall be designed to allow for mechanical interlocking.

c. MV and LV switchgear is to be included in the SCADA monitoring and control system.

d. In general the MV and LV switchgear design has to comply with the Transnet Pipelines specification PL 632 and PL 631 respectively.

e. MV and LV switchgear assemblies for installation in switch rooms or buildings with controlled environments shall be of Transnet Pipelines approved industrial types.

f. HT Switchgear assemblies for installation outdoors shall have weatherproof, vermin-proof, fully gasketed enclosures, adequate lighting and ventilation shall be provided.

g. Switchgear assemblies shall be provided with space heaters to prevent internal condensation.

4.1.2 Switchgear / Motor Control Centres

a. Switchgear shall be in accordance with the requirements of the relevant Transnet Pipelines specifications.

b. Data sheets shall be prepared for each equipment item, detailing the specific requirements of the subject equipment.

c. The switchboard shall incorporate incoming units and outgoing units for motor starters, distribution board feeders and feeders to individual consumers.

d. MV motor starters shall be Circuit Breakers. Protection shall be provided by means of approved electronic motor protection relays, and appropriate auxiliary relays as required.

e. LV motor starter and outgoing feeder circuits shall comprise Transnet Pipelines approved MCCB's, ammeters, contactors, overloads, auxiliary relays and earth leakage relays, "Local – Auto" selector switches, start push buttons, stop push buttons, control systems interface relays as appropriate for the required circuit duties.

f. Where indicated on schematic diagrams and as defined by the operating philosophy, incoming and outgoing units shall have facilities for remote control and monitoring by the SCADA system.

g. Electrical / Control Systems Interface panels shall form part of the 400V LV switchboard arrangement.

h. The requirements for main lighting distribution boards and motorised valve distribution boards shall be as shown on the 400V LV switchboard / MCC distribution Single Line Diagram.

i. Distribution boards shall be supplied as integral units in the LV switchboard / MCC arrangement unless specific site requirements (e.g. loads grouped at a significant distance from the substation) warrant the use of field mounted boards.

4.2 Protective Devices

4.2.1 General

a. The protective relaying system applied to the electrical distribution system shall be based on the use of Transnet Pipelines approved solid-state relaying equipment, supplied by vendor(s) experienced in the design, development and manufacture of such equipment. For medium voltage applications the relays shall be discrete devices. For low voltage applications the relays may either be discrete devices or devices fitted integrally within circuit breakers or other switching devices.

b. Protection relays shall generally comply with the requirements of IEC 60255.

c. The protective relaying philosophy shall be based on single contingency planning, so that the relay system will provide graded fault clearing for one of the following occurrences:

- failure of either the primary or backup relays to function, or failure in either of their associated secondary or control circuits
- failure of the circuit breaker to interrupt, including a faulty circuit breaker

d. The protection circuits of all circuit breakers used for automatic disconnection in conjunction with a non-integral protective relaying scheme shall be equipped with hand reset master lock-out relays.

4.2.2 Incoming Supply / Generator Protection

Protection arrangements for incoming supplies derived from local power supply authority networks shall be fully co-ordinated with the protection system in operation on the supply network. As a minimum, incoming supply feeders incorporating a step-down transformer shall be provided

with the following protective devices:

- high set instantaneous and time delayed phase fault over-current relays
- time delayed earth fault over-current relays, except when fuse protection is applied (primary winding)
- differential relays (biased type) – on transformers rated above 2000 kVA
- oil temperature indicator (trip and alarm)
- winding temperature indicator (trip and alarm) - above 1000 kVA
- pressure relief device (trip and alarm) - hermetically sealed type transformers only
- restricted earth fault relays (secondary winding) - resistance earth systems only
- facilities for Bucholz trip and alarm protection to be provided

4.2.3 Motor Circuits

a. Direct on line starting of MV motors shall be by electrically operated circuit breakers equipped as motor starters.

b. MV motor protective devices shall be Transnet Pipelines approved electronic protection relays.

c. MV Variable speed drive applications shall be fed from suitably equipped electrically operated circuit breaker feeders.

d. Typical Transnet Pipelines LV motor starting philosophy is as follows:

- LV motors ≤ 15kW DOL starting
- LV motors > 15kW –VSD's / Soft Starter application (contractor to provide prices for these options)

e. Cable lengths, P&ID and load schedules may require the use of VSDs on the complete range of motor ratings, the use of VSD application to avoid using two cables per motor installation.

f. LV motors (typically operating at 400V) shall be controlled using Transnet Pipelines approved Type 2 coordinated motor starter combinations.

g. LV motor protective devices shall as a minimum cater for the following:

- Rated short circuit protection
- Thermal overload with single phasing protection (motors rated up to 55kW only).
- Electronic motor protection (motors rated 75kW and above only).

4.2.4 General Purpose Feeder Circuits

Protective devices shall be applied according to the application but shall as a minimum include:

- instantaneous and time delayed over-current protection (MCCB with thermal and magnetic trips)
- time delayed earth fault (circuits rated 60 amps and above only)

4.3 Metering and Control

4.3.1 Main Incoming Supply

Tariff metering and control of an incoming supply from a local power supply authority network shall be as specified by the relevant supply authority. The protection scheme is to include a power analysing relay e.g. Siemens Simeas P.

4.3.2 Generator plant incoming supply

The following metering equipment shall be provided on generator control panel / generator circuit breaker panel:

- voltmeter and phase selector switch
- ammeter and phase selector switch
- kilo-watt meter
- power factor indicator
- frequency meter
- hours run counter
- synchro-scope

4.3.3 LV Switchboard / MCC

a. The LV switchgear shall comply with Transnet Pipelines Specification PL 631.

b. Incoming supply circuit breakers or isolators shall be equipped as a minimum with the following metering equipment:
   - Line side voltmeter and phase selector switch
   - Busbar voltmeter and phase selector switch
   - off maximum demand ammeters (1 per phase)

c. Outgoing feeder circuit breakers or switches, feeding major load centres, shall be equipped as a minimum with an ammeter connected in the (Y) phase.

d. LV motor starters shall be equipped with an ammeter connected in the (Y) phase.

e. The ammeter shall have a compressed upper scale calibrated up to six times motor full load current.

f. LV motor starters of 15kW and larger shall provide a 4-20mA feedback circuit for current to the control system.

g. LV contactor and switched feeder outgoing circuits shall be equipped with an ammeter connected in the (Y) phase when process or other considerations require indication of operating current.

4.3.4 Motor Control Stations

a. Start / stop pushbutton control stations mounted local to motors shall be of the weatherproof industrial duty type. Where appropriate, they shall be designed and certified for installation and use as appropriate for the designated area classification.

b. Start / stop control stations shall normally be installed onto suitable steel supports adjacent to their respective motors. Lock-off type emergency stop push buttons shall be located adjacent to the motor in all cases where the control station is remote from the motor.

c. Motors that can be started from more than one position or started automatically, controlled by a level switch, pressure switch or temperature switch etc., shall in addition, be controlled by a 'Local-Auto' selector switch mounted on the individual motor starter compartment

d. Field mounted ammeters shall only be provided where specifically required and essential for process or operational purposes.

e. No field mounted motor starter installation are allowed.

4.4 Power Transformers

4.4.1 Power Transformers shall be in accordance with the requirements of SANS 780 and SANS IEC 60076 sections 1 through to 10.

4.4.2 Transformers shall comply with the requirements of the project specification 2684358-U-A00-EL-SP-007.

4.4.3 Data sheets shall be prepared for each equipment item, detailing the specific requirements of the subject equipment.

4.4.4 Transformer standard kVA ratings shall be selected as defined in SANS standards. Transformers shall be rated to carry at least 125% of the estimated dual redundant maximum demand of the switchboard it is supplying. The rating shall be based on the naturally cooled full load temperature rise limits defined in the data sheets / specification. (See Sections 3.1.4 and 3.1.5).

4.4.5 Transformer nominal impedance shall preferably be selected from 'standard' values defined to result in the most economical design commensurate with:

- limiting through fault short circuit current values to permit use of switchgear with standard certified short circuit current ratings
- permitting the starting of the largest connected induction motors, direct-on-line whilst remaining within the voltage regulation requirements of sections 3.4.2 and 3.4.3.

4.5 Battery Charger Systems

4.5.1 General

Battery Charger systems shall be in accordance with the requirements of the Transnet Pipelines specifications: PL 647 and PL 648.

Data sheets shall be prepared for each equipment item, detailing the specific requirements of the subject equipment.

4.5.2 Switchgear Closing and Tripping Supply Unit

a. The switchgear tripping supply nominal output voltage shall be 110V DC.
b. Battery tripping equipment shall be located in the substation in close proximity to the switchboard serviced.
c. Battery tripping systems shall be designed for a standby time of 24 hours.
d. The rectifier and battery system shall be rated to supply the following loads:
    - Switchgear standing load, plus battery charging load, plus closing of two circuit breakers simultaneously - applies to rectifier only.

- Switchgear standing load for 24 hours plus tripping of all circuit breakers and latched switching devices twice in succession at the end of the 24 hours period - applies to battery system only.

e. The battery shall be of the sealed type.

4.6 UPS System

4.6.1 General

UPS systems, shall be in accordance with the requirements of Transnet Pipelines specifications PL 720 and IEC 62040.

Data sheets shall be prepared for each equipment item, detailing the specific requirements of the subject equipment.

4.6.2 Station Control System UPS System

a. The UPS system for plant control system / SCADA and communications equipment shall be located in the substation building.

b. SCADA / Control system UPS shall be determined by the technical requirements of the Control System in terms of type, make, model and size.

c. The UPS will require a serial communication interface to the control system to achieve an orderly shutdown of the control system.

d. The UPS system supplying uninterruptible AC power to the plant control and information systems shall comprise a single train rectifier / inverter / battery system with the rectifier/inverter rated to supply 100% of the calculated system load. The system shall incorporate a bypass supply and static switch changeover system.

e. Battery systems shall be designed with a standby minimum time of 30 minutes and shall be of the sealed lead-acid gas recombination type to SANS 1632.

f. The nominal output voltage of the system shall be 220V, 50 Hz.

g. Both the mains and bypass power supplies to the UPS system shall be derived directly from the station 400 V switchboard / MCC with a back-up supply from the standby diesel generator system. A 400 V / 230 V constant voltage transformer is required in the bypass supply link.

4.7 Electric Motors

4.7.1 General

a. Motors shall normally be 3-phase squirrel cage induction type machines, totally enclosed, fan cooled and adequately rated for the duty required by the driven equipment. Motors shall be certified for use within hazardous areas. Motors for use in hazardous areas shall be Ex ‘d’ rated (Explosion proof), even if located in a Zone 2 area and shall have a minimum degree of protection of IP 55.

b. Motors shall, whenever possible, be purchased as part of the driven equipment package.

c. Data sheets shall be prepared for each motor, detailing the specific requirements of the subject machine.

d. Where variable speed motors are employed with varying frequency inverter systems, the motors shall be designed and rated in a manner that the temperature rise of the motor under operating conditions will remain within safe limits over the entire speed range of the drive.

e. The insulation levels of the motors are to be rated for use with VSD systems

with specific reference to the peak voltage levels. In addition, this added insulation requirement needs to be applied to the VSD cable ratings, primary and secondary.

f. The design shall take into account the heating effect of harmonics generated by the rectifier inverter system and the decrease in cooling effect of fan cooling at reduced speeds.

g. Where drives of this type are supplied for installation within hazardous areas, the motors shall be appropriately certified by the SANS (or a SANS recognised **local** test authority) as being suitable for use in combination with a variable speed drive unit within the designated hazardous area applicable to the locality of the proposed installation, i.e. it shall meet all requirements in respect of zone classification, gas grouping and temperature class for safe operation over the full speed range and respective load duty.

4.7.2 MV Motors

a. Motors shall generally be in accordance with the requirements of project specification 2684358-U-A00-EL-SP-010, and IEC requirements IEC 60034 series.

b. Motors shall be designed for operation on 3300V, 6600V or 11000V, 3 phase, 50 Hz power supply systems having an earthed neutral via NER. The NER shall be rated for 50 to 300A for 30 seconds. Final values will be determined by means of a system study.

c. MV motors fed from vacuum circuit breakers shall be fitted with Zork surge suppression devices.

d. MV motors shall be fitted with space heaters. Leads for space heaters shall be terminated in a box separate from the motor main power termination box.

4.7.3 LV Motors

a. Motors shall generally be in accordance with the requirements of project specification 2684358-U-A00-EL-SP-005.

b. Motors shall be designed for operation on a 400V, 3 phase, 50 Hz power supply system having a solidly earthed neutral.

4.8 Standby Generator

4.8.1 Where required standby diesel engine driven generator sets shall be supplied in accordance with Transnet Pipelines specifications PL 622H and IEC Specification IEC60034-22 - AC Generators for reciprocating internal combustion engine driven generating sets.

4.8.2 Alternators shall have continuous capacity 5 % higher than the base rating of the diesel engine driver at power factor from 0.80 lagging to 0.95 leading.

4.8.3 Alternators shall be totally enclosed, fan cooled, unless installed within a building or purpose-built container type enclosure, in which case an open ventilated drip-proof machine may be used.

4.8.4 Alternator stator winding shall be suitable for star connection with both ends of each phase winding brought out to the terminal housing.

4.8.5 Alternator exciter shall be a rotating brushless type, mounted on or coupled to the alternator shaft.

4.8.6 Alternators larger than 120 kVA shall be equipped with RTD (Resistance Temperature Detector) elements.

4.8.7 Alternators shall be equipped with space heaters.

4.8.8 A free-standing generator control panel shall be furnished for installation in the electrical substation. Electrical protection equipment shall be located in the generator circuit breaker or contactor cubicle.

4.8.9 The selected rating of diesel generators must ensure that the continuous running load on the generator will not be less than 50% of the engine rated output power in order to avoid problems associated with engine choking and resultant loss of reliability. (Note: The minimum rating of diesel generator sets shall be 60 kVA per Transnet Pipelines specification PL622H.

4.8.10 The day tank capacity shall cater for 12 hours run time fully loaded.

5 Facilities Design Requirements

5.1 Control and Administration Buildings

5.1.1 General

Buildings shall be located in non-hazardous areas to permit the use of industrial type equipment. A minimum distance of 15 meters from any source of hazard shall be allowed to the nearest point of any building.

Buildings shall be conventional site built, single storey construction and shall be furnished with electrical services. Cable entries to the building shall be arranged for underground cables entering through the floor or in preformed cable trenches. In addition the substation buildings shall have concrete roofs.

5.2 Substation Buildings

5.2.1 General

a. Electrical substation buildings shall be of brick construction with a concrete

roof.

b. Substation buildings shall be located in non-hazardous areas to permit the use of standard industrial type switchgear. A minimum distance of 15 meters from any source of hazard shall be allowed to the nearest point of any substation building.

c. Substations floors shall be elevated from grade to provide for a cable entry basement or preformed trenching access.

d. Sleeved underground cable entries to the building shall be arranged for cable access. Draw boxes shall be provided to facilitate cable installation.

e. Substations shall be pressurised to provide a dust free atmosphere. Where specified, air conditioning equipment shall be provided to maintain the temperature within the building at a maximum of 30^{O}C. The air conditioning design temperature is selected to provide a margin below the switchgear operating temperatures of 35^{O}C average and 40^{O}C maximum.

f. MV and LV switchgear equipment will not be located in the same room.

g. Tripping Batteries shall be Valve Regulated Lead Acid type.

Note: Open rack Lead Acid mounted batteries, shall only be employed with Transnet Pipelines approval and shall be installed in a separately ventilated room, furnished to suit the special corrosive and hazardous environments.

h. VSD equipment shall be located in a separate air conditioned room.

i. Substations shall have a double door with a removable door panel to facilitate equipment removal at one end of the building and a personnel door at each end. Each personnel door is to be fitted with panic bar, and shall open outward.

j. Diesel generator sets shall be located within a separate room of the substation building.

k. Power transformers shall be located along the outside of the substation building in fenced enclosures a distance away from buildings.

l. Transformers shall be mounted on a concrete foundation surrounded by a pebble filled / or grated pit, the capacity of which shall be at least equal to the volume of the oil in the transformer. The pit shall either drain into an oily water sewer or a sump be provided from which spillage can be pumped.

m. Firewalls shall be provided between transformer bays whenever more than one transformer is installed, extending at least 300 mm above and 600 mm beyond the transformer. A minimum clearance of 800 mm shall be maintained between transformer extremities and the firewall.

n. All safety labels to be installed within the various areas of plant equipment eg. HV, MV and LV Subs; LV generator rooms; pump house; etc.

5.2.2 Space Allocation

a. Minimum working clearances around electrical equipment shall be as follows:

- 1000 mm minimum from top of equipment to bottom of ceiling
- 2500 mm between lines of switchgear
- 1200 mm between rear of the equipment and wall

b. 25 % spare space (or minimum one equipment enclosure tier) shall be allowed within substation buildings at each end of switchboard arrangements sufficient for the extension of the same.

c. Extra space is reserved for operation and maintenance of electrical equipment in accordance with the manufacturer's requirements.

5.3 Earthing Installations

5.3.1 General

a. A common earthing system shall be provided for electrical system equipment earthing, static protection and lightning protection. The earthing shall be in accordance with the requirements of the IP Model Code of Safe Practice - Part 1: Electrical 1991, SANS 10313, PL 727 and typical earthing drawing PL 727 except where further defined or modified by the requirements of the following sections.

b. A ground resistivity survey shall be carried out to provide data on the ground conditions and the results applied to the related earthing system design.

c. Major electrical equipment such as switchgear, transformers, distribution boards, floodlight towers or poles, control panels, and metallic frameworks for supporting same, shall be directly connected to the earthing system.

d. Static earthing protection shall be provided by connecting steel structures, towers, vessels, tanks, and similar items to the common earthing system.

e. Earthing connections to equipment shall be at purpose designed termination studs. Anchor bolts shall not be used.

5.3.2 Earthing Systems

a. Earthing system shall be designed on the ring principle with interconnecting conductors as necessary. This ring shall be connected to earth electrodes or as required by the design parameters.

b. Earthing system installations shall be carried out using PVC sheathed (green/yellow) stranded copper conductor earthing cable both above and below grade. The minimum size shall be 70 mm² except for branch conductors to equipment, which may be a minimum of 35 mm².

c. Earthing conductors shall be run underground at a minimum depth of 500 mm below grade in unpaved areas. In paved areas, conductors may be run on rough grade, under paving. In general, earthing conductors shall be run on the same routes as power and other cable systems.

d. Earthing conductors rising through paving or other concrete work shall be run in suitable protective sleeves, which shall project 75 mm above finished grade level.

e. Earth electrode design shall take account of soil and sub-soil conditions at the respective pipeline facilities site locations. Earth electrodes shall, wherever possible, consist of driven rods and shall be directly connected to an earth busbar mounted above grade, by a short length of 70 mm² cable, PVC sheathed coloured green / yellow.

f. Earth electrodes paralleled in a group, to reduce the earth resistance to the permissible value, shall be spaced apart a distance at least equal to the length of the buried electrode.

g. The resistance of the common earthing system to the general mass of earth, measured at any point on the plant site, shall not exceed 1 ohm.

5.3.3 Electrical System Earthing

The method of system earthing at each voltage level shall be as defined in section 3.2.1 of this specification. The points at which system earth connections are to be applied shall be defined on the single line diagrams and earthing layout drawings.

The neutrals of alternators and transformers shall be connected to an adjacent earth electrode directly or through an earthing resistor, as required.

5.3.4 Electrical Equipment Earthing

a. Frames of MV motors shall be connected to the earthing grid via a separate single core 70mm² PVC green earth wire run with the motor power cable.

b. Frames of LV motors shall be connected to the earthing system within the motor terminal box by utilising the fourth core of the motor power cable.

c. Note : For cable core sizes greater than 70mm², three core power cable shall be installed and a separate single core 70mm² PVC green earth wire run with the cable to the motor.

d. A copper conductor, 70 mm² minimum, shall be solidly tied into an earth electrode system for earthing substation equipment in a ring formation.

e. A main earthing ring conductor system shall be provided within substation buildings and other rooms containing electrical equipment e.g. control room. The earthing ring shall comprise a number of strategically positioned earthing busbars interconnected by at least a 70 mm² PVC sheathed conductor. The earthing ring shall also be interconnected with the common plant earthing system at a minimum of two separate points.

5.3.5 Static Bonding Connections

a. Plant equipment items supplied as assembled units shall be connected to the plant earthing system by a minimum of two separate bonding conductors.

b. Flanges of metallic piping systems that have insulated linings shall be bonded to ensure electrical continuity. A bond shall also be applied at any equipment connection. Flanged joints in other metallic piping systems shall be considered to be inherently electrically continuous.

c. Pipelines shall only be connected to the earthing system where they enter and leave the battery limits. The requirements of cathodic protection systems shall be observed.

d. Road and rail vehicle bonding facilities shall be installed at points in the plant, where classified hazardous products are loaded or unloaded from vehicles. Bonding facilities may also be required in non-hazardous areas if the product being handled is likely to give rise to a build up of static electricity in the vehicle, e.g. bulk powder loading / unloading. Bonding equipment shall incorporate integral local alarm facilities to alert operating personnel if the bonding connection becomes accidentally disconnected.

5.3.6 Computer / Instrumentation

a. Appropriately sized earth ring and equipment connections shall be installed in control rooms and other instrumentation equipment rooms as appropriate, for Computer / Instrumentation earthing. The earthing ring used for equipment / enclosure earthing shall be connected to the common earthing system by a minimum of two separate conductors.

b. An insulated earth ring shall be installed in the control room for an 'instrument high quality earth' of less than 1 ohm. This system shall be isolated from common earthing systems and building structures. It shall be connected to the substation main earth bar.

c. Additional earthing systems shall be installed for earthing of intrinsically safe type equipment. Requirements shall be as for the 'clean' earth system.

5.3.7 Lightning protection

A lightning study shall be carried out to provide data on the lightning conditions and the results applied shall be applied to the related lightning protection system design after having been reviewed and accepted by Transnet Pipelines.

Where applicable, tall or isolated structures shall be protected against lightning in accordance with SANS 10313.

a. Where applicable, tall or isolated structures shall be protected against lightning in accordance with SANS 10313.
b. Down conductors from air terminals or lightning poles shall be provided with an individual earth electrode as well as a connection to the common earthing system. The resistance to the general mass of earth at individual earth electrodes shall be a minimum of 1 ohms.
c. Provided they are electrically continuous, tall steel structures such as towers or structure columns shall be considered inherently protected against lightning by their connection to the plant earthing system. Bonds across joints may be used to ensure electrical continuity wherever necessary.

5.4 Lighting

5.4.1 Lighting Facilities

a. Lighting facilities shall generally consist of: All designs to comply with Transnet energy efficiency strategy. LED technology shall be employed.

- A system for supplying “switched” lighting circuits and 230V switched socket outlet circuits that will be permanently energized under normal operating conditions.
- An outdoor lighting system that is only energized at night and which is controlled by a light sensitive switch/photocell (or timer when specified) and contactor arrangement. (Note: in remote stations this facility may additionally be switched).
- Perimeter and mid-area lighting poles shall be mid-hinged.
- The above mentioned systems shall also contain a percentage of lights designated to transfer from the normal to the emergency / diesel generator standby power system whenever the main power supply fails.

b. The facilities of each system shall as a minimum consist of:

- A Low Voltage distribution switchboard located within the 400V switchboard / MCC within the substation building.
- Miscellaneous sub distribution boards as may be required.
- An area lighting distribution board containing 3 phase, and single phase double pole circuit-breakers located within the 400V switchboard / MCC in the substation building.

Note: The area lighting distribution board shall contain an automatic mains fail change over system which shall transfer designated lighting circuitry onto the emergency / diesel generator backup supply in the event of a mains failure. This distribution board shall also contain an area lighting day - night contactor panel which shall switch on the area lighting at night. The contactor control may be affected by a light sensitive switch or a 24 hour timer. A maintenance by-pass switch shall be installed in the distribution board for the purposes of checking the lighting during the daytime.

(Note: in remote stations this facility may additionally be switched and the lights left off during the times when the station is unmanned).

- Transnet Pipelines approved light fittings, switched socket outlets, junction boxes, mid – hinged poles and fixture support structures.

5.4.2 Lighting Fittings

a. For the purpose of standardization of the various types of fixtures throughout the various Transnet Pipelines sites of hazardous areas and floodlight fixtures, Transnet Pipelines will select the preferred manufacturer of these items. Specific details will be shown on the lighting layout drawings and / or will be stipulated in the RFP or Contract documentation.

b. In general, luminaires for illumination at grade and on operating platforms shall be energy efficient type.

c. Lighting fixtures for installation within hazardous areas shall be appropriately certified industrial type from a Transnet Pipelines approved supplier.

d. Lighting fixtures for switch rooms shall be energy efficient type, surface mounted industrial type.

e. Lighting fixtures for station offices and / or Control rooms shall be surface or flush mounted commercial type.

f. Lighting fixture type to be approved by Transnet Pipelines prior procurement.

5.4.3 Illumination levels

a. The illumination levels attained for normal lighting shall conform to the requirements of the OHS Act, as scheduled in the associated environmental regulations for work places, and any subsequent modifications to the schedule made by the Chief Inspector by notice in the Government Gazette.

b. The recommended illumination levels shall be used for design purposes as the minimum maintained levels. Initial lighting level designs must make allowance for a maintenance-ageing factor.

c. In all respects, lighting installations shall be in conformance with SANS 10098, SANS 10114, Part 1 and SANS 10142.

d. Lighting on rotating machinery must be such that the hazard of stroboscopic effects is eliminated.

e. Glare in any workplace shall be reduced to a level that does not impair vision. The use of antiglare lamps in computer and control rooms shall also be evaluated and considered during the design.

f. The final illumination levels shall be measured at the elevations listed above grade or at floor level and between two adjacent lighting fixtures.

g. Illumination levels and glare index shall be in accordance with the recommendations made in the SANS codes of practice. Typical minimum values applicable to Transnet Pipelines projects are given in the attached Annexure.

5.4.4 General Requirements

a. Lighting to be energy efficient as a rule.

b. For general area and perimeter lighting, it is preferred not to use high mast light poles, e.g. hoisting cable mechanism; only different lengths of mid-

hinged poles.

c. Luminaires shall be spaced to provide uniform lighting distribution on the working surfaces, and in general be arranged for a symmetrical appearance.

d. A maintenance factor of 70 % shall be used in design calculations and the lumen output of lamps shall be the "average through life" value.

e. The sub-circuit loading on each lighting distribution board shall be as follows:

- Maximum current per circuit = 10 amps (with 16 amp protective device).
- Loading for discharge lamps (including fluorescent) = Rated lamp (watts) plus ballast load.

f. Emergency lighting shall be provided as follows:

- Skeleton lighting in Control and Substation buildings.
- Anti-stumble lighting in operating areas.
- Local lighting at critical process points and local instrument panels.
- Stairways and escape routes

g. It is the purpose of the emergency lighting to allow safe movement of personnel rather than provide a high level of illumination. The emergency lighting system shall thus provide for a safe minimum illumination level in all working areas within the station.

h. The Environmental Regulations for Work Places of the OHS Act requires that emergency escape lighting be installed in all indoor work places without natural lighting. The level of luminance for emergency installations within buildings shall not be less than 20 lux at ground level.

i. Emergency light sources shall last long enough to ensure the safe shutdown of the plant and possible evacuation of the workplace.

j. All single-phase circuit-breakers, supplying 230V socket outlet circuits, shall be provided with earth leakage protection.

k. When feeding installations within hazardous areas, circuit-breakers shall be double-pole to isolate both phase and neutral in accordance with SANS 10089.

l. The installation methods for lighting fixtures shall be designed for the environment and hazardous area classification in which they are installed.

m. All lighting fixtures shall be rigidly mounted and firmly fixed to their supports. Installations shall be arranged for ease of maintenance.

n. Lighting circuits shall be protected by 16 Amp, single-pole breakers. The maximum load on any branch circuit shall not exceed 12 Amps.

o. Floodlighting fixtures shall be mounted on Transnet Pipelines approved reinforced concrete or galvanised steel poles.

p. Where floodlights are mounted on poles (or high masts) at a height in excess of 8m, or where the poles are located in areas inaccessible to vehicle mounted hydraulic work platforms, raising and lowering gear for maintenance of the floodlights or hinged type scissor masts shall be provided.

q. When economically viable to do so the use of floodlighting shall be maximized in operating areas, to eliminate the requirement for several locally mounted fluorescent fixtures.

r. All metallic components of light fittings shall be securely bonded to the

station safety earth.

5.4.5 Operating Plant Lighting

a. Luminaires in operations areas shall be solidly fixed and not suspended by means of items such as chains and conduits. They shall be mounted such that routine operations and reasonable maintenance can be conducted with safety and without the use of temporary scaffolding.

b. Luminaires for illumination at grade shall be mounted at a minimum height of 2200 mm to underside of luminaires, unless specific conditions require otherwise. Typical installation standard detail drawings shall be prepared and defined on layout drawings for each luminaire location.

c. Use shall be made of floodlights for general lighting of outdoor open areas. Floodlighting luminaires shall be mounted at sufficient elevation and directed so as not to be objectionable or dazzling to operating personnel. Plant structures shall be used where possible for mounting such floodlights, but where poles or towers are used, safe access and a working platform shall be provided for re-lamping and servicing.

d. Luminares for general illumination shall be located as close as possible to items such as instruments and gauges so that special lighting is unnecessary.

e. The site area lighting shall be controlled by 24 hour timers with manual switching where required and over-ride facilities.

f. Local lighting switches shall generally only be provided in enclosed buildings or as detailed in section 5.4.5(g).

g. Lighting switches and MCB distribution boards shall normally be located in the nearest substation. Where necessary: fused cut-outs or MCB units shall be provided on each floodlight pole.

5.4.6 Road Lighting

a. Road lighting shall be provided on all permanent metalled roads within the site plot limits only when it is not possible to provide adequate illumination using area and / or perimeter fence floodlighting.

b. Road lighting installations shall comply with the relevant SANS standards.

c. Lighting poles shall support luminaires at a minimum clear height of 6 metres above the finished road surface. Poles to present minimum obstruction to the movement of wide equipment packages on plant roadways.

d. Luminaire types and pole spacing shall be selected to achieve the required levels of illuminance and provide the most economic installation.

e. Power distribution from the station main substation to lighting poles shall be at 400 V, 3 phase, 4 wire, 50 Hz. A junction arrangement shall be provided in the base of each lighting pole, which shall incorporate a MCB and looping terminals suitable for the termination of 4-core power supply cables. The power supply shall be derived directly from a feeder in the 400 V, 3 phase, 4-wire switchboard from the dedicated area lighting distribution board. The arrangement selected shall be the most cost effective, taking account of the number and rating of feeders required. The power supply to street lighting circuits shall be switched by a 24 hour timer. Manual switching facilities and a manual override shall be provided.

f. Wherever possible lighting poles shall be sited in areas classified as non-hazardous. In the event that poles have to be sited in hazardous areas the selection of the luminaire shall be made accordingly and the fused cut-out shall be replaced by a MCB unit certified for installation and use as appropriate to the area classification.

5.4.7 Perimeter/Security Lighting

a. Lighting provided to illuminate perimeter security fences shall be fed from the permanent power supply via an area lighting day-night contactor controlled distribution system.

b. Lighting poles shall support luminaires at a minimum clear height of 6 metres above grade.

c. Luminaire types and pole spacing shall be selected to achieve the required levels of illuminance and provide the most economic installation.

d. Power distribution from the plant main substation to lighting pole shall be at 400 V, 3 phase, 4 wire, 50 Hz. A MCB shall be provided in the base of each lighting pole, which shall incorporate, looping terminals for termination of a 4-core power supply cable. The power supply shall be derived either directly from a feeder(s) in the 400 V plant switchboard or from a dedicated distribution board. The arrangement selected shall be the most cost effective, taking account of the number and rating of feeders required. The power supply to perimeter lighting circuits shall be switched by a 24 hour timer. Manual switching facilities and a manual override shall be provided.

e. Wherever possible lighting poles shall be sited in areas classified as non-hazardous. In the event that poles have to be sited in hazardous areas the selection of the luminaire MCB unit and installation materials shall be suitable for installation in the hazardous area.

5.4.8 Building Lighting

Lighting requirements in plant buildings located in non-hazardous areas are defined above in paragraph 5.4.3.

Lighting for control room instrument panels and similar installations shall be designed to illuminate the vertical panel with glare free uniform intensity.

5.5 Cable and Wiring System

5.5.1 General

a. Electric Cables shall comply with the relevant SANS Specifications.

b. Cable and wiring design to comply with Transnet Pipelines specification PL 727. No cable joints are allowed.

c. Low voltage cables for operation at 600 V or below and used for items such as power, control, and distribution board feeders shall have stranded copper conductors, PVC insulation, extruded PVC bedding, steel wire armour and PVC sheath overall, except for single-core cables which shall have non-magnetic armour. Minimum conductor size shall be 2.5 mm^2, except for signal cable to ETM/L panels which shall be 1.5mm^2. Cables shall be flame retardant and UV resistant.

d. Sub-circuit cables for lighting, socket outlets, and other circuits may be run above ground in similar cable to that detailed in Section 5.5.1.2 of this specification. Minimum conductor size for lighting circuits shall be 2.5 mm^2 stranded copper.

e. Cables shall be installed in directly buried sleeves, suitably sized for the

cable, with adequate free space to ease the installation of the cable. The sleeves shall be of a material that can tolerate hydro-carbon contamination or adverse soil conditions (e.g. sulphate reducing bacteria).

f. Due regard shall be paid to the routing of power cables with respect to electronic instrumentation and other similar low power systems to avoid interference. A minimum separation of 600 mm. shall be allowed between long parallel runs of power and control systems cabling. Where cable routes cross at 90 degrees, a vertical separation of 150 mm minimum shall be acceptable.

g. Small power reticulation in buildings shall consists of conduit or trunking with the respective colour coding: Raw Power(orange); UPS Power (purple); Data(blue); Fire(red).

h. The wire shall be general purpose house wire 1000v rating and shall comply to SANS 10142-1 for the current capacity requires of intended use.

5.5.2 Cable Sizing and Selection

a. The short time maximum current carrying capacity of cables shall be considered in conjunction with the current time setting of the electrical network protective system, to ensure that cables do not suffer damage under maximum through fault conditions. The cross-sectional areas of cross-linked polyethylene (XLPE) or EPR insulated cables relative to prospective fault currents shall be assessed from manufacturer's data.

b. Cables shall be sized according to the procedures and requirements set out in the SANS 1507 and SANS 10142 considering the following parameters:

- Continuous current rating
- Voltage drop restrictions
- Short circuit current rating
- Earth loop impedance

c. Manufacturer’s data and rating tables shall be used, when available, for the specific cable type, however in the absence of such information, the ratings etc given in the respective parts of ERA Report 69/30 shall be used.

d. Appropriate rating factors as tabled in manufacturer's data shall be applied in all cases for the following installation parameters:

- Depth of laying
- Ground temperature
- Air temperature
- Grouping of cables

e. The above parameters shall be determined for the installation from either site-measured data or established published data for similar installation conditions.

f. The voltage drop on distribution network cables shall comply with the parameters defined in section 3.4**.**

5.5.3 Underground Installations

a. Cables run underground shall be installed in sleeving with draw boxes provided at suitable intervals to facilitate the installation of the cables. 25% spare sleeving shall be provided to facilitate future additions.

b. The routing and arrangement of underground cables, particularly in areas adjacent to substations and control houses, shall be planned concurrently with main pipe routes and vehicle access ways, to give as far as possible, unimpeded direct routes.

c. Medium Voltage distribution cables to on-plot substations shall be installed in separate / segregated trenches and arranged in a single layer. Depth of trench shall be 1000 mm. Pilot and control cables shall be laid alongside their respective feeder cable. Spacing between centres of feeder cables shall be minimum 225 mm.

d. 400 V cables may be installed in a trench with up to two layers. Minimum depth to top side of LV cables shall be 750 mm.

e. Spacing between continuous current carrying LV cables shall be 150 mm. Care shall be taken to locate loaded and unloaded cables alternately where possible to minimise the effects of group de-rating factors.

f. Cables shall be laid on 75 mm of sand and covered with 75 mm of sand. The sand shall be screened to remove sharp objects and compacted to eliminate voids. Two layers of marker tape shall be installed over the cables as indicated on the standard drawings. The sand provided shall have been selected for the most favourable thermal grading available.

g. Motor control cables shall be laid alongside their respective motor power cable.

h. Single-core cables shall be run in trefoil formation held in place by suitable strapping. Where metal sheathed single core cables are used, the metal sheath shall be bonded at the switchboard end only.

i. No cables shall be run directly beneath pipes that follow the same direction as the cables, whether the pipes are laid directly in the ground or above ground.

j. Cable routes in unpaved areas shall be marked with reinforced concrete marker posts, located at each change of direction of the route and at no more than 25 m spacing on straight sections. In paved areas, marker discs embedded in the paving shall identify the trench route.

5.5.4 Above Ground Installations and Support Systems

a. Cable trays or ladder racks supported from structures shall be used for overhead multiple cable runs and cables shall be adequately secured in a single layer. Individual cables may be clipped and supported directly to structures, but where such structures are fireproofed, cables shall be clipped to cable tray or supported clear of fireproofing.

b. Cable clips for securing PVC sheathed cables to the tray shall be purpose or site fabricated from PVC sheathed stainless steel strips.

c. Overhead cables shall not be routed close to steel pipelines. A minimum distance of 500 mm shall be maintained between pipes and cables.

d. Overhead cable tray / ladder rack shall be hot-dipped galvanised steel.

e. Tray / ladder rack shall be run vertically only.

f. Straight sections and fittings shall have the provision for covers to be fitted when required for a specific installation.

g. Cable tray / ladder rack proprietary accessories shall be used if available

to limit the amount of site fabrication.

h. Proprietary tray / ladder rack factory supplied fabricated sections e.g. bends, tees, joint kits etc., shall be selected from a manufacturers component system and shall be identical to straight sections in materials, rung spacing, and strength.

i. Cable tray / ladder rack installation shall be connected to the common earth system in compliance with Transnet Pipelines specification PL 727.

j. The maximum straight section length of cable tray, when fully loaded in accordance with the manufacturer's recommendation, shall have a minimum safety factor of 1.5.

5.5.5 Cable Terminations

a. All cable terminations shall use compression type cable glands complying with the requirements of SANS 1213. Glands shall be manufactured in brass and shall be fitted with sealing washers as appropriate to installation conditions. Glands installed on classified electrical equipment installed in hazardous areas shall be suitably certified. The installation requirements of the respective protection class and certification shall be observed. Cable glands having dual EEx d / EEx e certifications are preferred.

b. Medium voltage terminations shall use terminal box designs suitable for the following alternative termination types:

- 'Raychem' heat shrink termination kits or equal.
- 'Elastimold' connectors and bushings or equal.
- 'Cold Shrink' terminations or equal.

c. The cable conductors of all terminations shall be fitted with properly sized crimped wire pins, or cable lugs selected on the basis of conductor size and terminal type. Bare copper wire terminations will not be allowed.

5.5.6 Cable Identification and Schedules

a. Power cables shall be identified at each end, and where they enter or leave underground ducts, by permanent stainless steel identification tags, bearing the cable reference number allocated on the cable schedules.

b. Cores of both multi-core and single-core cables shall be suitably marked at their termination point with ferrules in accordance with the wire or terminal identification shown on connection diagrams. Core idents shall be of the approved printed lables.

c. Cable terminations at motors and starters shall be made following the positive identification sequence (1-2-3) or (R-Y-B) of the conductors in accordance with the specified phase rotation sequence of the power supply.

d. Cables, except sub-circuits for lighting and socket outlets, shall be identified in accordance with cable schedules. To indicate the service for which the cable is to be utilised, the overall sheath will be coloured as follows:

Application	***Sheath Colour***
11 kV / 6.6 kV and 3.3 kV Cables	Black
600 / 1000V Cables	Black
Communication	Brown

e. Cables will be allocated a cable type reference, which shall also be used as a drum number prefix. Details shall be included on the project cable schedule.

5.6 Electric Surface Heating Systems

a. Electric trace heating systems shall be designed and installed in accordance with Transnet Pipelines approved designs.

b. Electric trace heating systems for winterisation (freeze protection) shall be applied to piping systems, vessels, etc. as defined on P & ID drawings and the piping line list.

c. Heaters applied to pipelines / equipment for winterisation purposes shall preferably be of the self-limiting type.

d. Electric surface heaters and all components and accessories to be installed in a designated classified area shall be certified, as a system, for installation within the designated Zone classification.

e. Heater circuits shall be controlled by air thermostat(s) set to switch 'ON' and 'OFF' between project specified temperature limits. Thermostats used to control heater circuits shall be provided with manual override, except when used as high temperature limiting cut-outs for the purposes of complying with hazardous area certification requirements.

5.7 Socket Outlets

5.7.1 General

Socket outlets of the types outlined in the following sections shall be provided for maintenance and inspection purposes.

5.7.2 Welding Socket Outlets

a. Outlets shall be provided and distributed in plant areas for portable welding supplies and other power requirements. Socket outlets shall be of a Transnet Pipelines approved single standardised type for installation in non-hazardous areas only, such that plugs used on portable equipment will be of a common pattern.

b. 63 amps, 400V, 3-phase, 3-wire plus earth, EEx d certified switched socket units shall be used. No more than two outlets shall be connected to any single circuit, which shall in turn be supplied from a 63 amp MCCB / residual current feeder circuit breaker on the station LV switchboard.

5.7.3 Switched Socket Outlets

a. 230V switched socket outlets shall be provided in the operating areas located on the basis of being accessible by use of a 25 m extension lead. Socket outlets shall be of a single standardised type in both hazardous and non-hazardous areas such that plugs used on portable equipment will be of a common pattern.

b. Not more than eight outlets shall be served from a single circuit derived from a 16 amp MCB / residual current circuit breaker on a distribution board in the substation.

c. The socket outlets shall be 16 amps, 230V, 3-pin (double pole and earth), EEx ‘d’ certified switched or unswitched as required for the application.

d. Matching plugs shall be supplied on the basis of one for each outlet.

5.7.4 Cathodic Protection

a. Cathodic protection shall be provided for underground structures, submerged structures, tankage and other metallic structures as and where required.

b. A Transnet Pipelines approved contractor shall be appointed to conduct soils surveys, recommend, engineer, design and implement the necessary cathodic protection systems.

c. Bonding Wire and cable for the cathodic protection systems shall be PVC insulated and coloured red for conductors at the +VE potential and black for the conductors at the -VE potential. In process areas susceptible to chemical contamination, such cables shall be PVC insulated and be jacketed with a nylon oversheath.

Preferred Equipment List

HV Yard Equipment	Make
Links	Actom
Primary Circuit Breakers	Actom
Voltage Transformers	Actom
Current Transformers	Actom
Main Distribution Transformers	Actom

MV Substation Equipment	
Switchgear	ABB/Siemens
Protection Relays	ABB/Siemens
Variable Speed Drives	ABB
Battery Charger	Blue Ginger
Power and Check Metering	Schneider

LV Equipment	
Auxiliary Distribution transformers	Powertech
LV MCC's/Panels	ABB/Siemens
Actuators	Rotork
Standby Generators	Cummins with Stanford Alternators / Generator Controls
UPS	Eaton

3.3kV MV Motors	
Mainline Motors	ABB/Acton

DRAWING OFFICE STANDARD PLANT & EQUIPMENT TAG NUMBERING (PL101)

DOCUMENT APPROVAL PROCESS

NAME		POSITION/MEETING NO.	SIGNATURE	DATE
Originator:				
Approver:				
Original date: 15 June 2016				
Effective date:				

TABLE OF CONTENT

1. INTRODUCTION

The purpose of this standard is to establish a uniform means of designating and identifying plant and equipment installed on the respective pump station sites within Transnet Pipelines, a Division of Transnet Limited. The designation systems detailed below have been designed to cater for both technical as well as financial/management requirements and are proposed to be integrated on both the AutoCAD P&ID (technical) and SAP R3 (financial/management) platforms throughout Transnet Pipelines. (For details of integration onto the SAP R3 platform, the reader is referred to Addendum No.1 attached).

By ensuring a comprehensive, consistent and uniform means of plant and equipment designation, it is hoped that this Standard will assist in the rapid identification of plant and equipment installed at the respective Transnet Pipelines sites, assimilation of design information associated with the plant and equipment installed, and assistance with the maintenance and fault finding history of installed technology.

2. SCOPE

2.1. General

This document defines identification and tag numbering standards to be adhered to in the tagging and identification of the following instrumentation, plant & equipment as installed on the respective Transnet Pipelines Pump Station sites:

- Process Plant (e.g. receivers, strainers etc.)
- Process Equipment (e.g. valves, pumps, motors etc.)
- Electrical Distribution Equipment (e.g. transformers, breakers, etc.)
- Instrumentation
- Electrical and Instrument Panels (Switchgear, DB Boards, PLC Panels, Junction Boxes)
- Electrical & Instrument Cabling
- Process Piping

These Standards are required to be adhered to by both Client and Contractor alike, for and on behalf of Transnet Pipelines. Both Client and Contractor will be required to familiarise themselves with all applicable Standards and Codes of Practise listed herein, and to ensure compliance in the execution of any work in terms of this document. Failure to comply may render the provider liable for corrections at his own cost.

These Standards 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 Pipelines 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 Schedule of Contract Documents) and this document, the former shall prevail.

2.2. Application to Work Activities

The Standards contained herein are suitable for use whenever plant and equipment are required to be identified or tagged, for the purposes of engineering design or installation on any of the respective Transnet Pipelines Pump Station Sites. These Standards thus cover designation of the following plant and equipment:

- Process Plant (e.g. receivers, strainers etc.)
- Process Equipment (e.g. valves, pumps, motors etc.)
- Electrical Distribution Equipment (e.g. transformers, breakers, etc.)
- Instrumentation
- Electrical and Instrument Panels (Switchgear, DB Boards, PLC Panels, Junction Boxes)
- Electrical & Instrument Cabling
- Process Piping

3. REFERENCE DOCUMENTATION

3.1. Plant and Equipment can be identified on Transnet Pipelines Sites using two forms of Identifiers; namely, by Function using the Function Designation System (identified by the prefix " = "), or by Location using the Location Designation System (identified by the prefix " + "). In this regard the following documentation included in the Appendices (Appendix 1) attached details each Standard:

FUNCTIONAL DESIGNATION	PL 118736-A	Plant & Equipment
	PL 118737	Instrumentation
	PL 118738	Panels
	PL 118739	Cabling
	PL 118740	Process Piping
LOCATION DESIGNATION	PL 118741	Panels

3.2. The following standard specifications are to be used for reference purposes and need to be noted by Tenderers in order to signify familiarity and compliance with the requirements. It is expected of Tenderers 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.

A. Standards and Recommended Practices for Instrumentation and Control, 11th Edition, Instrument Society of America.

- ANSI/ISA-5.1-2009 : Instrumentation Symbols and Identification
- ISA-S5.3-1983 : Graphic Symbols for DCS/Shared Display Instrumentation, Logic & Computer Systems
- ISA-S5.4-1991 : Instrument Loop Diagrams
- ANSI/ISA-S5.5-1985 : Graphic Symbols for Process Displays

B. Graphical Symbols for Electrical Diagrams NRS 002-2000 second edition

C. International Electro technical Commission Standards for Electrical Drawings
- IEC Publication 27 : Letter Symbols to be used in Electrical Technology
- IEC Publication 50 : International Electro technical Vocabulary
- IEC Publication 617 : Graphical Symbols for Diagrams

D. SANS-10111-1-2011 Engineering Standard

E. TPL-TECH-I-POL-001 - Measurement Policy
F. TPL-TECH-I-POL-002 - Control Policy
G. TPL-TECH-I-POL-003 - Instrumentation Policy

4. ABBREVIATIONS

For the purpose of understanding these Standards, the following abbreviations apply.

ANSI	:	American National Standards Institute
C & I	:	Control and Instrumentation
IEC	:	International Electrotechnical Commission
ISA	:	Instrument Society of America
SABS	:	South African Bureau of Standards
ASA	:	American Standards Association

5. PLANT & EQUIPMENT IDENTIFIERS

The following types of plant and equipment may be identified by use of Plant and Equipment Identifiers, which are allocated to unique pieces of plant and equipment installed at functional locations within a Transnet Pipelines Site:

- Process Plant (e.g. receivers, strainers etc.)
- Process Equipment (e.g. valves, pumps, motors etc.)
- Electrical Distribution Equipment (e.g. transformers, breakers, etc.)

[Composition of Process Plant & Equipment Identifiers conform to the Ops Code Standard as adopted by Transnet Pipelines and as detailed in Control and Instrumentation Policy No. C&I 700/94/001 April 1994. Composition of Electrical Distribution Equipment Identifiers conform to HT Distribution Equipment Identification Schemas as determined by Transtel Control (SARS Distribution)].

The reader is referred to the following Plant & Equipment Identification Standard as is included in the Appendices:

FUNCTIONAL DESIGNATION PL 118736-A Plant & Equipment

4.1. Process Plant Identifier Assignment Rules

Used to identify process plant installed on the respective Transnet Pipelines Pump Station sites. Note that Process Plant usually comprises of a **grouping of process vessels, equipment, and instrumentation that combine to perform a common function** e.g. piping, valves and instrumentation that combine to form a piece of process plant called a Receiver.

Assignment Rules

1. Each Plant item shall be identified by means of a two digit Station Identifier (and prefix "="), followed by a three digit alphanumeric Function Identifier (Ops Code) in compliance with PL 118736-A.

2. The first letter of the Ops Code Identifier shall convey the function of the equipment in the plant.

3. The second and third characters of the Ops Code Identifier shall comprise of a double-digit consecutive number used to uniquely identify the particular piece of process plant and shall be allocated per Pump station on a consecutive basis. (e.g. where three Auxiliary Pumps exist these shall be identified as X01, X02, X03 irrespective of their function).

   In multiproduct dedicated manifolds, the third letter may be used to identify the product type associated with the particular piece of process plant as follows:

   3 Diesel - 500ppm
   6 ULP - 95 Octane
   8 Avtur
   14 ULP - 93 Octane
   33 Diesel 50ppm
   76 Crude oil

4. VALVES, ACTUATORS & SWITCHBOXES

   Valve actuators and switchboxes are identified by the addition of a prefix to indicate function (in full compliance with ISA Standard S5.1), as follows:

   CV ANN Modulating/Control Valve Actuator
   XV ANN On/Off Valve Actuator
   ZV ANN Hand Valve with Switchbox
   HV ANN Hand Valve without Switchbox
   PRV Pressure relief valve
   PSV Pressure sustaining valve
   TRV Thermal relief valve
   PCV Damper

Process Plant Examples: (Allocated on a Pump Station basis).

Main Pump	P01	Main Line Pump No. 1
	P02	Main Line Pump No. 2
	P03	Main Line Pump No. 3
	P04	Main Line Pump No. 4
Accumulator Pump	A01	Accumulator Pump No. 1
	A02	Accumulator Pump No. 2
Booster Pump	B01	Booster Pump No. 1
	B02	Booster Pump No. 2
Auxiliary Pumps	X01	Sump Pump
	X02	Sump Pump
	X03	Lube Pump
	X04	Lube Pump
	X05	Inhibitor Pump
	X06	Inhibitor Pump
	X07	Petrol Blend Pump
	X08	Diesel Blend Pump
	X09	Petrol Prover Transfer Pump
	X10	Diesel Prover Transfer Pump
	X11	ULP Blend Pump
	X12	ULP Prover Transfer Pump
	Q01	Purge Air Fan 1
	Q02	Purge Air Fan 2
	Q03	Pressurisation Fan 1
	Q04	Pressurisation Fan 2
Meters	M01	Turbine/Positive Displacement Meter No 1.
	M02	Turbine/Positive Displacement Meter No 2.
Strainers	S01	Main Line Strainer
	S02	Main Line Strainer
	S03	Main Line Strainer
	S04	Main Line Strainer
	S05	Petrol Header Strainer (Delivery Station)
	S06	Petrol Header Strainer (Delivery Station)
	S07	Diesel Header Strainer (Delivery Station)
	S08	Diesel Header Strainer (Delivery Station)
	S09	ULP Header Strainer (Delivery Station)
	S10	ULP Header Strainer (Delivery Station)

4.2. Equipment Identifier Assignment Rules

Used to identify unique pieces of process equipment (e.g. valves, motors, actuators etc.) installed at functional locations within the respective Transnet Pipelines sites.

Assignment Rules.

1. Each Plant item shall be identified by means of a two digit Station Identifier (and prefix "= "), followed by a three digit alphanumeric Function Identifier (Ops Code) in compliance with PL 118736-A.

2. The first letter of the Ops Code Identifier shall convey the function of the equipment in the plant. Thus all equipment associated with the operation of the Receiver for example, shall be assigned the first letter "R".

   For Example:

   The Inlet Valve on Meter Prover Y01 shall be designated Y1A.
   The Discharge Valve on Launcher L02 shall be designated L2E.

3. The second letter of the Ops Code Identifier shall comprise of a single digit consecutive alphanumeric used to uniquely identify a particular piece of equipment. This character may be used to identify either the product type or origination (company from where the product was supplied) associated with the particular piece of equipment as follows:

   - 3 Diesel 500ppm
   - 6 ULP - 95 Octane
   - 8 Avtur
   - 14 ULP - 93
   - 33 Diesel - 50ppm
   - 73 Crude oil
   - C Caltex
   - S Shell
   - BP British Petroleum
   - R Sasol
   - T Total
   - M Engen
   - E Petro SA
   - U Zenex
   - W Vopak

   For Example:

   A Consignee Valve supplying Caltex shall be identified as CC1.
   A Header valve on a ULP (95 Octane) manifold shall be identified as H6A.

4. The third letter of the Ops Code Identifier shall convey additional information regarding the function of the designated equipment.

For Example:
Receiver Inlet Valve shall be identified as R1A, with A indicating functionality (Inlet).

Where two Prover Drain valves exist on Meter Prover Y01, these shall be identified as Y1W and Y2W respectively, function as denoted by the third character taking precedence over the second alphanumeric indicating product type or origination.

4.3. Electrical Distribution Equipment Identifier Assignment Rules

Used to identify unique pieces of electrical distribution equipment (e.g. transformers, alternators, breakers, links etc.) installed at functional locations within the respective Transnet Pipelines sites.

Assignment Rules.

1. Each Plant item shall be identified by means of a two digit Station Identifier (and prefix "= "), followed by a three digit alphanumeric Function Identifier (Control Code) in compliance with PL 118736-A.

2. The first letter of the Control Code Identifier shall convey the function of the equipment in the plant.

For Example:
Main Incomer Transformer shall be designated M1.
Incomer Breaker feeding the 3.3 kV MV Panels shall be designated F11.

3. The second and third characters of the Control Code Identifier shall comprise of a double-digit consecutive number used to uniquely identify the particular piece of process plant and shall be allocated per Pump station on a consecutive basis.

The second and third characters may be used to convey additional information such as supply voltage in the case of Breakers and Links, where:

50 – 59 denotes 11 kV supply upwards
10 – 19 denotes 3.3 kV supply
30 – 39 denotes 380 V supply

Electrical Distribution Equipment Examples: (Allocated on a Pump Station basis).

3.3 kV Main Incomer Transformer No. 1	M1
3.3 kV Main Incomer Transformer No. 2	M2
380 V Aux Transformer No. 1	A1
380 V Aux Transformer No. 2	A2

3.3 kV Incomer Breaker No. 1	(MV Panel)	F11
3.3 kV Incomer Breaker No. 2	(MV Panel)	F12
380 V Incomer Breaker No. 1	(LV Panel)	F31
380 V Incomer Breaker No. 2	(LV Panel)	F32
Incomer Supply No. 1 / 2	(3.3 kV AC)	E01/E02
Auxiliary Supply No. 1 / 2	(380 V AC)	E03/E04
Control & Tripping Supply	(110/50 V DC)	E05
Standby Generator	(380 V AC)	E06

6. INSTRUMENT IDENTIFIERS

Instrumentation may be identified by use of Instrument Identifiers, which are allocated to instrumentation installed at functional locations within a Transnet Pipelines Site.

Composition of these Identifiers conforms to the ISA Standard ANSI/ISA-S5.1-1984 Instrument Symbols and Identification.

The reader is referred to the following Plant & Equipment Identification Standard as included in the Appendices.

FUNCTIONAL DESIGNATION	PL 118737	Instrumentation

4.4. Assignment Rules

1. Each Plant item shall be identified by means of a two digit Station Identifier (and prefix "= "), followed by a four digit alphanumeric Function Identifier (ISA Standard S5.1) and three digit unique Item Identifier.

2. The Function Identifier shall comprise of a first letter, which is used to indicate the primary function of the instrument / equipment item (i.e. the measured or initiating variable), and one or more succeeding letters, covering the functions of the instrument. Where no identifiable functions exist, these succeeding letters may be omitted.

3. The Function Identifier shall be made according to function and not construction. Thus a differential pressure recorder used for flow measurement, shall be identified as FR and not PDR.

4. When used as part of an instrument loop, the first letter of the functional identifier shall be selected according to the measured or initiating variable and not according to the manipulated variable. Thus a control valve varying flow according to the dictates of a level controller shall be denoted LCV and not FCV.

5. The succeeding letters of the functional identifier shall be used to designate one or more readout or passive functions and one or more output functions or both. A modifying letter may

be used, if required, in addition to the succeeding letters, to denote alarming features, provided that these alarm signals constitute separate signals fed back to the control system/controller. In the event of alarm signals being derived from within a control system/controller itself, this alarm functionality may be denoted by the attachment of alarm prefixes to the outside the device symbol bubble itself. (i.e. has no impact on the device tag number).

6. The sequence of identification letters shall thus begin with the first letter (denoting primary function). Readout or passive function letters shall follow these in any sequence, and finally output letters in any sequence except for the output letter C (Control), that shall precede output letter V (Valve). All modifying letters, if used shall be interposed so that they immediately follow the letters they modify.

7. A multiple function device may be symbolised on a diagram by as many multiple device bubbles as there are measured variables, outputs and/or functions. Thus a Coriolis Mass Flowmeter with dual outputs of flow and temperature and located on the Diesel LP Manifold, may be identified with two tangent bubbles, inscribed FT 821 and TT 821 respectively.

8. The number of functional letters grouped for one instrument should be kept to a minimum according to the judgement of the user. The total number of letters within one group shall not exceed four.

9. The unique Item Identifier shall comprise of a three-digit numeral, the first two digits indicating the Device Group to which the instrument belongs and the third letter a consecutive number unique to the device. Device Group selection shall be selected according to function and not location. Thus a densitometer located remotely from a launcher (e.g. near a receiver) and used for Interface Control shall be assigned the Launcher Device Group number and not the Receiver Device Group number.

10. Item Identification digit allocations as detailed in Standard PL 118737 have been designed to cater for all applications as currently existing on Transnet Pipelines Pump Station Sites.

11. Item Identifiers shall be allocated on an individual instrument/equipment basis and not on an instrument/equipment loop basis. (This represents a deviation from recommendations as contained in the ISA Standard S5.1.).

12. Where two devices or sensors form part of a single measurement entity, and consequently have been assigned the same functional identification, a suffix may be appended to the Tag number to identify the respective devices or sensors.

For Example: Where dual turbine meter pickups return dual pulse trains 90 degrees out of phase for the purposes of calculating product flow, and where the resultant flow measurement has been assigned the Tag number FT 811, the dual pickup sensors may be identified as FE 811A and FE 811B respectively.

13. PUMP STATION IDENTIFICATION.
As per ISA Standard S5.1, and in order to assist in integration with both the AutoCAD P&ID and SAP R3 Business Management Platforms, Tag numbers for all Instrumentation and Equipment carry a prefix, used to identify the Transnet Pipelines Pump Station at which the equipment is located. Integration into the SAP R3 Platform requires the identification of managerial/cost centres and consequently the Pump Station identifier comprises of a four digit alpha numeric prefix, whereas integration into the AutoCAD P&ID Platform requires the identification of only the Pump Station at which the equipment is installed and thus the identifier comprises of a two digit integer prefix.

14. SOFTWARE MNEUMONIC DESIGNATION. In order to assist in the identification of more than one signal fed back to a control system/controller from a unique instrument or piece of equipment, a three digit alphanumeric suffix may be appended to the Tag Number and used for both software mneumonic identification as well as core identification numbering of the respective signals.

Suffixes defined to date are as follows:

Actuated Valve signals

OP	Valve Open Feedback
CL	Valve Closed Feedback
SL	Valve in Local/Off
O	Open Valve command
C	Close Valve command

Pump Starter signals

IRC	Start Pump command
IRT	Stop Pump command
PTR	Pressure Trip command
TVR	Mechanical Trip command
TOP	Thermal Overload Trip feedback
ELP	Earth Leakage Trip feedback
ERP	Electronic Protection Relay Failure feedback
FBL	Fuse Blown Trip feedback
SLO	Switchgear in Local/Off
PON	Pump Running feedback
POF	Pump Stopped feedback
RES	Remote Emergency Stop Trip feedback

MTR	Master Trip Relay Active feedback
SPH	Max Starts per Hour Exceeded Trip feedback
VT	Control Voltage Failure feedback
VSF	VSD Fault f/b (equivalent to ERP)
VSR	VSD Ready f/b (equivalent to MTR)

Fan signals

IRC	Start Fan command
IRT	Stop Fan command
TOP	Thermal Overload Trip feedback
FON	Fan Running feedback
FOF	Fan Stopped feedback

HV/MV Incomer signals

OP	Breaker/Link Open f/b
CL	Breaker/Link Closed f/b
SLO	Breaker in Local f/b
TCF	Trip Circuit Faulty f/b
MTR	Master Trip Relay f/b
BRS	Breaker Racked Out f/b
OCP	Over Current Trip f/b
ELP	Earth Fault Trip f/b
BEF	Balanced Earth Fault Trip f/b
BGF	Buchholtz Gas Fail Alarm f/b
OTP	Oil Temp Hi Alarm f/b
ERP	Electronic Protection Relay Fail f/b

Other signals

FB	Fault Bit
SB	Status Bit
PV	Process Variable
SP	Setpoint Variable
AHH	Process Trip High
AH	Process Alarm High
ALL	Process Trip Low
AL	Process Alarm Low

Instrument Identifier Examples:

PT	121	Pressure Transmitter located on HP Manifold (Routing Device Group)
PI	121	Pressure Gauge located on HP Manifold (Routing Device Group)
TE	121	Temperature Probe or primary measuring element
TT	121	Temperature Transmitter located on HP Manifold (Routing Device Group)
DX	811	Densitometer Source (Radioactive) located on Petrol LP Manifold.
DE	811	Densitometer Detector (Ionisation Chamber) located on Petrol LP Manifold.
FE	121	Flow element located on the HP manifold (Routing Device Group)
FT	121	Flow measurement located on the HP manifold (Routing Device Group)
ZI	101	Sphere detector located on the Receiver.

7. PANEL IDENTIFIERS

Electrical & Instrument Panels shall be identified by use of unique Panel Identifiers (both by Function and Location), allocated to panels installed at functional locations within a Transnet Pipelines Site.

Composition of these Identifiers conforms to the International Electrotechnical Commission Standards IEC Publication 750 Table 1.

The reader is referred to the following Plant & Equipment Identification Standard as included in the Appendices.

FUNCTIONAL DESIGNATION	PL 118738	Panels
LOCATION DESIGNATION	PL 118741	Panels

4.5. Assignment Rules – Functional Designation

1. Each Panel (and components thereof) shall be identified by means of a Functional and Location Identifier. The Functional Identifier shall comprise of a two digit Station Identifier (and prefix " = "), followed by a five digit alphanumeric Panel Identifier. Panel components may be uniquely identified by the addition of a three digit alphanumeric suffix and design typicals identified by the addition of a four digit alphanumeric suffix.

2. The first three characters of the Panel Identifier shall be is used to indicate the primary function of the panel (e.g. LV will indicate that the panel's primary function is that of LV Distribution, JB will indicate that the panel's primary function is that of Instrument marshalling etc.).

3. The last two digits of the Panel Identifier shall comprise of a two digit number used to uniquely identify the Panel in question. In all cases other than Instrument Junction Boxes and Control Panels, this unique integer number shall fall within the range as indicated in the Standard PL 118738, and shall be numbered in a consecutive manner. In the case of Instrument Junction Boxes and Control Panels however, this integer number shall be the same as the Instrument Group Identifier, thus identifying the Instrument Group to which the J/B has been associated. (Note that Instrumentation are marshalled in Junction Boxes on the basis of Device Groups).

4. Where Panels comprise of separate cubicles/tiers that contain equipment or marshalling unique to an individual piece of Process Plant/Equipment, these separate cubicles/tiers may be uniquely identified by means of an equipment identifier of the same format as detailed in Section 5 of this standard.

For example, an LV Panel LV 01 containing a cubicle housing a starter for auxiliary motor X01, may be uniquely identified by the Functional Identifier "= LV01 X01". In cases where only one

LV Distribution Panel is likely to exist on the Station, this identifier may be shortened to read "= LV X01". In the case where an MV panel tier houses a starter for mainline pump set P01, the tier may be uniquely identified by the Functional Identifier "= MV01 P01". In cases where only one MV Distribution Panel is.

5. Equipment components within panels may be uniquely identified using an additional Component Identifier, comprising of an alphanumeric first character (to identify component function) followed by a two digit integer number (used to uniquely identify the component). Component Identification is indicated by the addition of a minus sign "-" as a suffix to the identifier. Composition of these Identifiers conforms to the International Electrotechnical Commission Standards IEC Publication 750 Table 1.

6. Where identical or typical design schemas exist, these may optionally be indicated by an additional Document Typical Identifier, comprising of an alphanumeric first character (to identify document type) followed by a two digit integer number (used to uniquely identify the design schema standard. Design Typical Identifiers are indicated by the addition of a full stop sign "." as a suffix to the identifier. Note that Document Typical Identifiers may only appear in Documentation Headers i.e. may never form part of the Panel or Component Identifier.

Panel Identifier Examples:

LV 01	LV Distribution Panel 01
LV 21	Control Voltage Distribution Panel (may reside in Panel LV01 as a separate cubicle)
LV01 X01	Sub Distribution Cubicle of Panel LV01 containing Aux Motor Starter X01
	OR
LV X01	Sub Distribution Cubicle of Panel LV01 containing Aux Motor Starter X01
MV01	MV Incomer Panel 01
MV01 F11	Sub Distribution Cubicle of Panel MV01 containing Incomer Breaker F11
	OR
MV F11	Sub Distribution Cubicle of Panel MV01 containing Incomer Breaker F11
MV01 P01	Sub Distribution Cubicle of Panel MV01 containing Motor Starter P01
	OR
MV P01	Sub Distribution Cubicle of Panel MV01 containing Motor Starter P01
ETM 01	PLC Remote I/O Distribution Panel associated with MV Switchgear P01
ETL 01	PLC Remote I/O Distribution Panel associated with LV Panel LV01
DH 11	Density Hut Control Panel associated with Launcher Device Group 11

JB 10	Instrument Junction Box associated with Receiver Device Group 10
JB P01	Instrument Junction Box associated with Mainline Pumpset P01
FH01	Fire Hut Control Panel 01

4.6. Assignment Rules – Location Designation

Each Panel (and components thereof) shall be identified by means of a Functional and Location Identifier. The Location Identifier shall comprise of the Functional Identifier as detailed in Section 7.1 above (and prefix "+ "), followed by a three digit alphanumeric Tier/Row Identifier. Tier/Row Identification shall be indicated by the addition of a full stop sign "." as a suffix to the identifier.

Panel Identifier Examples:

LV01 X01.3F2	Aux Motor Starter Cubicle located in LV Panel LV01, Tier 3, Row 2
MV01 F11.1F	3.3 kV Incomer Breaker F11 located in MV Panel MV01, Tier 1

8. ELECTRICAL & INSTRUMENT CABLE IDENTIFIERS

Electrical & Instrument Cabling may be identified by use of Cable Identifiers, which are allocated to cabling installed at functional locations within and outside of Transnet Pipelines Pump Station confines.

The reader is referred to the following Plant & Equipment Identification Standard as included in the Appendices.

FUNCTIONAL DESIGNATION PL 118739 Cabling

4.7. Assignment Rules

1. Each Cable shall be identified by means of a Cable Identifier comprising of the following components:
   - single digit Type Identifier used to identify whether the cable is used for power or control purposes
   - a Functional Descriptor of the equipment to which the cable is terminated (either source or destination)
   - a Signal Type Identifier which may be used to indicate additional information under the following circumstances only:
     - on Instrument Multicores to indicate signal type (discrete or analogue)
     - on Electrical Cables running to motors, to differentiate between functions (heater versus emergency stop)

2. For details on Functional Descriptors, the reader is referred to Transnet Pipelines Specification PL727 "Cabling, Racking, Trenching & Earthing Installation Codes of Practice" Section 8.5.

9. PROCESSING PIPING IDENTIFIERS

Process Piping may be identified by use of Piping Identifiers, which are allocated to piping installed at functional locations within and outside of Transnet Pipelines Pump Station confines.

The reader is referred to the following Plant & Equipment Identification Standard as included in the Appendices.

FUNCTIONAL DESIGNATION PL 118740 Process Piping

4.8. Assignment Rules

1. Each Plant item shall be identified by means of a two digit Station Identifier (and prefix "= "), followed by a nine digit alphanumeric Function Identifier.

2. The Function Identifier shall comprise of a first letter used to denote Pressure Rating, followed by a three digit ID used to identify Line Size, followed by a two digit ID used to identify Material Composition, followed by a three digit number used to uniquely identify the pipe in question.

3. Process Piping Identifiers shall be allocated to P & ID Diagrams below the process line where drawn on the horizontal, and to the right of process lines were drawn vertically.

10. APPENDICES

Plant and Equipment can be identified on Transnet Pipelines Sites using two forms of Identifiers; namely, by Function using the Function Designation System (identified by the prefix "= "), or by Location using the Location Designation System (identified by the prefix "+ "). In this regard the following documentation attached details each Standard:

FUNCTIONAL DESIGNATION	PL 118736-A	Plant & Equipment
	PL 118737	Instrumentation
	PL 118738	Panels
	PL 118739	Cabling
	PL 118740	Process Piping
LOCATION DESIGNATION	PL 118741	Panels

ADDENDUM No 1

EQUIPMENT, ELECTRICAL AND INSTRUMENT TAG NUMBERING STANDARDS - INTEGRATION INTO THE SAP/R3 BUSINESS MANAGEMENT PLATFORM.

Equipment/Electrical/Instrument Tag Numbering Standards have been integrated into a Structure **Indicator** defined within the SAP R3 Business Management platform and used for the purposes of

equipment, electrical and instrument identification, specification, historic tracking and management reporting functionality. This Structure Indicator, as utilised by SAP R3, comprises of two separate parts, namely, a **Functional Location Identifier** which describes the specific location in the plant at which the equipment is installed, and an **Equipment/Instrument/Electrical Identifier** as defined in the respective Tag Numbering Standards attached. Incorporation of the Equipment, Instrument and Electrical Tag Numbering Systems into the Structure Indicator ensures integration between the AutoCAD P&ID Design and SAP R3 Business Management platforms.

Table A1. Structure Indicator.

STRUCTURE INDICATOR

FUNCTIONAL LOCATION IDENTIFIER — EQUIPMENT IDENTIFIER

X - X - XXXX - X - XXX - X - XXX - XXXXXXXXX

1 2 3 4 5 6 7 8

where

1. **Company Code** P for Transnet Pipelines.
2. **District Code** H for Head Office, N for Northern District, S for Southern District.
3. **Depot Code** Refer to Table A2 below.
4. **Depot Sub-Code** O for Operational, N for Non Operational cost allocation.
5. **Pipeline Code** Currently under investigation. PL1 for Multiproducts (12 inch), PL2 for Gas (18 inch), PL3 for Crude (16 inch), PL11 for NMPP (24 inch), SHR for Shared.
6. **Line Function Code** M for Mechanical, E for Electrical, C for Civil, I for Instrument, S for Services, T for Info Tech etc.
7. **Process/Plant Code** Refer to Table A3 below.
8. **Equipment Identifier** Refer to Tag Numbering Standards attached.

P - N - ALR1 - O - PL1 - M - R01 - XVR1A
P - N - ALR1 - O - PL1 - I - P01 - TT011
P - S - HWK - O - PL2 - E - X01 - K01
P - S - HTP1 - O - PL11 - I - P01 - PT011

A.1 FUNCTIONAL LOCATION IDENTIFIER.

The Functional Location Identifier is used to define the exact location of equipment/ instrumentation on a Transnet Pipelines Pump Station site. As such the Identifier has been split ito several parts called **codes** defined below.

A.1.1 Company Code

Used to identify the company to which the equipment belongs. This code is usually given the letter "**P**" to denote Transnet Pipelines.

A.1.2 District Code

Used to identify the District responsible for the management and maintenance of the equipment. The following options have currently been defined:

N for Northern Districts
S for Southern Districts
H for Head Office

A.1.3 Depot Code

Used to identify the Depot to which the equipment belongs. This code has been defined on managerial/cost centre basis. The following options have currently been defined:

Table A2. Depot Codes

Depot Name	Operations SAP R3	Technical SAP R3	M & I SAP R3	M & I AutoCAD P&ID
Airport	APT1			21
Alrode	ALR1	ALR2	ALR3	18
Benoni	BIR1			Not Allocated
Bethlehem	BEM1			13
Bethlehem TOP	BHT1			12
Coalbrook	CBK1	CBK2		17
Durban	DNR1			02
Duzi	Duzi			
Empangeni	EMG1	EMG2		32
Fort Mistake	FTM1			
Fynnlands	FYN1			01
Hillcrest	HLR1			03 (DJP) , 04 (DWP)

Hilltop	HTP1			
Howick	HWR1			07 (DJP) , 08 (DWP)
Jameson Park-1438	JMP			
Jameson Park TPL-1475	JMP1			
Klerksdorp	KRP1			20
Kendal	KDL1			36

Table 2. Continued

Depot Name	Operations SAP R3	Technical SAP R3	M & I SAP R3	M & I AutoCAD P&ID
Kroonstad	KRO1	KRO2		14
Ladysmith	LAY1	LAY2		09 (DJP) , 10 (DWP)
Ladysmith TOP	LST1			Not Allocated
Langlaagte	LLA1			24
Magdala	MGA1			15
Mahlabatini	MAT1			33
Mnambithi	MBT1			
Mngeni	MGN1			
Mooi River	MRR1			
Newcastle	NCS1			28
Pietermaritzburg	PZB1	PZB2		05
Pietermaritzburg TOP	PMT1			06
Potchefstroom	PCM1			19
Pretoria West	PWT			23
Quagga	QGA1			35
Rustenburg	RTR1			26
Sasolburg	SBG1			16
Scheepersnek	SCN1	SCN2		34
Secunda	SEC1			31
Standerton	SNR1	SNR2		30
Tarlton	TLR1	TLR2		25
Twini	TNI1			
Van Reenen	VRN1			11
Villiers	VLR1			
Volksrust	VRR1			29
Vrede				
Waltloo	WAO1			22
Warden	WDN1			
Wilge	WIL1			
Witbank	WIR1			27
Transnet Pipelines Head Office	PHO9			Not Allocated
Transnet Pipelines Northern District	NDO9			Not Allocated

Transnet Pipelines Southern District	SDO9			Not Allocated

A.1.4 **Depot Sub Code**

Used to assign equipment costs into operational and non-operational cost categories. The following two options are available:

O for operational costs
N for non-operational costs

A.1.5 **Pipeline Code**

Used to assign equipment to particular pipelines. Currently under evaluation by Transnet Pipelines. An initial proposal has been defined as follows:

PL1 for the Multiproducts (12 inch) pipeline
PL2 for the Gas (18 inch) pipeline
PL3 for the Crude (16 inch) pipeline
PL11 for the NMPP (24 inch) pipeline
SHR for shared equipment

A.1.6 **Line Function Code**

Used to define the Line Function responsible for the maintenance of the equipment. The following options have currently been defined:

C	for Civil
E	for Electrical
F	for Fire and Effluent
G	for General
I	for Metering and Instrumentation
M	for Mechanical
S	for Services
T	Information Technology

A.1.7 **Process Plant Code**

Used to define the location of process plant installed on the respective Transnet Pipelines sites. Note that Process Plant is defined as a **grouping of equipment and instrumentation that combine to perform a common function** e.g. piping, valves and instrumentation that combine to form a piece of process plant called a Receiver. Identification of Process Plant conforms to the Ops Code standard as adopted by Transnet Pipelines and detailed in PL 101 Section 5.1.

Table A3. Ops Code Definition (Process Plant)

X	X	X

OPERATIONAL CODE TABLE					
A	Accumulator	A		A	Inlet
B	Booster	B		B	
C	Consignee/or	C	Caltex	C	
D	Distributor	D		D	
E		E	Petro SA	E	Discharge
F	ProverTransfer	F		F	
G	Blender	G		G	
H	Header	H		H	
I	Isolation	I		I	
J		J		J	Control
K		K		K	Bypass
L	Launcher	L		L	
M	Meter	M	Engen	M	
N	Reverse Pump	N	BP	N	Transfer
O		O		O	
P	Main Pumps	P		P	
Q	Fans	Q		Q	
R	Receiver	R	Sasol	R	Reverse
S	Strainer	S	Shell	S	
T	Tank	T	Total	T	
U	Lube System	U		U	
V		V		V	Vent
W		W	Vopak	W	Drain
X	Aux Pumps	X		X	Launch
Y	Meter Prover	Y		Y	
Z		Z		Z	
		1			
		2			
		3	Diesel 500ppm		
		4			
		5			
		6	ULP-95 Octane		
		7			
		8	Avtur		
		9			
		14	Ulp -93 Octane		
		33	Diesel 50ppm		
		76	Crude Oil		

Note: For an adequate understanding of the Table above, please refer to the Assignment Rules below.

Assignment Rules.

1. Each Plant item shall be identified by means of a three digit alphanumeric identifier in compliance with Table 1.

2. The first letter shall convey the **functional location** of the equipment in the plant.

3. The second and third characters shall comprise of a double-digit consecutive number used to uniquely identify the particular piece of process plant and shall be allocated per Pump station on a consecutive basis. (E.g. where three Auxiliary Pumps exist these shall be identified as X01, X02, X03 irrespective of their function).

   In multiproduct dedicated manifolds, the third letter **may** be used to identify the product type associated with the particular piece of process plant as follows:

   3 Diesel 500ppm
   6 ULP - 95 Octane
   8 Avtur
   14 ULP - 93
   33 Diesel - 50ppm
   73 Crude oil

4. No separators (e.g. Dashes) shall be used to separate characters in the identifier.

Process Plant Examples: (Allocated on a Pump Station basis).

Main Pump	P01	Main Line Pump No. 1
	P02	Main Line Pump No. 2
	P03	Main Line Pump No. 3
	P04	Main Line Pump No. 4
Accumulator Pump	A01	Accumulator Pump No. 1
	A02	Accumulator Pump No. 2
Booster Pump	B01	Booster Pump No. 1
	B02	Booster Pump No. 2
Auxiliary Pumps	X01	Sump Pump
	X02	Sump Pump
	X03	Lube Pump
	X04	Lube Pump
	X05	Inhibitor Pump
	X06	Inhibitor Pump
	X07	Petrol Blend Pump
	X08	Diesel Blend Pump
	X09	Petrol Prover Transfer Pump
	X10	Diesel Prover Transfer Pump
	X11	ULP Blend Pump
	X12	ULP Prover Transfer Pump

	Q01	Purge Air Fan 1
	Q02	Purge Air Fan 2
	Q03	Pressurisation Fan 1
	Q04	Pressurisation Fan 2
Meters	M01	Turbine/Positive Displacement Meter No 1.
	M02	Turbine/Positive Displacement Meter No 2.
Strainers	S01	Main Line Strainer
	S02	Main Line Strainer
	S03	Main Line Strainer
	S04	Main Line Strainer
	S05	Petrol Header Strainer (Delivery Station)
	S06	Petrol Header Strainer (Delivery Station)
	S07	Diesel Header Strainer (Delivery Station)
	S08	Diesel Header Strainer (Delivery Station)
	S09	ULP Header Strainer (Delivery Station)
	S10	ULP Header Strainer (Delivery Station)

11. DOCUMENT CHANGE HISTORY:

The owner of this document is responsible for the revision and control of the document, including updating of the table below, which contains the history of the document with details of each revision.

Date	Previous Rev No.	New Rev No.	Details of Revision
15.01.99	00	01	Document approved for distribution.
23.05.00	01	02	Phase II revisions added.
15.04.01	02	03	Instrument Group ID Allocations revised. Plant & Equip Identification Stds clarified.
01.08.07	03	04	Transnet Pipelines logo added.
12.06.2012	04	05	New Transnet Standard Template Adopted Updating the Reference Documentation
25.05.2016	05	06	Document review & update & New Template
06-03-2017	05	06	NMPP codes included on PL-118736-A

This table summarises what has been changed in the document so that it is easy to keep track of the effected changes.

DRAWING OFFICE STANDARD EQUIPMENT, INSTRUMENT AND ELECTRICAL SYMBOLOGY (PL102)

DOCUMENT APPROVAL PROCESS

NAME		POSITION/MEETING NO.	SIGNATURE	DATE
Originator:				
Approver:				
Original date: 15 June 2016				
Effective date:				

TABLE OF CONTENT

1. INTRODUCTION

The purpose of this standard is to establish a uniform means of designating plant, equipment, instrumentation and electrical switchgear as installed on the respective pump station sites within Transnet Pipelines, on technical drawings and in documentation. By ensuring a comprehensive, consistent and uniform means of representing plant, equipment and instrumentation on technical drawings and in documentation, it is hoped that this Standard will assist in the rapid identification of equipment and instrumentation, as well as correct interpretation of information presented.

2. SCOPE

2.1. GENERAL

This document defines graphical symbology standards to be adopted when representing all plant, equipment, instrumentation and electrical switchgear on technical drawings and in documentation. Plant, equipment and instrumentation symbology has been based on the Instrument Society of America Standards ISA S5.1-1984 and ISA S5.3-2009 respectively, and supplemented to include Transnet Pipelines specific equipment. Electrical Switchgear symbology has been based on the International Electrotechnical Commission Standards IEC Publication 60617 as adopted by SABS/NRS 002-2000.

It is not the intent of these Standards to mandate the usage of each type of symbol for each occurrence of a generic device within the overall control system, which may result in undue complexity, but rather to enable the designer the facility to use internationally recognised symbology to convey the level of detail required to accurately reflect the process.

In this regard, symbology and rules of usage as defined within this Standard are required to be adhered to by Client and Contractor alike, for and on behalf of Transnet Pipelines, a Division of Transnet Ltd. Both Client and Contractor will be 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 provider liable for corrections at his own cost.

These Standards 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 Pipelines 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 Schedule of Contract Documents) and this document, the former shall prevail.

2.2. APPLICATION TO WORK ACTIVITIES

The Standards contained herein are suitable for use whenever plant, equipment, instrumentation or electrical switchgear are required to be represented in technical drawings and in documentation. These Standards thus cover designation of plant, equipment, instrumentation and electrical switchgear in the following types of documentation:

- Flow Diagrams, process and mechanical
- Piping and Instrumentation diagrams
- Instrumentation system diagrams
- Electrical switchgear diagrams
- Specifications, purchase orders, manifests and other lists
- Construction Drawings
- Technical Papers, literature and discussions
- Tagging of Instruments
- Installation, operation and maintenance instructions, drawings and records

3. REFERENCE DOCUMENTATION

The following standard specifications are to be used for reference purposes. It is expected of Tenderers 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.

A. Standards and Recommended Practices for Instrumentation and Control, 11th Edition, Instrument Society of America.

ANSI/ISA-S5.1-2009	Instrument Symbols and Identification
ANSI/ISA - S 5.2-1992	Binary Logic Diagrams for Process Operations
ANSI/ISA-S5.3-1983	Graphic Symbols for Distributed Control, Shared Display Instrumentation, Logic and Computer Systems
ANSI/ISA - S 5.5-1985	Graphic Symbols for Process Displays

B. Graphical Symbols for Electrical Diagrams NRS 002-2000 second edition.

C. International Electrotechnical Commission Standards for Electrical Drawings

IEC Publication 27	Letter Symbols to be used in Electrical Technology
IEC Publication 50	International Electrotechnical Vocabulary
IEC Publication 617	Graphical Symbols for Diagrams

D. American Society of Mechanical Engineers (ASME)

ASME Y32.11 - 1961	Graphical Symbols for Process Flow Diagrams
ASME Y32.2.3 - 1994	Graphical Symbols for Pipe Fittings, Valves & Piping.

4. ABBREVIATION

For the purpose of understanding these Standards, the following abbreviations apply.

ANSI	:	American National Standards Institute
C & I	:	Control and Instrumentation
IEC	:	International Electrotechnical Commission
ISA	:	Instrument Society of America
SABS	:	South African Bureau of Standards
ASA	:	American Standards Association

5. EQUIPMENT & INSTRUMENT SYMBOLOGY STANDARD

Equipment / Instrument Symbols as defined in the tables contained in Appendix A conform to the following standards:

A. Standards and Recommended Practices for Instrumentation and Control, 11th Edition, Instrument Society of America.

ANSI/ISA-S5.1-2009	Instrument Symbols and Identification
ANSI/ISA - S 5.2-1992	Binary Logic Diagrams for Process Operations
ANSI/ISA-S5.3-1983	Graphic Symbols for Distributed Control, Shared Display Instrumentation, Logic and Computer Systems
ANSI/ISA - S 5.5-1985	Graphic Symbols for Process Displays

B. American Society of Mechanical Engineers (ASME)

ASME Y32.11 - 1961	Graphical Symbols for Process Flow Diagrams
ASME Y32.2.3 - 1994	Graphical Symbols for Pipe Fittings, Valves & Piping.

The symbol descriptions listed to the right of each symbol are intended to serve as guidelines for applicability and have been supplemented by comments where further clarity may be required.

5.1. SYMBOL DEFINITIONS (Refer to Appendix A)

Table 1 General Instrument or Function Symbols
Table 2 Interlock and Math Functionality
Table 3 Line Symbology
Table 4 Fire System Symbology
Table 5 General Symbology
Table 6 Pump Symbology
Table 7 Valve Symbology
Table 8 Mechanical Symbology
Table 9 Equipment Symbology
Table 10 Tank Symbology

5.2. RULES FOR USAGE

5.2.1 . Individual pieces of equipment and instrumentation shall be uniquely identified on technical drawings and documentation via means of the symbols defined above. Where pieces of equipment / instrumentation have easily defined or recognisable relationships, these need not be individually tagged on a diagram. For example, an orifice plate need not be separately tagged to the differential pressure transmitter, for the purposes of flow measurement. Also, where there is a primary element connected to another instrument on a diagram, use of a symbol to represent the primary element on the diagram is optional.

5.2.2 . Where an instrument/equipment has more than one function and denotation of these are necessary to gain a full understanding of the process, these functions may be individually reflected by symbols located alongside one another and tagged separately. Use of contiguous symbols may thus be used to reflect the following additional functionality:

- Interfacing between associated instruments e.g. hardwiring, internal system links, backup.
- Instrument integrated multiple functions.

5.2.3. Brief explanatory notation may be added adjacent to the symbol or line to clarify instrument functionality e.g. a lead analyser may have the letters Pb placed adjacent to the symbol to indicate the function of the analyser; a temperature probe may have the letters PT100 placed adjacent to the symbol to indicate the element type.

5.2.4. Where math functionality is performed within an instrument (e.g. square root extraction) such functionality may be indicated by means of explanatory notation placed adjacent to the instrument symbol.

5.2.5. Orientation and sizing of symbology should be selected with neatness and legibility in mind. Function Block designation and Tag Numbers should always be drawn on the horizontal.

5.2.6. Electrical, pneumatic or other power supply to an instrument need not be shown, unless it is essential to an understanding of the function or operation of an instrument or loop.

5.2.7. The sequence in which instruments or functions are connected on a diagram should reflect the functional logic and need not necessarily correspond to the signal connection sequence. For example, an analogue instrument using voltage feedback requires parallel wiring whereas an instrument using current feedback requires series wiring, although both are represented in documentation using identical symbology.

5.2.8. The degree of detail to be applied to each document or drawing lies is entirely at the discretion of the user. For example, sketches and technical papers usually contain simplified symbology whereas P & ID Diagrams and Process Flow Diagrams may show all in-line components. In all cases, consistency should be exercised for each document /drawing type, and in this regard the reader is required to familiarise himself with examples of drawings included in the Drawing Standards Document in order to ascertain degree of detail requirements.

5.2.9. Interlocking Functionality. For the sake of clarity and in order to prevent technical drawings from becoming cluttered, only hardwired interlocking functionality need be reflected on technical drawings produced for and on behalf of Transnet Pipelines. All other interlocking functionality shall be defined in Software Documentation and Functional Design Specifications accompanying the installation of Control Systems technology.

5.2.10. Where graphical symbols are similar in nature and may cause misinterpretation, cautionary notes should be added to the document/drawing, in order to assist in interpretation.

5.2.11. Alarm and Trip Functionality. All derived tags (alarm and trip functionality) shall be represented by the placement of additional notation alongside the instrument symbol on a drawing. In this regard the following notation has been derived to date:

PAHH	Press Trip High
PAH	Press Alarm High
PALL	Press Trip Low
PAL	Press Alarm Low
dP/dT	Rate of Change
PDA	Deviation from Setpoint

6. EQUIPMENT & INSTRUMENT SYMBOLOGY STANDARD

Electrical Switchgear Symbology used shall conform to the International Electrotechnical Commission Standards IEC Publication 60617 as adopted by SABS/NRS 002-2000 (Amended 1994).

Lists of the more commonly used symbols have been included in Appendix B for reference purposes. The symbol descriptions listed to the right of each symbol are intended to serve as guidelines for applicability and have been supplemented by comments where further clarity may be required.

7. APPENDICES
APPENDIX A

Equipment & Instrument Symbol Tables

Table 1
General Instrument or Function Symbols

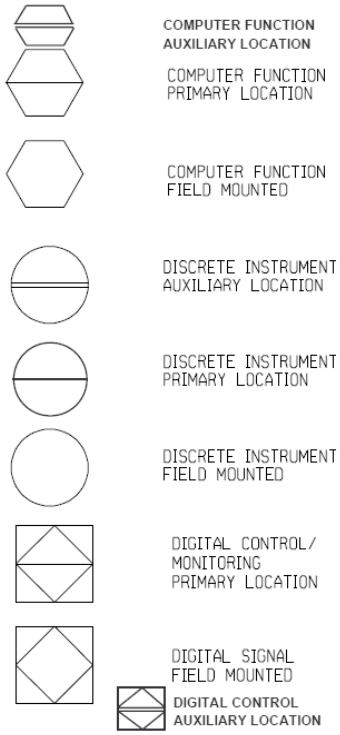


Table 2
Interlock and Math Functionality

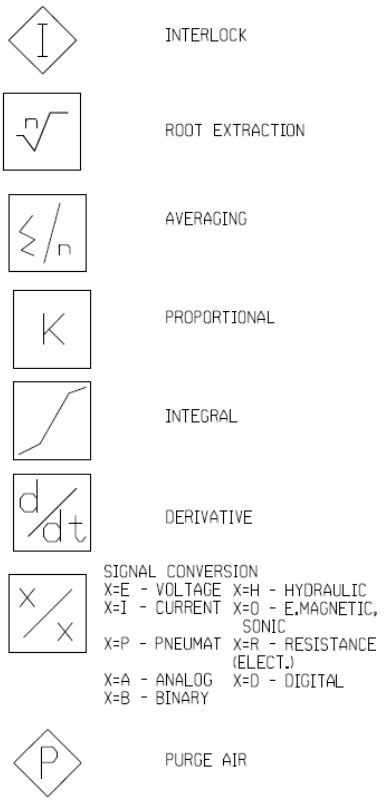


Table 3
Line Symbology

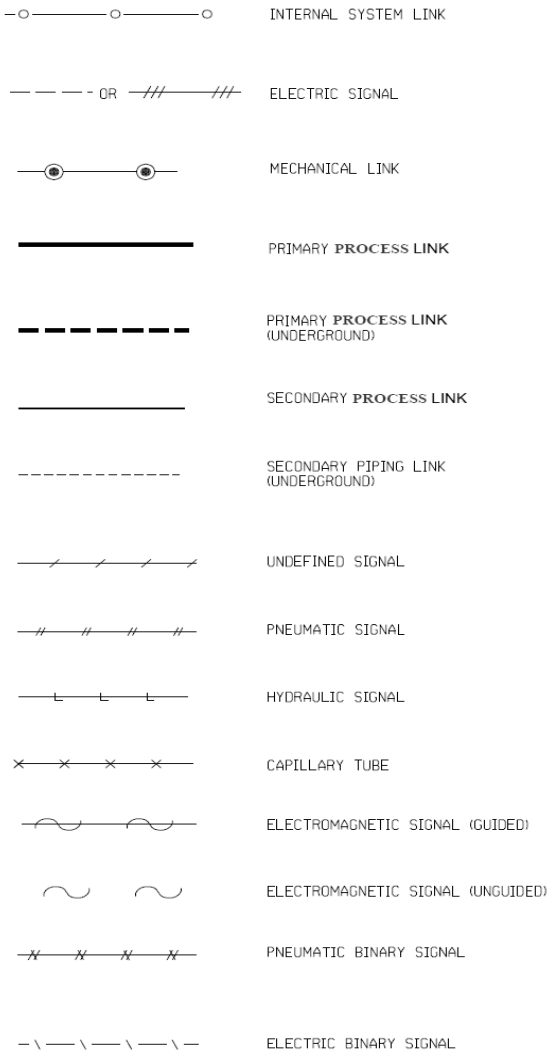


Table 4
Fire System Symbology

Table 5
General Symbology

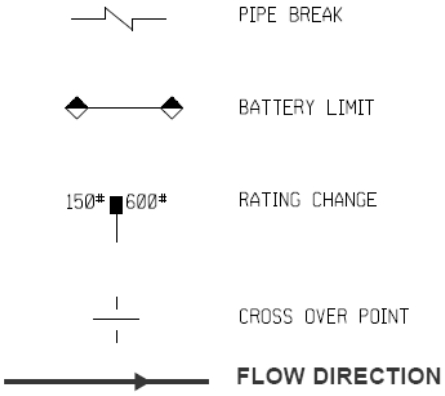


Table 6
Pump Symbology

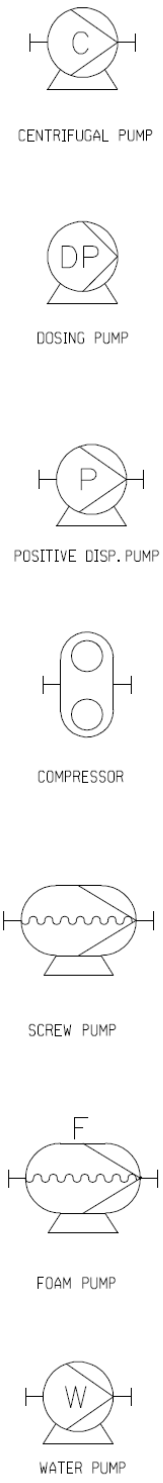


Table 7
Valve Symbology

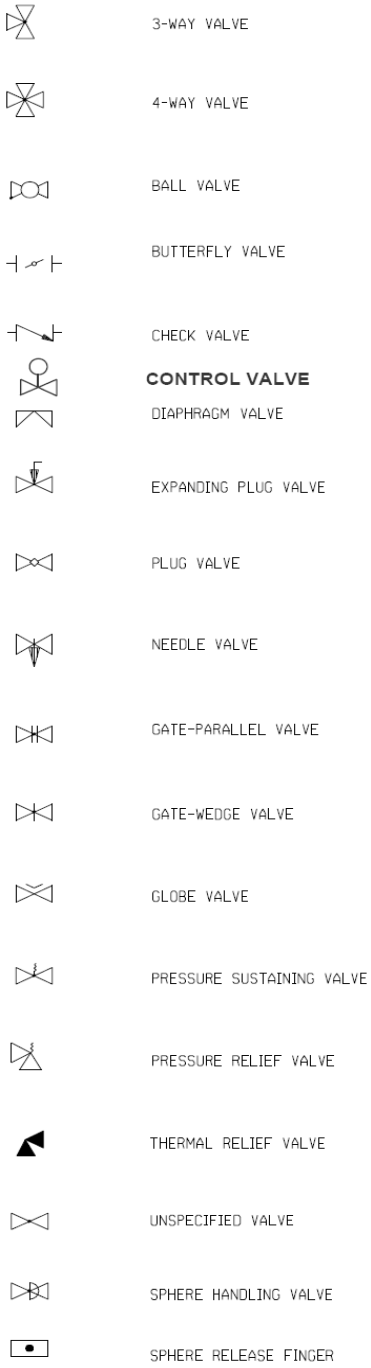


Table 8
Mechanical Symbology

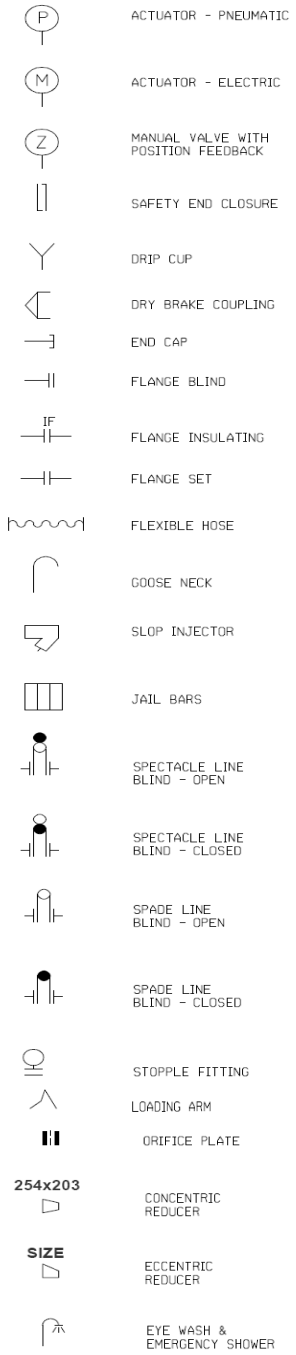


Table 9
Equipment Symbology

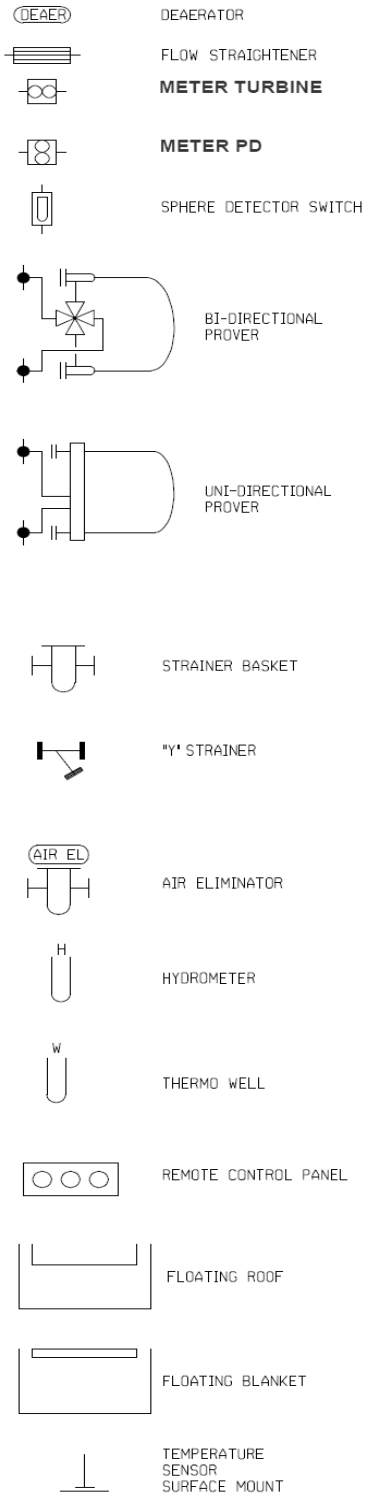
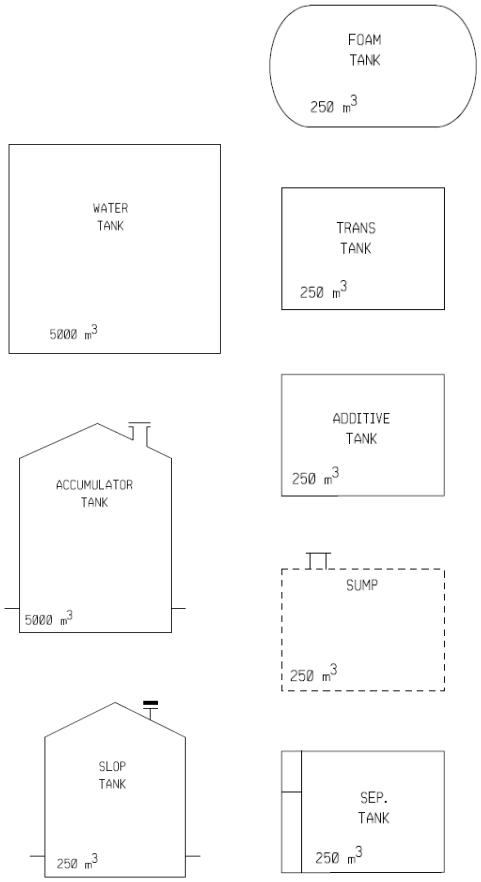


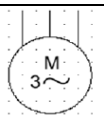
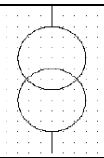
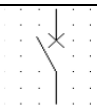
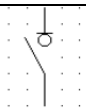
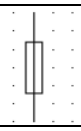
Table 10
Tank Symbology



APPENDIX B

Electrical Switchgear Symbol Tables

Graphical Symbols for Electrical Diagrams NRS 002-2000 second edition.

	Earth general symbol Earthing, general symbol, Ground (US) general symbol; Grounding (US) general symbol		Coil, general symbol, Winding general symbol Inductor; Choke
	Make contact, general symbol, switch, general symbol		Semiconductor diode, general symbol
	Break contact		Induction motor, three phase, squirrel cage
	Change-over break before make contact		Transformer with two windings, general symbol (form 1)
	Circuit Breaker		Rectifier
	Disconnector, Isolator		Primary cell
	Switch-disconnector, On-load isolating switch		Lamp, general symbol lamp Signal lamp, general symbol
	Operating device, general symbol; Relay coil, general symbol Operating coil of a selector (form 1)		Direct current
	Fuse, general symbol		Alternating current
	Resistor, general symbol		
	Capacitor, general symbol		

8. DOCUMENT CHANGE HISTORY:

The owner of this document is responsible for the revision and control of the document, including updating of the table below, which contains the history of the document with details of each revision.

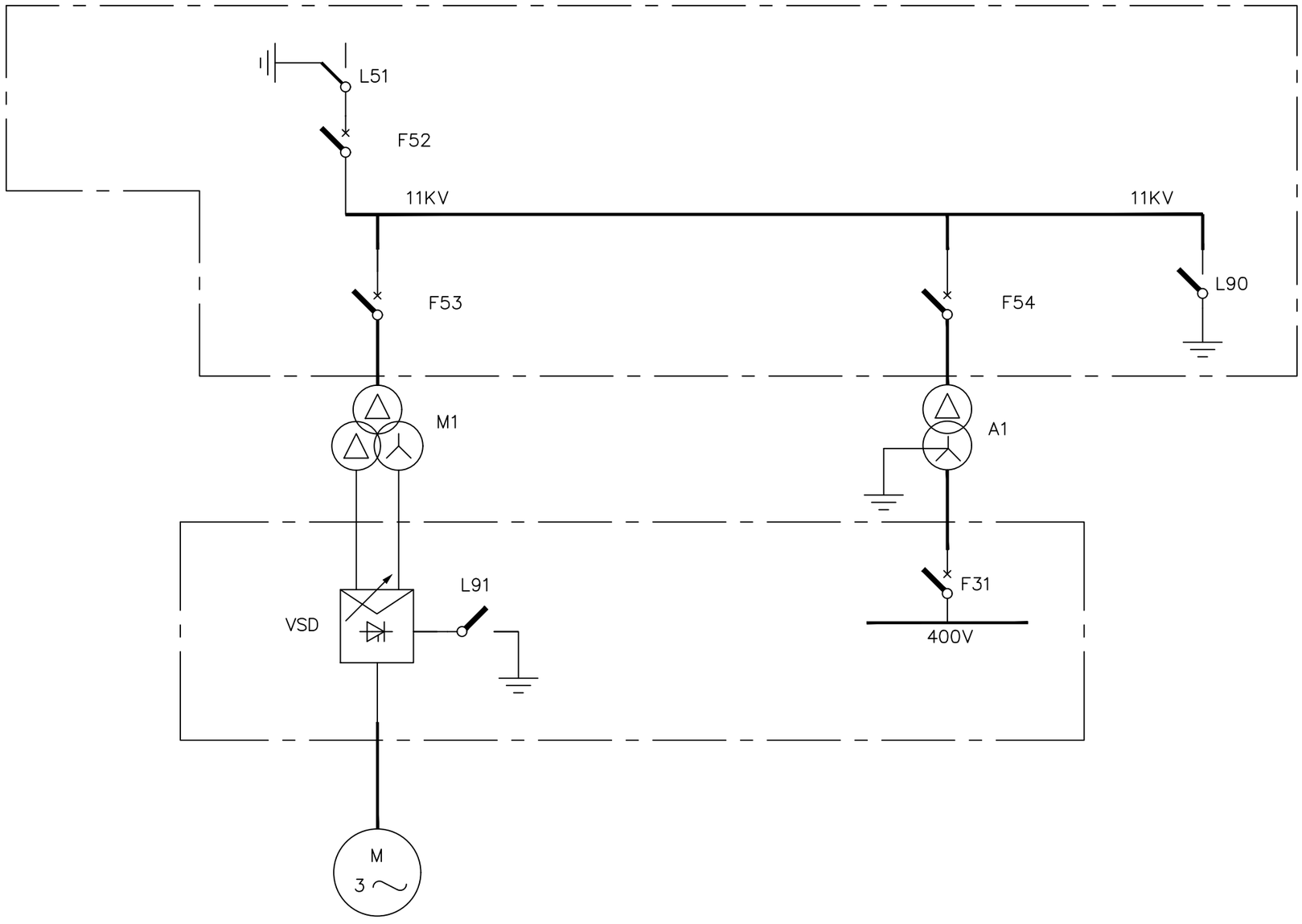
Date	Previous Rev No.	New Rev No.	Details of Revision
15.01.99	00	01	Document approved for distribution.
12.06.12	01	02	New Transnet Standard Template Adopted
26.05.16	02	03	Document review and update & New Template

This table summarises what has been changed in the document so that it is easy to keep track of the effected changes.

ALL EQUIPMENT UNDER JURISDICTION OF "CONTROL"

11KV SUPPLY

MNGENI,DUZI AND MOOI RIVER



LEGEND

= CIRCUIT BREAKER

= LINK

= VARIABLE SPEED DRIVE

M1 = MAIN TRANSFORMER 2.1MVA

A1 = AUX. TRANSFORMER 150 KVA

FOR INFORMATION PURPOSES ONLY

TRANSNET pipelines

H.V. DISTRIBUTION DIAGRAM

TYPICAL 11KV: CRUDE BOOSTER SUBSTATION

REVISIONS

PROJECT NAME

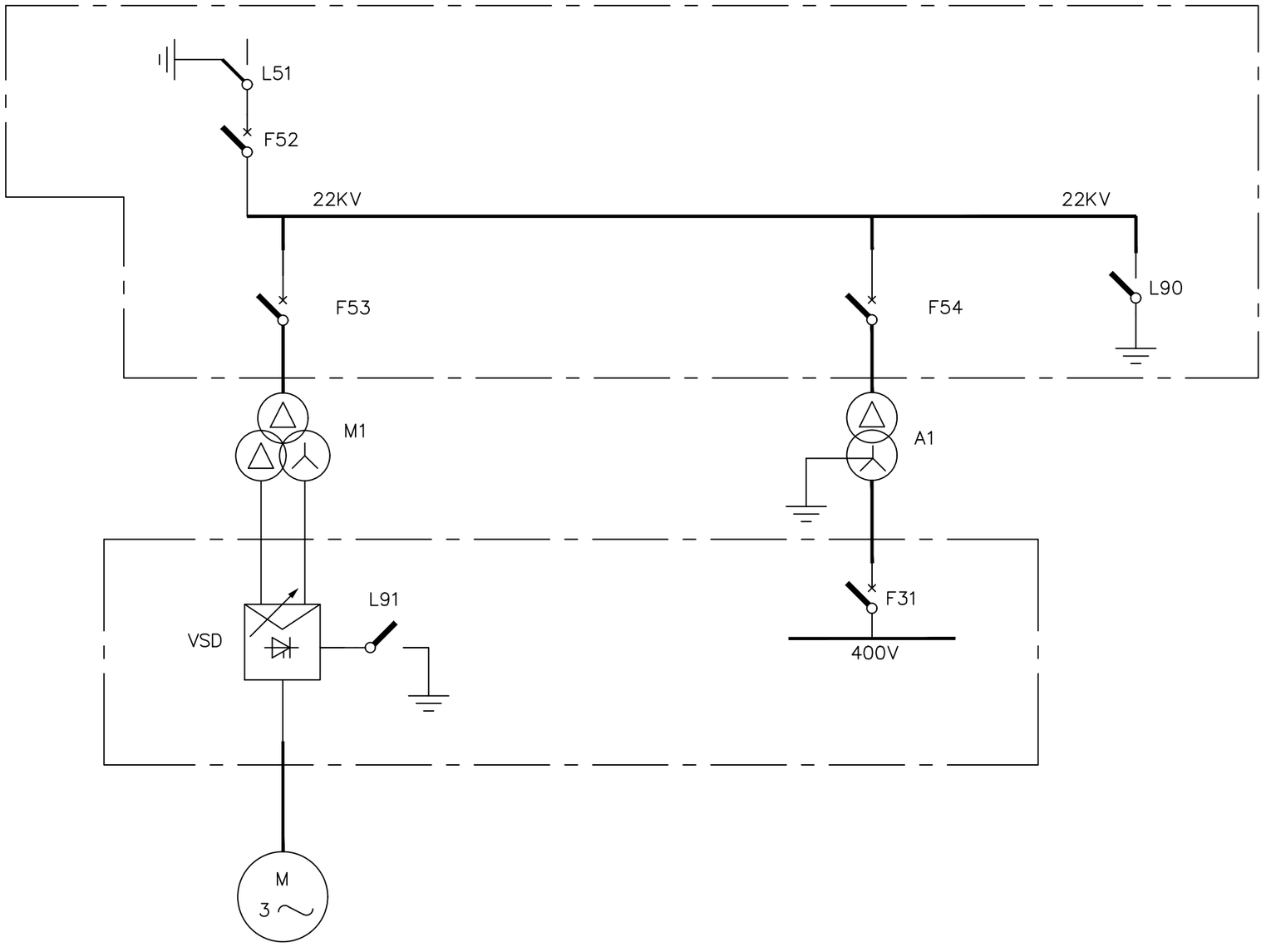
DRAWN	W.D	REF.	
TRACED	CAD	DATE	2023-06-26
CHECKED	V.G	APPROVED	Z.M
SCALE	N.T.S.		

DRAWING No. PL 122646 REV

ALL EQUIPMENT UNDER JURISDICTION OF "CONTROL"

22KV SUPPLY

FORT MISTAKE AND WILGE



LEGEND

= CIRCUIT BREAKER

= LINK

= VARIABLE SPEED DRIVE

M1 = MAIN TRANSFORMER 2.1MVA

A1 = AUX. TRANSFORMER 150 KVA

FOR INFORMATION PURPOSES ONLY

TRANSNET pipelines

H.V. DISTRIBUTION DIAGRAM

TYPICAL 22kV CRUDE BOOSTER SUBSTATIONS

REVISIONS			
PROJECT NAME			
DRAWN	W.D	REF.	
TRACED	CAD	DATE	2023-06-26
CHECKED	V.G	APPROVED	Z.M
SCALE	N.T.S.		
DRAWING No. PL 122647			REV