


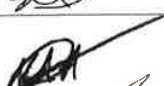

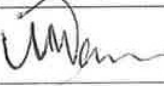
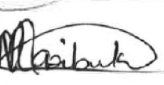


TRANSNET SOC LTD

ENQUIRY/CONTRACT NUMBER:

CONTRACT TITLE: ACQUISITION OF CRITICAL SPARES (TRANSFORMERS WORK PACKAGE) AT RICHARDS BAY FOR TRANSNET SOC LTD (REG.NO.1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS, (HEREINAFTER REFERRED TO AS "TPT") FOR THE PORT OF RICHARDS BAY, AS A ONCE OFF SUPPLY.

### Scope of Work Approval Signatures

	Name	Title	Signature	Date
Compiled by	Kedibone Phume	Projects Manager		02/03/2021
Reviewed	Mbali Cele	Senior Project Manager(Acting)		03/03/2021
Reviewed	Siyabulela Diya	Technical Manager – HT Department		03/03/2021
Reviewed	Khulani Msane	Engineering Technician		03/03/2021
Approved	Vusimuzi Mazibuko	Engineering Manager – HT and Automation		04/03/2021



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## **SCOPE OF WORK**

**DESIGN, MANUFACTURE, SUPPLY AND DELIVERY OF HIGH VOLTAGE TRANSFORMERS  
FOR TRANSNET SOC LTD OPERATING AS TRANSNET PORT TERMINALS AT THE PORT  
OF RICHARDS BAY BULK TERMINAL**

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## **C3.1: *PURCHASER'S* GOODS INFORMATION**

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## **1 DESCRIPTION OF WORKS AND BACKGROUND**

### **1.1 Interpretation and Terminology**

The following abbreviations are used in this document:

<b>Abbreviation</b>	<b>Abbreviation meaning</b>
CEMP	Construction Environmental Management Plan
CD	Compact Disc
CDR	Contractor Documentation Register
CDS	Contractor Documentation Schedule
CRL	Contractor Review Label
CSHEO	Contractor's Safety, Health and Environmental Officer
CM	Construction Manager
DWG	Drawings
EO	Environmental Officer
IR	Industrial Relations
IRCC	Industrial Relations Co-ordinating Committee
CIRP	Contractor's Industrial Relations Practitioner
Native	Original electronic file format of documentation
QA	Quality Assurance
SANS	South African National Standards
SHE	Safety, Health and Environment
SHEC	Safety, Health and Environment Coordinator

## **2 SCOPE OF WORKS**

### **2.1 General Description of the Works**

The work comprises of the design, manufacture, supply and delivery of High Voltage Transformers to the Port of Richards Bay, Transnet Port Terminals.

The following is the general requirements for supply of Transformers:

2.1.1 All transformers to be indoors designed and oil sealed standard: IEC60422.

2.1.2 All transformers must be fitted with bushing insulators.

2.1.3 Transformers must comply with SANS specification SANS 780:2009 Distribution Transformers.

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2.1.4 Transformers must comply with the following Transnet Standard Specification (refer to attachments):

- EEAM-Q-020 (Test On Electrical Equipment);
- EEAM-Q-021 (Specification for Electronic Equipment);
- EEAM-Q-023 (Med Voltage Equipment);
- EEAM-Q-013-E (Technical Data Sheet);
- EEAM-Q-008 (Corrosion protection);
- EEAM-Q-009 (Quality Management); and
- EEAM-Q-016 (General Requirements and Conditions).

2.1.5 All transformers must be protected against corrosion by comply with TPT Specifications attached under Annexures: EEAM-Q-008 Specification for Corrosion Protection.

## 2.2 Specifications

2.2.1 The following table comprises of the quantities and specifications of the required High Voltage Transformers to be supplied:

Item #	Equipment	Description and specification	QTY	Power	Enclosure	Vector number	Oil standard	Output voltage	Ratings
1	Elmec Shiploader 1	11kV Auto Transformer (1.6MVA output)	1	1.6 MVA	Indoors	DY11=DYN 11	MINERAL OIL, THAT IS USED FOR ONAN TRANSFORMERS	11kV (voltage in equals voltage out)	1.6 MVA
2	Substation	11kV - 110V ac voltage transformer	2	200VA		N/A		110 (secondary)	200VA
3	Substation	3.3kV - 110V ac voltage transformer	2	200VA		N/A		110 (secondary)	200VA
4	Substation	11kV - 3.3kV Transformer	2	2MVA		DY11=DYN 11		3.3kV (secondary)	2MVA
5	Substation	11kV - 400v transformer	2	2MVA		DY11=DYN 11		400v (secondary)	2MVA

### 2.2.2 Supporting Documents and TPT Specifications

SPECIFICATION means the document/s forming part of the contract in which are described the details and referenced part numbers of Transformers required by Transnet-Port of Richards Bay. The specifications referred to in this document include reference to the following (attached):

- EEAM-Q-020 (Test On Electrical Equipment)

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- EEAM-Q-021 (Specification for Electronic Equipment)
- EEAM-Q-023 (Med Voltage Equipment)
- EEAM-Q-013-E (Technical Data Sheet)
- EEAM-Q-008 (Corrosion protection)
- EEAM-Q-009 (Quality Management) and EEAM-Q-016 (General Requirements and Conditions), and;
- NRS 054

### **3 OPERATING MANUALS AND MAINTENANCE SCHEDULES**

The Manuals and Data Packs shall each be supplied by the *Supplier*. The Supplier shall provide 3 hardcopies and 2 electronic copies of all the operating, maintenance manuals and test certificates in English. The Data Pack and Operation and Maintenance Manuals shall be supplied as separate documents, each bearing a unique document reference number provided by the Purchaser. Manuals and Data Packs shall be well indexed and user friendly.

### **4 CONSTRAINTS ON HOW THE *SUPPLIER* PROVIDES THE GOODS AND SERVICES**

#### **4.1 Work to be done by the Delivery Date**

All manufactured Transformers to be sufficiently tested, certified and approved for delivery, installation and use in accordance with the ISO 9001-2015 quality management standards. Test certificates and delivery notes shall be supplied and handed over to Richards Bay Technical Department upon delivery of the respective spares.

#### **4.2 Management meetings**

The Supply Manager shall arrange for a once-off clarification meeting before the award of business to offer the opportunity to the Supplier to ask for any clarity that he/she may have concerning issues like specification, delivery lead times etc. for the required spares.

Any other meetings can be conducted as and when needed by either Client or the Supplier.

All meetings conducted shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

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### **4.3 Documentation control**

4.3.1 The *Supplier* shall submit all documentation (including correspondence and drawings) to Transnet Port Terminal (*Purchaser*) standards as dictated by the EEAM-Q-009 and to the *Supply Manager's* requirements in accordance with the *Purchaser's* document control procedure. The *Supplier* shall copy or send directly to the Richards Bay Transnet Port Terminal (TPT RCB) document controller, email address: [RBayDocControl@transnet.net](mailto:RBayDocControl@transnet.net), on all correspondences containing contract documentation.

4.3.2 The *Supplier* shall use his own suitable document control system for the control, maintenance and handling of all relevant documentation issued to him.

## **5 QUALITY ASSURANCE REQUIREMENTS**

The Supplier's Quality Management System must be in accordance with the International Standard ISO 9001-2015 and maintain the necessary accreditation and certification.

Once the contract is awarded proof of the following certification must be provided.

The Contractor shall have, maintain and demonstrate its use to the Project Manager the documented Quality Management System to be used in the performance of the works. The Contractor must submit his Quality Management System documents to the Project Manager as part of his program under ECC Clause 31.2 to include details of:

- Quality Management Plan for the contract
- Quality Control Plan
- Quality Policy
- Index of Procedures to be used; and
- A schedule of internal and external audits during the contract

The Contractor develops and maintains a comprehensive register of documents that will be generated throughout the contract including all quality related documents as part of its Quality Plan. The Project Manager indicates those documents required to be submitted for information, review or acceptance and the Contractor indicates such requirements within his register of documents. The register shall indicate the dates of issue of the documents with the Project Manager responding to documents submitted by the Contractor for review or acceptance within the period for reply prior to such documents being used by the Contractor.

The Quality Plan means the Contractor's statement, which outlines strategy, methodology, resources allocation, QA and Quality Control co-ordination activities to ensure that the works meet the standards stated in the Works.

Additionally, the following Purchaser's quality management documents must be adhered to:

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- EEAM-Q-021 (Specification for Electronic Equipment)
- EEAM-Q-008 (Corrosion protection)
- EEAM-Q-009 (Quality Management)

## **6 PROJECT PROGRAMME**

### **6.1 Programme Constraint**

The Contract programme, progress reports, subsequent updates, revisions and supplementary programmes as detailed in this section are an essential part of the project control system used by the Purchaser for managing the spares and in monitoring the progress of the spares under the Contract. The information and data provided by the Supplier pursuant to this procedure must therefore be reliable, accurate and timely in presentation. The programme must show lead times, original delivery dates and updated delivery dates etc. for every spares that the Supplier will supply and deliver. The delivery lead times are based on the time period to deliver the spares from award.

The Purchaser's preferred lead time for the Transformers is stipulated below:

- Maximum of 26 Weeks and minimum of 24 weeks lead time for 11KV transformers
- Maximum of 22 Weeks and minimum of 20 weeks lead time for 3.3KV-110Vac transformer

### **6.2 Programme Submission**

A copy of the Supplier's First Programme shall be submitted with the Tender Document returnable that shall comply with the requirements as indicated in the Works Information. The Supplier's Detailed Programme shall be submitted in both hard and soft copy forms within two weeks of award using a computer software package approved by the Supply Manager.

The preferred software package is Microsoft Projects.

### **6.3 Constraints at the Delivery Place**

The Supplier shall commit to the delivery milestones for carrying out the works through the project schedule. The delivery lead times will be used to evaluate the supplier. The Supplier is only allowed to deliver the goods during the working week (Weekdays – Monday to Friday) between 07h00 till 15h30.

The delivery address is as follows:

Transnet Port Terminals (TPT) at Richards Bay  
Transnet Harbour, Newark Road, Central Stores, Richards Bay, 3900.

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## **7 WARRANTIES AND GUARANTEES**

Warranties and Guarantees period on Transformers supplied in accordance with the requirements of Specifications for a period of 12 months from the date of delivery. The Supplier shall submit and maintain warranty certificates/ documentation from the OEM's on spares they have supplied and delivered to TPT Richards Bay.

Client prefers an **18 months** for a warranty and guarantee period on each of the transformers to be supplied.

## **8 EXPECTED DESIGN LIFE SPAN**

The transformers are expected to have the design life span of maximum of 25 years and with a minimum of 15 years, testing will be done at the supplier's facilities to proof the transformers functionality as per the requirement.

## **9 INVOICING AND PAYMENT**

The Supplier shall provide the Purchaser with a tax invoice and delivery note upon delivery of the respective spares/ components. These documents shall also be submitted to the Supply Manager.

The Supplier shall address the tax invoice to Purchaser and include on each invoice the following information:

- Name and address of the Supplier and the Supply Manager;
- The contract number and title;
- Supplier's VAT registration number;
- The Purchaser's VAT registration number.
- Description of goods and services provided for each item invoiced based on the Price Schedule;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT.

## **10 PROCUREMENT**

### **10.1 Plant and Materials**

#### **10.1.1 Plant & materials provided "free issue" by the *Purchaser***

There are no 'free issue' parts to be supplied by the Purchaser and all spares are to be provided by the Supplier.

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### **10.1.2 Supplier's Procurement of Spares**

The Supplier must take all necessary steps to ensure that all spares are adequately protected against damage during shipping, transport and storage.

### **10.2 Purchaser's entry and security control, permits, and site regulations**

The delivery area is situated within a Customs controlled area and the Supplier and his people shall observe all Customs regulations within the port area.

The delivery area is also within a promulgated port area and the Supplier and his people shall observe all ISPS and Port Regulations within the port area. Copies of the Harbour Regulations are obtainable from the Port admin offices.

### **10.3 Services and other facilities**

At all times during the delivery of the goods the Supplier is responsible for the safety of all persons and on the goods and shall have the necessary systems and procedures in place to effectively manage this.


The Supplier(s) must provide the information requested and comply with the requirements stated.

### **10.4 Work to be done at the Delivery Place by the Delivery Date**

In order to achieve the status of Delivery, the Supplier is required to move the goods into a storage area allocated by the Purchaser for this purpose.

## **11 ANNEXURES**

- i. EEAM-Q-020 (Test On Electrical Equipment)
- ii. EEAM-Q-021 (Specification for Electronic Equipment)
- iii. EEAM-Q-023 (Med Voltage Equipment)
- iv. EEAM-Q-013-E (Technical Data Sheet)
- v. EEAM-Q-008 (Corrosion protection)
- vi. EEAM-Q-009 (Quality Management) and EEAM-Q-016 (General Requirements and Conditions).

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COMPILED BY:       <b>EQUIPMENT ENGINEERING AND ASSET MANAGEMENT (GENERAL MANAGER)</b>		REVIEWED BY:       <b>SENIOR MANAGER (PROJECT MANAGER)</b>		REVIEWED BY:       <b>SENIOR MANAGER (ASSET MANAGER)</b>																																		
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**KEYWORDS**  
SPECIFICATION

DATE OF LAST REVIEW: N/A

DATE OF NEXT REVIEW: 01/06/2005

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2011/06/08



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## **1. SCOPE**

- 1.1. This specification covers site electrical pre-operational tests and commissioning tests required for electrical apparatus, wire, cables and other miscellaneous equipment and material as called for in the specifications and must be read in conjunction with the other specifications.

## **2. GENERAL INFORMATION**

- 2.1. Pre-operational tests and acceptance certificates as herein specified are defined as those tests and inspections required by the ENGINEER prior to equipment being energized to determine that the apparatus involved may be safely energized.
- 2.2. Calibrating tests, checks on limit switch settings, interlocking, PLC functioning etc. are so called cold commissioning or dry tests.
- 2.3. Hot commissioning tests are the tests as specified by the Engineer such as burn in tests for electronic equipment and continuous cycle tests etc. when the equipment is handling the product it was designed for.
- 2.4. Final acceptance will not only depend on equipment dependability, as determined by the subject tests, but will depend on complete operational tests on all equipment to show that the equipment will perform the functions for which it was designed.
- 2.5. These specifications intend that the workmanship methods, inspections and materials used in erection and installation of the subject equipment shall conform with accepted engineering practices, the specifications as prepared by the Engineer, Manufacturer's instructions and the relevant Standards as referred to in all the attached specifications.
- 2.6. The Contractor shall bear the costs of all tests required.

## **3. RESPONSIBILITY**

- 3.1. The testing shall be performed by and under the immediate supervision of the Contractor.
- 3.2. The Contractor shall adjust, set, co-ordinate, calibrate and test all systems and equipment furnished and/or installed by him.
- 3.3. The Contractor shall determine, and the Engineer shall approve the individuals in whom final responsibility and authority rests for carrying out these tests and

inspection procedures on particular equipment. The method to be followed in obtaining clearances on electrical equipment shall also be established and such method rigidly adhered to.

- 3.4. All testing shall be scheduled by the Contractor and cleared through the Engineer. No testing of any kind shall be done or scheduled without this clearance.
- 3.5. The Contractor shall notify in person or by letter all the interested parties at least 24 hours prior to tests, establishing the time the test is to be performed.
- 3.6. The interested parties to be informed will be determined in conjunction with the Engineer.
- 3.7. The parties notified shall be responsible for having their representatives present at the designated time. Absence of any one representative will not prohibit the test from proceeding on schedule, unless such representative is essential in doing the tests.
- 3.8. Each of the notified interested parties and the testers employed shall be individually responsible for the safety of all members of their organization during such time as the tests are performed.
- 3.9. The Contractor will coordinate all testing to ensure that all trades are prepared and that the conditions are safe.
- 3.10. Detailed testing method and equipment shall be approved by the Engineer.
- 3.11. On some tests, particularly the final inspections of important equipment, the manufacturer's Engineer or representative shall be present and perform same. The request for a manufacturer's representative shall be made sufficiently in advance to the date the test is scheduled so that satisfactory arrangements for the representative's services can be made. Frequently, the manufacturer's responsibility applies to both electrical and mechanical equipment. Where such joint responsibility exists, the request for a manufacturer's representative shall be arranged to satisfy both electrical and mechanical requirements simultaneously.
- 3.12. Manufacturer's instructions shall be carefully read for any special conditions that may be required for testing.
- 3.13. Following established procedures, equipment will be energized after certification on the relevant form by the personnel performing the tests, that equipment is ready for energizing and with the concurrence of the Engineer.

#### **4. TESTING EQUIPMENT**

- 4.1. All testing equipment for tests which are to be performed shall be furnished by the Contractor.

- 4.2 Testing equipment required to prove guarantee values shall be calibrated immediately prior to the relevant tests to be performed. The error curves shall be submitted with the report.

## **5. TESTING RECORDS**

- 5.1. Test results shall be entered in test forms provided by the Contractor or, if such forms are not available, in test forms approved by the Engineer.
- 5.2. Authorized, qualified representatives of the parties interested (see paragraph 3.0 shall be present to approve a test when made. One (1) copy of the rough draft-test report shall be given to each authorized representative at the time the test is made.
- 5.3. Formal test reports approved by the Engineer shall be supplied and prepared by the party performing the test within 48 hours, signed by the authorized representatives, and furnished to the Engineer for distribution.

## **6. SAFETY PRECAUTIONS**

- 6.1. The Contractor shall exercise extreme care in performing the tests specified so as not to jeopardize the safety of personnel and to prevent equipment damage during any tests. All exposed live parts subject to testing shall be guarded by personnel, barricades, or other practical means to ensure against personnel being injured by coming in contact or close proximity to exposed parts.
- 6.2. All equipment, exposed live parts, etc., shall be completely discharged by grounding or other accepted methods so as to eliminate the possibility of injury to personnel from electrical shock after the tests have been completed.

## **7. PROVISIONAL ACCEPTANCE**

- 7.1. The Engineer's Provisional Acceptance of any electrical installation shall be based upon the completion of tests and checks prescribed in clauses 8 through 13, submission of test data (where required), satisfactory materials and workmanship, and demonstration of satisfactory start-up.

## **8. EARTH CONTINUITY AND RESISTANCE TESTS**

### **8.1. General:**

- 8.1.1. All earthing and bonding cables must be checked for continuity and earth resistance.

### **8.2. Test procedure:**

- 8.2.1. Measuring the cable and connection resistance simultaneously with a resistance bridge or accurate multi-meter.

### **8.3. Acceptance:**

- 8.3.1. The resistance of the earthing and bonding cables and connections must be less than stated in SABS 0142/latest.
- 8.3.2. Complete and accurate records of all resistance readings of all earthing conductors of motors, transformers, power cables etc. must be made.

The records shall include the following:

- 8.3.2.1. Complete identification of the cable and connection points including its approximate length;
- 8.3.2.2. Resistance reading;
- 8.3.2.3. The approximate average cable temperature.
- 8.3.3. No electrical systems will be energized until the master copy of its test record is approved by the Engineer.

## **9. MEDIUM VOLTAGE CABLES**

### **9.1. General:**

- 9.1.1. The Contractor shall give all medium voltage cables a high potential test in compliance with the cable manufacturers specifications, after all splices and potheads or cable terminations have been made.
- 9.1.2. The medium voltage cables shall be given a complete dielectric absorption test before and after the high potential test. The cable test shall be performed prior to connections to the electrical equipment at either end.
- 9.1.3. The Contractor shall supply all instruments for testing.

9.2. Test Procedures:

- 9.2.1. Medium voltage stress cone type terminations or potheads shall remain intact but testing shall not include any bus work beyond the pothead or stress termination.
- 9.2.2. Cable continuity and phase identification shall be checked.
- 9.2.3. In setting up the test set special safety precautions should be taken regarding grounding of the test equipment. The test set, it's voltmeter and the cable shield should be grounded at the same ground.
- 9.2.4. All 4 core cables shall be tested between one conductor and ground with the other conductors and the metallic shield, metallic sheath or armour grounded to the same ground. Each conductor to be tested in this manner.
- 9.2.5. All single conductor cables shall also be tested between one conductor and ground with the other conductor in the same conduit grounded.
- 9.2.6. Each cable is to be given a full dielectric absorption test as herein specified with a suitable motor driven or electronic megger. The readings taken shall be recorded in the test record.
- 9.2.7. The dielectrical absorption megger test shall be applied for a long enough duration to fully charge the cable. Megger readings shall be taken every fifteen (15) seconds during the first three (3) minutes and at one (1) minute intervals thereafter. The test shall continue until three (3) equal readings one (1) minute apart are obtained. The cable may then be considered to be fully charged.
- 9.2.8. All cables should have approximately the same megohm reading. In the event that a cable shows an appreciably lower resistance value than the others in the same conduit or cable run, this condition shall be discussed with the Engineer prior to the application of the high potential test.
- 9.2.9. After an acceptable megger test, the Contractor shall give the cables a direct current (DC) high potential test. The test potential shall be 80% of the factory test voltage for 15 minutes. The test voltages shall be applied gradually during the first minutes in five equal steps. Leakage current readings shall be taken at each voltage increment, and at one (1) minute intervals after full test voltage has been applied for the remainder of the test. After completion of the test, cables shall be discharged slowly. No test will be accepted where there is an appreciable increase in leakage current throughout the test.

9.2.10. Cables shall not be subjected to more than one (1) high potential test without approval of the Engineer. During these tests a man shall be stationed at each point where the cable has exposed connections.

9.2.11. The successful high potential test shall be immediately followed by another megger test as heretofore specified.

9.3. Acceptance:

9.3.1. The cable must withstand the specified high voltage without an appreciable increase in leakage current.

9.3.2. Final acceptance will also depend on satisfactory results of the two megger tests. The results of the final megger test should reasonably parallel those of the first megger test and should show no evidence of permanent injury to the cable caused by the high voltage test.

9.3.3. Complete and accurate records of all megger and accompanying high potential tests shall be made. The records shall include the following:-

9.3.3.1. Complete identification of the cable including its approximate length;

9.3.3.2. Megger readings vs time data;

9.3.3.3. High potential and leakage current readings vs time data;

9.3.3.4. The approximate average cable temperature.

9.3.4. No cable shall be energized until the master copy of its test record is approved by the Engineer.

## 10. LOW VOLTAGE POWER CABLES

10.1. General:

10.1.1. All wires and cables shall be tested for continuity. Except for 60 volt services and below, all wires and cables shall be given a megger test.

10.1.2. All cable connections must pass visual inspections for workmanship and conformance with standard practice.

10.2. Test Procedure:

10.2.1. Continuity shall be checked by means of a DC test device using bell or buzzer.



- 10.2.2. Bus tie cables shall be meggered before connections to buses are made.
- 10.2.3. Each 400 volt service cable from substations shall be meggered with the cable connected to the switch gear with the corresponding breaker racked in and open. Connections at the other end of each of these cables shall be as follows:-
  - 10.2.3.1. Cables to individual motors shall be disconnected from the motor for initial tests, and followed by cables connected to motors as per specification for rotating equipment;
  - 10.2.3.2. Cables to control centres shall be connected to the control centre main breaker with breaker in the open position.
- 10.2.4. Minimum megger readings shall be 1 Me 6 ohm.
- 10.2.5. The megger test must be held until the reading reaches a constant value. For 400 volt cables the cable megger test shall be held until three (3) equal readings, each one (1) minute apart, are obtained.
- 10.2.6. A 1000 volt motor-driven or electronic megger with a value of at least twice that of the RMS voltage shall be used on all service conductors.
- 10.3. Acceptance:
  - 10.3.1. Minimum megger requirements must be met.
  - 10.3.2. Any cable having a megger reading 50% lower than average, even though meeting minimum requirements, shall await further instructions from the Engineer as to drying or other treatment to be given the cable prior to acceptance.
  - 10.3.3. Complete and accurate records of all tests and inspections shall be made.

## **11. MEDIUM VOLTAGE SWITCH GEAR AND CIRCUIT BREAKERS**

- 11.1. General:
  - 11.1.1. All switch gear shall be given operational tests. This shall include mechanical operation, as well as operation by control circuits, relays and tripping devices. All breakers and busbars shall be given a megger test.
- 11.2. Test Procedures:
  - 11.2.1. Megger tests on the medium voltage bus shall be applied between each phase separately and ground with other phases tied to ground. All breakers shall be racked-out.

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- 11.2.2. In addition each breaker shall be given a megger test in the racked-out and closed position. Megger tests shall be applied between each phase to ground and to each other phase.
  - 11.2.3. A suitable motor driven or electronic megger shall be used. Each test shall be held until a constant reading is obtained. Minimum test values shall be as specified in specifications.
  - 11.2.4. All test readings shall be recorded.
  - 11.2.5. All circuit breakers shall be operated through at least three (3) open-close-open cycles in both the rack-in and test positions by manual operation and by control circuits from each control point. All indication lights, annunciators, alarms and targets shall be observed to determine correct operation and breaker mechanism shall be observed for correct alignment, freedom of binding and good contact. All breakers shall be checked for ease of rack-in and rack-out and checked to determine that the breaker cannot be moved out of operation position while the breaker is closed.
  - 11.2.6. The interchangeability of the circuit breakers shall be demonstrated.
  - 11.2.7. PT and CT data shall be recorded and PT and CT circuits shall be checked with a multi-tester.
  - 11.2.8. Protective relays shall be adjusted and calibrated with an injection type test arrangement (multi-amp or equal). Results shall be recorded and the co-ordination of the protective relaying shall be proved.
  - 11.2.9. After initial energization, switch gear shall be checked for correct phase sequence.
  - 11.3. Acceptance:
    - 11.3.1. Minimum megger requirements must be met;
    - 11.3.2. Proper mechanical and electrical operation of switch gear must be assured;
    - 11.3.3. Correct protective relaying operation must be proven;
    - 11.3.4. Complete and accurate records of all tests and inspections shall be made.

## **12. POWER TRANSFORMERS**

- 12.1. General:
  - 12.1.1. Before testing, all transformers shall be inspected for cleanliness, damage, moisture (blue coloured silica gel), oil leaks and phase identification. Each transformer winding shall be given megger tests.

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- 12.1.2. Oil filled transformers shall have the oil checked for dielectric strength.
  - 12.1.3. Accessories and auxiliary circuits to switchgear and alarm panels shall be checked.

12.2. Test Procedures:

- 12.2.1. Transformer windings shall be meggered with cables disconnected. (The cables have to be disconnected anyhow for cable high potential tests). See clause 9.0.
- 12.2.2. The 400 volt connection to the switchgear does not have to be opened, but the secondary isolator shall be racked out.
- 12.2.3. The transformer neutral has to be disconnected from ground.
- 12.2.4. When meggering the primary side, the secondary winding has to be grounded and vice versa.
- 12.2.5. The minimum values of the specified megger tests shall be as specified in the standard specification.
- 12.2.6. All 2500 V megger tests shall be held at least five (5) minutes and until three (3) consecutive equal readings one (1) minute apart are obtained. Readings shall be taken every thirty (30) seconds during the first two (2) minutes and every minute thereafter. 1000 V Megger readings must be held until the reading reaches a constant value and until three (3) consecutive equal readings one (1) minute apart are obtained.
- 12.2.7. The oil samples for the dielectric strength test shall be taken from the bottom of the transformer tank and tested in accordance with SABS Specifications.
- 12.2.8. Oil temperature indicator, level gauge and pressure relief devices must be manually actuated to check operation of auxiliary circuits.
- 12.2.9. To check the Bucholz relay, air shall be injected at the test connection.

12.3. Acceptance:

- 12.3.1. Minimum megger requirements must be met.
- 12.3.2. Oil dielectric strength shall be above the minimum specified by the manufacturer.
- 12.3.3. Auxiliary circuits shall be fully operational.

### **13. LOW VOLTAGE SWITCH GEAR**

#### **13.1. General:**

- 13.1.1. The 400 volt switch gear bus shall be given a phase-to phase and phase-to-ground megger test.
- 13.1.2. All switch gear, relays and control devices shall be given complete operational tests to show that the equipment performs all design functions and meets design and equipment procurement specifications.

#### **13.2. Test Procedures:**

- 13.2.1. With transformer secondary breaker and load breakers open, all current transformers shorted, all potential transformer fuses removed and all 400 volt feeder breaker load terminals grounded, the 400 volt bus shall be given a phase-to-phase and phase-to-ground megger test.
- 13.2.2. Megger tests on the 400 volt bus shall be applied between each phase and ground with phases not under test also grounded.
- 13.2.3. All circuit breakers shall be operated through at least three (3) open-close-open cycles in both the rack-in and test position by manual operation and by control circuits from each control point (draw out breakers only). All indicating lights, annunciators, and breaker mechanisms shall be observed for correct alignment, freedom of binding and good contact. Draw out breakers shall be checked for ease of rack-in and rack-out and checked to determine that the breaker cannot be moved out of operating position while the breaker is closed.
- 13.2.4. PT and CT data shall be recorded and PT and CT circuits shall be checked with a multi-tester.
- 13.2.5. Protective relays shall be adjusted and calibrated with an injection type test arrangement (multi-amp or equal). Results shall be recorded and the co-ordination of the protective relaying shall be proved.
- 13.2.6. After initial energization, switch gear shall be checked for correct phase sequence.

#### **13.3. Acceptance:**

- 13.3.1. Minimum megger requirements must be met.
- 13.3.2. Proper mechanical and electrical operation of switch gear must be assured.
- 13.3.3. Correct protective relaying operation must be proven.

- 13.3.4. Complete and accurate records of all tests and inspections shall be made.

## **14. ROTATING EQUIPMENT - 400V AND LOWER**

### **14.1. General:**

- 14.1.1. All rotating equipment, large and small, rated 400 volt and lower shall pass a minimum megger reading at room temperature. Any machine not passing this test shall be dried and retested until it either passes or is found unsatisfactory.
- 14.1.2. Prior to testing, all rotating equipment shall be inspected for cleanliness, damages, moisture, alignment, proper lubrication, oil leaks and phase identification.
- 14.1.3. For motors fed from main control panels or motor control centres, the setting of the protective equipment shall be checked.
- 14.1.4. For motors fed directly from 400 volt, switchgear setting of the protective relays is covered by clause 13.0.

### **14.2. Test Procedures:**

- 14.2.1. The circuit breaker is to be racked in, but in the open position. Where magnetic contractors are used, the contactor shall be in the open position so that the section of conductor between the contactor and terminals is included in the test. Control circuit conductors shall be isolated.
- 14.2.2. Megger tests shall be applied between all phases tied together and ground.
- 14.2.3. Megger tests shall be taken with the motor winding temperature at room temperature.
- 14.2.4. All 400 volt motor cables shall be tested before connections are made at the motor in accordance with clause 10.0. Megger tests for each 400 volt motor shall include the cables feeding it.
- 14.2.5. A motor-driven or electronic megger with a service voltage of at least twice the RMS voltage shall be used on all motors.
- 14.2.6. Minimum megger readings shall be 1 Meg ohms.
- 14.2.7. The megger test must be held until the reading reaches a constant value and until three (3) consecutive equal readings one (1) minute apart are obtained.

- 14.2.8. For motors fed from main control panels or motor control centres, overload- and instantaneous over-current protection has to be set to suit the particular drives.
- 14.2.9. After successful performance of mechanical and insulation tests and after the electrical starter protection have been adjusted, the motor may be "bumped" to check for proper rotation.
- 14.3. Acceptance:
  - 14.3.1. All rotating equipment must pass the megger insulation tests as specified and satisfy all representatives as to cleanliness and neatness of the installation.
  - 14.3.2. Complete and accurate records of all tests shall be made. Final acceptance of rotating equipment cannot be made until the equipment is operated during hot commissioning. The equipment shall prove proper rotation, lubrication, alignment and freedom from excessive vibration to the satisfaction of the Engineer.

## **15. COLD COMMISSIONING**

- 15.1. The programmable logic control system shall only be tested once the LV switchboard and other control panels have been tested in the manual mode and been provisionally accepted by the Engineer.
- 15.2. The control system shall firstly be tested DRY, i.e. all motor fuses shall be removed or circuit breakers shall be in the OPEN positions.
- 15.3. All plant/external inputs to the PLC shall be individually checked in the field or motor control centre by operating the required field limit switch, relays etc. and checked on the programmer monitor if the status indication of the correct input reference alters.
- 15.4. All plant/external outputs shall be checked individually by forcing the PLC output coil by means of the programming unit and checking the field, motor control or mimic display panel if the correct relay, indication lamp or contactor has operated.
- 15.5. A signed test record showing all input/ output references and reference to which field, motor control centre or mimic panel device was initiated or was operated shall be made and handed to the Engineer before the second part of the DRY test commences.
- 15.6. The second part of the DRY test shall be by carrying out drive selections, route start ups and route stops for all possible drives as listed. All inputs which cannot be present because of the absence of any plant movement shall be simulated by a plant input simulator to be provided by the Contractor.

- 15.7. Upon completion of the tests, a signed test record showing all route selections, starts and stops simulated for every route and a list of all simulated inputs/outputs used shall be made and handed to the Engineer.
- 15.8. The Contractor shall then call upon the Engineer to witness a repetition of all previous DRY tests.


## **16. HOT COMMISSIONING**

- 16.1. Commissioning of the whole installation shall not commence until all work which is essential for safe operation has been completed.
- 16.2. First, the electrical equipment and circuitry shall be checked and tested in each Motor Control Board and shall be rendered "healthy" and fully operational before any other part of the installation is commissioned.
- 16.3. The settings of all protective, instrument and timing devices are to be correctly based on the manufacturer's characteristic curves.
- 16.4. The operation of all equipment and motors shall be tested on the "manual" sequence first prior to attempting "automatic" sequence control.
- 16.5. Commissioning shall follow the electrical testing procedures necessary prior to start-up of the equipment.
- 16.6. The start-up of each system or plant shall be done in the presence of the authorized representatives of the machine suppliers, the mechanical contractors, the electrical suppliers of the boards, the Electrical Contractor and the Engineer, unless otherwise arranged by the Engineer.
- 16.7. During hot commissioning the temperature rise of all motors will be calculated using the resistance method.
- 16.8. For a period determined elsewhere in this document, after completion of the foregoing operations, the Electrical Contractor shall arrange for a competent representative to remain on site to test-run the installation to the satisfaction of the Engineer.

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***END OF SPECIFICATION HE8/2/8 [Version 4]***

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REVISION 0	REFERENCE  EEAM-Q-021							
DOCUMENT TYPE    SPECIFICATION		AUTHORISATION DATE: Date signed by CEO						
TITLE: SPECIFICATION FOR ELECTRONIC EQUIPMENT			PAGE    1 of 5					
COMPILED BY:	REVIEWED BY:	REVIEWED BY:						
EQUIPMENT ENGINEERING AND ASSET MANAGEMENT (GENERAL MANAGER)	SENIOR MANAGER (PROJECT MANAGER)	SENIOR MANAGER (ASSET MANAGER)						
ACCEPTED BY:		AUTHORIZED BY:						
CHIEF FINANCIAL OFFICER		CEO						
FUTURE REVISION RECORD NUMBER	DESCRIPTION OF REVISION	APPROVAL	DATE 01/04/2003					
-1-								
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KEYWORDS SPECIFICATION	DATE OF LAST REVIEW: N/A
	DATE OF NEXT REVIEW: 01/06 2005



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1. **SCOPE**

- 1.1. This specification covers TPT's requirements for electronic equipment and must be read in conjunction with the main Specification.
- 1.2. The production standard of all electronic equipment shall be in accordance with the relevant and recognized standards and recommendations for the electronics industry such as contained in IEC Publications, British Standard Specifications, DIN Specifications, standards recommended by the Electronic Industries Association or any other pertinent and widely accepted standards/recommendations.
- 1.3. The national or international standards (if any) to which the electronic equipment complies to shall be stated.
- 1.4. TPT reserves the right to inspect and/or test electronic equipment offered and to use relevant standards/ recommendations for the electronics industry as outlined in Clause 1.2. above as a basis for acceptance/rejection of equipment supplied by the successful tenderer.
- 1.5. When the equipment offered includes, or is required to interact with a Programmable Logic Controller or a microprocessor based device the mode of interfacing between the programmable device and other equipment offered shall clearly be described.
- 1.6. An indication of the extent to which the electronic equipment has been service proven in industry (e.g. names of major users, volume of sales etc.) shall be provided.
- 1.7. Tenderers shall certify that electronic equipment is designed and/or protected to operate reliably under the service conditions listed in the main Specification.
- 1.8. Tenderers shall certify that electronic equipment as designed and supplied is capable of operating reliably with the electrical system of supply as specified in the main Specification.
- 1.9. All electronic equipment shall be suitably protected against voltage spikes, over voltage, over current and over temperature. Details of the protection shall be submitted at the time of tendering.
- 1.10. All electronic equipment shall be effectively screened against electromagnetic, radio or microwave interference.

- 1.11. All electronic cards must be treated (coated) for use in a tropical environment.

- 1.11. Electronic equipment must be installed in a dust free/air-conditioned environment.
- 1.12. The functions of all controls, switches, indications etc. shall be engraved or otherwise clearly and permanently marked on all equipment in English.
- 1.13. Construction and installation of all equipment offered shall be such that overhaul and maintenance will be readily possible.
- 1.14. Microprocessor based devices:
  - 1.14.1. All microprocessor based devices, e.g. Programmable Logic Controllers offered shall be of a standard design with respect to both hardware and software and must be freely available in the Republic of South Africa.
  - 1.14.2. Only the latest generation modules available in South Africa shall be used.
  - 1.14.3. A fully documented and commented source code listing must be supplied for the program used by the PLC.
  - 1.14.4. All software and hardware required for software maintenance must be specified and must be listed with recommended initial spares.
  - 1.14.5. The unit shall be of a heavy duty industrial type specifically designed for this type of application.
- 1.15. All PLC output cards shall be fitted with relays rated at least 4A 230V in preference to semi-conductor switching devices.
- 1.16. Electronic equipment manuals:
  - 1.16.1. Maintenance manuals required in terms of the main specification shall include all the necessary information on electronic equipment to enable SAPO's maintenance staff to fully comprehend the function of the equipment down to module or card level. In order to comply with this condition the following information (as applicable) shall be included in manuals:-
    - 1.16.1.1. Complete circuit diagrams;
    - 1.16.1.2. System block or logic diagrams;
    - 1.16.1.3. Layout and interconnection diagrams;
    - 1.16.1.4. Test procedures (flow chart form preferred) and information to enable testing such as voltage values and tolerances, waveforms, polarities etc;
    - 1.16.1.5. A complete description of the electronic equipment, including the function of all input and output points,


maintenance and calibration procedures, reference to special test instruments required etc.

- 1.16.2. Symbols used on diagrams shall be in accordance with IEC Publication 117 or BS 3939.
- 1.16.3. In the case of encapsulated modules (i.e. discrete components permanently enclosed), the complete internal circuitry, including the identification of all discrete components, shall be submitted on diagrams.
- 1.17. All electronic equipment shall be fully year 2000 compliant and shall be certified by the supplier and/or designer as such. Completed and signed certificates shall be submitted to TPT immediately after final commissioning of the equipment

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***END OF SPECIFICATION HE8/2/9 [Version 5]***

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	<b>REFERENCE</b>  <b>EEAM-Q-023</b>		<b>REVISION</b>  <b>0</b>																									
<b>DOCUMENT TYPE</b> SPECIFICATION		<b>AUTHORISATION DATE:</b> Date signed by CEO																										
<b>TITLE:</b> <b>SPECIFICATION FOR MEDIUM VOLTAGE EQUIPMENT FOR USE ON PORT EQUIPMENT</b>			<b>PAGE</b> 1 of 15																									
<b>COMPILED BY:</b>   <b>EQUIPMENT ENGINEERING AND ASSET MANAGEMENT (GENERAL MANAGER)</b>		<b>REVIEWED BY:</b>   <b>SENIOR MANAGER (PROJECT MANAGER)</b>		<b>REVIEWED BY:</b>   <b>SENIOR MANAGER (ASSET MANAGER)</b>																								
<b>ACCEPTED BY:</b>   <b>CHIEF FINANCIAL OFFICER</b>		<b>AUTHORIZED BY:</b>   <b>CEO</b>																										
<b>FUTURE REVISION RECORD NUMBER</b>	<b>DESCRIPTION OF REVISION</b>	<b>APPROVAL</b>	<b>DATE</b> <b>01/04/2003</b>																									
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<b>KEYWORDS</b> SPECIFICATION	<b>DATE OF LAST REVIEW:</b> N/A  <b>DATE OF NEXT REVIEW:</b> 01/06/2005
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## 1. **SCOPE**

- 1.1. This specification covers SAPO's requirements for medium voltage switch gear, transformers, cables and protection equipment for use on port equipment

## 2. **GENERAL REQUIREMENTS**

- 2.1. All equipment shall be suitable for service in the system and environmental conditions specified in the main specification.
- 2.2. All medium voltage supply equipment associated with the supply of power to the equipment shall be efficiently earthed to the equipment structure. I.e. trailing cables, translifters, cable reels and slip ring enclosures, cable racks etc.
- 2.3. Robust earth shoes sliding on crane rails etc. shall also be provided to effectively earth the equipment to the associated crane rails.
- 2.4. Cable reel systems shall comply with SAPO's Specification HE8/2/7.
- 2.5. Medium voltage cables shall comply with NRS 013/latest except where special cables have otherwise been specified.
- 2.6. The main incoming switching device shall not be used as the main-breaker on the equipment in order that power for lights and anti-condensation heater supplies for motors, panels etc. can be obtained from the secondary side of the distribution transformer. A separate low voltage air-break circuit breaker shall be used for this purpose.
- 2.7. Equipment where trailing cables are connected by means of plugs and sockets must be provided with pilot wire protection in the trailing cable and early break contacts to ensure that breakers feeding the trailing cable can only be switched on if the plug is properly connected, or is switched off before being disconnected.
- 2.8. Routine as well as type test certificates of all equipment shall be supplied in



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duplicate.

- 2.9. The pollution level (IEC 186) shall be taken as "Medium" (creepage distance of 20mm/kV) for all equipment installed indoors or inside enclosures with a minimum protection of IP 55. For equipment installed outdoors the pollution level shall be taken as heavy (creepage distance of 25 mm/kV).
- 2.10. Enclosures for cable termination in air shall comply with NRS 008.
- 2.11. Mini-substations shall comply with NRS 004.
- 2.12. Insulated bushings shall comply with SABS 1035.
- 2.13. Battery chargers shall comply with NRS 026.
- 2.14. Definitions in this specification are according to NRS 040-1, High voltage operating regulations (Definitions).
- 2.15. Work on medium voltage equipment shall be carried out in accordance with the Safety Instructions: High-Voltage Electrical Equipment of Spoornet.

### 3. **DISTRIBUTION TRANSFORMERS**

- 3.1. Transformers must be of the dry, cast resin type and must comply with IEC 726 as well as the applicable clauses of SABS 780/latest.
- 3.2. Transformers must be fitted with primary circuit tapplings corresponding to 95, 97.5, 100, 102.5, and 105% of the rated voltage by means of bolted links.
- 3.3. Both low voltage and high voltage terminals shall be arranged for cable connection from the bottom or top as preferred but provision shall be made for a cover attached to the transformer covering all connection points so as to afford protection against accidental contact.
- 3.4. Transformers shall be protected by means of a circuit-breaker or switch-fuse and digital protection relays, as well as PT100 RTD's, as specified in the main specification.
- 3.5. "Zorc" or similar type surge protection devices must be fitted at the transformer terminals.

3.6. MV Transformer tests

- 3.6.1. Type test (temperature rise test) shall be undertaken on one transformer of each particular design in terms of SABS 780.
- 3.6.2. Routine tests shall be undertaken in terms of SABS 780.
- 3.6.3. Tests certificates covering the tests referred to and called for above shall be submitted in duplicate by the contractor.

4. **MEDIUM VOLTAGE MOTOR CONTROLS**

- 4.1. Medium voltage motors shall comply with SAPO Specification HE8/2/3.
- 4.2. Medium voltage motors shall be started by means of direct on line switching or by series reactance starter, solid state soft starters or stator rotor (slipping motor), depending on the inertia of the load, using vacuum contactors only.
- 4.3. General requirements
  - 4.3.1. Held or latched type circuits for vacuum contactors may be used although held type is preferred.
  - 4.3.2. Medium voltage motors and starters shall be protected by a circuit-breaker or switch-fuse and digital motor protection relays and shall be mounted as close to the motor as possible.
  - 4.3.3. Starters equipped shall be provided with shunt trip to automatically open the switch-fuse in case the vacuum contactor fails to open.
  - 4.3.4. Starters shall comply with Clause 5 and shall generally consist of the following:
    - 4.3.4.1. Either fixed switch-disconnectors and HRC fuses or fixed switch-fuses with visible blade safety features, or alternatively;
      - 4.3.4.1.1. Draw out type carriages housing the vacuum contactor and HRC fuses;
    - 4.3.4.2. Digital motor protection relays;

- 4.3.4.3. Starters, e.g. DOL, soft starters, variable speed control, etc. as required in the main specification;
- 4.3.4.4. Vacuum contactors etc.
- 4.3.5. "Zorc" or similar type surge suppression devices must be fitted at the motor terminals for all motors.
- 4.3.6. Short circuit protection shall be by means of high rupturing capacity striker pin fuses. Cables for motors need only be sized for thermal current effects and not short circuit currents.
- 4.3.7. Only digital type motor protection relays shall be used and the following features shall be incorporated in the relays:-
  - 4.3.7.1. PT100 RTD protection for stator windings and bearing over temperature;
  - 4.3.7.2. Contactor opening inhibit in case of short circuit conditions to allow the fuses to break the short circuit current;
  - 4.3.7.3. Single phasing, overload and earth fault protection;
  - 4.3.7.4. Manual reset for short circuit, phase failure, earth leakage etc. Thermal overload can be either auto or manual reset.
- 4.4. Series reactor starters
  - 4.4.1. Series reactor starters shall be used when specified in the main specification.
  - 4.4.2. Reactors shall be provided with a short circuiting contactor for normal running. A timer circuit shall be provided for protection against excessive starting time as well as opening of the shortening contactor for abnormal reasons.
  - 4.4.3. Reactor winding insulation shall be of class H but temperature rise shall be limited to class B (120°C). PT100 RTD protection shall be provided.

## 5. MEDIUM VOLTAGE SWITCHGEAR PANELS

These clauses are based on the requirements of and IEC 298 and highlights SAPO's preferences for alternatives given therein. All prospective electrical subcontractors must be

in possession of all NRS specifications referred to.

5.1. Metal enclosed ring main units shall comply with NRS 006.

5.2. General

5.2.1. The type of switchgear to be used for the equipment will either be circuit-breakers, switch-disconnectors or switch-fuses, as specified in the main specification and shall be suitable for the specified fault levels and suitably rated for the equipment they feed.

5.2.2. Each switchgear panel shall be a self-contained unit with a minimum degree of protection of IP3X for indoor installation and IP55 for outdoor installation unless otherwise specified in the main specification.

5.2.3. Access to equipment installed inside panels (e.g. current transformers, cable terminations etc.) shall be such that removal and replacement thereof can be conveniently carried out with the panels in situ, by removal of barriers or covers fixed with screws (not self tapping).

5.2.4. Anti-condensation heaters shall be provided to ensure that no condensation can occur in any of the compartments. A switch shall be provided to control the heaters.

5.2.4.1. The heaters shall be supplied from 110 V AC.

5.2.4.2. The wiring from the heater elements to connection terminals shall be high temperature insulation covered, with a suitable compression-type gland.

5.2.5. Panels shall have the following equipment or as specified in the main specification:-

5.2.5.1. Isolating and switching devices;

5.2.5.2. Medium voltage contactors;

5.2.5.3. Striker pin trip feature for HRC fuses;

5.2.5.4. Voltage transformer/s;

5.2.5.5. Current transformers;

5.2.5.6. Ammeter and volt meter with selection switch as well as

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phase rotation indicator;

- 5.2.5.7. Protection relays, instruments, control fuses, push buttons etc. mounted on the front of the panel;
  - 5.2.5.8. Busbars;
  - 5.2.5.9. Earthing devices;
  - 5.2.5.10. /test switch and circuitry for testing of the panel without the medium voltage present.
- 5.2.6. Where fixed type switchgear is installed and the switchgear is fed from a common busbar, a disconnecter shall be installed on the incoming side of the switching device.
- 5.2.6.1. These panels shall be provided with an armoured glass window to visually inspect the state of the disconnecting and switching devices.
  - 5.2.6.2. A notice bearing the following inscription shall be provided adjacent to the operating mechanism of the disconnecter:-  
  
***"DO NOT OPERATE UNDER LOAD"***
- 5.2.7. Voltage transformer operated or DC battery operated switching devices as required by the main specification must be offered.
- 5.2.8. Trip and live circuit indication shall be provided on the front of the switchgear panel.
- 5.2.9. Continuous neon lamp or light emitting diode indication for switching device shunt trip healthy shall be provided on the panel.
- 5.2.10. All joints and tees in busbars shall be made with hot-dipped galvanized high tensile steel bolts, nuts and washers.
- 5.2.11. High voltage and low voltage equipment shall be housed in separate compartments.
- 5.2.12. The busbars shall be contained in a separate compartment. For air insulated equipment this compartment shall be easily accessible and shall be fitted with removable panels secured by means of an adequate number of screws. (Not self-tapping).

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- 5.2.13. SF6 switching devices shall be fitted with a pressure gauge to monitor gas pressure.
  - 5.2.14. Each switchgear panel shall be provided with a suitable panel pack ("P" pack), jointing pack ("J" pack) as well as switchboard accessories pack ("S" pack).
  - 5.2.15. Only one test pack for each type of switching device supplied shall be provided for testing the switching device in the isolated position.
- 5.3. Circuit-breaker panels
- 5.3.1. The circuit-breaker shall be of the vertical or horizontal isolating, draw out, truck type, as specified in the main specification.
  - 5.3.2. Circuit-breakers shall be of the sulphur-hexafluoride (SF<sub>6</sub>) or vacuum type.
  - 5.3.3. Both the cable as well as busbars shall be provided with fault-make earthing facilities, unless otherwise approved.
  - 5.3.4. The breaker panel shall be provided with the necessary over current and earth fault current transformers and associated digital protection relay and control equipment for short circuit, overload and earth fault protection.
- 5.4. Switch-disconnector panels
- 5.4.1. Integral type circuit test facilities shall be provided.
- 5.5. Switch-fuse panels
- 5.5.1. Integral three-pole earthing facilities to earth both sides of the switching device shall be provided, unless otherwise approved.
  - 5.5.2. Fuses shall be of the air-insulated, cartridge striker pin type.
  - 5.5.3. Integral type circuit test facilities must be provided.
- 5.6. Cable termination compartments
- 5.6.1. Cables shall terminate in air-insulated compartments complying with NRS 008.

- 5.6.2. Insulated gland plates with substantial copper earthing strips connected to the earth terminal shall be provided for termination of cables.

#### 5.7. Current transformers

- 5.7.1. Current transformers shall comply with IEC 185.
- 5.7.2. Current transformers shall have the following minimum accuracy classes:-
  - 5.7.2.1. Indicating instruments - 3.
  - 5.7.2.2. Protection purposes - 10P10.
  - 5.7.2.3. Metering purposes - 0.5.
- 5.7.3. The secondary rating of the transformer shall be either 1 or 5 amp as required by the protection or metering equipment.
- 5.7.4. Core balance current transformers used for earth fault protection shall have an injection test winding.

#### 5.8. Voltage transformers

- 5.8.1. Voltage transformers shall comply with NRS 030 (IEC 186).
- 5.8.2. Dry type voltage transformers of the withdrawable type shall be provided in switchgear panels for the provision of 110 V AC or DC control voltage as well as 110 V AC anti-condensation heater supplies and for voltage instrument indication and phase rotation, or as required by the main specification.
- 5.8.3. Voltage transformers shall have the following minimum accuracy classes:
  - 5.8.3.1. Indicating instruments - 3;
  - 5.8.3.2. Protective systems - 6P;
  - 5.8.3.3. Metering - 0.5.
- 5.8.4. The primary of the voltage transformer shall be connected to the busbar side through high-voltage fuse-links.
- 5.8.5. Secondaries of voltage transformers shall be protected by MCCB's

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mounted on panel doors.

5.8.6. The rating of the transformer shall be suitable for the connected load but shall be a minimum of 100 VA per phase.

5.8.6.1. In the case of solenoid closing mechanisms the voltage transformer shall be capable of closing the switching device twice in quick succession without overheating.

5.8.6.2. Where DC closing circuits are used the voltage transformer shall be connected to its own suitable silicon rectifier, adequately rated for the duty, and provided with surge protection.

5.9. Control, protection and alarm circuitry

5.9.1. Control, protection and alarm systems and circuitry shall be as required by the system or as specified in the main specification but shall be approved by SAPO.

5.9.2. Voltage as well as ammeter selector switches shall be provided.

5.10. Auxiliary supplies

5.10.1. Control supplies can be either of the following as required by the main specification:

5.10.1.1. Voltage transformer, 110 V AC;

5.10.1.2. Voltage transformer and rectifier, 110 V DC

5.10.1.3. V DC battery operated.

5.11. Protection Relays and instruments

5.11.1. Ammeters shall incorporate thermal maximum demand indication where required.

5.11.2. Accuracy for all indicating instruments shall be at least 3%.

5.11.3. Protective relays shall be designed, manufactured and tested in accordance with BS 142 or IEC Publication 255.

5.11.3.1. Protective relays shall have been type tested to verify



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performance and safety. Proof of these tests in the form of type test certificates shall be included in tender documents.

5.11.3.2. Relays shall have the following minimum ratings:

5.11.3.2.1. Error class rating of 10;

5.11.3.2.2. Operating time class index of 60;

5.11.3.2.3. Rated number of contact operations with electrical duty class index N3;

5.11.3.2.4. Mechanical stability class index S2.

5.11.3.3. Relays shall:

5.11.3.3.1. have three over current elements for each pole;

5.11.3.3.2. be rated in conjunction with its associated current transformer(s), to withstand the over current in the secondary winding of the current transformer/s under fault conditions;

5.11.3.3.3. be continuously rated for any current setting;

5.11.3.3.4. be clearly marked with the current ratio of the current transformer associated there-with;

5.11.3.3.5. be directional;

5.11.3.3.6. have contacts rated to make and carry the current of their associated circuits. The trip coil current shall be interrupted by auxiliary contacts on the circuit breaker;

5.11.3.3.7. have manual reset for short circuit, earth fault and phase failure;

5.11.3.3.8. have an additional set of normally open and normally closed contacts, or auxiliary relays, for remote indication of the relay operation. The contacts shall be capable of handling 50 W in the range of 24 to 110 V DC, and shall be wired to a terminal strip at the back of the panel.

5.11.4. Microprocessor based digital protection relays with the following features

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or as required by the system or as specified in the main specification shall be supplied:-

- 5.11.4.1. Definite minimum dependent time lag featuring either an inverse time lag, very inverse time lag or extremely inverse time lag time/current relationship;
- 5.11.4.2. Instantaneous;
- 5.11.4.3. Combined time lag and high-set instantaneous;
- 5.11.4.4. Definite time lag;
- 5.11.4.5. Differential pilot wire protection if required.
- 5.11.5. Relays for transformer protection shall have the following features:-
  - 5.11.5.1. over current and earth fault protection consisting of at least two extremely inverse definite minimum time lag over current elements, at least two high set instantaneous over current elements with low transient over reach characteristics, at least one extremely inverse definite minimum time lag earth fault element;
  - 5.11.5.2. restricted earth fault protection of star windings, the relay shall be of the instantaneous type and shall be tuned to 50 Hz;
  - 5.11.5.3. biased differential protection with high speed characteristics, biased to provide stability during through faults and shall not be operated by normal inrush currents.
  - 5.11.5.4. over temperature, PT 100 thermistors for dry type transformers;
- 5.11.6. All relays shall have current settings adjustable in infinite steps.
  - 5.11.6.1. The time delay relays shall have adjustable time lag ranging from 0 to 2 seconds.
- 5.11.7. Sensitive earth fault relays shall be of the static type and have a current setting of 0.5% to 8% and an operating time adjustable from 1 to 99 seconds.

5.11.8. Digital relays shall incorporate PT100 RTD inputs where required.

5.12. Test Terminal Blocks

5.12.1. Readily accessible, suitably enclosed test terminal blocks shall be provided on the front panel of the switch unit for the purpose of testing the protective systems.

5.13. General

5.13.1. Two copies of all type and routine test certificates shall be supplied in accordance with NRS 003 for all equipment in the panels as applicable.

5.13.2. Marking labelling and documentation shall be done according to NRS 003/latest.

5.13.3. Wire numbering shall be done according to NRS 003/latest. Graphic symbols for wiring diagrams shall comply with NRS 002/latest.

**6. EARTHING AND BONDING**

6.1. All equipment shall be connected to the equipment earthing by means of separate insulated copper bars or straps which shall have a minimum cross sectional area as specified below:-

6.1.1. Medium voltage switch boards-

bonding together of frames of all panels of each zone -125mm<sup>2</sup>

earthing cable glands of each zone - 125mm<sup>2</sup>

6.1.2. Low voltage switchboards-

earthing frame work - 80mm<sup>2</sup>

6.1.3. Distribution transformers -

earthing framework - 125mm<sup>2</sup>

earthing separately of neutral terminal - 125mm<sup>2</sup>

- 6.1.4. Batteries and battery charging equipment,  
other low voltage equipment and other accessory  
equipment such as control relay panels, exposed metal work. etc -35mm<sup>2</sup>

## 7. PROTECTION AGAINST CORROSION


- 7.1. Panels for indoor installation shall be constructed from mild steel frames and mild steel sheeting (at least 2 mm), painted according to specification HE9/2/8.
- 7.2. Panels for outdoor installation shall be constructed from mild steel frames and 3CR12 or similar steel sheeting (at least 2 mm), painted according to specification HE9/2/8.
- 7.3. All bolts, nuts, washers fixing equipment etc. shall be stainless steel.

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**END OF SPECIFICATION HE8/2/11 [Version 3]**

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**ANNEXURE NO 1**

<b>REVISION</b>  0		<b>REFERENCE</b>  EEAM-Q-013															
<b>DOCUMENT TYPE :</b> DATA SHEET				<b>AUTHORISATION DATE:</b> Date signed by CEO													
<b>TITLE:</b> TECHNICAL DATA SHEET – ANNEXURE 1				<b>PAGE</b> 1 of 3													
<b>COMPILED BY:</b>        EQUIPMENT ENGINEERING AND ASSET MANAGEMENT (GENERAL MANAGER)		<b>REVIEWED BY:</b>        SENIOR MANAGER (PROJECT MANAGER)		<b>REVIEWED BY:</b>        SENIOR MANAGER (ASSET MANAGER)													
<b>ACCEPTED BY:</b>        				<b>AUTHORIZED BY:</b>        CEO													
<b>FUTURE REVISION RECORD NUMBER</b>	<b>DESCRIPTION OF REVISION</b>	<b>AP PR OV AL</b>	<b>DATE</b>  01/04/2003														
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<b>KEYWORDS</b> DATA SHEET			<b>DATE OF LAST REVIEW:</b> N/A  <b>DATE OF NEXT REVIEW:</b> JUNE 2004														

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**ANNEXURE NO 1**

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**TRANSNET PORT TERMINALS  
A DIVISION OF TRANSNET LIMITED**

**TECHNICAL DATA SHEET  
[Information To Be Submitted By ATenderer]**

**1. FACTORY BUILT ASSEMBLIES**

- 1.1 Name of manufacturer .....
- 1.2 Manufacturer's type No .....
- 1.3 Degree of protection offered [Ipxx] .....
- 1.4 Anti-condensation heaters .....

**2. CONTACTORS**

- 2.1 name of manufacturer .....
- 2.2 Manufacturer's type No .....
- 2.3 Type of contactor .....
- 2.4 Thermal current rating .....
- 2.5 voltage rating .....
- 2.6 Mechanical life [operations] .....
- 2.7 Electrical life [hours] .....
- 2.8 Utilisation category: AC .....

**3. SWITCH DISCONNECTERS**

- 3.1 name of manufacturer .....
- 3.2 Manufacturer's type No .....
- 3.3 Rated thermal current [A] .....
- 3.4 Rated full load current [A] .....
- 3.5 Type of operation .....
- 3.6 Rated making capacity [kA] .....
- 3.7 Rated rupturing capacity [kA] .....
- 3.8 Utilisation category .....
- 3.9 Mechanical endurance .....
- 3.10 Electrical endurance .....

**ANNEXURE NO 1**

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**4. OTHER INFORMATION**

4.1 The following specific information is required and should preferably be incorporated in the equipment schedule to be submitted by Tenderers.

4.1.1 Current Transformers:

The type, ratio rated burden saturation factor, over current rating, class and British Standard No. for each current transformer.

4.1.2 Voltage Transformers:

The type, number of phases, voltage ratio, rated burden, class and British Standard No. for each voltage transformer.

4.1.3 Protective Relays:

The name of manufacturer, type, normal current rating, over current rating, range of current and time setting, rated burden, number and rating of contacts and type of operation indicator for each relay.

4.1.4 Instruments and Meters:

The name of manufacturer, type current and/or voltage range and grade for each instrument and meter.

4.1.5 Capacitors and Associated Equipment:

The name of manufacturer, type, rating, dielectric, inrush currents, etc.

**NOTE:**

***THE INFORMATION CALLED FOR ABOVE NEED NOT NECESSARILY BE FILLED IN ON THIS FORM, BUT MAY BE INCLUDED IN THE TENDERER'S MAIN SPECIFICATION.***


**TENDERER'S SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

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**END OF ANNEXURE 1 [VERSION 4] TO HE8/2/2 [VERSION 4]**

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<b>REVISION</b>  Ver. 17		<b>REFERENCE</b>  EEAM-Q-008			
<b>DOCUMENT TYPE:</b> SPECIFICATION			<b>AUTHORISATION DATE:</b> Date signed by CEO		
<b>TITLE:</b> <b>SPECIFICATION FOR CORROSION PROTECTION</b>				<b>PAGE</b> 0 of 13	
<b>COMPILED BY:</b>  EQUIPMENT ENGINEERING AND ASSET MANAGEMENT (GENERAL MANAGER)		<b>REVIEWED BY:</b>  SENIOR MANAGER (PROJECT MANAGER)		<b>REVIEWED BY:</b>  SENIOR MANAGER (ASSET MANAGER)	
<b>ACCEPTED BY:</b>  CHIEF FINANCIAL OFFICER			<b>AUTHORIZED BY:</b>  CEO		
<b>FUTURE REVISION RECORD NUMBER</b>		<b>DESCRIPTION OF REVISION</b>		<b>APPROVAL</b>	
				<b>DATE</b> 18/06/2008	
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<b>KEYWORDS</b> SPECIFICATION			<b>DATE OF LAST REVIEW:</b> N/A  <b>DATE OF NEXT REVIEW:</b> 18/06/2008		

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## 1. SCOPE

- 1.1. This specification covers Transnet Port Terminals requirements for protective coating of iron and steel structures, electrical motors, gear boxes etc. against corrosion and must be read in conjunction with the main specification as well as the following (latest editions):-

SABS 064	"Preparation of steel surfaces for coating"
SABS 763	"Hot-dip (galvanized) zinc coatings"
SABS 1091	"National colour standards for paint"
BS 5493	"Code of practice for protective coating of iron and steel structures against corrosion"

## 2. TYPES OF CORROSION PROTECTION TO BE USED

- 2.1. The coatings specified in this specification are chosen according to BS 5439, Table 3, part 9, to ensure that the condition of the surface will be at least RE2 on the European scale of degree of rust, after 10 years in a environment of frequent salt spray, chemicals and polluted coastal atmosphere. During the 10 years, the normal maintenance painting will be done.
- 2.2. The paint manufacturer shall guarantee the paint for at least 10 years.
- 2.3. Should a tenderer wish to offer coating systems other than those specified, as an alternative, he shall submit full technical details and a list comparing all appropriate details of the alternatives proposed, with the original specified.
- 2.4. Tenderers must ensure that the different coats they offer in their tenders are compatible with each other.
- 2.5. The coating of proprietary items must be done according to Clause 3.
- 2.6. All galvanized components including bolts and nuts but excluding walkway gratings, must be painted with the specified system, unless otherwise approved.

The following coating systems must be used unless otherwise specified in the main specification:-

Substrate	Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
3CR12 steel	1	Surface tolerant epoxy primer	DULUX /SIGMA Sigmacover primer  INTERNATIONAL (PLASCON) Intergard 269  STONCOR (CHEMRITE COATINGS) Carboline 193 Primer	65-75
	2	Two component recoatable, polyurethane finish (Gloss)	DULUX / SIGMA Sigmadur gloss  INTERNATIONAL (PLASCON) Interthane 990  STONCOR (CHEMRITE COATINGS) Carboline 134	65-75
Galvanized Steel	1	Surface tolerant epoxy primer	DULUX /SIGMA- Sigmacover primer  INTERNATIONAL (PLASCON) Intergard 269  STONCOR (CHEMRITE COATINGS) Carboline 193 Primer	65-75
	2	Two component recoatable, polyurethane finish (Gloss)	DULUX /SIGMA- Sigmadur gloss  INTERNATIONAL (PLASCON) Interthane 990  STONCOR (CHEMRITE COATINGS) Carboline 134	65-75

Substrate	Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
Mild steel	1	Two component self curing inorganic zinc ethyl silicate OR two component zinc rich polyamide cured	DULUX /SIGMA- Sigma MC60 OR Sigma-cover primer	65-75

		epoxy primer	INTERNATIONAL (PLASCON) Interzinc 233 OR Interzinc 52 or 53	
			STONCOR (CHEMRITE COATINGS) Carbo Zinc 11 OR Carbo-line 658 Primer	
	2	Flexible recoatable high build polyamide cured MIO epoxy	DULUX/SIGMA – Sigmacover CM MIO	125-150
			INTERNATIONAL (PLASCON) Interseal 010 MIO	
			STONCOR (CHEMRITE COATINGS) Carboline 190 HB M.I.O. or Carboline 193 M.I.O.	
	3	Two component recoatable, polyurethane finish (Gloss)	DULUX/SIGMA Sigmadur gloss	65-75
			INTERNATIONAL (PLASCON) Interthane 990	
			STONCOR (CHEMRITE COATINGS) Carboline 134	

- 2.7. The paint manufacturer's recommendations for the application of the different coating systems, curing time before handling or application of subsequent coats, health and safety recommendations etc. must be carefully adhered to.
- 2.8. Paint contractors must have a quality management system which must be submitted to the Engineer for approval before commencement of the work.
- 2.9. Galvanizing shall be done to SABS 763 heavy duty hot dip galvanizing to a thickness of at least 85µm. Electroplated components in zinc or cadmium are not acceptable.
- 2.10. All mounting bolts, nuts, washers and brackets as well as all fixing bolts, studs nuts and washers shall be of stainless steel. Fixing rivets shall be of either stainless steel or brass.
- 2.11. High tensile bolts for friction grip joints must not be galvanised and must be primed and painted after installation. High tensile bolts must be certified.
- 2.12. The full paint system shall be applied to all surfaces which are to be covered with wear pads, linings etc.
- 2.13. For steelwork which will be transported over long distances and erected on site the two pack epoxy primers is preferred.

### 3. **PROPRIETARY ITEMS**

- 3.1. Proprietary items such as gearboxes, motors, brakes etc. must either be painted according to this specification or where the coating system is equal to or exceeds this specification sufficient proof of the coating system applied must be provided. Items which are nearly equal to this specification shall be given a finishing coat according to this specification's thicknesses and final colours and to the following procedure:-
  - 3.1.1. A cross cut test must be done to SABS SM159 to determine if the original coating adheres correctly to the substrate;
  - 3.1.2. The original coating shall be rubbed down to remove any smooth finishing to form a suitable key for the finish coat and any damaged areas prepared and patch primed with a suitable primer;
  - 3.1.3. The item must then be detergent washed to remove any foreign matter, taking care that no dust, solvent etc. contaminates any working part of the item;
  - 3.1.4. A test shall be done on the existing coat to ensure that the finish coat will not react with and cause undue dissolving and lifting of the existing coat. This can be done by applying a small quantity of the finishing coat thinners.
    - 3.1.4.1. Should any undue dissolving or lifting occur, a suitable intermediate or barrier coat must be applied before the finishing coat is applied.
  - 3.1.5. Proprietary items which failed the cross cut test and which generally have inadequate protection shall be dismantled and the full corrosion protection specification applied.

#### **4. SURFACE PREPARATION**

- 4.1. All steel surfaces shall be detergent washed and fresh water rinsed to remove all oil, grease and surface contaminants before shot blasting.
- 4.2. Sharp edges shall be radiused and major roughness of welds shall be removed by grinding. Welding spatter and flux shall be removed.
- 4.3. Components manufactured from hot rolled steel sections and steel plate shall be blast cleaned to base metal in accordance with SABS 064 grade SA2½ - very thorough blast cleaning, to remove all mill scale, rust, weld spatter etc.
  - 4.3.1. "Sharp" chilled iron shot, chilled iron grit, or granular abrasive slag is to be used to produce a proper degree of surface roughness.
  - 4.3.2. Blast profile shall be determined by micrometer profile gauge, Keane-Tator surface profile comparator or Testex press-o-film.
  - 4.3.3. The profile height shall be between 40 and 50µm at any point.
- 4.4. Good quality blast cleaning and spray painting equipment shall be used. Air used for spraying and blast cleaning shall be free from all traces of oil, water and salinity. Water and oil traps must be fitted to all equipment.
- 4.5. Wheel abrading equipment shall not be used unless an angular profile the same as clause 4.3.3 is achieved.
- 4.6. When wet blasting is done the primer shall be applied before oxidization starts or surface contamination occurs.
- 4.7. Components manufactured from 3CR12 steel shall be lightly abraded. The components shall then be passivated by using a mixture of 10 - 15% nitric acid in water which is rinsed off after 10 - 15 minutes. The surface shall be neutralized to pH 7 before it is coated.
- 4.8. Hot-dip galvanized components, galvanized bolts and nuts etc. shall be lightly abraded with a galvanizing pre-cleaner. The components shall then be washed with detergent and water and washed down with clean water until a water break free surface is achieved. Allow to dry thoroughly.

#### **5. JOINTS AND MATING SURFACES OF MEMBERS**

- 5.1. Mating (faying) surfaces of members which have to be joined by high tensile steel bolts in friction grip shall be cleaned according to Clause 4 and painted with primer only.
  - 5.1.1. After being assembled joints so formed shall be seal welded and painted or after the intermediate coat was applied the edges shall be sealed with an approved brand of paintable flexible sealant or mastic (e.g. Butyl rubber, polyurethane sealer or two component epoxy), by means of a suitable caulking gun.
- 5.2. All rivets, bolts, welds, sharp edges etc. must be covered with a "stripe coat" of the primer or intermediate coat specified to ensure the correct dry film thickness on sharp edges, as well as sealing of bolt threads to head etc.
- 5.3. All other mating surfaces must be sealed with an approved brand of flexible Butyl rubber, paintable Silicone, polyurethane sealer or two component epoxy sealer, and joined while still wet. All excess compounds must be completely removed.

#### **6. PAINTING PROCEDURES**

- 6.1. Directly before the application of paint, the area to be painted shall be degreased with a suitable degreaser and left to dry.
- 6.2. Paint shall only be applied under the following conditions:-

- 6.2.1. There is adequate light.
- 6.2.2. The steel temperature is between 5 and 50°C and at least 3°C above the dew point of the air.
- 6.2.3. The relative humidity of the air is between the limits specified by the paint supplier.
- 6.2.4. Wind does not interfere with the method used and sand and dust cannot be blown onto wet paint.
- 6.3. Steelwork shall be supported on trestles, at least 900 mm off the ground for painting purposes.
- 6.4. An adequate number of test readings shall be taken per square meter in order to determine the dry film thickness.
  - 6.4.1. The paintwork shall be acceptable if the average of the test readings taken falls within or exceeds the ranges given.
  - 6.4.2. Paintwork shall not be acceptable if any single test reading is less than the specified minimum thickness.
- 6.5. An ultrasonic or electronic magnetic flux thickness measurement gauge shall be used, but in case of dispute, destructive testing shall be applied. The painted steelwork shall present a clean, neat appearance of uniform colour and gloss as applicable to the paint used. Each coat of paint shall be applied as a continuous, even film of uniform thickness. More than one application of paint may be required to achieve the dry film thicknesses specified or to obliterate the colour of the previous coating.
- 6.6. The use of thinners or solvents at any stage of the work is prohibited, unless specified by the paint manufacturer.
- 6.7. Precautions shall be taken to prevent coatings from being applied to equipment nameplates, instrument glasses, signs etc.



## 7. COLOUR CODES

Machinery and equipment shall be painted in the following final colours:-

	Area	Colour	Code No. [SABS 1091 and International No's]
7.1.1	Mobile equipment (cranes, loaders etc.)		
	a) Structure, machinery and electrical houses, operator's cabins, chutes, hoppers etc.	Transnet Red	RAL 3020
	b) Undercarriage, travel bogies, rubber tyred rims	Transnet Red	RAL 3020
7.1.2	Industrial buildings, conveyor structures		
	a) Roofs and canopies	Pantone cool grey 10	RAL 7037 (Staubgrau)
	b) Painted walls	Pantone cool grey 3	RAL 7035 (Lightgrau) or SABS 1091 G62 (Pale grey)
	c) Steel columns, rafters, trusses	Pantone cool grey 5	RAL 7004 (Signalgrau)
7.1.3	General		
	a) Guards	Golden yellow	SABS 1091-B49 RAL 1003
	b) Sheaves	Orange	RAL 2008
	c) Cable reels (Stainless steel)	Orange	RAL 2008
	Machine buffers and parts of machine which could constitute a serious hazard	Golden Yellow (High Gloss) with Luminous green stripes in chevron pattern	SABS B49 and Luminous green

Area	Colour	Code No. [SABS 1091 and International No's]
e) Any exposed rotating part of machinery, electrical Switch-gear (other than starting and stopping devices and emergency stop control), electrical services e.g. conduit and allied fittings	Light Orange (High Gloss)	SABS 1091 B26 BS 381C-557
f) Low voltage switchgear panels where orange is not aesthetically acceptable	Light grey	SABS 1091-G29 BS 381C-631
g) Medium voltage cable trays, switchgear and motors (3,3 kV and up)	Oxford Blue	SABS FO2 BS 381C-105 RAL5003
h) Starting devices, low voltage cable trays and switchgear	Mid brunswick green (high gloss)	BS 381C-228 SABS1091-EO4 RAL6005
i) Portnet Logo	Transnet White	RAL 3012
j) Parts of stationary machinery (Electrical, motors, gearboxes, brakes, transformers, etc.)	Light Grey	SABS G29 BS 381C-631
k) Hand levers, hand wheels, oiling points, handrails on walkways, ladders	Golden Yellow (High Gloss)	SABS 1091 B49 BS 381C-356
l) Stopping devices, grease points, motor fan covers and danger signs (not symbolic safety signs for which see SABS 1186)	Signal red (High Gloss)	SABS 1091 A11 BS 381C-537 RAL3001
m) Walkways (non slip surfaces) (galvanized gratings not to be painted)	Shop floor green	
n) Informatory signs and notices (not symbolic safety signs for which see SABS 1186)	White on Emerald Green (High Gloss)	White on SABS 1091 E14 BS 381C- 228

Area	Colour	Code No. [SABS 1091 and International No's]
7.1.4	Pipe lines	
	a) Reclaim water piping	Aluminium
	b) Slurry pipe lines	Dark admiralty grey
	c) Fire protection piping	Signal red
	d) Washwater drain pipes	Light grey
	e) Instrument air	White with Strong blue band
	f) Plant air	White with Flag blue band
	g) Potable water	Grass green

7.1.5 Colour bands for pipes shall be 75 mm wide for pipe sizes up to 150 mm diameter and 100 mm wide for 150 mm and above. The colour bands shall be applied to the pipe flanges, valves, junctions, walls or structures etc. in such a manner that the pipe may be easily identifiable. On straight sections the maximum spacing shall be 100 x the pipe diameter.

## 8. FIELD TOUCH-UP PAINTING

8.1. Damaged and unpainted areas, fasteners, welds, etc. shall be cleaned by wire brushing with hand tool or power tool in a manner which will minimize damage to sound paint. Grinding will not be allowed. Rust spots shall be cleaned to bright metal. Thick edges of old paint abutting on bare metal surfaces shall be feathered by scraping and sanding.

8.1.1. Where welding is required on areas already coated with the coating system, the coat should be stepped back for  $\pm 30\text{mm}$  around the weld area.

8.2. The paint shall be applied to match the original coats in accordance with the manufacturer's recommendations for the specific paint system.

Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.

8.3. Areas of damaged galvanizing shall be repaired with an approved cold galvanizing product or metal sprayed by the wire spraying process with Zinc, and then touched up with the specific paint system.

## 9. GENERAL

9.1. All walkways, floors, maintenance platforms etc. must be painted with a durable, non skid coating of the appropriate colour.

9.2. Exposed machined surfaces must be coated with a strippable corrosion inhibitor (e.g. Tectyl).

9.3. Where different materials will be in contact with each other and galvanic corrosion can occur the contact areas of the materials must be isolated from each other or the joints made water proof to prevent ingress of moisture.

9.4. All components must be designed with corrosion prevention in mind and specifically the following:-

- 9.4.1. No entrapment of dirt, product, moisture etc.
- 9.4.2. No areas must be inaccessible for maintenance such as too narrow gaps etc.
- 9.4.3. Large flat areas rather than complicated shapes and profiles.
- 9.4.4. No sharp corners and discontinuous welds.
- 9.5. Parts of equipment which are exposed to high temperatures must be coated with the following system:-

Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (μm)
1	Two component self curing inorganic zinc ethyl silicate	DULUX /SIGMA-Sigma MC60  INTERNATIONAL (PLASCON) Interzinc 233  STONCOR (CHEMRITE COATINGS) Carbo Zinc 11	65-75
2	Single component high temperature moisture curing silicone with aluminuim flakes	DULUX/SIGMA – Sigmatherm Silicate  INTERNATIONAL (PLASCON) Intertherm 50  STONCOR (CHEMRITE COATINGS) Carboline 1248	40

## 10. MAINTENANCE PAINTING OF STRUCTURES

- 10.1. Areas which are only lightly corroded must be cleaned by means of high pressure water blasting or wire brushing by power tool and the following system applied:-

Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (μm)
1	Surface tolerant two pack epoxy primer with aluminuim pigments	Dulux/SIGMA Aluprimer  STONCOR (CHEMRITE COATINGS) Carbomastic 15  INTERNATIONAL (PLASCON) Intergard 468,	125-150
2	Same as first coat OR micaceous iron oxide (MIO) epoxy	DULUX/SIGMA – Sigmacover CM MIO	125-150

		INTERNATIONAL (PLASCON) Interseal 010 MIO	
		STONCOR (CHEMRITE COATINGS) Carboline 190 HB M.I.O. or Carboline 193 M.I.O.	
3	Two component recoatable, polyurethane finish (Gloss)	DULUX/SIGMA Sigmadur gloss	65-75
		INTERNATIONAL (PLASCON) Interthane 990	
		STONCOR (CHEMRITE COATINGS) Carboline 134	

10.1.1. Alternatively, the Noxyde paint system can be used, consisting of two to three coats of water based Noxyde paint to achieve a DFT of 350 to 400 microns. Where the Noxyde system is used on areas other than slightly corroded structural areas, the following additional requirements must be observed:


- 10.1.1.1. Very smooth surfaces (e.g. 3CR12, stainless steel or hot-dip galvanized components, bolts, nuts and fittings, and HT bolts): Parts must be thoroughly degreased using OptiDegreaser, washed down with potable water, and immediately when dry, a single coat of OptiPrimeAqua applied.
- 10.1.1.2. Paintable flexible sealant/mastic: Only sealant approved by the paint manufacturer may be used, and an initial coat of OptiPrimeAqua applied over it before the further coats of Noxyde are applied.
- 10.1.1.3. Bolted/rivited connections: After blasting or and/or cleaning as required, apply a coat of OptiPrimeAqua and an additional stripe coat of Noxyde, in contrasting colour, to all bolt/nut and plate edges and crevices.

- 10.2. The adhesion of old coatings must be verified by doing a cross cut adhesion test on selected areas.
- 10.3. The compatibility of the new paint system on the old coating must be tested and guaranteed in writing by the paint supplier.
- 10.4. The work and coating system must be guaranteed for a minimum of 12 months.
- 10.5. All heavily corroded areas must be shot blasted to minimum SA2 and the three coat system indicated in clause 2.6 applied.
- 10.6. Areas where the old coating is still sound need only be high pressure cleaned with a suitable solvent and coated with one of the primers suggested in clause 10.2 (as tie coat) and then with one of the top coats suggested in clause 2.6 to get the appropriate colour and finish. The minimum dry film thickness of this tie coat must be 75 microns and top coat must be 50 microns, but the previous coating colour shall be completely obliterated to present a uniform colour.

Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.

- 10.7. Repairs to the insides of all the enclosed sections of the booms as well as the insides of the crane legs, sill beams, cross beams, pylon cross bracing members etc. shall be done as above but the top coat need not be applied.

**\*\*\* END OF SPECIFICATION HE 9/2/8 [Version 17] \*\*\***

REVISION  0	REFERENCE  EEAM-Q-009			
DOCUMENT TYPE SPECIFICATION			AUTHORISATION DATE: Date signed by CEO	
TITLE: QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION			PAGE 1 of 14	
COMPILED BY:	REVIEWED BY:	REVIEWED BY:		
SENIOR MANAGER (QUALITYMANAGER)	SENIOR MANAGER (PROJECT MANAGER)	SENIOR MANAGER (GENERAL MANAGER)		
ACCEPTED BY:		AUTHORIZED BY:		
CHIEF FINANCIAL OFFICER		CEO		
FUTURE REVISION RECORD NUMBER	DESCRIPTION OF REVISION	APPROVAL	DATE 01/03/2010	
-1-				
<p align="center"><b>CONTENTS</b></p> <p>1.0 QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION</p>				

KEYWORDS SPECIFICATION	DATE OF LAST REVIEW: N/A
	DATE OF NEXT REVIEW: 01/03 2010

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## 1. Introduction

This Specification outlines the minimum requirements to ensure that products and services supplied to Transnet Port Terminals are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in the Contract, all associated specifications, drawings, codes and standards.

## 2. Definitions

Term, Abbreviation	Meaning
Data	All drawings/documents/data/information and DP's required to be supplied under the Contract
Data Pack (DP)	A compilation of manufacturing data, certification, inspection and testing records prepared by the Supplier/Contractor to verify compliance with the Contractual requirements.
Employer	For the purposes of this document, the term Employer has the same meaning as applied to the term Client.
Field Inspection Checklist (FIC)	A document that details the checks, requirements and test parameters for each type of equipment to permit field installation and pre- commissioning of the equipment.
TPT	Transnet Port Terminals is the Employer's Nominated Agent in terms of the Conditions of Contract.
Inspection Release Report (IRR)	A document issued to the Supplier/Contractor by TPT advising release of the Materials for shipment. This does not relieve the Supplier/Contractor of its obligations in accordance with the Terms and Conditions of the Contract.
Inspection Waiver Report (IWR)	<p>A document issued to the Supplier/Contractor by TPT advising that TPT has waived final inspection for the materials listed in this document. The issue of this Report does not preclude further inspection by TPT, is issued without prejudice and does not relieve the Supplier/ Contractor from the guarantees and obligations included in the Contract/ Contract.</p> <p>A document prepared by the Supplier/Contractor providing relevant information applicable to the installation and maintenance of the specific equipment, including consumables (eg. oils etc)</p>
Project Quality Plan (PQP)	A document that outlines the Supplier/Contractor's strategy, methodology, resources allocation, Quality Assurance and Quality Control coordination activities to ensure that Goods and Services supplied meet or exceed the requirements defined in the Contract, drawings, codes and standards.
Quality Control Plan (QCP)*	<p>A document outlining specific manufacturing / construction inspection and testing requirements, including responsibilities, test acceptance criteria, nomination of witness and hold points.</p> <p>For the purposes of this document, the term Supplier/Contractor has the same meaning as applied to the term Sub-Supplier/Sub-Contractor</p>
Supplier/Contractor	This refers to the documentation required to be submitted by the relevant Supplier / Contractor in terms of the Contract.
Supplier/Contractor Data Requirements	These requirements are generally tailored to suit the particular Scope of Work, although it also addresses the manner in which the documentation is required to be submitted, eg Hard copy, Electronic copy etc
Technical Query Note (TQN)	This refers to a document used by the Supplier/Contractor to formally clarify a Technical Query related to the scope of supply. This should not be used where a non-conformance has already been initiated.

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### **3. Applicable Documents**

#### **3.1 General**

All work performed shall comply with the requirements of this Specification, the documentation referenced in the Contract and the latest revision/edition of the relevant Codes and Standards referenced herein.

#### **3.2 Statutory Regulations**

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

#### **3.3 Codes and Standards**

<b>Document No.</b>	<b>Title</b>
ISO 9001	International Standard Series Quality Systems
EEAM-Q-013	Punch Listing Standard

### **4. Quality System**

#### **4.1 General**

The Supplier/Contractor shall be responsible for all quality activities necessary to ensure the Work meets the requirements specified in the Contract, and shall manage and coordinate all Quality aspects of Work in accordance with the requirements of this Specification, and the Supplier/Contractor's PQP and QCP's once reviewed and approved by TPT.

The Supplier/Contractor shall ensure that all Sub-Suppliers/Sub-Contractors also conform with the requirements of this Specification.

#### **4.2 Supplier/Contractor Quality System Requirements**

The Supplier/Contractor shall have, maintain and demonstrate its use to TPT, its documented Quality Management System. The Supplier/Contractors Quality Management System should be in accordance with the International Standard ISO 9001.

The Supplier/Contractor shall submit its Quality System documentation to TPT at the time of tender and at Contract Phases as detailed below:

- Project Quality Plan
- Quality Policy
- Index of Procedures to be used
- Programme of internal and external audits

#### **4.3 Supplier/Contractor Documentation Requirements**

The Supplier/Contractor shall develop and maintain a comprehensive register of documents that will be generated throughout the project, and shall include all quality related documents. The register shall be submitted to TPT for review.

TPT shall indicate those documents required to be submitted for information/review and/or acceptance and this shall be indicated in the Supplier/Contractors' Document Register. The register shall indicate the dates of issue of the documents taking into account sufficient time to allow TPT review/acceptance cycle prior to the document being required for use.

---

## **5. Quality Assurance**

### **5.1 Project Quality Plan**

Where specified, the Supplier/Contractor shall submit a PQP to TPT within 28 days after the Contract start date. The PQP shall detail how the Supplier/Contractor's Quality System will be applied to the Scope of Work specified in the Contract, and shall address the following:

- Satisfying the technical and quality requirements of the Supplier/Contractor's Scope of Work, and relevant elements of the applicable ISO 9001 standard
- include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls and records used to control and verify compliance with the specified Contractual requirements

Include a listing of all special processes (eg. welding and non-destructive testing, cube testing etc) envisaged for use, including confirmation of personnel certification as required

- Include all proposed method statements (for site based work activities)
- Include a description of the Supplier/Contractor's project organisation, with key positions and responsibilities identified and individuals named. The organisation structure shall also indicate the resources committed to the management / coordination of QA / QC activities
- Include a listing of all Quality Control Plans (QCP's), and associated Field Inspection Checklists (FIC's), as applicable
- Identify in the Project Quality Plan any Sub-Supplier/Sub-Contractor work. Sub-Supplier/Sub-Contractor plans shall be approved by the Supplier/Contractor, and a copy forwarded to the TPT
- Include the proposed Authorised Inspection Authority (where applicable - for pressurised equipment and systems)
- Include a schedule of proposed quality records

The PQP shall be controlled and re-submitted for approval when required to incorporate any change necessary during the Contract duration to ensure that the document is maintained as an effective control, change management and records. The change management will be done to an agreed policy or procedure.

Note: Where the Supplier/Contractor is required to provide a PQP, no work shall commence until the PQP is approved by TPT.

### **5.2 Procedures**

The Supplier/Contractor's PQP and procedures shall address the system elements and activities appropriate to the Scope of Work, in compliance with the specified Quality Standard.

Where specified, the Supplier/Contractor shall submit copies of Quality Procedures for review. In addition, the Supplier/Contractor shall ensure that copies of all Procedures relevant to the Scope of Work are available for reference by TPT at each work location.

These will include, as applicable, the following:

#### **5.2.1 Document Control**

The Supplier/Contractor's Project Quality Plan shall provide a description of how TPT provided, Supplier/Contractor and Sub-Supplier/Sub-Contractor documents are to be managed. The description shall address as a minimum:

- Management tools and databases
- Receipt, registration and maintenance
- Internal and external distribution to Employer, third parties and Sub-Contractors
- Management of Codes, Standards and Specifications

- 
- Internal review and approval routines and authorities
  - How it is ensured that the correct revisions of documents are available at the point of use including retention periods for all documentation.

### **5.2.2 Design Control**

Where the Supplier/Contractor is responsible for any aspect of design related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these design activities.

### **5.2.3 Procurement**

Where the Supplier/Contractor is responsible for any aspect of procurement related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these activities.

## **5.3 Supplier/Contractor Audits**

The Supplier/Contractor shall:

- Carry out audits in accordance with its Quality System at its own and Sub-Supplier/Sub-Contractor's facilities to ensure project quality requirements are being achieved
- Include a QA Audit Schedule in the Supplier/Contractor PQP submitted to TPT prior to commencement of the Scope of Work. The Audit Schedule shall include all audits to be implemented by the Supplier/Contractor and Sub-Supplier/Sub-Contractor during the execution of the Contract
- Where stipulated in the Contract, perform an audit within three months after the Contract start date and thereafter at a minimum frequency of three months. Audit reports shall be submitted to TPT at the completion of each Audit. Where unsatisfactory performance is evident, additional audits shall be performed by the Supplier/Contractor as directed by TPT.

## **5.4 Transnet Port Terminals Audit**

TPT reserves the right to perform quality audits or participate as an observer in Supplier/Contractor audits to verify compliance with the Contractual requirements. The Supplier/Contractor shall within a time frame as agreed upon, correct any adverse audit finding advised by TPT.

# **6. Inspection and Testing**

## **6.1 General**

TPT may, at its discretion perform surveillance inspection at the Supplier/Contractor's premises, SubSupplier/Sub-Contractor's premises or at the location of the Scope of Work.

Dependent on the nature of the Scope of Work and the frequency of inspections TPT may elect to have inspection personnel resident at the place of manufacture, fabrication, or assembly.

The Supplier/Contractor shall ensure free entry and access is given to TPT, certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and quality records at all parts of the Supplier/Contractor's and Sub-Supplier/Sub-Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

The Supplier/Contractor shall provide TPT with all necessary tools, calibrated measuring equipment, safety equipment and workspace to verify or witness tests in progress.

While TPT is at the Supplier/Contractor's premises, the Supplier/Contractor shall provide, free of charge, reasonable facilities including office facilities and reasonable access to a telephone, facsimile machine and computer connection point.

The Supplier/Contractor shall provide notice in writing in within a time frame time as agreed upon, to allow the attendance of TPT and other representatives at nominated witness and hold points.

---

## 6.2 Quality Control Plans

The Supplier/Contractor shall prepare and submit QCP's to TPT for review in accordance with the requirements of the Contract and PQP.

QCP's shall identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, witness and hold points.

The Supplier/Contractor shall not commence fabrication or manufacture prior to review and approval of the applicable QCP by the TPT.

QCP's shall include reference to all tests specified in the Contract Document.

A typical format for an QCP is shown in Appendix A. The Supplier/Contractor may use its own format providing all information shown in Appendix A is included.

## 6.3 Inspection Points

The QCP shall identify points in the fabrication, manufacturing and/or installation process that are selected for inspection and shall be denoted by the following inspection codes:

- Hold Point (H)                      Inspection point in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Holding points require written notification to TPT.
- Witness Point (W)                      An inspection point in the manufacturing cycle that will be witnessed or verified. If TPT confirms it is unable to attend after being provided with the written notification then manufacture may proceed. Witness points require written notification to TPT.
- Review Point (R)                      A point at which products and quality records are verified and endorsed. Review points are not notifiable points.
- Surveillance (S)                      An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.

The Supplier/Contractor shall maintain the status of testing and inspection by progressively having the QCP's signed off.

## 6.4 Revision to Quality Control Plans

Revision of the QCP shall be subject to the same submission, review and acceptance routines as described for the original QCP issue

## 6.5 Kick Off Meeting

After the Contract start date, and prior to manufacture, TPT will require a Kick Off Meeting with the Supplier/Contractor to discuss fully the implications of meeting TPT quality requirements. This meeting may be held as part of the Contract kick-off meeting for each package or may be a separate meeting, subject to the critical or complex nature of the work. This requirement for a pre-inspection meeting may be repeated when sub-Supplier/Contractors of key equipment are engaged.

After mobilization of the Contractor, and prior to the commencement of any construction activities, TPT will arrange for a Quality kick-off meeting to discuss fully the implications of meeting the projects' quality requirements. This meeting may be held as part of the formal kick-off meeting for each contractor, or may be a separate meeting subject to the critical or complex nature of the work.

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## **6.6 Schedule of Inspection**

The Supplier/Contractor shall submit a Schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The Schedule shall be regularly updated with progress and issued to TPT to show the current inspection and test status.

## **6.7 Field Inspection Checklists**

For site installation and construction activities, the Supplier/Contractor shall prepare Field Inspection Checklists (FIC's) to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCP's.

FIC's shall be provided to TPT for initial review, and shall be used to record the results of inspection and testing (where applicable), and on completion be submitted to TPT to confirm satisfactory completion of the tests and inspections at nominated QCP witness and hold points.

## **6.8 Inspection Notification**

The Supplier/Contractor shall notify TPT in writing at least two calendar weeks prior to the advent of inspections or tests that require witnessing.

For inspections or tests within the country, arrangements shall be confirmed at least two working days before the event. For inspection and tests outside of the country, arrangements shall be confirmed at least seven working days before the event.

Inspection notifications shall include the following essential information:

- Contract Number
- Location of Inspection or Test
- Nature of Inspection or Test
- Date and Time of Inspection or Test
- Name and telephone number of the Supplier/Contractor's Representative.

## **6.9 Inspection and Testing**

The Supplier/Contractor is responsible for the conduct of all Supplier/Contractor inspections and tests, and includes:

- Documenting inspection and tests result in the QCP's and relevant FIC's
- Progressively inspecting the quality of the Scope of Work performed, including that of all Sub-Supplier/Sub-Contractors
- Inspecting to meet all Contractual requirements, in number, type and form
- Inspecting day to day activities, material receipts, issue of material for installation, in-process inspections, and final inspections.

Completed original QCP's and FIC's shall be submitted to TPT in the DP

## **6.10 Inspection Release**

At completion of the Scope of Work, either in total or in phases, TPT may issue an Inspection Release Report (IRR) or a waiver of inspection.

The issue of either an inspection release or waiver of inspection does not relieve the Supplier/Contractor of its obligations under the Contract. The Supplier/Contractor shall ensure a copy of the release note and final expediting release note for transport, where appropriate, is attached to the delivery docket and accompanies the Work to the designated destination indicated in the Contract. Items delivered to TPT without a copy of these documents may not be accepted.

A copy of the inspection release or waiver of inspection shall be included in the DP.

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## **6.11 Special Processes**

It is the Supplier/Contractor's responsibility to ensure that all processes which require prequalified procedures and/or work methods are tested and qualified before work begins. This typically covers such activities as welding, non-destructive testing, special fabrication techniques and painting. Unless specified such procedures are the Supplier/Contractor's responsibility and do not require submission to TPT before work begins. When such procedures are requested, no work shall commence until procedures are approved by TPT.

It is the Supplier/Contractor's responsibility to ensure all operators are qualified for the processes in accordance with the procedure and/or applicable standards. Records of qualification of operators shall be maintained by the Supplier/Contractor and made available to TPT when requested.

Records of qualification of procedures and processes shall be maintained by the Supplier/Contractor in accordance with the applicable procedure or code.

## **6.12 Welding Procedures**

Where the Supplier/Contractor's Scope of Work includes fabricated weldments, Welding Procedure Specifications (WPS) defining the method, preparation and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of the Supplier/Contractor's Scope of Work. The procedure shall only be submitted to TPT when requested in the Contract.

WPS shall include all welding essential and non-essential variables for each process used, including appropriate test results and shall comply with the standard or code pertaining to welding required in the execution of the Supplier/Contractor's Scope of Work.

When requested in the Contract a suitably marked "weld map" shall be completed by the Supplier/Contractor for all items to be fabricated. A summary of WPS shall be prepared and when used, shall be identified on the weld map.

Where TPT approval is required, fabrication shall not commence until written approval of WPS and Welding Procedure Qualification Records (WPQR) is received by the Supplier/Contractor. No welding fabrication will be accepted that is not covered by an TPT approved WPS/WPQR.

Welding Procedure Qualification (WPQ) tests may be witnessed by TPT and/or an independent inspection authority. Testing of the specimens prepared during the WPQ Tests shall be carried out by an independent approved testing laboratory independent of the Supplier/Contractor. In certain instances, a certificate to EN 10204 3.1 B may be required which will be clarified at Tender review and clarification stage.

Where actual weld deposit analysis and weld metal physical properties are required for procedure qualification, the information shall be taken from the procedure qualification tests. Data listed in the catalogues of the manufacturer of welding consumables is not acceptable.

Welders/welding operators shall be qualified in accordance with the relevant welding code prior to commencing production fabrication. Specific Welder Qualifications (WQ's) records will be reviewed by TPT in the Supplier/Contractor's works and should NOT be submitted for review.

A register of welders qualified to work shall be maintained by the Supplier/Contractor.

## **6.13 Material Traceability**

Where, and to the extent that material traceability is required, the Contractor shall provide its procedures for the maintenance of material identification throughout all phases of manufacture. Methods of identification, routines for re-stamping or stencilling as appropriate shall be defined and agreed with the Employer.

Adequate records shall be maintained throughout construction enabling traceability of key materials from final product back to original material certificates. The material traceability records shall form part of the DP

The Contractor shall prepare a schedule of materials and equipment that are subject to traceability requirements.



## **6.14 Material Certification**

Where specified in the Contract the following certificates shall be provided to TPT and included in the DP.

Type A:	A Supplier/Contractor's certificate of compliance with the Contract. This certifies that the goods or services are supplied in compliance with the Contract without mention of any test results (EN10204 certificate 2.1).
Type B:	A certificate issued by a laboratory or test facility independent of the Supplier/Contractor's works. It shall quote test results carried out on the product supplied and state whether compliance with the relevant technical standard, code etc has been complied with. (EN 10204 certificate 3.1 B).
Type C:	The same as Type B, the tests are to be witnessed by a third party (EN 10204 certificate 3.1C).

## **7. Non Conforming Products**

### **7.1 General**

The Supplier/Contractor shall establish and maintain procedures to control material or products that do not meet the specified requirements.

All Supplier/Contractor product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- If the Supplier/Contractor discovers material or product which is not in accordance with the requirements of the Contract, i.e. a non conformance (NCR), the Supplier/Contractor shall promptly initiate the non-conformance procedure in terms of the Supplier/Contractor's Quality Management System, advise TPT promptly, and provide a copy of the NCR to TPT
- If TPT or it's agent identifies a non conformance an TPT NCR may be raised.
- Originals of all closed out NCR's shall be included in the DP.

### **7.2 Corrective and Preventative Action**

If the Supplier/Contractor proposes a disposition of any non conforming materials or product which varies from the requirements of the Specification or Contract, such a proposal shall be submitted in writing to TPT whose decision on the proposal shall be obtained in writing before the non conforming material or product is covered up or incorporated into the Works, or is the subject of any other disposition.

The disposition of non-conformances which do not vary the requirements of the Contract, specification or drawings may be approved by the Supplier/Contractor following discussion and agreement with TPT.

## **8. Concession Requests and Technical Queries**

### **8.1 Concession Requests**

Where a Supplier/Contractor requests a Concession to deviate from the requirements of the Contract or specified requirements, the Supplier/Contractor shall raise the request with TPT using the format as shown in Annexure B.

The Concession Requests shall clearly identify all elements of the proposed deviation together with any resulting technical, commercial and/or schedule impacts.

Completed original Concession Requests shall be included in the DP.

### **8.2 Technical Queries**

For clarification of technical issues (only), Supplier/Contractor may submit a Technical Query Note (TQN) to TPT in accordance with the Contract.

The TQN shall clearly identify all elements of the query, and all supporting documentation and/or drawings shall be attached where appropriate.

Completed original TQN's shall be included in the DP.

---

## **9. Inspection, Measuring and Test Equipment**

### **9.1 Calibration**

The Supplier/Contractor, including its Sub-Supplier/Sub-Contractors shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant Supplier/Contractor procedures and/or the equipment manufacturer's specifications.

Where calibration is required by an external laboratory, the Supplier/Contractor shall ensure that the facility selected for calibration possesses current certification. Calibration certificates shall contain a statement that the test equipment is accurate to within specified tolerances.

The Supplier/Contractor should establish the frequency of calibration for each item of equipment (including jigs, fixtures or templates) and record the details in a 'Measuring and Test Equipment Register' (or similar).

### **9.2 Use of Inspection, Measuring and Test Equipment**

The Supplier/Contractor shall ensure that authorised equipment users:

- Use the equipment in accordance with manufacturers instructions, and accepted industry practices
- Ensure the equipment is covered by a current calibration certificate
- Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
- Prior to commencement of each inspection or test activities:
  - Identify the measurements to be made
  - Determine the accuracy required
  - Select the appropriate inspection, measuring or test equipment for the scope of work.

### **9.3 Verification of Previous Test Results**

Where the calibration status of the equipment is unknown, expired or has doubtful accuracy, the equipment shall immediately be quarantined, and tagged according to Supplier/Contractor's Quality System procedures. The Supplier/Contractor shall then arrange for either in-house or external calibration, and:

- review all previous test results associated with the suspect equipment
- identify the inspections, measurements or tests required to re-validate the results
- ensure that suitable re-testing is performed with calibrated equipment
- document the results of the re-testing on the respective inspection and test documentation.

## **10. Quality Records**

Supplier/Contractors shall maintain Quality Records necessary to provide objective evidence that demonstrates and verifies achievement of the QA / QC requirements associated with the Scope of Work. All Quality Records, including original source material test certificates and non destructive test reports, shall be retained by the Supplier/Contractor during the project, and be provided to TPT at the times, and in the quantities specified in the Contract.

The Supplier/Contractor shall collate all quality records in the DP and submit the DP to TPT in accordance with the Contract and all referenced standards and specifications. This DP shall be compiled progressively, and shall be available for review at all phases of manufacture or construction activities.

The Scope of Work shall not be complete until the Supplier/Contractor's DP including the quality records from Sub-Supplier/Sub-Contractors have been reviewed and accepted by TPT.

The DP shall be compiled progressively during the execution of the Scope of Work and shall be made available for review by TPT as required.



## Annexure A - Sample Quality Control Plan

Quality Control Plan No.:	Rev:	Date Issued:
Contract No.:	Description:	Item No.:
Supplier / Contractor:	Location:	

[illegible]

## **Annexure B - Request for Concession**

<b>Request for Concession</b>				<b>No: _____ of 2</b>	
<b>A. SUPPLIER/CONTRACTOR SUPPLIED INFORMATION</b>					
SUPPLIER/CONTRACTOR NAME:			CONTRACT NO.:		
SUPPLIER/CONTRACTOR CONCESSION NO.:			DATE:		
Required concession applicable to: (Item/Material/Equipment/Area)					
Description of Concession — Revised Requirements:					
Justification:					
(NOTE: This concession will be rejected if the following information is not provided):					
(i) VALUE OF BENEFIT TO CLIENT	(ii) AGREE TO AN EXTENSION OF THE WARRANTY	YES	NO	(iii) ANY IMPACT ON SCHEDULE?	NO
S/R	IF "YES" WHAT PERIOD?			CF "YES" \ WHAT PERIOD?	
References:					
Original reference:					
Requirements	Rev.:	Specification	N	Rev.:	
Drawing No.:	Rev.:	Specification	O.	Rev.:	
Drawing No.:	Rev.:	Specification	:	Rev.:	
Attached documentation:			N		
applicable					
Requested by:					
(Supplier/Contractor) Name:			Signature		
			: _____ D		
Note: Sections B to F on Page 2					

<b><i>Request for Concession No:</i></b>			
<b>B. SITE ADMINISTERED CONTRACT?</b>	Yes <input type="checkbox"/>	Nn <input type="checkbox"/>	Go to "D"
Possible QC implications:			
<div style="border: 1px solid black; padding: 5px; min-height: 40px;"> Recommendations  Recommendations </div>	<div style="border: 1px solid black; padding: 5px; min-height: 40px;"> Rejected </div>		
Site Construction Manager:		Signature:	Date:
Site Engineer:		Signature:	Date:
<b>C. RECOMMENDATION BY CONTRACT ADMINISTRATOR: Name:</b>			
Signature		Date:	
<b>D. RECOMMENDATION BY ENGINEERING:</b>			
<input type="checkbox"/> Recommended	<input type="checkbox"/> Rejected	<input type="checkbox"/> Conditional, with the following	
recommendations:			
Package Engineer:		Signature:	Date:
Lead Discipline Engineer:		Signature:	Date:
Engineering Manager:		Signature:	Date:
Comments:			
<b>E. PROJECT MANAGER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			
Name: _____ Signature _____ Date: _____			
<b>F. EMPLOYER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			

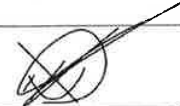

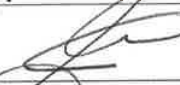

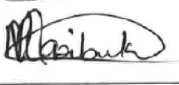


TRANSNET SOC LTD

ENQUIRY/CONTRACT NUMBER:

CONTRACT TITLE: ACQUISITION OF CRITICAL SPARES (TRANSFORMERS WORK PACKAGE) AT RICHARDS BAY FOR TRANSNET SOC LTD (REG.NO.1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS, (HEREINAFTER REFERRED TO AS "TPT") FOR THE PORT OF RICHARDS BAY, AS A ONCE OFF SUPPLY.

### Scope of Work Approval Signatures

	Name	Title	Signature	Date
Compiled by	Kedibone Phume	Projects Manager		02/03/2021
Reviewed	Mbali Cele	Senior Project Manager(Acting)		03/03/2021
Reviewed	Siyabulela Diya	Technical Manager – HT Department		03/03/2021
Reviewed	Khulani Msane	Engineering Technician		03/03/2021
Approved	Vusimuzi Mazibuko	Engineering Manager – HT and Automation		04/03/2021



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## **SCOPE OF WORK**

**DESIGN, MANUFACTURE, SUPPLY AND DELIVERY OF HIGH VOLTAGE TRANSFORMERS  
FOR TRANSNET SOC LTD OPERATING AS TRANSNET PORT TERMINALS AT THE PORT  
OF RICHARDS BAY BULK TERMINAL**

Document reference	Title	No of pages
	This cover page	1
C3.1	<i>Purchaser's</i> Goods Information	4
	Total number of pages	11



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## **C3.1: *PURCHASER'S* GOODS INFORMATION**

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## **1 DESCRIPTION OF WORKS AND BACKGROUND**

### **1.1 Interpretation and Terminology**

The following abbreviations are used in this document:

<b>Abbreviation</b>	<b>Abbreviation meaning</b>
CEMP	Construction Environmental Management Plan
CD	Compact Disc
CDR	Contractor Documentation Register
CDS	Contractor Documentation Schedule
CRL	Contractor Review Label
CSHEO	Contractor's Safety, Health and Environmental Officer
CM	Construction Manager
DWG	Drawings
EO	Environmental Officer
IR	Industrial Relations
IRCC	Industrial Relations Co-ordinating Committee
CIRP	Contractor's Industrial Relations Practitioner
Native	Original electronic file format of documentation
QA	Quality Assurance
SANS	South African National Standards
SHE	Safety, Health and Environment
SHEC	Safety, Health and Environment Coordinator

## **2 SCOPE OF WORKS**

### **2.1 General Description of the Works**

The work comprises of the design, manufacture, supply and delivery of High Voltage Transformers to the Port of Richards Bay, Transnet Port Terminals.

The following is the general requirements for supply of Transformers:

2.1.1 All transformers to be indoors designed and oil sealed standard: IEC60422.

2.1.2 All transformers must be fitted with bushing insulators.

2.1.3 Transformers must comply with SANS specification SANS 780:2009 Distribution Transformers.

TRANSNET SOC LTD

ENQUIRY/CONTRACT NUMBER:

CONTRACT TITLE: ACQUISITION OF CRITICAL SPARES (TRANSFORMERS WORK PACKAGE) AT RICHARDS BAY FOR TRANSNET SOC LTD (REG.NO.1990/000900/30) OPERATING AS TRANSNET PORT TERMINALS, (HEREINAFTER REFERRED TO AS "TPT") FOR THE PORT OF RICHARDS BAY, AS A ONCE OFF SUPPLY.

2.1.4 Transformers must comply with the following Transnet Standard Specification (refer to attachments):

- EEAM-Q-020 (Test On Electrical Equipment);
- EEAM-Q-021 (Specification for Electronic Equipment);
- EEAM-Q-023 (Med Voltage Equipment);
- EEAM-Q-013-E (Technical Data Sheet);
- EEAM-Q-008 (Corrosion protection);
- EEAM-Q-009 (Quality Management); and
- EEAM-Q-016 (General Requirements and Conditions).

2.1.5 All transformers must be protected against corrosion by comply with TPT Specifications attached under Annexures: EEAM-Q-008 Specification for Corrosion Protection.

## 2.2 Specifications

2.2.1 The following table comprises of the quantities and specifications of the required High Voltage Transformers to be supplied:

Item #	Equipment	Description and specification	QTY	Power	Enclosure	Vector number	Oil standard	Output voltage	Ratings
1	Elmec Shiploader 1	11kV Auto Transformer (1.6MVA output)	1	1.6 MVA	Indoors	DY11=DYN 11	MINERAL OIL, THAT IS USED FOR ONAN TRANSFORMERS	11kV (voltage in equals voltage out)	1.6 MVA
2	Substation	11kV - 110V ac voltage transformer	2	200VA		N/A		110 (secondary)	200VA
3	Substation	3.3kV - 110V ac voltage transformer	2	200VA		N/A		110 (secondary)	200VA
4	Substation	11kV - 3.3kV Transformer	2	2MVA		DY11=DYN 11		3.3kV (secondary)	2MVA
5	Substation	11kV - 400v transformer	2	2MVA		DY11=DYN 11		400v (secondary)	2MVA

### 2.2.2 Supporting Documents and TPT Specifications

SPECIFICATION means the document/s forming part of the contract in which are described the details and referenced part numbers of Transformers required by Transnet-Port of Richards Bay. The specifications referred to in this document include reference to the following (attached):

- EEAM-Q-020 (Test On Electrical Equipment)

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- EEAM-Q-021 (Specification for Electronic Equipment)
- EEAM-Q-023 (Med Voltage Equipment)
- EEAM-Q-013-E (Technical Data Sheet)
- EEAM-Q-008 (Corrosion protection)
- EEAM-Q-009 (Quality Management) and EEAM-Q-016 (General Requirements and Conditions), and;
- NRS 054

### **3 OPERATING MANUALS AND MAINTENANCE SCHEDULES**

The Manuals and Data Packs shall each be supplied by the *Supplier*. The Supplier shall provide 3 hardcopies and 2 electronic copies of all the operating, maintenance manuals and test certificates in English. The Data Pack and Operation and Maintenance Manuals shall be supplied as separate documents, each bearing a unique document reference number provided by the Purchaser. Manuals and Data Packs shall be well indexed and user friendly.

### **4 CONSTRAINTS ON HOW THE *SUPPLIER* PROVIDES THE GOODS AND SERVICES**

#### **4.1 Work to be done by the Delivery Date**

All manufactured Transformers to be sufficiently tested, certified and approved for delivery, installation and use in accordance with the ISO 9001-2015 quality management standards. Test certificates and delivery notes shall be supplied and handed over to Richards Bay Technical Department upon delivery of the respective spares.

#### **4.2 Management meetings**

The Supply Manager shall arrange for a once-off clarification meeting before the award of business to offer the opportunity to the Supplier to ask for any clarity that he/she may have concerning issues like specification, delivery lead times etc. for the required spares.

Any other meetings can be conducted as and when needed by either Client or the Supplier.

All meetings conducted shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the conditions of contract to carry out such actions or instructions.

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### 4.3 Documentation control

4.3.1 The *Supplier* shall submit all documentation (including correspondence and drawings) to Transnet Port Terminal (*Purchaser*) standards as dictated by the EEAM-Q-009 and to the *Supply Manager's* requirements in accordance with the *Purchaser's* document control procedure. The *Supplier* shall copy or send directly to the Richards Bay Transnet Port Terminal (TPT RCB) document controller, email address: [RBayDocControl@transnet.net](mailto:RBayDocControl@transnet.net), on all correspondences containing contract documentation.

4.3.2 The *Supplier* shall use his own suitable document control system for the control, maintenance and handling of all relevant documentation issued to him.

## 5 QUALITY ASSURANCE REQUIREMENTS

The Supplier's Quality Management System must be in accordance with the International Standard ISO 9001-2015 and maintain the necessary accreditation and certification.

Once the contract is awarded proof of the following certification must be provided.

The Contractor shall have, maintain and demonstrate its use to the Project Manager the documented Quality Management System to be used in the performance of the works. The Contractor must submit his Quality Management System documents to the Project Manager as part of his program under ECC Clause 31.2 to include details of:

- Quality Management Plan for the contract
- Quality Control Plan
- Quality Policy
- Index of Procedures to be used; and
- A schedule of internal and external audits during the contract

The Contractor develops and maintains a comprehensive register of documents that will be generated throughout the contract including all quality related documents as part of its Quality Plan. The Project Manager indicates those documents required to be submitted for information, review or acceptance and the Contractor indicates such requirements within his register of documents. The register shall indicate the dates of issue of the documents with the Project Manager responding to documents submitted by the Contractor for review or acceptance within the period for reply prior to such documents being used by the Contractor.

The Quality Plan means the Contractor's statement, which outlines strategy, methodology, resources allocation, QA and Quality Control co-ordination activities to ensure that the works meet the standards stated in the Works.

Additionally, the following Purchaser's quality management documents must be adhered to:

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- EEAM-Q-021 (Specification for Electronic Equipment)
- EEAM-Q-008 (Corrosion protection)
- EEAM-Q-009 (Quality Management)

## **6 PROJECT PROGRAMME**

### **6.1 Programme Constraint**

The Contract programme, progress reports, subsequent updates, revisions and supplementary programmes as detailed in this section are an essential part of the project control system used by the Purchaser for managing the spares and in monitoring the progress of the spares under the Contract. The information and data provided by the Supplier pursuant to this procedure must therefore be reliable, accurate and timely in presentation. The programme must show lead times, original delivery dates and updated delivery dates etc. for every spares that the Supplier will supply and deliver. The delivery lead times are based on the time period to deliver the spares from award.

The Purchaser's preferred lead time for the Transformers is stipulated below:

- Maximum of 26 Weeks and minimum of 24 weeks lead time for 11KV transformers
- Maximum of 22 Weeks and minimum of 20 weeks lead time for 3.3KV-110Vac transformer

### **6.2 Programme Submission**

A copy of the Supplier's First Programme shall be submitted with the Tender Document returnable that shall comply with the requirements as indicated in the Works Information. The Supplier's Detailed Programme shall be submitted in both hard and soft copy forms within two weeks of award using a computer software package approved by the Supply Manager.

The preferred software package is Microsoft Projects.

### **6.3 Constraints at the Delivery Place**

The Supplier shall commit to the delivery milestones for carrying out the works through the project schedule. The delivery lead times will be used to evaluate the supplier. The Supplier is only allowed to deliver the goods during the working week (Weekdays – Monday to Friday) between 07h00 till 15h30.

The delivery address is as follows:

Transnet Port Terminals (TPT) at Richards Bay  
Transnet Harbour, Newark Road, Central Stores, Richards Bay, 3900.

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## **7 WARRANTIES AND GUARANTEES**

Warranties and Guarantees period on Transformers supplied in accordance with the requirements of Specifications for a period of 12 months from the date of delivery. The Supplier shall submit and maintain warranty certificates/ documentation from the OEM's on spares they have supplied and delivered to TPT Richards Bay.

Client prefers an **18 months** for a warranty and guarantee period on each of the transformers to be supplied.

## **8 EXPECTED DESIGN LIFE SPAN**

The transformers are expected to have the design life span of maximum of 25 years and with a minimum of 15 years, testing will be done at the supplier's facilities to proof the transformers functionality as per the requirement.

## **9 INVOICING AND PAYMENT**

The Supplier shall provide the Purchaser with a tax invoice and delivery note upon delivery of the respective spares/ components. These documents shall also be submitted to the Supply Manager.

The Supplier shall address the tax invoice to Purchaser and include on each invoice the following information:

- Name and address of the Supplier and the Supply Manager;
- The contract number and title;
- Supplier's VAT registration number;
- The Purchaser's VAT registration number.
- Description of goods and services provided for each item invoiced based on the Price Schedule;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT.

## **10 PROCUREMENT**

### **10.1 Plant and Materials**

#### **10.1.1 Plant & materials provided "free issue" by the *Purchaser***

There are no 'free issue' parts to be supplied by the Purchaser and all spares are to be provided by the Supplier.

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### **10.1.2 Supplier's Procurement of Spares**

The Supplier must take all necessary steps to ensure that all spares are adequately protected against damage during shipping, transport and storage.

### **10.2 Purchaser's entry and security control, permits, and site regulations**

The delivery area is situated within a Customs controlled area and the Supplier and his people shall observe all Customs regulations within the port area.

The delivery area is also within a promulgated port area and the Supplier and his people shall observe all ISPS and Port Regulations within the port area. Copies of the Harbour Regulations are obtainable from the Port admin offices.

### **10.3 Services and other facilities**

At all times during the delivery of the goods the Supplier is responsible for the safety of all persons and on the goods and shall have the necessary systems and procedures in place to effectively manage this.

The Supplier(s) must provide the information requested and comply with the requirements stated.

### **10.4 Work to be done at the Delivery Place by the Delivery Date**

In order to achieve the status of Delivery, the Supplier is required to move the goods into a storage area allocated by the Purchaser for this purpose.

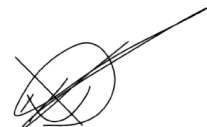
## **11 ANNEXURES**

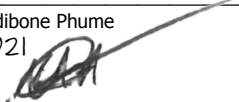
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- ii. EEAM-Q-021 (Specification for Electronic Equipment)
- iii. EEAM-Q-023 (Med Voltage Equipment)
- iv. EEAM-Q-013-E (Technical Data Sheet)
- v. EEAM-Q-008 (Corrosion protection)
- vi. EEAM-Q-009 (Quality Management) and EEAM-Q-016 (General Requirements and Conditions).

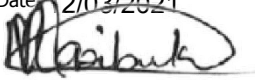



TECHNICAL EVALUATION FOR SUPPLY AND DELIVERY OF CRITICAL SPARES - TRANSFORMERS WORK PACKAGE					
Evaluation Criteria	Description	Scoring Principal	Returnable Schedule	Criteria	% Weightings
Eligibility Criteria	Track record of the company	Supplier must be accredited by the OEM or Supplier must be accrdited as either OEM or a distributerand to provide the accreditation certificate and CIDB level 4 EP.	T2.2-15	Yes/no	
	Accreditation Certificates	Valid ISO 9001 accreditation certificates to be provided by the OEM.The Supplier's Quality Management System must be in accordance with the International Standard ISO 9001-2015 and maintain the necessary accreditation and certification. Service provider to proof that Transformers will be manufactured locally.	T2.2-16	Yes/no	
Technical and Operational	Spares availability (Transformers)	First preference interms of spares supply/service support will be giving to locals. Supply must provide proof of address, water or electricity bill showing their physical address.  Spares availability in Richards Bay/Empangeni = 20 points Spares available in KZN = 8 points Spares available within South Africa = 5 points	T2.2-17	Location	20
	Guarantee/Warrantee	Warranties and Guarantees on Transformers supplied in accordance with the requirements of Specifications starting from the date of delivery.  For a guarantee ≥ 12 months = 30 points For a guarantee < 12 months = 0 points	T2.2-18	Guarantee/Warrantee Specified	30
	Previous Experience	≥Five (5) contactable references in the last five years = 20 points along with supporting document of contactable references detail as follows: - Project Name and Description; - Client; - Project Value; and - Contactable reference details i.e. cellphone, landline and email address < Five (5) contactable reference in the last five years = 0 points	T2.2-19	Previous Experience/ Proven track record	20
Lead time	Delivery Lead Time 11kV transformer	Tenderer has submitted a holistic delivery program and its: ≤ 24 weeks = 15 points > 24 weeks ≤ 26 weeks = 10 points >26 weeks = 0 points	T2.2-20	Lead time in weeks	15
	Delivery Lead Time 3.3kV transformer	Tenderer has submitted a holistic delivery program and its: ≤ 20 weeks = 15 points > 20 weeks ≤ 22 weeks = 10 points >22 weeks = 0 points	T2.2-21	Lead time in weeks	15
Total Weighting:					100

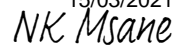
The minimum technical threshold is 70%


  
Project Manager: Kedibone Phume  
Date: 12/03/2021

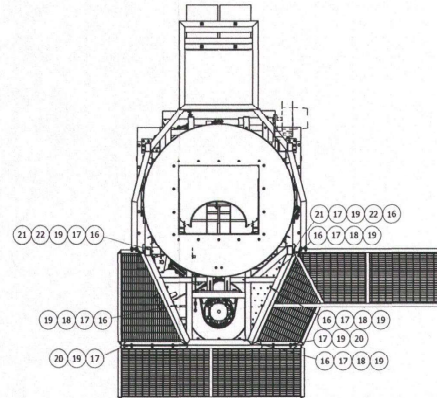
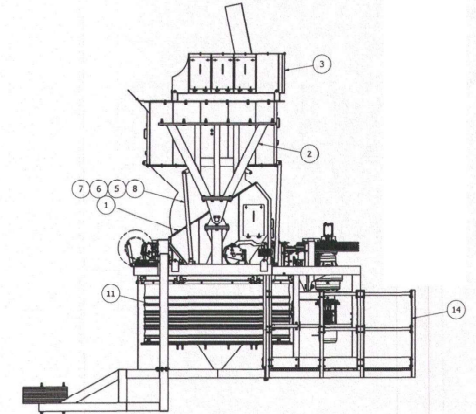
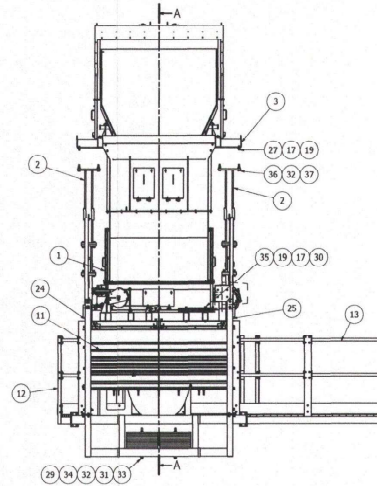
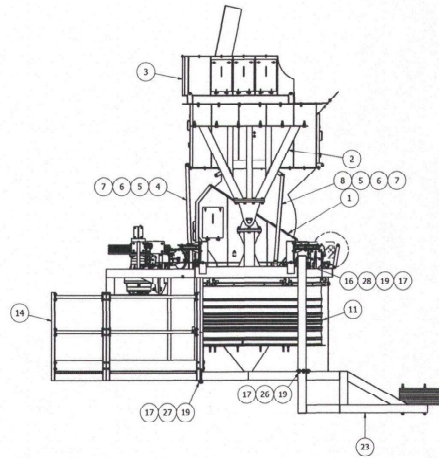
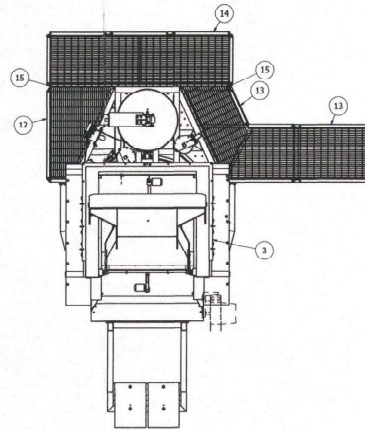
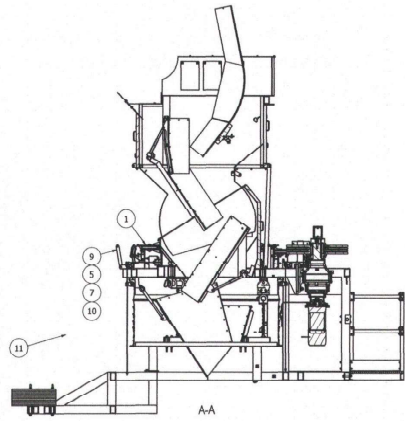
  
Senior Project Manager (Acting): Mbali Cele  
Date: 12/03/2021

  
Engineering Manager: Vusimuzi Mazibuko  
Date: 17/03/2021

  
Technical Manager: Siyabulela Diya  
Date: 15/03/2021

  
Engineering Technician: Khulani Msane  
Date:

 pp  
Senior Engineering Manager: Bongani Mandla  
Date: 18/03/21

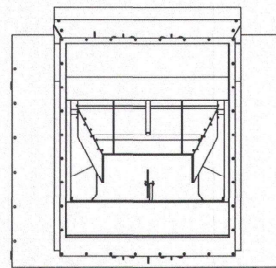
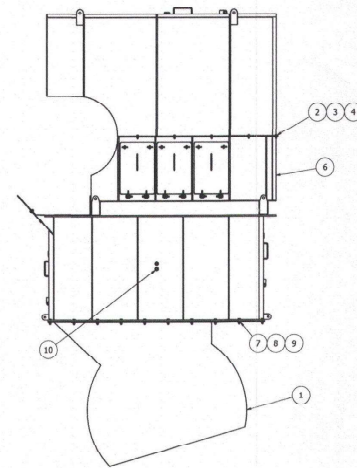
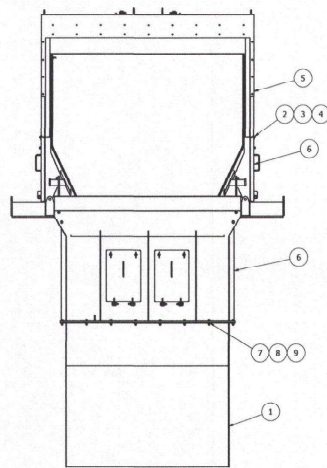
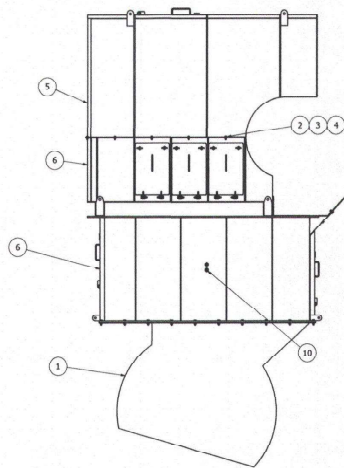


CCL PARTS LIST				
ITEM	QTY	PART NUMBER	DESCRIPTION	MASS
1	1	45300463	PIVOTING HEADCHUTE ASSEMBLY	1183.777 kg
2	2	45340189	PIVOT HANGER ASSEMBLY	269.290 kg
3	1	45300463	FIXED HEADCHUTE COMPLETE ASSEMBLY	2032.603 kg
4	1500,000 mm	45300204	PIVOT FIXING LINK	5.696 kg
5	16	10300027	WASHER - FLAT M12	0.006 kg
6	6	10300101	HEX HEAD SETSCREW M12 x 35	0.048 kg
7	6	10300028	NYLOC NUT M12	0.019 kg
8	2600,000 mm	45340187	PIVOT POINT FIXING LINK	4.891 kg
9	1	45360303	STOWED FIXING LINK	1.138 kg
10	2	10300035	HEX HEAD SETSCREW M12 x 40	0.053 kg
11	1	45310121	FTT ADAPTOR ASSEMBLY	626.388 kg
12	1	45380040	WORK PLATFORM SECTION 1	122.392 kg
13	1	45380041	WORK PLATFORM SECTION 2	305.844 kg
14	1	45380042	WORK PLATFORM SECTION 3	255.005 kg
15	4	45380043	PLATFORM SECTION LINK PLATES	0.543 kg
16	25	45300094	M16 Bolt Packer	0.084 kg
17	172	10300047	WASHER - FLAT M16	0.011 kg
18	11	10300062	HEX HEAD BOLT M16 x 120	0.228 kg
19	63	10300048	NYLOC NUT M16	0.037 kg
20	6	10300052	HEX HEAD SETSCREW M16 x 40	0.100 kg
21	10	10300086	M16 SQUARE REVELED WASHER TO DIN 434	0.031 kg
22	10	10300371	HEX HEAD BOLT M16 x 110	0.243 kg
23	1	45350134	BALANCE FRAME	409.530 kg
24	1	45350136	BALANCE FRAME BRACE 2	39.462 kg
25	1	45350135	BALANCE FRAME BRACE	39.462 kg
26	8	10300053	HEX HEAD SETSCREW M16 x 45	0.108 kg
27	20	10300054	HEX HEAD SETSCREW M16 x 50	0.114 kg
28	9	10300123	HEX HEAD BOLT M16 x 180	0.322 kg
29	24	45350137	LARGE BALANCE PLATE	44.969 kg
30	6	45350138	SMALL BALANCE PLATE	13.663 kg
31	4	10310360	M20 x 450 Threaded Bar	1.442 kg
32	56	10300065	WASHER - FLAT M20	0.017 kg
33	8	10310080	NYLOC NUT M20	0.027 kg
34	4	45300207	M20 BOLT PACKER	0.057 kg
35	2	10300790	M16 x 730 G THREADED BAR (GALV)	0.954 kg
36	24	10300089	HEX HEAD SETSCREW M20 x 80 GAL 10.9	0.270 kg
37	24	10300051	M20 Nyloc Nut Gt 10.9 Galv	0.071 kg
38	1	12920334	70S CONTROL PANEL ELECTRICAL BOM ASSEMBLY	1.628 kg

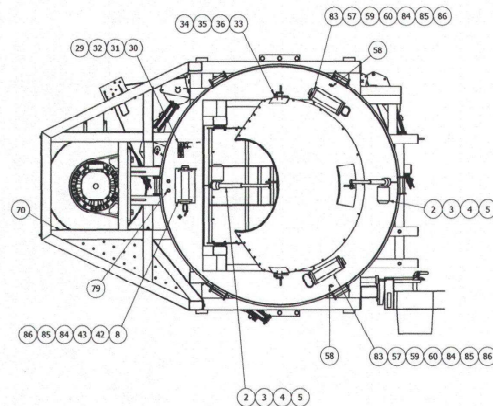
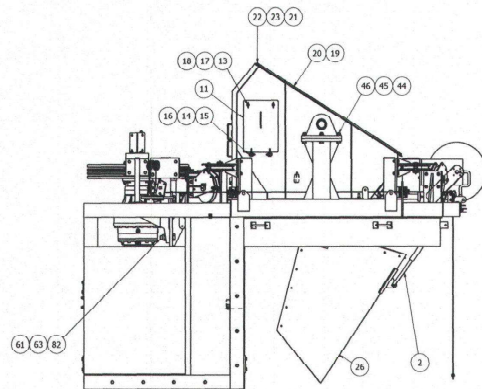
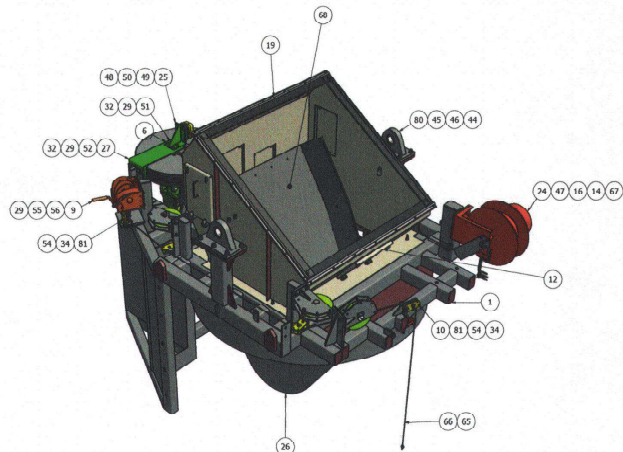
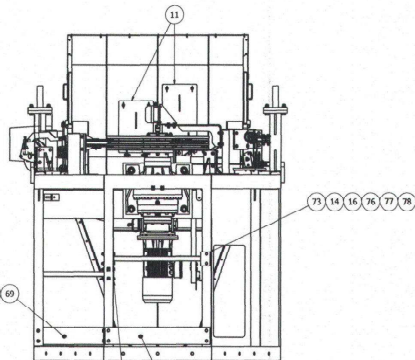
Released for Manufacture

NOTE: THE FOLLOWING TO BE USED FOR THE PROJECT PROJECT: 45300463 TITLE: HEADCHUTE COMPLETE ASSEMBLY DWG No: 45300462		CLEVELAND CARCASSES LTD 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000		TOTAL MASS: N/A Sandvik (S706)
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CCL PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	45300408	PIVOTING HEADCHUTE FABRICATION
2	2	45390208	LINEAR ACTUATOR MECVEL AL13 M05 AC 200mm STROKE
3	2	45320311	ACTUATOR KEEP PIN 2
4	2	45320312	ACTUATOR KEEP PIN 1
5	6	10390085	Split Pin 4x32
6	1	45400097	705 WINCH ASSEMBLY
8	1	45400029	Load Cell Assembly TFS 10000 kg - 240mm Shop
9	1	45400074	HAND WINCH DOUBLE COMPARTMENT WIN500-CR/25
10	6	45420216	SHOULD PULLEY ASSEMBLY
11	4	45390200	HATCH COVER 262x400
12	1	45390201	HATCH COVER 400x260
13	10	10390070	DROPPATCH (LH0943)
14	44	10390011	WASHER - FLAT M10
15	10	10300233	HEX HEAD BOLT M10 x 45
16	22	10300012	NYLOC NUT M10
17	10	10310029	WASHER - FLAT M8
18	10	10310012	NYLOC NUT M8
19	2	45350083	BRUSH STRIP SEAL 1557 LONG MADE FROM 4535-0040
20	2	45350074	BRUSH STRIP 1410 LONG MADE FROM 4535-0040
21	56	10300062	WASHER - FLAT M5
22	28	10310190	CHEESE HEAD SCREW M5x20
23	28	10310003	NYLOC NUT M5
24	1	45400064	FEEDING DRUM 45800030 ELECTRICAL ASSEMBLY 13x1.5mm CABLE (25m) WITH SS BOX
25	1	45460183	TOP LIMIT SWITCH BRACKET
26	1	45320320	TOP DEFLECTOR ASSEMBLY
27	1	45460059	ROTARY LIMIT SWITCH BRACKET
28	1	45460053	SRS COMPLETE W ELEC BOM 1250282
29	98	10300027	WASHER - FLAT M12
30	1	45460050	ULTIMATE LIMIT SWITCH ASSEMBLY W/ 1290284 ELEC BOM
31	30	10300036	HEX HEAD BOLT M12 x 45
32	46	10300028	NYLOC NUT M12
33	2	45320314	DEFLECTOR RETAINING FLAT
34	59	10300000	WASHER - FLAT M8
35	11	10300013	SPRING WASHER M8
36	4	10300029	HEX HEAD SETSCREW M8 x 30
37	2	45320321	DEFLECTOR RETAINING FLAT
38	7	10300005	HEX HEAD SETSCREW M8 x 25
42	2	45390094	M10 DNR Pin-kn
43	2	46030041	XTBA WIDE STRIP BRACKET SHIM Ø18 HPS/PC x 1 VS CTBS
44	24	10300065	WASHER - FLAT M20
45	12	10300075	HEX HEAD BOLT M20 x 80
46	12	10300051	M20 Nyloc Nut Gr 10.9 Galv
47	4	10300018	HEX HEAD BOLT M10 x 40
48	8	10310018	WASHER - FLAT M6
49	4	10310302	CHEESE HEAD SCREW M6x30
50	4	10310021	NYLOC NUT M6
51	4	10300101	HEX HEAD SETSCREW M12 x 35
52	4	10300035	HEX HEAD SETSCREW M12 x 40
54	24	10300062	NYLOC NUT M8
55	4	10300125	SPRING WASHER M12
56	4	10300033	HEX HEAD SETSCREW M12 x 30
57	3	45130225	M05 STRIP PIN FOR 240mm STRIPS WITH HANDLE
58	3	45460042	1/8" TUBUL BPPR 3/16" I.D. LH0943/UNITED 1147
59	6	45010030	CARDINE HOOK ST/ST Ø114
60	3	10300057	R-CLIP TO SUIT Ø45-56 PIN
61	8	10300096	WASHER - FLAT M20
63	4	10300095	NYLOC NUT M20
65	2	45390053	SHACKLE 0.5" SWG SWL GREEN PIN DLE EN13889 GALVANIZED
66	1	45410047	SHOULD ROPE SET (Ø5mm GALV TENSILE CORE) 1350 kg MBL
67	1	45480004	GRIP CABLE 10MM-20MM GALV ANTI-SLIP
68	1	45320322	LOWER PIVOTING DEFLECTOR ASSEMBLY
69	1	45380044	KICK FLAT 1
70	1	45380045	KICK FLAT 2
71	1	45380047	KICK FLAT 4
72	1	45380048	HAND RAIL FAB 2
73	1	45380049	HAND RAIL FAB 3
74	6	10300319	HEX HEAD SETSCREW M12 x 150
75	2	10300043	HEX HEAD BOLT M12 x 120
76	10	45390032	M10 BOLT PACKER
77	4	10300259	HEX HEAD SETSCREW M10 x 110
78	4	10300318	HEX HEAD SETSCREW M10 x 150 GAL 8.8
79	1	12970085	MOA ATX B 200 PLASTIC STOPPING PLUG - PACK OF 10
80	2	45460192	Ø60 PIVOT HANGER ASSEMBLY - EXTENDED WELD
81	24	10300067	HEX HEAD BOLT M8 x 35
82	4	10300156	HEX HEAD BOLT M20 x 110
83	2	45130228	240mm STRIP BRACKET ASSEMBLY
84	12	10300047	WASHER - FLAT M16
85	6	10300093	HEX HEAD BOLT M16 x 230 Gr 10.9
86	6	10300092	M16 GR 10.9 SWL NYLOC NUT
87	4	12910064	Enclosure Ø254 150x150x80 M1 1521

REVISION  0	REFERENCE  EEAM-Q-009			
DOCUMENT TYPE SPECIFICATION		AUTHORISATION DATE: Date signed by CEO		
TITLE: QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION			PAGE 1 of 14	
COMPILED BY:	REVIEWED BY:	REVIEWED BY:		
SENIOR MANAGER (QUALITYMANAGER)	SENIOR MANAGER (PROJECT MANAGER)	SENIOR MANAGER (GENERAL MANAGER)		
ACCEPTED BY:		AUTHORIZED BY:		
CHIEF FINANCIAL OFFICER		CEO		
FUTURE REVISION RECORD NUMBER	DESCRIPTION OF REVISION	APPROVAL	DATE 01/03/2010	
-1-				
<p style="text-align: center;"><b>CONTENTS</b></p> <p>1.0 QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION</p>				

KEYWORDS SPECIFICATION	DATE OF LAST REVIEW: N/A
	DATE OF NEXT REVIEW: 01/03 2010

**DETAILS CONTENTS**

Title	Page
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## 1. Introduction

This Specification outlines the minimum requirements to ensure that products and services supplied to Transnet Port Terminals are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in the Contract, all associated specifications, drawings, codes and standards.

## 2. Definitions

Term, Abbreviation	Meaning
Data	All drawings/documents/data/information and DP's required to be supplied under the Contract
Data Pack (DP)	A compilation of manufacturing data, certification, inspection and testing records prepared by the Supplier/Contractor to verify compliance with the Contractual requirements.
Employer	For the purposes of this document, the term Employer has the same meaning as applied to the term Client.
Field Inspection Checklist (FIC)	A document that details the checks, requirements and test parameters for each type of equipment to permit field installation and pre- commissioning of the equipment.
TPT	Transnet Port Terminals is the Employer's Nominated Agent in terms of the Conditions of Contract.
Inspection Release Report (IRR)	A document issued to the Supplier/Contractor by TPT advising release of the Materials for shipment. This does not relieve the Supplier/Contractor of its obligations in accordance with the Terms and Conditions of the Contract.
Inspection Waiver Report (IWR)	<p>A document issued to the Supplier/Contractor by TPT advising that TPT has waived final inspection for the materials listed in this document. The issue of this Report does not preclude further inspection by TPT, is issued without prejudice and does not relieve the Supplier/ Contractor from the guarantees and obligations included in the Contract/ Contract.</p> <p>A document prepared by the Supplier/Contractor providing relevant information applicable to the installation and maintenance of the specific equipment, including consumables (eg. oils etc)</p>
Project Quality Plan (PQP)	A document that outlines the Supplier/Contractor's strategy, methodology, resources allocation, Quality Assurance and Quality Control coordination activities to ensure that Goods and Services supplied meet or exceed the requirements defined in the Contract, drawings, codes and standards.
Quality Control Plan (QCP)*	<p>A document outlining specific manufacturing / construction inspection and testing requirements, including responsibilities, test acceptance criteria, nomination of witness and hold points.</p> <p>For the purposes of this document, the term Supplier/Contractor has the same meaning as applied to the term Sub-Supplier/Sub-Contractor</p>
Supplier/Contractor	This refers to the documentation required to be submitted by the relevant Supplier / Contractor in terms of the Contract.
Supplier/Contractor Data Requirements	These requirements are generally tailored to suit the particular Scope of Work, although it also addresses the manner in which the documentation is required to be submitted, eg Hard copy, Electronic copy etc
Technical Query Note (TQN)	This refers to a document used by the Supplier/Contractor to formally clarify a Technical Query related to the scope of supply. This should not be used where a non-conformance has already been initiated.



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### **3. Applicable Documents**

#### **3.1 General**

All work performed shall comply with the requirements of this Specification, the documentation referenced in the Contract and the latest revision/edition of the relevant Codes and Standards referenced herein.

#### **3.2 Statutory Regulations**

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

#### **3.3 Codes and Standards**

<b>Document No.</b>	<b>Title</b>
ISO 9001	International Standard Series Quality Systems
EEAM-Q-013	Punch Listing Standard

### **4. Quality System**

#### **4.1 General**

The Supplier/Contractor shall be responsible for all quality activities necessary to ensure the Work meets the requirements specified in the Contract, and shall manage and coordinate all Quality aspects of Work in accordance with the requirements of this Specification, and the Supplier/Contractor's PQP and QCP's once reviewed and approved by TPT.

The Supplier/Contractor shall ensure that all Sub-Suppliers/Sub-Contractors also conform with the requirements of this Specification.

#### **4.2 Supplier/Contractor Quality System Requirements**

The Supplier/Contractor shall have, maintain and demonstrate its use to TPT, its documented Quality Management System. The Supplier/Contractors Quality Management System should be in accordance with the International Standard ISO 9001.

The Supplier/Contractor shall submit its Quality System documentation to TPT at the time of tender and at Contract Phases as detailed below:

- Project Quality Plan
- Quality Policy
- Index of Procedures to be used
- Programme of internal and external audits

#### **4.3 Supplier/Contractor Documentation Requirements**

The Supplier/Contractor shall develop and maintain a comprehensive register of documents that will be generated throughout the project, and shall include all quality related documents. The register shall be submitted to TPT for review.

TPT shall indicate those documents required to be submitted for information/review and/or acceptance and this shall be indicated in the Supplier/Contractors' Document Register. The register shall indicate the dates of issue of the documents taking into account sufficient time to allow TPT review/acceptance cycle prior to the document being required for use.

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## **5. Quality Assurance**

### **5.1 Project Quality Plan**

Where specified, the Supplier/Contractor shall submit a PQP to TPT within 28 days after the Contract start date. The PQP shall detail how the Supplier/Contractor's Quality System will be applied to the Scope of Work specified in the Contract, and shall address the following:

- Satisfying the technical and quality requirements of the Supplier/Contractor's Scope of Work, and relevant elements of the applicable ISO 9001 standard
- include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls and records used to control and verify compliance with the specified Contractual requirements

Include a listing of all special processes (eg. welding and non-destructive testing, cube testing etc) envisaged for use, including confirmation of personnel certification as required

- Include all proposed method statements (for site based work activities)
- Include a description of the Supplier/Contractor's project organisation, with key positions and responsibilities identified and individuals named. The organisation structure shall also indicate the resources committed to the management / coordination of QA / QC activities
- Include a listing of all Quality Control Plans (QCP's), and associated Field Inspection Checklists (FIC's), as applicable
- Identify in the Project Quality Plan any Sub-Supplier/Sub-Contractor work. Sub-Supplier/Sub-Contractor plans shall be approved by the Supplier/Contractor, and a copy forwarded to the TPT
- Include the proposed Authorised Inspection Authority (where applicable - for pressurised equipment and systems)
- Include a schedule of proposed quality records

The PQP shall be controlled and re-submitted for approval when required to incorporate any change necessary during the Contract duration to ensure that the document is maintained as an effective control, change management and records. The change management will be done to an agreed policy or procedure.

Note: Where the Supplier/Contractor is required to provide a PQP, no work shall commence until the PQP is approved by TPT.

### **5.2 Procedures**

The Supplier/Contractor's PQP and procedures shall address the system elements and activities appropriate to the Scope of Work, in compliance with the specified Quality Standard.

Where specified, the Supplier/Contractor shall submit copies of Quality Procedures for review. In addition, the Supplier/Contractor shall ensure that copies of all Procedures relevant to the Scope of Work are available for reference by TPT at each work location.

These will include, as applicable, the following:

#### **5.2.1 Document Control**

The Supplier/Contractor's Project Quality Plan shall provide a description of how TPT provided, Supplier/Contractor and Sub-Supplier/Sub-Contractor documents are to be managed. The description shall address as a minimum:

- Management tools and databases
- Receipt, registration and maintenance
- Internal and external distribution to Employer, third parties and Sub-Contractors
- Management of Codes, Standards and Specifications

- 
- Internal review and approval routines and authorities
  - How it is ensured that the correct revisions of documents are available at the point of use including retention periods for all documentation.

### **5.2.2 Design Control**

Where the Supplier/Contractor is responsible for any aspect of design related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these design activities.

### **5.2.3 Procurement**

Where the Supplier/Contractor is responsible for any aspect of procurement related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these activities.

## **5.3 Supplier/Contractor Audits**

The Supplier/Contractor shall:

- Carry out audits in accordance with its Quality System at its own and Sub-Supplier/Sub-Contractor's facilities to ensure project quality requirements are being achieved
- Include a QA Audit Schedule in the Supplier/Contractor PQP submitted to TPT prior to commencement of the Scope of Work. The Audit Schedule shall include all audits to be implemented by the Supplier/Contractor and Sub-Supplier/Sub-Contractor during the execution of the Contract
- Where stipulated in the Contract, perform an audit within three months after the Contract start date and thereafter at a minimum frequency of three months. Audit reports shall be submitted to TPT at the completion of each Audit. Where unsatisfactory performance is evident, additional audits shall be performed by the Supplier/Contractor as directed by TPT.

## **5.4 Transnet Port Terminals Audit**

TPT reserves the right to perform quality audits or participate as an observer in Supplier/Contractor audits to verify compliance with the Contractual requirements. The Supplier/Contractor shall within a time frame as agreed upon, correct any adverse audit finding advised by TPT.

# **6. Inspection and Testing**

## **6.1 General**

TPT may, at its discretion perform surveillance inspection at the Supplier/Contractor's premises, SubSupplier/Sub-Contractor's premises or at the location of the Scope of Work.

Dependent on the nature of the Scope of Work and the frequency of inspections TPT may elect to have inspection personnel resident at the place of manufacture, fabrication, or assembly.

The Supplier/Contractor shall ensure free entry and access is given to TPT, certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and quality records at all parts of the Supplier/Contractor's and Sub-Supplier/Sub-Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

The Supplier/Contractor shall provide TPT with all necessary tools, calibrated measuring equipment, safety equipment and workspace to verify or witness tests in progress.

While TPT is at the Supplier/Contractor's premises, the Supplier/Contractor shall provide, free of charge, reasonable facilities including office facilities and reasonable access to a telephone, facsimile machine and computer connection point.

The Supplier/Contractor shall provide notice in writing in within a time frame time as agreed upon, to allow the attendance of TPT and other representatives at nominated witness and hold points.

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## 6.2 Quality Control Plans

The Supplier/Contractor shall prepare and submit QCP's to TPT for review in accordance with the requirements of the Contract and PQP.

QCP's shall identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, witness and hold points.

The Supplier/Contractor shall not commence fabrication or manufacture prior to review and approval of the applicable QCP by the TPT.

QCP's shall include reference to all tests specified in the Contract Document.

A typical format for an QCP is shown in Appendix A. The Supplier/Contractor may use its own format providing all information shown in Appendix A is included.

## 6.3 Inspection Points

The QCP shall identify points in the fabrication, manufacturing and/or installation process that are selected for inspection and shall be denoted by the following inspection codes:

- Hold Point (H)                      Inspection point in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Holding points require written notification to TPT.
- Witness Point (W)                  An inspection point in the manufacturing cycle that will be witnessed or verified. If TPT confirms it is unable to attend after being provided with the written notification then manufacture may proceed. Witness points require written notification to TPT.
- Review Point (R)                      A point at which products and quality records are verified and endorsed. Review points are not notifiable points.
- Surveillance (S)                      An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.

The Supplier/Contractor shall maintain the status of testing and inspection by progressively having the QCP's signed off.

## 6.4 Revision to Quality Control Plans

Revision of the QCP shall be subject to the same submission, review and acceptance routines as described for the original QCP issue

## 6.5 Kick Off Meeting

After the Contract start date, and prior to manufacture, TPT will require a Kick Off Meeting with the Supplier/Contractor to discuss fully the implications of meeting TPT quality requirements. This meeting may be held as part of the Contract kick-off meeting for each package or may be a separate meeting, subject to the critical or complex nature of the work. This requirement for a pre-inspection meeting may be repeated when sub-Supplier/Contractors of key equipment are engaged.

After mobilization of the Contractor, and prior to the commencement of any construction activities, TPT will arrange for a Quality kick-off meeting to discuss fully the implications of meeting the projects' quality requirements. This meeting may be held as part of the formal kick-off meeting for each contractor, or may be a separate meeting subject to the critical or complex nature of the work.

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## **6.6 Schedule of Inspection**

The Supplier/Contractor shall submit a Schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The Schedule shall be regularly updated with progress and issued to TPT to show the current inspection and test status.

## **6.7 Field Inspection Checklists**

For site installation and construction activities, the Supplier/Contractor shall prepare Field Inspection Checklists (FIC's) to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCP's.

FIC's shall be provided to TPT for initial review, and shall be used to record the results of inspection and testing (where applicable), and on completion be submitted to TPT to confirm satisfactory completion of the tests and inspections at nominated QCP witness and hold points.

## **6.8 Inspection Notification**

The Supplier/Contractor shall notify TPT in writing at least two calendar weeks prior to the advent of inspections or tests that require witnessing.

For inspections or tests within the country, arrangements shall be confirmed at least two working days before the event. For inspection and tests outside of the country, arrangements shall be confirmed at least seven working days before the event.

Inspection notifications shall include the following essential information:

- Contract Number
- Location of Inspection or Test
- Nature of Inspection or Test
- Date and Time of Inspection or Test
- Name and telephone number of the Supplier/Contractor's Representative.

## **6.9 Inspection and Testing**

The Supplier/Contractor is responsible for the conduct of all Supplier/Contractor inspections and tests, and includes:

- Documenting inspection and tests result in the QCP's and relevant FIC's
- Progressively inspecting the quality of the Scope of Work performed, including that of all Sub-Supplier/Sub-Contractors
- Inspecting to meet all Contractual requirements, in number, type and form
- Inspecting day to day activities, material receipts, issue of material for installation, in-process inspections, and final inspections.

Completed original QCP's and FIC's shall be submitted to TPT in the DP

## **6.10 Inspection Release**

At completion of the Scope of Work, either in total or in phases, TPT may issue an Inspection Release Report (IRR) or a waiver of inspection.

The issue of either an inspection release or waiver of inspection does not relieve the Supplier/Contractor of its obligations under the Contract. The Supplier/Contractor shall ensure a copy of the release note and final expediting release note for transport, where appropriate, is attached to the delivery docket and accompanies the Work to the designated destination indicated in the Contract. Items delivered to TPT without a copy of these documents may not be accepted.

A copy of the inspection release or waiver of inspection shall be included in the DP.

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## **6.11 Special Processes**

It is the Supplier/Contractor's responsibility to ensure that all processes which require prequalified procedures and/or work methods are tested and qualified before work begins. This typically covers such activities as welding, non-destructive testing, special fabrication techniques and painting. Unless specified such procedures are the Supplier/Contractor's responsibility and do not require submission to TPT before work begins. When such procedures are requested, no work shall commence until procedures are approved by TPT.

It is the Supplier/Contractor's responsibility to ensure all operators are qualified for the processes in accordance with the procedure and/or applicable standards. Records of qualification of operators shall be maintained by the Supplier/Contractor and made available to TPT when requested.

Records of qualification of procedures and processes shall be maintained by the Supplier/Contractor in accordance with the applicable procedure or code.

## **6.12 Welding Procedures**

Where the Supplier/Contractor's Scope of Work includes fabricated weldments, Welding Procedure Specifications (WPS) defining the method, preparation and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of the Supplier/Contractor's Scope of Work. The procedure shall only be submitted to TPT when requested in the Contract.

WPS shall include all welding essential and non-essential variables for each process used, including appropriate test results and shall comply with the standard or code pertaining to welding required in the execution of the Supplier/Contractor's Scope of Work.

When requested in the Contract a suitably marked "weld map" shall be completed by the Supplier/Contractor for all items to be fabricated. A summary of WPS shall be prepared and when used, shall be identified on the weld map.

Where TPT approval is required, fabrication shall not commence until written approval of WPS and Welding Procedure Qualification Records (WPQR) is received by the Supplier/Contractor. No welding fabrication will be accepted that is not covered by an TPT approved WPS/WPQR.

Welding Procedure Qualification (WPQ) tests may be witnessed by TPT and/or an independent inspection authority. Testing of the specimens prepared during the WPQ Tests shall be carried out by an independent approved testing laboratory independent of the Supplier/Contractor. In certain instances, a certificate to EN 10204 3.1 B may be required which will be clarified at Tender review and clarification stage.

Where actual weld deposit analysis and weld metal physical properties are required for procedure qualification, the information shall be taken from the procedure qualification tests. Data listed in the catalogues of the manufacturer of welding consumables is not acceptable.

Welders/welding operators shall be qualified in accordance with the relevant welding code prior to commencing production fabrication. Specific Welder Qualifications (WQ's) records will be reviewed by TPT in the Supplier/Contractor's works and should NOT be submitted for review.

A register of welders qualified to work shall be maintained by the Supplier/Contractor.

## **6.13 Material Traceability**

Where, and to the extent that material traceability is required, the Contractor shall provide its procedures for the maintenance of material identification throughout all phases of manufacture. Methods of identification, routines for re-stamping or stencilling as appropriate shall be defined and agreed with the Employer.

Adequate records shall be maintained throughout construction enabling traceability of key materials from final product back to original material certificates. The material traceability records shall form part of the DP

The Contractor shall prepare a schedule of materials and equipment that are subject to traceability requirements.

## **6.14 Material Certification**

Where specified in the Contract the following certificates shall be provided to TPT and included in the DP.

Type A:	A Supplier/Contractor's certificate of compliance with the Contract. This certifies that the goods or services are supplied in compliance with the Contract without mention of any test results (EN10204 certificate 2.1).
Type B:	A certificate issued by a laboratory or test facility independent of the Supplier/Contractor's works. It shall quote test results carried out on the product supplied and state whether compliance with the relevant technical standard, code etc has been complied with. (EN 10204 certificate 3.1 B).
Type C:	The same as Type B, the tests are to be witnessed by a third party (EN 10204 certificate 3.1C).

## **7. Non Conforming Products**

### **7.1 General**

The Supplier/Contractor shall establish and maintain procedures to control material or products that do not meet the specified requirements.

All Supplier/Contractor product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- If the Supplier/Contractor discovers material or product which is not in accordance with the requirements of the Contract, i.e. a non conformance (NCR), the Supplier/Contractor shall promptly initiate the non-conformance procedure in terms of the Supplier/Contractor's Quality Management System, advise TPT promptly, and provide a copy of the NCR to TPT
- If TPT or it's agent identifies a non conformance an TPT NCR may be raised.
- Originals of all closed out NCR's shall be included in the DP.

### **7.2 Corrective and Preventative Action**

If the Supplier/Contractor proposes a disposition of any non conforming materials or product which varies from the requirements of the Specification or Contract, such a proposal shall be submitted in writing to TPT whose decision on the proposal shall be obtained in writing before the non conforming material or product is covered up or incorporated into the Works, or is the subject of any other disposition.

The disposition of non-conformances which do not vary the requirements of the Contract, specification or drawings may be approved by the Supplier/Contractor following discussion and agreement with TPT.

## **8. Concession Requests and Technical Queries**

### **8.1 Concession Requests**

Where a Supplier/Contractor requests a Concession to deviate from the requirements of the Contract or specified requirements, the Supplier/Contractor shall raise the request with TPT using the format as shown in Annexure B.

The Concession Requests shall clearly identify all elements of the proposed deviation together with any resulting technical, commercial and/or schedule impacts.

Completed original Concession Requests shall be included in the DP.

### **8.2 Technical Queries**

For clarification of technical issues (only), Supplier/Contractor may submit a Technical Query Note (TQN) to TPT in accordance with the Contract.

The TQN shall clearly identify all elements of the query, and all supporting documentation and/or drawings shall be attached where appropriate.

Completed original TQN's shall be included in the DP.

---

## **9. Inspection, Measuring and Test Equipment**

### **9.1 Calibration**

The Supplier/Contractor, including its Sub-Supplier/Sub-Contractors shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant Supplier/Contractor procedures and/or the equipment manufacturer's specifications.

Where calibration is required by an external laboratory, the Supplier/Contractor shall ensure that the facility selected for calibration possesses current certification. Calibration certificates shall contain a statement that the test equipment is accurate to within specified tolerances.

The Supplier/Contractor should establish the frequency of calibration for each item of equipment (including jigs, fixtures or templates) and record the details in a 'Measuring and Test Equipment Register' (or similar).

### **9.2 Use of Inspection, Measuring and Test Equipment**

The Supplier/Contractor shall ensure that authorised equipment users:

- Use the equipment in accordance with manufacturers instructions, and accepted industry practices
- Ensure the equipment is covered by a current calibration certificate
- Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
- Prior to commencement of each inspection or test activities:
  - Identify the measurements to be made
  - Determine the accuracy required
  - Select the appropriate inspection, measuring or test equipment for the scope of work.

### **9.3 Verification of Previous Test Results**

Where the calibration status of the equipment is unknown, expired or has doubtful accuracy, the equipment shall immediately be quarantined, and tagged according to Supplier/Contractor's Quality System procedures. The Supplier/Contractor shall then arrange for either in-house or external calibration, and:

- review all previous test results associated with the suspect equipment
- identify the inspections, measurements or tests required to re-validate the results
- ensure that suitable re-testing is performed with calibrated equipment
- document the results of the re-testing on the respective inspection and test documentation.

## **10. Quality Records**

Supplier/Contractors shall maintain Quality Records necessary to provide objective evidence that demonstrates and verifies achievement of the QA / QC requirements associated with the Scope of Work. All Quality Records, including original source material test certificates and non destructive test reports, shall be retained by the Supplier/Contractor during the project, and be provided to TPT at the times, and in the quantities specified in the Contract.

The Supplier/Contractor shall collate all quality records in the DP and submit the DP to TPT in accordance with the Contract and all referenced standards and specifications. This DP shall be compiled progressively, and shall be available for review at all phases of manufacture or construction activities.

The Scope of Work shall not be complete until the Supplier/Contractor's DP including the quality records from Sub-Supplier/Sub-Contractors have been reviewed and accepted by TPT.

The DP shall be compiled progressively during the execution of the Scope of Work and shall be made available for review by TPT as required.





### Annexure A - Sample Quality Control Plan


Quality Control Plan No.: _____	Rev: _____	Date Issued: _____
Contract No.: _____	Description: _____	Item No.: _____
Supplier / Contractor: _____	Location: _____	

[illegible]

## **Annexure B - Request for Concession**

<b>Request for Concession</b>				<b>No: _____ of 2</b>	
<b>A. SUPPLIER/CONTRACTOR SUPPLIED INFORMATION</b>					
SUPPLIER/CONTRACTOR NAME:			CONTRACT NO.:		
SUPPLIER/CONTRACTOR CONCESSION NO.:			DATE:		
Required concession applicable to: (Item/Material/Equipment/Area)					
Description of Concession — Revised Requirements:					
Justification:					
(NOTE: This concession will be rejected if the following information is not provided):					
(i) VALUE OF BENEFIT TO CLIENT	(ii) AGREE TO AN EXTENSION OF THE WARRANTY	YES	NO	(iii) ANY IMPACT ON SCHEDULE?	NO
S/R	IF "YES" WHAT PERIOD?			CF "YES" \ WHAT PERIOD?	
References:					
Original reference:					
Requirements	Rev.:	Specification	N	Rev.:	
Drawing No.:	Rev.:	Specification	O.	Rev.:	
Drawing No.:	Rev.:	Specification	:	Rev.:	
Attached documentation:			N		
applicable					
Requested by:					
(Supplier/Contractor) Name:			Signature		
			D		
Note: Sections B to F on Page 2					

<b><i>Request for Concession No:</i></b>			
<b>B. SITE ADMINISTERED CONTRACT?</b>	Yes <input type="checkbox"/>	Nn <input type="checkbox"/>	Go to "D"
Possible QC implications:			
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Recommendations</div> <div style="border: 1px solid black; padding: 5px;">Recommendations</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; padding: 5px;"></div>	Rejected	
Site Construction Manager:		Signature:	Date:
Site Engineer:		Signature:	Date:
<b>C. RECOMMENDATION BY CONTRACT ADMINISTRATOR: Name:</b>			
Signature		Date:	
<b>D. RECOMMENDATION BY ENGINEERING:</b>			
<input type="checkbox"/> Recommended	<input type="checkbox"/> Rejected	<input type="checkbox"/> Conditional, with the following	
recommendations:			
Package Engineer:		Signature:	Date:
Lead Discipline Engineer:		Signature:	Date:
Engineering Manager:		Signature:	Date:
Comments:			
<b>E. PROJECT MANAGER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			
Name:		Signature	Date:
<b>F. EMPLOYER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			

<b>REVISION</b>  0		<b>REFERENCE</b>  EEAM-Q-008																																				
<b>DOCUMENT TYPE:</b> SPECIFICATION				<b>AUTHORISATION DATE:</b> 2019-01-29																																		
<b>TITLE:</b> SPECIFICATION FOR CORROSION PROTECTION				<b>PAGE</b> 0 of 13																																		
<b>COMPILED BY:</b> QUALITY MANAGER (COE) KRIS NAIDOO  _____ Date:		<b>REVIEWED BY:</b> ENGINEERING MANAGER (COE) JESSENDRAN PILLAY  _____ Date:		<b>REVIEWED BY:</b> PRINCIPAL ENGINEER (COE) ROFHIWA TAKALANI  _____ Date:																																		
<b>REVIEWED BY:</b> CHIEF ENGINEER (COE) SABELO MZIMELA  _____ Date:			<b>AUTHORIZED BY:</b> GENERAL MANAGER ENGINEERING JOSHIAH MPOFU  _____ Date:																																			
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<b>KEYWORDS</b> SPECIFICATION			<b>DATE OF LAST REVIEW:</b> N/A <b>DATE OF NEXT REVIEW:</b> 2019-02-01																																			

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**1. SCOPE**

- 1.1. This specification covers Transnet Port Terminals requirements for protective coating of iron and steel structures, electrical motors, gear boxes etc. against corrosion and must be read in conjunction with the main specification as well as the following (latest editions):-

BS EN ISO 8502 "Preparation of steel surfaces for coating"

BS EN ISO 1461 "Hot-dip (galvanized) zinc coatings"

BS 5252 "National colour standards for paint"

BS 5493 "Code of practice for protective coating of iron and steel structures against corrosion"

**2. TYPES OF CORROSION PROTECTION TO BE USED**

- 2.1. The coatings specified in this specification are chosen according to BS 5493 Table 3, part 9, to ensure that the condition of the surface will be at least RE2 on the European scale of degree of rust, after 10 years in a environment of frequent salt spray, chemicals and polluted coastal atmosphere. During the 10 years, the normal maintenance painting will be done.
- 2.2. The paint manufacturer shall guarantee the paint for at least 10 years.
- 2.3. Should a tenderer wish to offer coating systems other than those specified, as an alternative, he shall submit full technical details and a list comparing all appropriate details of the alternatives proposed, with the original specified.
- 2.4. Tenderers must ensure that the different coats they offer in their tenders are compatible with each other.
- 2.5. The coating of proprietary items must be done according to Clause 3.
- 2.6. All galvanized components including bolts and nuts but excluding walkway gratings, must be painted with the specified system, unless otherwise approved.

The following coating systems must be used unless otherwise specified in the main specification:-

Substrate	Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
3CR12 steel (EN 10088)	1	Surface tolerant epoxy primer	DULUX /SIGMA Sigmacover primer 7413 INTERNATIONAL (PLASCON) Intergard 269  STONCOR (CHEMRITE COATINGS) Carboline 193 Primer	65-75
	2	Two component recoatable, polyurethane finish (Gloss)	DULUX / SIGMA Sigmadur gloss 520 INTERNATIONAL (PLASCON) Interthane 990  STONCOR (CHEMRITE COATINGS) Carboline 134	65-75
Galvanized Steel	1	Surface tolerant epoxy primer	DULUX /SIGMA- Sigmacover primer 7413 INTERNATIONAL (PLASCON) Intergard 269  STONCOR (CHEMRITE COATINGS) Carboline 193 Primer	65-75
	2	Two component recoatable, polyurethane finish (Gloss)	DULUX /SIGMA- Sigmadur gloss 520 INTERNATIONAL (PLASCON) Interthane 990  STONCOR (CHEMRITE COATINGS) Carboline 134	65-75
Substrate	Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
Mild steel	1	Two component self curing inorganic zinc ethyl silicate OR two component zinc rich polyamide cured	DULUX /SIGMA- Sigma Sigma zinc 160 OR Sigma-cover primer	65-75

	epoxy primer	INTERNATIONAL (PLASCON) Interzinc 52	
		STONCOR (CHEMRITE COATINGS) Carbo Zinc 11 OR Carbo- Zinc 658 Primer	
2	Flexible recoatable high build polyamide cured MIO epoxy	DULUX/SIGMA – Sigmacover CM 456	125-150
		INTERNATIONAL (PLASCON) Interseal 670	
		STONCOR (CHEMRITE COATINGS) Carboline 193	
3	Two component recoatable, polyurethane finish (Gloss)	DULUX/SIGMA Sigmadur gloss	65-75
		INTERNATIONAL (PLASCON) Interthane 990	
		STONCOR (CHEMRITE COATINGS) Carboline 134	



- 2.7. The paint manufacturer's recommendations for the application of the different coating systems, curing time before handling or application of subsequent coats, health and safety recommendations etc. must be carefully adhered to.
- 2.8. Paint contractors must have a quality management system which must be submitted to the Engineer for approval before commencement of the work.
- 2.9. Galvanizing shall be done to BS EN ISO 1461 heavy duty hot dip galvanizing to a thickness of at least 85µm. Electroplated components in zinc or cadmium are not acceptable.
- 2.10. All mounting bolts, nuts, washers and brackets as well as all fixing bolts, studs nuts and washers, less than 12mm, shall be of stainless steel. Fixing rivets shall be of either stainless steel or brass.
- 2.11. High tensile bolts for friction grip joints must not be galvanised and must be primed and painted after installation. High tensile bolts must be certified.
- 2.12. The full paint system shall be applied to all surfaces except for wear pads, linings etc., which are to be covered with appropriate protection.
- 2.13. For steelwork which will be transported over long distances and erected on site the two pack epoxy primers is preferred.

### 3. **PROPRIETARY ITEMS**

- 3.1. Proprietary items such as gearboxes, motors, brakes etc. must either be painted according to this specification or where the coating system is equal to or exceeds this specification sufficient proof of the coating system applied must be provided. Items which are nearly equal to this specification shall be given a finishing coat according to this specification's thicknesses and final colours and to the following procedure:-
  - 3.1.1. A cross cut test must be done to BS EN ISO 2409 to determine if the original coating adheres correctly to the substrate;
  - 3.1.2. The original coating shall be rubbed down to remove any smooth finishing to form a suitable key for the finish coat and any damaged areas prepared and patch primed with a suitable primer;
  - 3.1.3. The item must then be detergent washed to remove any foreign matter, taking care that no dust, solvent etc. contaminates any working part of the item;
  - 3.1.4. A test shall be done on the existing coat to ensure that the finish coat will not react with and cause undue dissolving and lifting of the existing coat. This can be done by applying a small quantity of the finishing coat thinners.
    - 3.1.4.1. Should any undue dissolving or lifting occur, a suitable intermediate or barrier coat must be applied before the finishing coat is applied.
  - 3.1.5. Proprietary items which failed the cross cut test and which generally have inadequate protection shall be dismantled and the full corrosion protection specification applied.

#### **4. SURFACE PREPARATION**

- 4.1. All steel surfaces shall be detergent washed and fresh water rinsed to remove all oil, grease and surface contaminants before shot blasting.
- 4.2. Sharp edges shall be radiused and major roughness of welds shall be removed by grinding. Welding spatter and flux shall be removed.
- 4.3. Components manufactured from hot rolled steel sections and steel plate shall be blast cleaned to base metal in accordance with Swedish Standard SSPC SP10 grade SA2½ - very thorough blast cleaning, to remove all mill scale, rust, weld spatter etc.
  - 4.3.1. "Sharp" chilled iron shot, chilled iron grit, or granular abrasive slag is to be used to produce a proper degree of surface roughness.
  - 4.3.2. Blast profile shall be determined by micrometer profile gauge, Keane-Tator surface profile comparator or Testex press-o-film.
  - 4.3.3. The profile height shall be between 40 and 50µm at any point.
- 4.4. Good quality blast cleaning and spray painting equipment shall be used. Air used for spraying and blast cleaning shall be free from all traces of oil, water and salinity. Water and oil traps must be fitted to all equipment.
- 4.5. Wheel abrading equipment shall not be used unless an angular profile the same as clause 4.3.3 is achieved.
- 4.6. When wet blasting is done the primer shall be applied before oxidization starts or surface contamination occurs.
- 4.7. Components manufactured from 3CR12 steel shall be lightly abraded. The components shall then be passivated by using a mixture of 10 - 15% nitric acid in water which is rinsed off after 10 - 15 minutes. The surface shall be neutralized to pH 7 before it is coated.
- 4.8. Hot-dip galvanized components, galvanized bolts and nuts etc. shall be lightly abraded with a galvanizing pre-cleaner. The components shall then be washed with detergent and water and washed down with clean water until a water break free surface is achieved. Allow to dry thoroughly.

#### **5. JOINTS AND MATING SURFACES OF MEMBERS**

- 5.1. Mating (faying) surfaces of members which have to be joined by high tensile steel bolts in friction grip shall be cleaned according to Clause 4 and painted with primer only.
  - 5.1.1. After being assembled joints so formed shall be seal welded and painted or after the intermediate coat was applied the edges shall be sealed with an approved brand of paintable flexible sealant or mastic (e.g. Butyl rubber, polyurethane sealer or two component epoxy), by means of a suitable caulking gun.
- 5.2. All rivets, bolts, welds, sharp edges etc. must be covered with a "stripe coat" of the primer or intermediate coat specified to ensure the correct dry film thickness on sharp edges, as well as sealing of bolt threads to head etc.
- 5.3. All other mating surfaces must be sealed with an approved brand of flexible Butyl rubber, paintable Silicone, polyurethane sealer or two component epoxy sealer, and joined while still wet. All excess compounds must be completely removed.

#### **6. PAINTING PROCEDURES**

- 6.1. Directly before the application of paint, the area to be painted shall be degreased with a suitable degreaser and left to dry.

- 6.2. Paint shall only be applied under the following conditions:-
  - 6.2.1. There is adequate light.
  - 6.2.2. The steel temperature is between 5 and 50°C and at least 3°C above the dew point of the air.
  - 6.2.3. The relative humidity of the air is between the limits specified by the paint supplier.
  - 6.2.4. Wind does not interfere with the method used and sand and dust cannot be blown onto wet paint.
- 6.3. Steelwork shall be supported on trestles, at least 900 mm off the ground for painting purposes.
- 6.4. An adequate number of test readings shall be taken per square meter in order to determine the dry film thickness.
  - 6.4.1. The paintwork shall be acceptable if the average of the test readings taken falls within or exceeds the ranges given.
  - 6.4.2. Paintwork shall not be acceptable if any single test reading is less than the specified minimum thickness.
- 6.5. An ultrasonic or electronic magnetic flux thickness measurement gauge shall be used, but in case of dispute, destructive testing shall be applied. The painted steelwork shall present a clean, neat appearance of uniform colour and gloss as applicable to the paint used. Each coat of paint shall be applied as a continuous, even film of uniform thickness. More than one application of paint may be required to achieve the dry film thicknesses specified or to obliterate the colour of the previous coating.
- 6.6. The use of thinners or solvents at any stage of the work is prohibited, unless specified by the paint manufacturer.
- 6.7. Precautions shall be taken to prevent coatings from being applied to equipment nameplates, instrument glasses, signs etc.

## 7. COLOUR CODES

Machinery and equipment shall be painted in the following final colours:-

	Area	Colour	Code No. [091 BS 5252 and International No's]
7.1.1	Mobile equipment (cranes, loaders etc.)		
	a) Structure, machinery and electrical houses, operator's cabins, chutes, hoppers etc.	Transnet Red	RAL 3020
	b) Undercarriage, travel bogies, rubber tyred rims	Transnet Red	RAL 3020
7.1.2	Industrial buildings, conveyor structures		
	a) Roofs and canopies	Pantone cool grey 10	RAL 7037 (Staubgrau)
	b) Painted walls	Pantone cool grey 3	RAL 7035 (Lightgray)
	c) Steel columns, rafters, trusses	Pantone cool grey 5	RAL 7004 (Signalgray)
7.1.3	General		
	a) Guards	Golden yellow	RAL 1003
	b) Sheaves	Orange	RAL 2008
	c) Cable reels (Stainless steel)	Orange	RAL 2008
	Machine buffers and parts of machine which could constitute a serious hazard	Golden Yellow (High Gloss) with Luminous green stripes in chevron pattern	SABS B49 and Luminous green

Area	Colour	Code No. [BS5252 and International No's]
e) Any exposed rotating part of machinery, electrical Switch-gear (other than starting and stopping devices and emergency stop control), electrical services e.g. conduit and allied fittings	Light Orange (High Gloss)	SABS 1091 B26 BS 381C-557 RAL 2007
f) Low voltage switchgear panels where orange is not aesthetically acceptable	Light grey	RAL 7035
g) Medium voltage cable trays, switchgear and motors (3,3 kV and up)	Saphire Blue	RAL5003
h) Starting devices, low voltage cable trays and switchgear	Moss Green	RAL6005
i) Transnet Logo	Transnet Red (Traffic Red)	RAL 3020 on White (RAL 9010) Background
j) Parts of stationary machinery (Electrical, motors, gearboxes, brakes, transformers, etc.)	Light Grey	RAL 7035
k) Hand levers, hand wheels, oiling points, handrails on walkways, ladders	Golden Yellow (High Gloss)	RAL 1004
l) Stopping devices, grease points, motor fan covers and danger signs (not symbolic safety signs for which see SABS 1186)	Signal red (High Gloss)	RAL3001
m) Walkways (non slip surfaces) (galvanized gratings not to be painted)	Shop floor green or black	
n) Informatory signs and notices (not symbolic safety signs for which see SABS 1186)	White on Emerald Green (High Gloss)	White on RAL 6001

Area	Colour	Code No. [SABS 1091 and International No's]
7.1.4 Pipe lines		
a) Reclaim water piping	Aluminium	
b) Slurry pipe lines	Iron Grey	RAL 7011
c) Fire protection piping	Signal red	RAL 3001
d) Washwater drain pipes	Light grey	RAL 7035
e) Instrument air	White with Strong blue band	White RAL 5005
f) Plant air	White with Flag blue band	White RAL 5015
g) Potable water	Grass green	RAL 6010

7.1.5 Colour bands for pipes shall be 75 mm wide for pipe sizes up to 150 mm diameter and 100 mm wide for 150 mm and above. The colour bands shall be applied to the pipe flanges, valves, junctions, walls or structures etc. in such a manner that the pipe may be easily identifiable. On straight sections the maximum spacing shall be 100 x the pipe diameter.

## 8. FIELD TOUCH-UP PAINTING

8.1. Damaged and unpainted areas, fasteners, welds, etc. shall be cleaned by wire brushing with hand tool or power tool in a manner which will minimize damage to sound paint. Grinding will not be allowed. Rust spots shall be cleaned to bright metal. Thick edges of old paint abutting on bare metal surfaces shall be feathered by scraping and sanding.

8.1.1. Where welding is required on areas already coated with the coating system, the coat should be stepped back for  $\pm 30$ mm around the weld area.

8.2. The paint shall be applied to match the original coats in accordance with the manufacturer's recommendations for the specific paint system.

Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.

8.3. Areas of damaged galvanizing shall be repaired with an approved cold galvanizing product or metal sprayed by the wire spraying process with Zinc, and then touched up with the specific paint system.

## 9. GENERAL

9.1. All walkways, floors, maintenance platforms etc. must be painted with a durable, non skid coating of the appropriate colour.

9.2. Exposed machined surfaces must be coated with a strippable corrosion inhibitor (e.g. Tectyl).

9.3. Where different materials will be in contact with each other and galvanic corrosion can occur the contact areas of the materials must be isolated from each other or the joints made water proof to prevent ingress of moisture.

9.4. All components must be designed with corrosion prevention in mind and specifically the following:-

- 9.4.1. No entrapment of dirt, product, moisture etc.
- 9.4.2. No areas must be inaccessible for maintenance such as too narrow gaps etc.
- 9.4.3. Large flat areas rather than complicated shapes and profiles.
- 9.4.4. No sharp corners and discontinuous welds.

9.5. Parts of equipment which are exposed to high temperatures must be coated with the following system:-

Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
1	Two component self curing inorganic zinc ethyl silicate	DULUX /SIGMA-Sigma Xinc 160  INTERNATIONAL (PLASCON) Interzinc 52  STONCOR (CHEMRITE COATINGS) Carbo Zinc 11	65-75
2	Single component high temperature moisture curing silicone with aluminuim flakes	DULUX/SIGMA – Sigmatherm Silicate  INTERNATIONAL (PLASCON) Intertherm 50  STONCOR (CHEMRITE COATINGS) Thermaline	40

## 10. MAINTENANCE PAINTING OF STRUCTURES

10.1. Areas which are only lightly corroded must be cleaned by means of high pressure water blasting or wire brushing by power tool and the following system applied:-

Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
1	Surface tolerant two pack epoxy primer with aluminuim pigments	Dulux/SIGMA Aluprimer  STONCOR (CHEMRITE COATINGS) Carbomastic 15  INTERNATIONAL (PLASCON) Intergard 242	125-150
2	Same as first coat OR micaceous iron oxide (MIO) epoxy	DULUX/SIGMA – Sigmacover 456  INTERNATIONAL	125-150

		(PLASCON) Interseal 1052	
		STONCOR (CHEMRITE COATINGS) Carboline 193	
3	Two component recoatable, polyurethane finish (Gloss)	DULUX/SIGMA Sigmadur gloss  INTERNATIONAL (PLASCON) Interthane 990  STONCOR (CHEMRITE COATINGS) Carboline 134	65-75

10.1.1. Alternatively, the Noxyde paint system can be used, consisting of two to three coats of water based Noxyde paint to achieve a DFT of 350 to 400 microns. Where the Noxyde system is used on areas other than slightly corroded structural areas, the following additional requirements must be observed:

10.1.1.1. Very smooth surfaces (e.g. 3CR12, stainless steel or hot-dip galvanized components, bolts, nuts and fittings, and HT bolts): Parts must be thoroughly degreased using OptiDegreaser, washed down with potable water, and immediately when dry, a single coat of OptiPrimeAqua applied.

10.1.1.2. Paintable flexible sealant/mastic: Only sealant approved by the paint manufacturer may be used, and an initial coat of OptiPrimeAqua applied over it before the further coats of Noxyde are applied.

10.1.1.3. Bolted/rivited connections: After blasting or and/or cleaning as required, apply a coat of OptiPrimeAqua and an additional stripe coat of Noxyde, in contrasting colour, to all bolt/nut and plate edges and crevices.

10.2. The adhesion of old coatings must be verified by doing a cross cut adhesion test on selected areas.

10.3. The compatibility of the new paint system on the old coating must be tested and guaranteed in writing by the paint supplier.

10.4. The work and coating system must be guaranteed for a minimum of 12 months.

10.5. All heavily corroded areas must be shot blasted to minimum SA2 and the three coat system indicated in clause 2.6 applied.


10.6. Areas where the old coating is still sound need only be high pressure cleaned with a suitable solvent and coated with one of the primers suggested in clause 10.2 (as tie coat) and then with one of the top coats suggested in clause 2.6 to get the appropriate colour and finish. The minimum dry film thickness of this tie coat must be 75 microns and top coat must be 50 microns, but the previous coating colour shall be completely obliterated to present a uniform colour.

Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.



- 10.7. Repairs to the insides of all the enclosed sections of the booms as well as the insides of the crane legs, sill beams, cross beams, pylon cross bracing members etc. shall be done as above but the top coat need not be applied.

**\*\*\* END OF SPECIFICATION HE 9/2/8 [Version 17] \*\*\***

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**1. SCOPE**

- 1.1. This specification covers Sapo's general requirements and conditions for the design, supply, erection and commissioning of port equipment and structures and must be read in conjunction with the main specification.

**2. GENERAL**

- 2.1. Each Tenderer shall provide Sapo with sufficient proof of having suitable experience regarding the designing and/or manufacturing of similar equipment, proven in practise and applied in circumstances similar to those intended by Sapo. To this end, complete and detailed reference lists shall be submitted with the tender.
- 2.2. The equipment in general and the intended operation of the equipment to be supplied, shall be in full compliance with the Occupational Health and Safety Act, Act 85 of 1993, as amended.
- 2.3. The tenderer must submit an offer in accordance with the main specification, and may only then submit alternative offers. Full details as requested in these tender documents should be submitted for each alternative offer. Full details of the differences or deviation from the main offer shall also be submitted.
- 2.4. The Tenderer shall submit a complete list of proposed sub-contractors and suppliers of major components with his tender.
  - 2.4.1. The list of sub-contractors must contain sufficient detail to enable SAPO to grant approval for the respective sub-contracting.
- 2.5. A complete list of major components shall be submitted with the tender, containing sufficient details like make, description, rating, standard of design and manufacture, etc. to enable Sapo's Engineers to decide about its suitability in terms of local conditions, availability, past experiences, etc.
- 2.6. To enable Sapo to apply life-cycle costing in comparison of offers, a complete list of major components to be replaced during the life of the equipment shall be submitted, indicating for each item the expected mean time between failures, based on past experience, and total cost of replacement, including labour and material. Any additional material that can assist Sapo to apply life cycle costing can be submitted by the Tenderer.
- 2.7. The equipment as made and supplied shall be complete in every respect, of modern design using most advanced technology extensively supported by reputable local companies, and be designed and built to applicable recognised standards and good engineering practices.
- 2.8. All components to be fitted shall have been tested for reliability and extended lifetime in conditions to be expected.

- 2.9. The Tenderer shall complete the Schedule of Prices. The lump sum quoted for each category shall be deemed to cover all costs of the design, materials, plant and labour of each item to complete the work according to the drawings and specifications.
- 2.10. All special tools, software and devices essential for the effective operation and/or maintenance of the plant and equipment, shall be listed, detailed and quoted for separately in the Schedule of Prices.
- 2.11. Further to clause 11 of the E5M (1980), the Contractor shall comply with all Municipal regulations regarding the inspection of any portion of the Works. The Contractor shall further provide the Engineer with documented proof of compliance when so requested by the Engineer.
- 2.12. All handbooks, training manuals, wording on drawings and equipment designation labels shall be in English and the Contractor shall ensure that the correct and accurate translation of English is used throughout.
- 2.13. The works will only be accepted (and the certificate of acceptance issued) when the works has been successfully commissioned and tested, and all final drawings, manuals and other documents required in terms of the contract has been delivered to SAPO and accepted by SAPO
- 2.14. Where "tonne", "ton" or the abbreviation "t" is used, it shall be taken as meaning "metric ton" which is equivalent to 1 000kg or approximately 2 204,62 pound mass.

### **3. STATEMENT OF COMPLIANCE**

- 3.1. All tenders are to be accompanied by a separate clause by clause statement of compliance to the requirements of the main specification, as well as to all its annexures, completed and signed by the Tenderer. A general statement that equipment offered is in compliance with the specification is not acceptable.
- 3.2. Every statement of non-compliance or partial compliance shall be fully defined by the Tenderer.
- 3.3. Where a simple statement of compliance against a particular clause could be insufficient to describe exactly what is being offered, a description, fully explaining the Tenderer's offer, shall be submitted with the tender.

### **4. COPYRIGHT OF PLANS, DIAGRAMS AND DOCUMENTS**

- 4.1. The contractor will grant to Sapo a non-exclusive licence, in accordance with the provisions of section 22 of the Copyright Act 1978 (Act 98 of 1978), (a) to copy any plan, diagram, drawing, specification, bill of

quantities, design calculation or other similar document made other than under the direction or control of Sapo, by the Contractor in connection with the installation, (b) to make free and unrestricted use thereof for its own purposes, (c) to provide copies thereof to consultants to be used by them for the purpose of the consultancy and (d) to provide other parties with copies for tenders invited by it. The Contractor, further more, if any plan, diagram, drawing, specification, bill of quantities, design calculations or other similar document made, other than under the direction or control of Sapo, by any principal or sub-contractor of the Contractor, is used in connection with the installation, shall cause such principal or sub-contractor to grant to Sapo a similar non-exclusive licence in respect of such plan, diagram, drawing, specification, bill of quantities, design calculation or other similar document. The provisions of this clause shall not apply to documents made, in the case of equipment to be supplied in connection with the manufacturing process of the equipment supplied but only to the equipment supplied itself. No separate or extra payment shall be due by Sapo in respect of any non-exclusive licence granted in terms of this clause.

## **5. DESIGN CALCULATIONS**

- 5.1. Tenders must be accompanied by a preliminary design analysis and drawings for structural work. The design calculations and drawings shall be sufficiently comprehensive for Transnet Engineers to make a fair and accurate assessment of the essential details and general qualities of the scheme offered. The various loading combinations used for the analysis of the structure must be detailed and submitted with the tender.
- 5.2. At the completion of the Works, the Contractor shall supply as part of the contract, one set of clearly set out, edited and bound, final complete design, stability and stress analysis for all structural items.
- 5.3. Designs based on computer analysis must include properly drawn up, indexed and reference diagrams of all bending moments, shear and axial forces and deflections for all the loading cases. A number reference drawing to facilitate reading of computer printouts must be included.

## **6. CERTIFICATION**

- 6.1. Where applicable, the Contractor shall for each piece of equipment fully completed and taken over by Sapo, submit the necessary certificate of classification and/or certification by a recognised testing authority in compliance with requirements of applicable standards and rules.

## **7. CONTRACT MANAGEMENT**

- 7.1. The Tenderer shall submit a full set of financial statements, as required in terms of the Companies Act, for the last three financial years. This shall

include the financial statements, auditor's report and chairman's report of the Tenderer and proposed main sub-contractors.

- 7.2. The Tenderer shall submit an organogram of the company with his tender which shall show all posts down to supervisory level for all personnel who will be directly involved with this contract and down to managerial level for all other posts in the Tenderer's organisation.
- 7.3. The Tenderer shall submit a C.V. of all personnel who will be directly involved with the management and execution of this contract down to supervisory level. This shall include qualifications and past experience.
- 7.4. The successful Tenderer shall be prepared to commit himself in writing to providing Sapo with an adequate, experienced and stable project team for the duration of the contract. Every effort must be exercised by the Contractor to minimise replacement of individual project members in order to ensure optimum contract management continuity. Prior advice and full motivation must be submitted to Sapo before the replacement of any of the Contractor's key personnel involved with the project.
- 7.5. The Tenderer shall submit a detailed barchart showing all major activities and identifying all major milestones to be achieved in this contract. This barchart will be critically analysed by Sapo as it will show whether Tenderers are able to plan the project efficiently. This barchart will be taken into account when evaluating offers received.
- 7.6. The Contractor shall submit a fully detailed schedule within two weeks after the official contract showing all activities from a Work Breakdown Structure commencing from date of contract to the final commissioning and acceptance based on the initial barchart submitted with the tender.
- 7.7. The Tenderer shall submit details of resource management which will be applied to this contract for:
  - 7.7.1. Manpower
  - 7.7.2. Finance
  - 7.7.3. Equipment
  - 7.7.4. Material supply
- 7.8. This should be in sufficient detail to establish where the above resources will be obtained and how they will be managed during the duration of the contract.
- 7.9. It is a requirement of this contract that the Contractor will employ a full time, fully experienced site manager who has been delegated sufficient authority to manage the contract efficiently on site during erection and commissioning.

## **8. QUALITY MANAGEMENT**

- 8.1. The Contractor shall be required to install and operate a quality



management system which conforms to the requirements of SABS ISO 9001/9002.

- 8.2. The Tenderer must submit a detailed statement of his quality system with this tender which shall include the following:-
  - 8.2.1. Statement of quality management policy and objectives.
  - 8.2.2. Statement of the design control system with emphasis on design review procedures and customer requirements evaluation.
  - 8.2.3. Statement of the documentation and change control procedures.
  - 8.2.4. Statement of the quality control procedures that will apply to purchased materials.
  - 8.2.5. Statement of the quality control plan for all components manufactured or supplied so that inspection is carried out to ensure conformance to the specification.
  - 8.2.6. Statement of the quality control procedure that will apply to installation and painting on site.
- 8.3. The sole responsibility for ensuring that the components supplied conform to the specification shall rest with the Contractor.
- 8.4. The Contractor shall notify the Engineer of all inspections at least 3 working days in advance of such inspections. The Engineer reserves the right to have an inspector present at such inspections. The Contractor shall have the relevant quality control plans available at such inspections. The Engineer shall give the Contractor 24 hour notice in writing of his intention to attend the inspections.
  - 8.4.1. Where the contract provides for tests on the premises of the Contractor or of his sub-contractor, the Contractor shall provide such assistance, labour, materials, electricity, fuel, stores, apparatus and instruments as may be a requisite and as may be reasonable demanded to carry out such tests efficiently. All gauges, templates, tools and other equipment required to check the accuracy of the work shall be calibrated at regular intervals by a laboratory approved by the National Calibration Services of the Council for Scientific and Industrial Research of South Africa, or by the respective authority in the country of origin of the equipment
  - 8.4.2. As and when the equipment has passed these tests, the Engineer shall furnish the Contractor a certificate in writing to this effect.
  - 8.4.3. If as a result of such an inspection, examination or test the Engineer decides that such equipment is defective or not in accordance with the requirements, he shall notify the Contractor accordingly, stating in writing his objections and reasons therefore. The Contractor shall timeously make good the defect

to ensure that the equipment complies with the requirements. Thereafter, if required by the Engineer, the tests shall be repeated under the same terms and conditions save that all reasonable expenses to which Sapo may be put by the repetition of the tests will be deducted from the contract sum.

- 8.4.4. Unless the Engineer otherwise directs, no equipment or materials are to be delivered to site until the Engineer issues an inspection certificate in respect of such equipment. The Contractor shall be responsible for the reception on site of all equipment delivered for the purpose of the contract.
- 8.5. SAPO reserves the right to conduct a quality assurance audit on the Contractor's quality control system at regular intervals.
- 8.6. If required by the Engineer the Contractor shall produce evidence to show that both his welding procedures and welders have passed all the relevant tests required in terms of BS 5135 and SABS 044 Parts III and IV.
- 8.7. The Contractor shall hold design review meetings during the planning phases of this contract. This will be to establish all customer requirements and to provide approval in principle for design interfaces for all designs and specifications to ensure that quality is designed into the final product.
- 8.8. The Contractor shall not change any design or specification feature which has any of the following impacts without formal approval by the Engineer:
  - 8.8.1. Financial
  - 8.8.2. Interface with other equipment or installations
  - 8.8.3. Safety
  - 8.8.4. Departure from customer requirements

## **9. SITE SURVEY BY CONTRACTOR**

- 9.1. Immediately after award of the contract, and prior to final design, the successful Tender shall survey the complete site of final operation of the equipment tendered for. This survey shall serve to confirm dimensions and for relative positions of all items and equipment that will interface with the equipment tendered for, e.g. rail gauges, conveyor position relative to rails, location of electrical power supply points, location and dimensions of any obstacle protruding into the operations envelope, etc.
- 9.2. It will be the contractor's responsibility to ensure that equipment supplied in terms of the contract will interface successfully with existing items and equipment.
- 9.3. Any major deviation from data supplied by Sapo in the tender documents shall be brought under the attention of the Engineer. Any potential impact

of a commercial or technical nature shall be discussed and finalised with the Engineer, prior to final design of the equipment.

- 9.4. The Tenderer shall allow in all respects in his tender for this requirement to survey the operation site and confirm tender data.

## **10. DRAWINGS AND SCHEMATICS**

- 10.1. On the contract being placed, the Contractor shall at once prepare and must submit two copies of black line paper prints of the general arrangements, working drawings and schematics for approval by the Engineer. These drawings and schematics must be submitted in a systematic manner, accompanied by an index sheet of all the drawings and schematics in question. Approval in principle by the Engineer must be obtained prior to commencement of fabrication or construction. Time required for preparation and approval of these drawings must be included in the Tenderer's program.
- 10.2. Drawings which are submitted for the Engineer's formal approval shall bear the signature and designation of the Tenderer's "responsible professional Engineer".
- 10.3. General arrangement drawings shall show the complete structural layout arrangements with plan views, elevations, cross sections, location and sizes of members, erection details, cladding details, services where applicable, etc.
- 10.4. Notwithstanding any formal approval in principal of drawings and schematics submitted to Sapu, the sole responsibility for the adequacy of the design, fabrication and installation or erection as well as accuracy of workmanship and quality of all materials, shall rest entirely with the Contractor who will be required to rectify any defects.
- 10.5. The Contractor's fabrication shop drawings and detailed drawings are not required for approval except when the Engineer requests such drawings specifically for approval or to assist him in the inspection of the structure at any stage.
- 10.6. At the completion of the Works, the Contractor shall supply as part of the contract two sets of paper prints and a set of latest AUTOCAD version files in the DXF format of the general arrangement, manufacturing and detailed working drawings and schematics, showing every portion of the work as actually made for the equipment, giving all wording in English and all dimensions in Metric units.
- 10.7. The drawings and schematics shall comply with the applicable SABS, British, VDE or ISO standards. The official Sapu title block with the Sapu serial No. and numbering system must be included in the lower right hand corner.
- 10.7.1. The Contractor will be advised regarding numbering and detailing of drawings.

- 10.8. Prints and CAD files must be delivered not later than 2 months after completion of the commissioning of the equipment.

## **11. SITE BOOKS**

- 11.1. The Contractor shall supply and have available at the site office at all times, the following site books:

11.1.1. Site instruction book:

This shall be a suitable carbon copy book, size A4, with two detachable sheets for receiving and recording instructions in triplicate issued by the Engineer or his authorised representative.

11.1.2. Site diary book:

This shall be a suitable carbon copy book, size A4, with two detachable sheets for a page to a day and all events affecting the Works, such as arrivals of plans, breakdown of machinery, weather conditions etc., must be entered. The plant, labour and material on site must be recorded as well as work performed.

Entries will be made by the Contractor (or his appointed agent) and signed by both parties daily. The diary may be used to establish the validity of claims for extension of time.

- 11.2. These site books will remain the property of Sapo and will be used for reference purposes and during the guarantee period.

## **12. CO-OPERATION WITH OTHER PARTIES**

- 12.1. Departments of Transnet and other contractors may be working in the confines of the contract work site and in the general area surrounding it during the course of the contract. The Contractor shall make reasonable allowance in all tendered rates for the necessity to interface with the activities of other contractors and Transnet, and to allow for access and safe working conditions.

- 12.2. The success of the project depends on the effective co-operation of all contractors on site, and the Contractor will if necessary be required to discuss his programme on a day to day basis with the Engineer's Deputy to ensure effective co-ordination.

## **13. CUSTOMS AND PORT REGULATIONS**

- 13.1. The Works are situated within a Customs controlled area and the Contractor and his staff shall observe all Customs regulations within the

port area.

- 13.2. The Works are sited within a promulgated port area and the Contractor and his staff shall observe all Port Regulations within the port area. Copies of the Harbour Regulations are obtainable from the Port admin offices.
- 13.3. The fullest collaboration between the Contractor, Sapo and the Engineer is essential in regard to the working of the port.

#### **14. INSTRUCTION OF SAPO'S PERSONNEL**

- 14.1. Sapo's personnel concerned with operating, and maintenance will be made available for instruction by the Contractor in their various functions at the Port concerned.
- 14.2. The necessary formal lecturing on the working, adjustment, maintenance and fault finding procedures shall be arranged for at the Port concerned.
- 14.3. Details of alternative and additional official courses offered shall be specified at tender stage i.e. full procedures, duration, place of training, competence and qualifications of personnel to be trained.

#### **15. OPERATING AND MAINTENANCE INSTRUCTION MANUALS AND PARTS CATALOGUE**

- 15.1. The Contractor will be required to furnish three final copies of each manual/handbook supplied in terms of the contract.
- 15.2. One copy of the preliminary set of manuals/handbooks must be available on site one month prior to commissioning.
- 15.3. One copy of the final set of handbooks will be kept in the workshop and the Contractor must cover every page of this set with translucent plastic.
- 15.4. The following manuals shall be supplied as part of the contract:
  - 15.4.1. Maintenance Instruction Manual.
  - 15.4.2. Workshop Reference Manual.
  - 15.4.3. Operator's Manual.
  - 15.4.4. Parts Catalogue.
  - 15.4.5. Training Manual.
- 15.5. The *Maintenance Instruction Manual* shall include:
  - 15.5.1. Safety instructions to be observed by maintenance and operating personnel.

- 15.5.2. A general description with illustrations and flow diagrams of the works, indicating all major items, with a functional description of these items.
- 15.5.3. Full detail of all faultfinding procedures (electrical and mechanical).
- 15.5.4. Detailed periodic maintenance programmes in respect of the whole of the works, including electrical components and structural work.
- 15.5.5. Comprehensive data and procedure descriptions (suitably illustrated) on routine maintenance, including intervals, tasks, wear tolerances and lubrication detail.
- 15.5.6. A list of all equipment that require lubrication must be compiled under the following headings.
- 15.5.7. Name, description, location.
- 15.5.8. Recommended lubricant.
- 15.5.9. Frequency of lubrication.
- 15.5.10. A list of all PLC fault codes and their probable causes.
- 15.5.11. Diagrams of all electrical, pneumatic and hydraulic circuits.

15.6. The *Workshop Reference Manual* shall include:

- 15.6.1. Safety instructions to be observed by maintenance and operating personnel.
- 15.6.2. Complete data and procedures on the repair and overhaul of all items of the works.
- 15.6.3. Detailed diagrams of all electrical, pneumatic and hydraulic circuits.
- 15.6.4. A list of all PLC fault codes and their probable causes.
- 15.6.5. A complete listing of the PLC programs.
- 15.6.6. Data necessary for condition monitoring purposes, like the number of teeth on gears, number of balls/rollers in bearings etc.
- 15.6.7. Detailed Supplier data sheets on all standard equipment that forms part of the works.
- 15.6.8. Design, installation, inspection and performance or load test certificates as required by law (including Act 85 of 1993).
- 15.6.9. Completed commissioning document for the works.

- 15.7. The *Operator's Manual* must detail the safe and efficient operation of the works, and must include the following:
  - 15.7.1. Safety instructions to be observed by the operating personnel.
  - 15.7.2. Start-up procedure.
  - 15.7.3. Shut-down procedure.
  - 15.7.4. Storm anchoring procedure if applicable.
  - 15.7.5. Diagram showing the lay-out of controls and operator meters and displays.
  - 15.7.6. Detail of the use of the controls and interpretation of the meters and displays.
  - 15.7.7. Detailed check-lists for the daily, weekly and monthly inspections to be performed by the operator.
  - 15.7.8. A list of all fault codes that could be displayed at operator, with a description and detail of what action should be taken by operator when such a code is displayed.
- 15.8. The *Parts Catalogue* shall comprehensively list all parts of the works with full descriptions, locations, re-order numbers and supplier, and will include illustrated diagrams of assemblies showing all parts of the assembly. A list of suppliers and their contact detail shall also be included.
- 15.9. The *Training Manual*:
  - 15.9.1. Comprehensive pictures and text shall be provided to enable SAPOt Academy (NPA's division responsible for training) to compile final training manuals for operator training, including first line maintenance.
  - 15.9.2. Pictures and text shall be in digital format supplied on CD Rom to enable Sapo to edit the content.
  - 15.9.3. To assist the Contractor in compiling the necessary information, the following requirements must be complied with for all major parts of the equipment.
    - 15.9.3.1. Identify (i.e. description and picture of) the part and describe where the part can be found on the equipment.
    - 15.9.3.2. Explain the function of the part; and
    - 15.9.3.3. Describe what the operator has to do to keep the part in good working order.
- 15.10. All final manuals shall be supplied by the Contractor as soon as possible after the works has been successfully commissioned, in order for the works to be accepted (see clause 2.13).

## **16. RECOMMENDED SPARES**

- 16.1. A complete priced list of recommended mechanical and electrical spares to enable SAPO to operate and maintain the installation efficiently for its useful life and to obtain spares as required must be submitted by the Contractor not later than one month after the finalisation of the design. This list of recommended spares must include full details on the source or supplier in each and every case.
- 16.2. Spares for the equipment must be classified as:
  - 16.2.1. Initial spares which are the major assemblies and critical single items that have been established from experience as being necessary to maintain the installation fully operational after commissioning for a period of twelve months.
  - 16.2.2. Recommended maintenance spares which are the spares that the Contractor recommends as necessary for the maintenance of the installation over and above the initial spares described above, and include all wearing items and slow moving contingency (insurance) spares.
- 16.3. Each spare part must be comprehensively described, and Contractors must furnish the manufacturer's part number as well as any applicable international item number.
- 16.4. Tenderers shall state:
- 16.5. Whether all essential renewable parts for all the equipment will be readily available in the Republic of South Africa.
- 16.6. What after sales service and operational instruction can be offered to Sapo.

## **17. GUARANTEE AND GUARANTEE PERIOD**

- 17.1. The Contractor shall guarantee that all components and material supplied are new and fit the specified purpose for which they are purchased and are free from any defects in design, workmanship and material and are in strict accordance with the specifications and drawings, unless otherwise agreed in writing by Sapo.
- 17.2. The Contractor shall agree to replace without charge to Sapo any defective items discovered within 12 months from the date of acceptance, provided that the equipment has been operated and maintained in accordance with the Contractor's written operating instructions; normal wear and tear excluded.
- 17.3. During the guarantee period the Contractor shall have a branch or local agent at or near the Port with full time personnel available for guarantee




repairs. Spare parts and equipment must also be available from the branch or agent.

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***END OF SPECIFICATION HE 9/2/9 [Version 7]***

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REVISION  0	REFERENCE  EEAM-Q-009			
DOCUMENT TYPE SPECIFICATION		AUTHORISATION DATE: Date signed by CEO		
TITLE: QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION		PAGE 1 of 14		
COMPILED BY:	REVIEWED BY:	REVIEWED BY:		
SENIOR MANAGER (QUALITYMANAGER)	SENIOR MANAGER (PROJECT MANAGER)	SENIOR MANAGER (GENERAL MANAGER)		
ACCEPTED BY:		AUTHORIZED BY:		
CHIEF FINANCIAL OFFICER		CEO		
FUTURE REVISION RECORD NUMBER	DESCRIPTION OF REVISION	APPROVAL	DATE 01/03/2010	
-1-				
<p align="center"><b>CONTENTS</b></p> <p>1.0 QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION</p>				

KEYWORDS SPECIFICATION	DATE OF LAST REVIEW: N/A
	DATE OF NEXT REVIEW: 01/03 2010

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## 1. Introduction

This Specification outlines the minimum requirements to ensure that products and services supplied to Transnet Port Terminals are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in the Contract, all associated specifications, drawings, codes and standards.

## 2. Definitions

<b>Term, Abbreviation</b>	<b>Meaning</b>
Data	All drawings/documents/data/information and DP's required to be supplied under the Contract
Data Pack (DP)	A compilation of manufacturing data, certification, inspection and testing records prepared by the Supplier/Contractor to verify compliance with the Contractual requirements.
Employer	For the purposes of this document, the term Employer has the same meaning as applied to the term Client.
Field Inspection Checklist (FIC)	A document that details the checks, requirements and test parameters for each type of equipment to permit field installation and pre- commissioning of the equipment.
TPT	Transnet Port Terminals is the Employer's Nominated Agent in terms of the Conditions of Contract.
Inspection Release Report (IRR)	A document issued to the Supplier/Contractor by TPT advising release of the Materials for shipment. This does not relieve the Supplier/Contractor of its obligations in accordance with the Terms and Conditions of the Contract.
Inspection Waiver Report (IWR)	<p>A document issued to the Supplier/Contractor by TPT advising that TPT has waived final inspection for the materials listed in this document. The issue of this Report does not preclude further inspection by TPT, is issued without prejudice and does not relieve the Supplier/ Contractor from the guarantees and obligations included in the Contract/ Contract.</p> <p>A document prepared by the Supplier/Contractor providing relevant information applicable to the installation and maintenance of the specific equipment, including consumables (eg. oils etc)</p>
Project Quality Plan (PQP)	A document that outlines the Supplier/Contractor's strategy, methodology, resources allocation, Quality Assurance and Quality Control coordination activities to ensure that Goods and Services supplied meet or exceed the requirements defined in the Contract, drawings, codes and standards.
Quality Control Plan (QCP)*	<p>A document outlining specific manufacturing / construction inspection and testing requirements, including responsibilities, test acceptance criteria, nomination of witness and hold points.</p> <p>For the purposes of this document, the term Supplier/Contractor has the same meaning as applied to the term Sub-Supplier/Sub-Contractor</p>
Supplier/Contractor	This refers to the documentation required to be submitted by the relevant Supplier / Contractor in terms of the Contract.
Supplier/Contractor Data Requirements	These requirements are generally tailored to suit the particular Scope of Work, although it also addresses the manner in which the documentation is required to be submitted, eg Hard copy, Electronic copy etc
Technical Query Note (TQN)	This refers to a document used by the Supplier/Contractor to formally clarify a Technical Query related to the scope of supply. This should not be used where a non-conformance has already been initiated.

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### **3. Applicable Documents**

#### **3.1 General**

All work performed shall comply with the requirements of this Specification, the documentation referenced in the Contract and the latest revision/edition of the relevant Codes and Standards referenced herein.

#### **3.2 Statutory Regulations**

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

#### **3.3 Codes and Standards**

<b>Document No.</b>	<b>Title</b>
ISO 9001	International Standard Series Quality Systems
EEAM-Q-013	Punch Listing Standard

### **4. Quality System**

#### **4.1 General**

The Supplier/Contractor shall be responsible for all quality activities necessary to ensure the Work meets the requirements specified in the Contract, and shall manage and coordinate all Quality aspects of Work in accordance with the requirements of this Specification, and the Supplier/Contractor's PQP and QCP's once reviewed and approved by TPT.

The Supplier/Contractor shall ensure that all Sub-Suppliers/Sub-Contractors also conform with the requirements of this Specification.

#### **4.2 Supplier/Contractor Quality System Requirements**

The Supplier/Contractor shall have, maintain and demonstrate its use to TPT, its documented Quality Management System. The Supplier/Contractors Quality Management System should be in accordance with the International Standard ISO 9001.

The Supplier/Contractor shall submit its Quality System documentation to TPT at the time of tender and at Contract Phases as detailed below:

- Project Quality Plan
- Quality Policy
- Index of Procedures to be used
- Programme of internal and external audits

#### **4.3 Supplier/Contractor Documentation Requirements**

The Supplier/Contractor shall develop and maintain a comprehensive register of documents that will be generated throughout the project, and shall include all quality related documents. The register shall be submitted to TPT for review.

TPT shall indicate those documents required to be submitted for information/review and/or acceptance and this shall be indicated in the Supplier/Contractors' Document Register. The register shall indicate the dates of issue of the documents taking into account sufficient time to allow TPT review/acceptance cycle prior to the document being required for use.

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## **5. Quality Assurance**

### **5.1 Project Quality Plan**

Where specified, the Supplier/Contractor shall submit a PQP to TPT within 28 days after the Contract start date. The PQP shall detail how the Supplier/Contractor's Quality System will be applied to the Scope of Work specified in the Contract, and shall address the following:

- Satisfying the technical and quality requirements of the Supplier/Contractor's Scope of Work, and relevant elements of the applicable ISO 9001 standard
- include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls and records used to control and verify compliance with the specified Contractual requirements

Include a listing of all special processes (eg. welding and non-destructive testing, cube testing etc) envisaged for use, including confirmation of personnel certification as required

- Include all proposed method statements (for site based work activities)
- Include a description of the Supplier/Contractor's project organisation, with key positions and responsibilities identified and individuals named. The organisation structure shall also indicate the resources committed to the management / coordination of QA / QC activities
- Include a listing of all Quality Control Plans (QCP's), and associated Field Inspection Checklists (FIC's), as applicable
- Identify in the Project Quality Plan any Sub-Supplier/Sub-Contractor work. Sub-Supplier/Sub-Contractor plans shall be approved by the Supplier/Contractor, and a copy forwarded to the TPT
- Include the proposed Authorised Inspection Authority (where applicable - for pressurised equipment and systems)
- Include a schedule of proposed quality records

The PQP shall be controlled and re-submitted for approval when required to incorporate any change necessary during the Contract duration to ensure that the document is maintained as an effective control, change management and records. The change management will be done to an agreed policy or procedure.

Note: Where the Supplier/Contractor is required to provide a PQP, no work shall commence until the PQP is approved by TPT.

### **5.2 Procedures**

The Supplier/Contractor's PQP and procedures shall address the system elements and activities appropriate to the Scope of Work, in compliance with the specified Quality Standard.

Where specified, the Supplier/Contractor shall submit copies of Quality Procedures for review. In addition, the Supplier/Contractor shall ensure that copies of all Procedures relevant to the Scope of Work are available for reference by TPT at each work location.

These will include, as applicable, the following:

#### **5.2.1 Document Control**

The Supplier/Contractor's Project Quality Plan shall provide a description of how TPT provided, Supplier/Contractor and Sub-Supplier/Sub-Contractor documents are to be managed. The description shall address as a minimum:

- Management tools and databases
- Receipt, registration and maintenance
- Internal and external distribution to Employer, third parties and Sub-Contractors
- Management of Codes, Standards and Specifications

- 
- Internal review and approval routines and authorities
  - How it is ensured that the correct revisions of documents are available at the point of use including retention periods for all documentation.

### **5.2.2 Design Control**

Where the Supplier/Contractor is responsible for any aspect of design related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these design activities.

### **5.2.3 Procurement**

Where the Supplier/Contractor is responsible for any aspect of procurement related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these activities.

## **5.3 Supplier/Contractor Audits**

The Supplier/Contractor shall:

- Carry out audits in accordance with its Quality System at its own and Sub-Supplier/Sub-Contractor's facilities to ensure project quality requirements are being achieved
- Include a QA Audit Schedule in the Supplier/Contractor PQP submitted to TPT prior to commencement of the Scope of Work. The Audit Schedule shall include all audits to be implemented by the Supplier/Contractor and Sub-Supplier/Sub-Contractor during the execution of the Contract
- Where stipulated in the Contract, perform an audit within three months after the Contract start date and thereafter at a minimum frequency of three months. Audit reports shall be submitted to TPT at the completion of each Audit. Where unsatisfactory performance is evident, additional audits shall be performed by the Supplier/Contractor as directed by TPT.

## **5.4 Transnet Port Terminals Audit**

TPT reserves the right to perform quality audits or participate as an observer in Supplier/Contractor audits to verify compliance with the Contractual requirements. The Supplier/Contractor shall within a time frame as agreed upon, correct any adverse audit finding advised by TPT.

# **6. Inspection and Testing**

## **6.1 General**

TPT may, at its discretion perform surveillance inspection at the Supplier/Contractor's premises, SubSupplier/Sub-Contractor's premises or at the location of the Scope of Work.

Dependent on the nature of the Scope of Work and the frequency of inspections TPT may elect to have inspection personnel resident at the place of manufacture, fabrication, or assembly.

The Supplier/Contractor shall ensure free entry and access is given to TPT, certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and quality records at all parts of the Supplier/Contractor's and Sub-Supplier/Sub-Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

The Supplier/Contractor shall provide TPT with all necessary tools, calibrated measuring equipment, safety equipment and workspace to verify or witness tests in progress.

While TPT is at the Supplier/Contractor's premises, the Supplier/Contractor shall provide, free of charge, reasonable facilities including office facilities and reasonable access to a telephone, facsimile machine and computer connection point.

The Supplier/Contractor shall provide notice in writing in within a time frame time as agreed upon, to allow the attendance of TPT and other representatives at nominated witness and hold points.



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## 6.2 Quality Control Plans

The Supplier/Contractor shall prepare and submit QCP's to TPT for review in accordance with the requirements of the Contract and PQP.

QCP's shall identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, witness and hold points.

The Supplier/Contractor shall not commence fabrication or manufacture prior to review and approval of the applicable QCP by the TPT.

QCP's shall include reference to all tests specified in the Contract Document.

A typical format for an QCP is shown in Appendix A. The Supplier/Contractor may use its own format providing all information shown in Appendix A is included.

## 6.3 Inspection Points

The QCP shall identify points in the fabrication, manufacturing and/or installation process that are selected for inspection and shall be denoted by the following inspection codes:

- Hold Point (H)                      Inspection point in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Holding points require written notification to TPT.
- Witness Point (W)                  An inspection point in the manufacturing cycle that will be witnessed or verified. If TPT confirms it is unable to attend after being provided with the written notification then manufacture may proceed. Witness points require written notification to TPT.
- Review Point (R)                      A point at which products and quality records are verified and endorsed. Review points are not notifiable points.
- Surveillance (S)                      An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.

The Supplier/Contractor shall maintain the status of testing and inspection by progressively having the QCP's signed off.

## 6.4 Revision to Quality Control Plans

Revision of the QCP shall be subject to the same submission, review and acceptance routines as described for the original QCP issue

## 6.5 Kick Off Meeting

After the Contract start date, and prior to manufacture, TPT will require a Kick Off Meeting with the Supplier/Contractor to discuss fully the implications of meeting TPT quality requirements. This meeting may be held as part of the Contract kick-off meeting for each package or may be a separate meeting, subject to the critical or complex nature of the work. This requirement for a pre-inspection meeting may be repeated when sub-Supplier/Contractors of key equipment are engaged.

After mobilization of the Contractor, and prior to the commencement of any construction activities, TPT will arrange for a Quality kick-off meeting to discuss fully the implications of meeting the projects' quality requirements. This meeting may be held as part of the formal kick-off meeting for each contractor, or may be a separate meeting subject to the critical or complex nature of the work.

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## **6.6 Schedule of Inspection**

The Supplier/Contractor shall submit a Schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The Schedule shall be regularly updated with progress and issued to TPT to show the current inspection and test status.

## **6.7 Field Inspection Checklists**

For site installation and construction activities, the Supplier/Contractor shall prepare Field Inspection Checklists (FIC's) to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCP's.

FIC's shall be provided to TPT for initial review, and shall be used to record the results of inspection and testing (where applicable), and on completion be submitted to TPT to confirm satisfactory completion of the tests and inspections at nominated QCP witness and hold points.

## **6.8 Inspection Notification**

The Supplier/Contractor shall notify TPT in writing at least two calendar weeks prior to the advent of inspections or tests that require witnessing.

For inspections or tests within the country, arrangements shall be confirmed at least two working days before the event. For inspection and tests outside of the country, arrangements shall be confirmed at least seven working days before the event.

Inspection notifications shall include the following essential information:

- Contract Number
- Location of Inspection or Test
- Nature of Inspection or Test
- Date and Time of Inspection or Test
- Name and telephone number of the Supplier/Contractor's Representative.

## **6.9 Inspection and Testing**

The Supplier/Contractor is responsible for the conduct of all Supplier/Contractor inspections and tests, and includes:

- Documenting inspection and tests result in the QCP's and relevant FIC's
- Progressively inspecting the quality of the Scope of Work performed, including that of all Sub-Supplier/Sub-Contractors
- Inspecting to meet all Contractual requirements, in number, type and form
- Inspecting day to day activities, material receipts, issue of material for installation, in-process inspections, and final inspections.

Completed original QCP's and FIC's shall be submitted to TPT in the DP

## **6.10 Inspection Release**

At completion of the Scope of Work, either in total or in phases, TPT may issue an Inspection Release Report (IRR) or a waiver of inspection.

The issue of either an inspection release or waiver of inspection does not relieve the Supplier/Contractor of its obligations under the Contract. The Supplier/Contractor shall ensure a copy of the release note and final expediting release note for transport, where appropriate, is attached to the delivery docket and accompanies the Work to the designated destination indicated in the Contract. Items delivered to TPT without a copy of these documents may not be accepted.

A copy of the inspection release or waiver of inspection shall be included in the DP.

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## **6.11 Special Processes**

It is the Supplier/Contractor's responsibility to ensure that all processes which require prequalified procedures and/or work methods are tested and qualified before work begins. This typically covers such activities as welding, non-destructive testing, special fabrication techniques and painting. Unless specified such procedures are the Supplier/Contractor's responsibility and do not require submission to TPT before work begins. When such procedures are requested, no work shall commence until procedures are approved by TPT.

It is the Supplier/Contractor's responsibility to ensure all operators are qualified for the processes in accordance with the procedure and/or applicable standards. Records of qualification of operators shall be maintained by the Supplier/Contractor and made available to TPT when requested.

Records of qualification of procedures and processes shall be maintained by the Supplier/Contractor in accordance with the applicable procedure or code.

## **6.12 Welding Procedures**

Where the Supplier/Contractor's Scope of Work includes fabricated weldments, Welding Procedure Specifications (WPS) defining the method, preparation and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of the Supplier/Contractor's Scope of Work. The procedure shall only be submitted to TPT when requested in the Contract.

WPS shall include all welding essential and non-essential variables for each process used, including appropriate test results and shall comply with the standard or code pertaining to welding required in the execution of the Supplier/Contractor's Scope of Work.

When requested in the Contract a suitably marked "weld map" shall be completed by the Supplier/Contractor for all items to be fabricated. A summary of WPS shall be prepared and when used, shall be identified on the weld map.

Where TPT approval is required, fabrication shall not commence until written approval of WPS and Welding Procedure Qualification Records (WPQR) is received by the Supplier/Contractor. No welding fabrication will be accepted that is not covered by an TPT approved WPS/WPQR.

Welding Procedure Qualification (WPQ) tests may be witnessed by TPT and/or an independent inspection authority. Testing of the specimens prepared during the WPQ Tests shall be carried out by an independent approved testing laboratory independent of the Supplier/Contractor. In certain instances, a certificate to EN 10204 3.1 B may be required which will be clarified at Tender review and clarification stage.

Where actual weld deposit analysis and weld metal physical properties are required for procedure qualification, the information shall be taken from the procedure qualification tests. Data listed in the catalogues of the manufacturer of welding consumables is not acceptable.

Welders/welding operators shall be qualified in accordance with the relevant welding code prior to commencing production fabrication. Specific Welder Qualifications (WQ's) records will be reviewed by TPT in the Supplier/Contractor's works and should NOT be submitted for review.

A register of welders qualified to work shall be maintained by the Supplier/Contractor.

## **6.13 Material Traceability**

Where, and to the extent that material traceability is required, the Contractor shall provide its procedures for the maintenance of material identification throughout all phases of manufacture. Methods of identification, routines for re-stamping or stencilling as appropriate shall be defined and agreed with the Employer.

Adequate records shall be maintained throughout construction enabling traceability of key materials from final product back to original material certificates. The material traceability records shall form part of the DP

The Contractor shall prepare a schedule of materials and equipment that are subject to traceability requirements.

## **6.14 Material Certification**

Where specified in the Contract the following certificates shall be provided to TPT and included in the DP.

Type A:	A Supplier/Contractor's certificate of compliance with the Contract. This certifies that the goods or services are supplied in compliance with the Contract without mention of any test results (EN10204 certificate 2.1).
Type B:	A certificate issued by a laboratory or test facility independent of the Supplier/Contractor's works. It shall quote test results carried out on the product supplied and state whether compliance with the relevant technical standard, code etc has been complied with. (EN 10204 certificate 3.1 B).
Type C:	The same as Type B, the tests are to be witnessed by a third party (EN 10204 certificate 3.1C).

## **7. Non Conforming Products**

### **7.1 General**

The Supplier/Contractor shall establish and maintain procedures to control material or products that do not meet the specified requirements.

All Supplier/Contractor product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- If the Supplier/Contractor discovers material or product which is not in accordance with the requirements of the Contract, i.e. a non conformance (NCR), the Supplier/Contractor shall promptly initiate the non-conformance procedure in terms of the Supplier/Contractor's Quality Management System, advise TPT promptly, and provide a copy of the NCR to TPT
- If TPT or it's agent identifies a non conformance an TPT NCR may be raised.
- Originals of all closed out NCR's shall be included in the DP.

### **7.2 Corrective and Preventative Action**

If the Supplier/Contractor proposes a disposition of any non conforming materials or product which varies from the requirements of the Specification or Contract, such a proposal shall be submitted in writing to TPT whose decision on the proposal shall be obtained in writing before the non conforming material or product is covered up or incorporated into the Works, or is the subject of any other disposition.

The disposition of non-conformances which do not vary the requirements of the Contract, specification or drawings may be approved by the Supplier/Contractor following discussion and agreement with TPT.

## **8. Concession Requests and Technical Queries**

### **8.1 Concession Requests**

Where a Supplier/Contractor requests a Concession to deviate from the requirements of the Contract or specified requirements, the Supplier/Contractor shall raise the request with TPT using the format as shown in Annexure B.

The Concession Requests shall clearly identify all elements of the proposed deviation together with any resulting technical, commercial and/or schedule impacts.

Completed original Concession Requests shall be included in the DP.

### **8.2 Technical Queries**

For clarification of technical issues (only), Supplier/Contractor may submit a Technical Query Note (TQN) to TPT in accordance with the Contract.

The TQN shall clearly identify all elements of the query, and all supporting documentation and/or drawings shall be attached where appropriate.

Completed original TQN's shall be included in the DP.

---

## **9. Inspection, Measuring and Test Equipment**

### **9.1 Calibration**

The Supplier/Contractor, including its Sub-Supplier/Sub-Contractors shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant Supplier/Contractor procedures and/or the equipment manufacturer's specifications.

Where calibration is required by an external laboratory, the Supplier/Contractor shall ensure that the facility selected for calibration possesses current certification. Calibration certificates shall contain a statement that the test equipment is accurate to within specified tolerances.

The Supplier/Contractor should establish the frequency of calibration for each item of equipment (including jigs, fixtures or templates) and record the details in a 'Measuring and Test Equipment Register' (or similar).

### **9.2 Use of Inspection, Measuring and Test Equipment**

The Supplier/Contractor shall ensure that authorised equipment users:

- Use the equipment in accordance with manufacturers instructions, and accepted industry practices
- Ensure the equipment is covered by a current calibration certificate
- Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
- Prior to commencement of each inspection or test activities:
  - Identify the measurements to be made
  - Determine the accuracy required
  - Select the appropriate inspection, measuring or test equipment for the scope of work.

### **9.3 Verification of Previous Test Results**

Where the calibration status of the equipment is unknown, expired or has doubtful accuracy, the equipment shall immediately be quarantined, and tagged according to Supplier/Contractor's Quality System procedures. The Supplier/Contractor shall then arrange for either in-house or external calibration, and:

- review all previous test results associated with the suspect equipment
- identify the inspections, measurements or tests required to re-validate the results
- ensure that suitable re-testing is performed with calibrated equipment
- document the results of the re-testing on the respective inspection and test documentation.

## **10. Quality Records**

Supplier/Contractors shall maintain Quality Records necessary to provide objective evidence that demonstrates and verifies achievement of the QA / QC requirements associated with the Scope of Work. All Quality Records, including original source material test certificates and non destructive test reports, shall be retained by the Supplier/Contractor during the project, and be provided to TPT at the times, and in the quantities specified in the Contract.

The Supplier/Contractor shall collate all quality records in the DP and submit the DP to TPT in accordance with the Contract and all referenced standards and specifications. This DP shall be compiled progressively, and shall be available for review at all phases of manufacture or construction activities.

The Scope of Work shall not be complete until the Supplier/Contractor's DP including the quality records from Sub-Supplier/Sub-Contractors have been reviewed and accepted by TPT.

The DP shall be compiled progressively during the execution of the Scope of Work and shall be made available for review by TPT as required.



### Annexure A - Sample Quality Control Plan

Quality Control Plan No.:	Rev:	Date Issued:
Contract No.:	Description:	Item No.:
Supplier / Contractor:	Location:	

[illegible]

## **Annexure B - Request for Concession**



<b>Request for Concession</b>				<b>No: _____ of 2</b>	
<b>A. SUPPLIER/CONTRACTOR SUPPLIED INFORMATION</b>					
SUPPLIER/CONTRACTOR NAME:			CONTRACT NO.:		
SUPPLIER/CONTRACTOR CONCESSION NO.:			DATE:		
Required concession applicable to: (Item/Material/Equipment/Area)					
Description of Concession — Revised Requirements:					
Justification:					
(NOTE: This concession will be rejected if the following information is not provided):					
(i) VALUE OF BENEFIT TO CLIENT	(ii) AGREE TO AN EXTENSION OF THE WARRANTY	YES	NO	(iii) ANY IMPACT ON SCHEDULE?	NO
S/R	IF "YES" WHAT PERIOD?			CF "YES" \ WHAT PERIOD?	
References:					
Original reference:					
Requirements	Rev.:	Specification	N	Rev.:	
Drawing No.:	Rev.:	Specification	O.	Rev.:	
Drawing No.:	Rev.:	Specification	:	Rev.:	
Attached documentation:			N		
applicable					
Requested by:					
(Supplier/Contractor) Name:			Signature		
			D		
Note: Sections B to F on Page 2					


<b><i>Request for Concession No:</i></b>			
<b>B. SITE ADMINISTERED CONTRACT?</b>	Yes <input type="checkbox"/>	Nn <input type="checkbox"/>	Go to "D"
Possible QC implications:			
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Recommendations</div> <div style="border: 1px solid black; padding: 5px;">Recommendations</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; padding: 5px;"></div>	Rejected	
Site Construction Manager:		Signature:	Date:
Site Engineer:		Signature:	Date:
<b>C. RECOMMENDATION BY CONTRACT ADMINISTRATOR: Name:</b>			
Signature		Date:	
<b>D. RECOMMENDATION BY ENGINEERING:</b>			
<input type="checkbox"/> Recommended	<input type="checkbox"/> Rejected	<input type="checkbox"/> Conditional, with the following	
recommendations:			
Package Engineer:		Signature:	Date:
Lead Discipline Engineer:		Signature:	Date:
Engineering Manager:		Signature:	Date:
Comments:			
<b>E. PROJECT MANAGER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			
Name:		Signature	Date:
<b>F. EMPLOYER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			

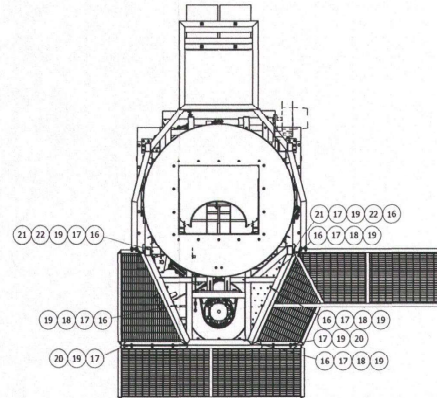
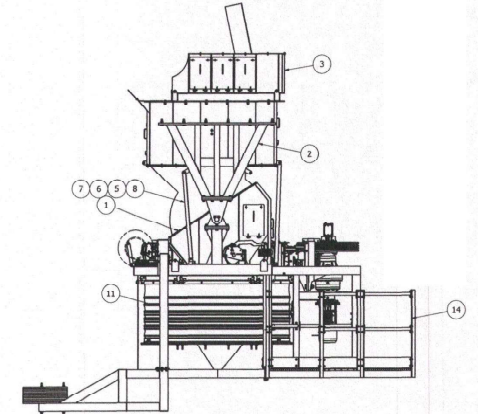
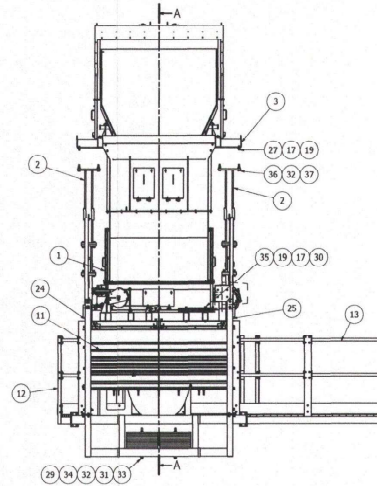
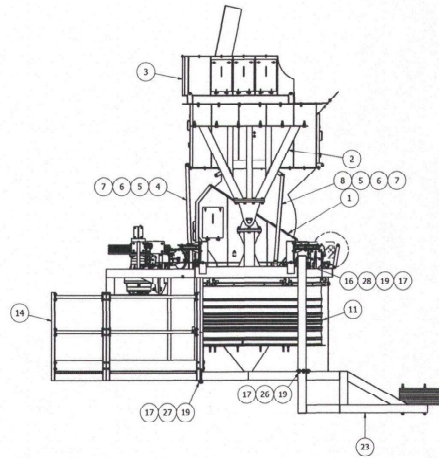
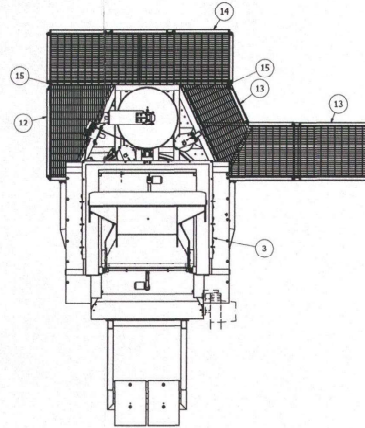
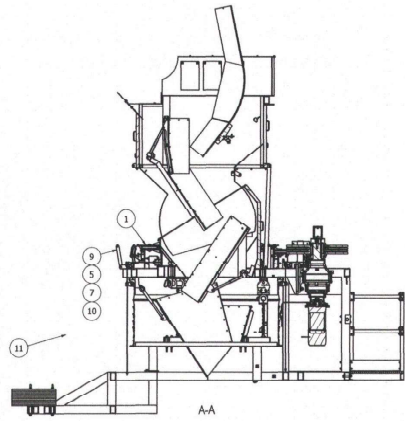


TECHNICAL EVALUATION FOR SUPPLY AND DELIVERY OF CRITICAL SPARES - TRANSFORMERS WORK PACKAGE					
Evaluation Criteria	Description	Scoring Principal	Returnable Schedule	Criteria	% Weightings
Eligibility Criteria	Track record of the company	Supplier must be accredited by the OEM or Supplier must be accrredited as either OEM or a distributor.	T2.2-15	Yes/no	
	Accreditation Certificates	Valid ISO 9001 accreditation certificates to be provided by the OEM.The Supplier's Quality Management System must be in accordance with the International Standard ISO 9001-2015 and maintain the necessary accreditation and certification. Service provider to proof that Transformers will be manufactured locally.	T2.2-16	Yes/no	
Technical and Operational	Spares availability (Transformers)	The recommended Service Provider must have a registered business address within Umhlathuze Municipality. The proof to be submitted must be a confirmation letter with company's letterhead stating the physical address of the company (i.e., company office location), the letter is to be stamped/signed by the service provider  Spares availability in Richards Bay/Empangeni = 20 points Spares available in KZN = 8 points Spares available within South Africa = 5 points	T2.2-17	Location	20
	Guarantee/Warrantee	Warranties and Guarantees on Transformers supplied in accordance with the requirements of Specifications starting from the date of delivery.  For a guarantee ≥ 12 months = 30 points For a guarantee < 12 months = 0 points	T2.2-18	Guarantee/Warrantee Specified	30
	Previous Experience	≥Five (5) contactable references in the last five years = 20 points along with supporting document of contactable references detail as follows: - Project Name and Description; - Client; - Project Value; and - Contactable reference details i.e. cellphone, landline and email address < Five (5) contactable reference in the last five years = 0 points	T2.2-19	Previous Experience/ Proven track record	20
Lead time	Delivery Lead Time 11kV transformer	Tenderer has submitted a holistic delivery program and its: ≤ 24 weeks = 15 points > 24 weeks ≤ 26 weeks = 10 points >26 weeks = 0 points	T2.2-20	Lead time in weeks	15
	Delivery Lead Time 3.3kV transformer	Tenderer has submitted a holistic delivery program and its: ≤ 20 weeks = 15 points > 20 weeks ≤ 22 weeks = 10 points >22 weeks = 0 points	T2.2-21	Lead time in weeks	15
Total Weighting:					100

The minimum technical threshold is 70%

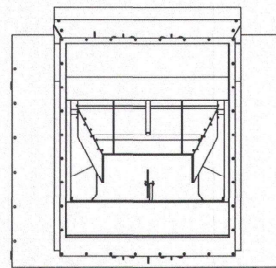
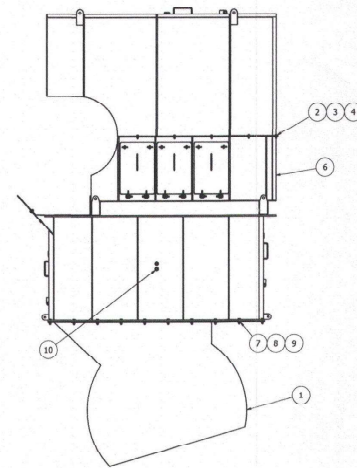
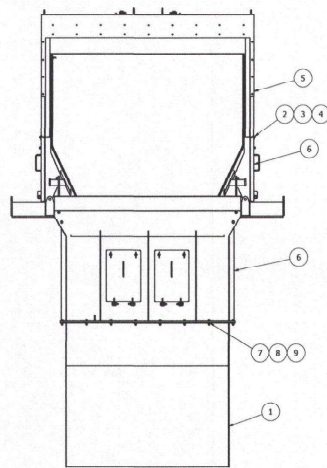
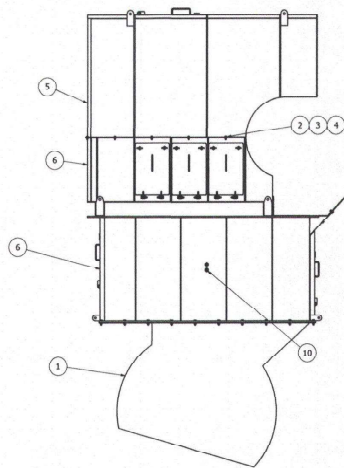
  
Project Manager: Kedibone Phume  
Date: 15/08/2022  
  
Engineering Technician: Khulani Msane  
Date: 15/08/2022

  
15/08/2022  
Technical Manager: Siyabulela Diya  
Date:

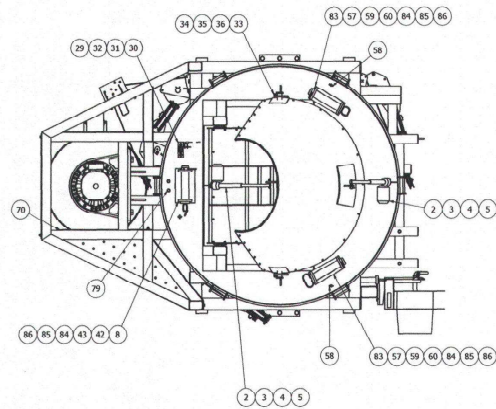
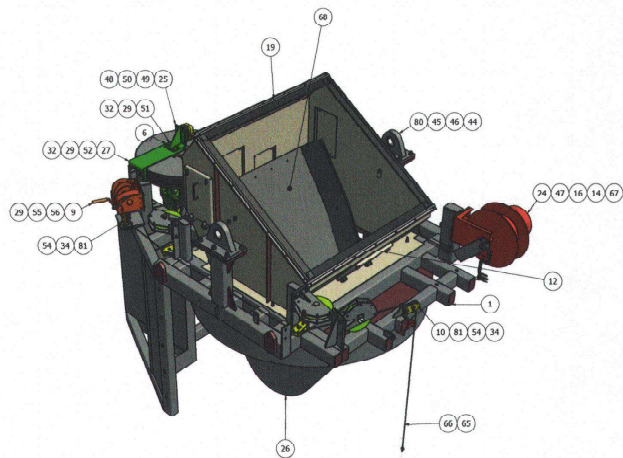
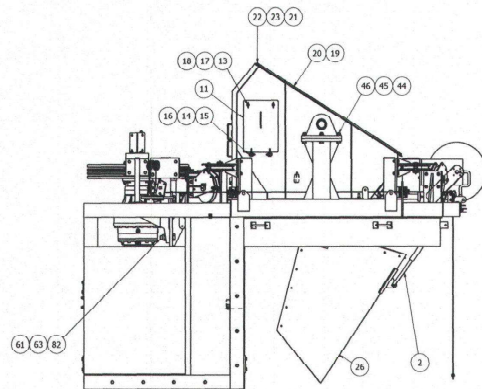
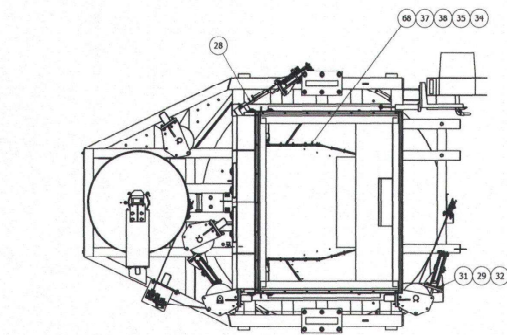
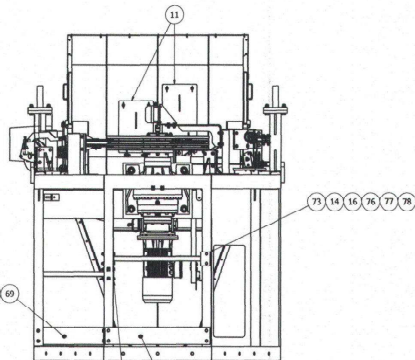


CCL PARTS LIST				
ITEM	QTY	PART NUMBER	DESCRIPTION	MASS
1	1	45300463	PIVOTING HEADCHUTE ASSEMBLY	1183.777 kg
2	2	45340189	PIVOT HANGER ASSEMBLY	269.290 kg
3	1	45300463	FIXED HEADCHUTE COMPLETE ASSEMBLY	2032.603 kg
4	1500,000 mm	45300204	PIVOT FIXING LINK	5.696 kg
5	16	10300027	WASHER - FLAT M12	0.006 kg
6	6	10300101	HEX HEAD SETSCREW M12 x 35	0.048 kg
7	8	10300028	NYLOC NUT M12	0.019 kg
8	2600,000 mm	45340187	PIVOT POINT FIXING LINK	4.891 kg
9	1	45360303	STOWED FIXING LINK	1.138 kg
10	2	10300035	HEX HEAD SETSCREW M12 x 40	0.053 kg
11	1	45310121	FTT ADAPTOR ASSEMBLY	626.388 kg
12	1	45380040	WORK PLATFORM SECTION 1	122.392 kg
13	1	45380041	WORK PLATFORM SECTION 2	305.844 kg
14	1	45380042	WORK PLATFORM SECTION 3	255.005 kg
15	4	45380043	PLATFORM SECTION LINK PLATES	0.543 kg
16	25	45390094	M16 Bolt Packer	0.084 kg
17	172	10300047	WASHER - FLAT M16	0.011 kg
18	11	10300062	HEX HEAD BOLT M16 x 120	0.228 kg
19	63	10300048	NYLOC NUT M16	0.037 kg
20	6	10300052	HEX HEAD SETSCREW M16 x 40	0.100 kg
21	10	10300086	M16 SQUARE REVELED WASHER TO DIN 434	0.031 kg
22	10	10300371	HEX HEAD BOLT M16 x 130	0.243 kg
23	1	45350134	BALANCE FRAME	409.530 kg
24	1	45350136	BALANCE FRAME BRACE 2	39.462 kg
25	1	45350135	BALANCE FRAME BRACE	39.462 kg
26	8	10300053	HEX HEAD SETSCREW M16 x 45	0.108 kg
27	20	10300054	HEX HEAD SETSCREW M16 x 50	0.114 kg
28	9	10300123	HEX HEAD BOLT M16 x 180	0.322 kg
29	24	45350137	LARGE BALANCE PLATE	44.969 kg
30	6	45350138	SMALL BALANCE PLATE	13.663 kg
31	4	10310360	M20 x 450 Threaded Bar	1.442 kg
32	56	10300065	WASHER - FLAT M20	0.017 kg
33	8	10310080	NYLOC NUT M20	0.027 kg
34	4	45390207	M20 BOLT PACKER	0.057 kg
35	2	10300790	M16 x 730 G THREADED BAR (GALV)	0.954 kg
36	24	10390089	HEX HEAD SETSCREW M20 x 80 GAL 10.9	0.270 kg
37	24	10390051	M20 Nyloc Nut Gt 10.9 Galv	0.071 kg
38	1	12920334	705 CONTROL PANEL ELECTRICAL BOM ASSEMBLY	1.628 kg










CCL PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	45300408	PIVOTING HEADCHUTE FABRICATION
2	2	45390208	LINEAR ACTUATOR MECVEL AL13 M05 AC 200mm STROKE
3	2	45320311	ACTUATOR KEEP PIN 2
4	2	45320312	ACTUATOR KEEP PIN 1
5	6	10390085	Split Pin 4x32
6	1	45400097	705 WINCH ASSEMBLY
8	1	45400029	Load Cell Assembly TFS 10000 kg - 240mm Shop
9	1	45400074	HAND WINCH DOUBLE COMPARTMENT WIN500-CR/25
10	6	45420216	SHOULD PULLEY ASSEMBLY
11	4	45390200	HATCH COVER 262x400
12	1	45390201	HATCH COVER 400x260
13	10	10390070	DROPPATCH (LH0943)
14	44	10390011	WASHER - FLAT M10
15	10	10300233	HEX HEAD BOLT M10 x 45
16	22	10300012	NYLOC NUT M10
17	10	10310029	WASHER - FLAT M8
18	10	10310032	NYLOC NUT M8
19	2	45350083	BRUSH STRIP SEAL 1557 LONG MADE FROM 4535-0040
20	2	45350074	BRUSH STRIP 1410 LONG MADE FROM 4535-0040
21	56	10300062	WASHER - FLAT M5
22	28	10310190	CHEESE HEAD SCREW M5x20
23	28	10310003	NYLOC NUT M5
24	1	45400064	FEEDING DRUM 45800030 ELECTRICAL ASSEMBLY 13x1.5mm CABLE (25m) WITH SS BOX
25	1	45460183	TOP LIMIT SWITCH BRACKET
26	1	45320320	TOP DEFLECTOR ASSEMBLY
27	1	45460259	ROTARY LIMIT SWITCH BRACKET
28	1	45460263	SRS COMPLETE W ELEC BOM 1250282
29	98	10300027	WASHER - FLAT M12
30	1	45460250	ULTIMATE LIMIT SWITCH ASSEMBLY W/ 1290284 ELEC BOM
31	30	10300036	HEX HEAD BOLT M12 x 45
32	46	10300028	NYLOC NUT M12
33	2	45320314	DEFLECTOR RETAINING FLAT
34	59	10300000	WASHER - FLAT M8
35	11	10300013	SPRING WASHER M8
36	4	10300029	HEX HEAD SETSCREW M8 x 30
37	2	45320321	DEFLECTOR RETAINING FLAT
38	7	10300005	HEX HEAD SETSCREW M8 x 25
42	2	45390094	M10 DNR Pin-kn
43	2	46030041	XTBA WIDE STRIP BRACKET SHIM Ø18 HPS/PC x 1 VS CTBS
44	24	10300065	WASHER - FLAT M20
45	12	10300075	HEX HEAD BOLT M20 x 80
46	12	10300051	M20 Nyloc Nut Gr 10.9 Galv
47	4	10300018	HEX HEAD BOLT M10 x 40
48	8	10310018	WASHER - FLAT M6
49	4	10310302	CHEESE HEAD SCREW M6x30
50	4	10310021	NYLOC NUT M6
51	4	10300101	HEX HEAD SETSCREW M12 x 35
52	4	10300035	HEX HEAD SETSCREW M12 x 40
54	24	10300062	NYLOC NUT M8
55	4	10300125	SPRING WASHER M12
56	4	10300033	HEX HEAD SETSCREW M12 x 30
57	3	45130225	M05 STRIP PIN FOR 240mm STRIPS WITH HANDLE
58	3	45460262	1/2" TUBUL BPPR 1/2" (1/2" LUNDS/UNITED) 1/2"
59	6	45010030	CARDINE HOOK ST/ST Ø14
60	3	10300057	R-CLIP TO SUIT Ø45-56 PIN
61	8	10300096	WASHER - FLAT M30
63	4	10300095	NYLOC NUT M30
65	2	45390053	SHACKLE 0.53KG SWL GREEN PIN DLE EN1889 GALVANIZED
66	1	45410147	SHOULD ROPE SET (Ø5mm GALV TENSILE CORE) 1350 kg MBL
67	1	45430004	GRIP CABLE 10MM-20MM GALV ANTI-SLIP
68	1	45320322	LOWER PIVOTING DEFLECTOR ASSEMBLY
69	1	45380044	KICK FLAT 1
70	1	45380045	KICK FLAT 2
71	1	45380047	KICK FLAT 4
72	1	45380048	HAND RAIL FAB 2
73	1	45380049	HAND RAIL FAB 3
74	6	10300319	HEX HEAD SETSCREW M12 x 150
75	2	10300043	HEX HEAD BOLT M12 x 120
76	10	45390032	M10 RAIL PUCKER
77	4	10300259	HEX HEAD SETSCREW M10 x 110
78	4	10300318	HEX HEAD SETSCREW M10 x 150 GAL 8.8
79	1	12970085	MOA ATX B 200 PLASTIC STOPPING PLUG - PACK OF 10
80	2	45460192	Ø60 PIVOT HANGER ASSEMBLY - EXTENDED WELD
81	24	10300067	HEX HEAD BOLT M8 x 35
82	4	10300156	HEX HEAD BOLT M30 x 110
83	2	45130228	240mm STRIP BRACKET ASSEMBLY
84	12	10300047	WASHER - FLAT M16
85	6	10300093	HEX HEAD BOLT M16 x 230 Gr 10.9
86	6	10300092	M16 GR 10.9 SWL NYLOC NUT
87	4	12910064	Enclosure Ø254 150x150x80 M1 1521

REVISION  0	REFERENCE  EEAM-Q-009			
DOCUMENT TYPE SPECIFICATION		AUTHORISATION DATE: Date signed by CEO		
TITLE: QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION			PAGE 1 of 14	
COMPILED BY:	REVIEWED BY:	REVIEWED BY:		
SENIOR MANAGER (QUALITYMANAGER)	SENIOR MANAGER (PROJECT MANAGER)	SENIOR MANAGER (GENERAL MANAGER)		
ACCEPTED BY:		AUTHORIZED BY:		
CHIEF FINANCIAL OFFICER		CEO		
FUTURE REVISION RECORD NUMBER	DESCRIPTION OF REVISION	APPROVAL	DATE 01/03/2010	
-1-				
<p align="center"><b>CONTENTS</b></p> <p>1.0 QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION</p>				

KEYWORDS SPECIFICATION	DATE OF LAST REVIEW: N/A
	DATE OF NEXT REVIEW: 01/03 2010

**DETAILS CONTENTS**

Title	Page
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## 1. Introduction

This Specification outlines the minimum requirements to ensure that products and services supplied to Transnet Port Terminals are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in the Contract, all associated specifications, drawings, codes and standards.

## 2. Definitions

Term, Abbreviation	Meaning
Data	All drawings/documents/data/information and DP's required to be supplied under the Contract
Data Pack (DP)	A compilation of manufacturing data, certification, inspection and testing records prepared by the Supplier/Contractor to verify compliance with the Contractual requirements.
Employer	For the purposes of this document, the term Employer has the same meaning as applied to the term Client.
Field Inspection Checklist (FIC)	A document that details the checks, requirements and test parameters for each type of equipment to permit field installation and pre- commissioning of the equipment.
TPT	Transnet Port Terminals is the Employer's Nominated Agent in terms of the Conditions of Contract.
Inspection Release Report (IRR)	A document issued to the Supplier/Contractor by TPT advising release of the Materials for shipment. This does not relieve the Supplier/Contractor of its obligations in accordance with the Terms and Conditions of the Contract.
Inspection Waiver Report (IWR)	<p>A document issued to the Supplier/Contractor by TPT advising that TPT has waived final inspection for the materials listed in this document. The issue of this Report does not preclude further inspection by TPT, is issued without prejudice and does not relieve the Supplier/ Contractor from the guarantees and obligations included in the Contract/ Contract.</p> <p>A document prepared by the Supplier/Contractor providing relevant information applicable to the installation and maintenance of the specific equipment, including consumables (eg. oils etc)</p>
Project Quality Plan (PQP)	A document that outlines the Supplier/Contractor's strategy, methodology, resources allocation, Quality Assurance and Quality Control coordination activities to ensure that Goods and Services supplied meet or exceed the requirements defined in the Contract, drawings, codes and standards.
Quality Control Plan (QCP)*	<p>A document outlining specific manufacturing / construction inspection and testing requirements, including responsibilities, test acceptance criteria, nomination of witness and hold points.</p> <p>For the purposes of this document, the term Supplier/Contractor has the same meaning as applied to the term Sub-Supplier/Sub-Contractor</p>
Supplier/Contractor	This refers to the documentation required to be submitted by the relevant Supplier / Contractor in terms of the Contract.
Supplier/Contractor Data Requirements	These requirements are generally tailored to suit the particular Scope of Work, although it also addresses the manner in which the documentation is required to be submitted, eg Hard copy, Electronic copy etc
Technical Query Note (TQN)	This refers to a document used by the Supplier/Contractor to formally clarify a Technical Query related to the scope of supply. This should not be used where a non-conformance has already been initiated.



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### **3. Applicable Documents**

#### **3.1 General**

All work performed shall comply with the requirements of this Specification, the documentation referenced in the Contract and the latest revision/edition of the relevant Codes and Standards referenced herein.

#### **3.2 Statutory Regulations**

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

#### **3.3 Codes and Standards**

<b>Document No.</b>	<b>Title</b>
ISO 9001	International Standard Series Quality Systems
EEAM-Q-013	Punch Listing Standard

### **4. Quality System**

#### **4.1 General**

The Supplier/Contractor shall be responsible for all quality activities necessary to ensure the Work meets the requirements specified in the Contract, and shall manage and coordinate all Quality aspects of Work in accordance with the requirements of this Specification, and the Supplier/Contractor's PQP and QCP's once reviewed and approved by TPT.

The Supplier/Contractor shall ensure that all Sub-Suppliers/Sub-Contractors also conform with the requirements of this Specification.

#### **4.2 Supplier/Contractor Quality System Requirements**

The Supplier/Contractor shall have, maintain and demonstrate its use to TPT, its documented Quality Management System. The Supplier/Contractors Quality Management System should be in accordance with the International Standard ISO 9001.

The Supplier/Contractor shall submit its Quality System documentation to TPT at the time of tender and at Contract Phases as detailed below:

- Project Quality Plan
- Quality Policy
- Index of Procedures to be used
- Programme of internal and external audits

#### **4.3 Supplier/Contractor Documentation Requirements**

The Supplier/Contractor shall develop and maintain a comprehensive register of documents that will be generated throughout the project, and shall include all quality related documents. The register shall be submitted to TPT for review.

TPT shall indicate those documents required to be submitted for information/review and/or acceptance and this shall be indicated in the Supplier/Contractors' Document Register. The register shall indicate the dates of issue of the documents taking into account sufficient time to allow TPT review/acceptance cycle prior to the document being required for use.

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## **5. Quality Assurance**

### **5.1 Project Quality Plan**

Where specified, the Supplier/Contractor shall submit a PQP to TPT within 28 days after the Contract start date. The PQP shall detail how the Supplier/Contractor's Quality System will be applied to the Scope of Work specified in the Contract, and shall address the following:

- Satisfying the technical and quality requirements of the Supplier/Contractor's Scope of Work, and relevant elements of the applicable ISO 9001 standard
- include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls and records used to control and verify compliance with the specified Contractual requirements

Include a listing of all special processes (eg. welding and non-destructive testing, cube testing etc) envisaged for use, including confirmation of personnel certification as required

- Include all proposed method statements (for site based work activities)
- Include a description of the Supplier/Contractor's project organisation, with key positions and responsibilities identified and individuals named. The organisation structure shall also indicate the resources committed to the management / coordination of QA / QC activities
- Include a listing of all Quality Control Plans (QCP's), and associated Field Inspection Checklists (FIC's), as applicable
- Identify in the Project Quality Plan any Sub-Supplier/Sub-Contractor work. Sub-Supplier/Sub-Contractor plans shall be approved by the Supplier/Contractor, and a copy forwarded to the TPT
- Include the proposed Authorised Inspection Authority (where applicable - for pressurised equipment and systems)
- Include a schedule of proposed quality records

The PQP shall be controlled and re-submitted for approval when required to incorporate any change necessary during the Contract duration to ensure that the document is maintained as an effective control, change management and records. The change management will be done to an agreed policy or procedure.

Note: Where the Supplier/Contractor is required to provide a PQP, no work shall commence until the PQP is approved by TPT.

### **5.2 Procedures**

The Supplier/Contractor's PQP and procedures shall address the system elements and activities appropriate to the Scope of Work, in compliance with the specified Quality Standard.

Where specified, the Supplier/Contractor shall submit copies of Quality Procedures for review. In addition, the Supplier/Contractor shall ensure that copies of all Procedures relevant to the Scope of Work are available for reference by TPT at each work location.

These will include, as applicable, the following:

#### **5.2.1 Document Control**

The Supplier/Contractor's Project Quality Plan shall provide a description of how TPT provided, Supplier/Contractor and Sub-Supplier/Sub-Contractor documents are to be managed. The description shall address as a minimum:

- Management tools and databases
- Receipt, registration and maintenance
- Internal and external distribution to Employer, third parties and Sub-Contractors
- Management of Codes, Standards and Specifications

- 
- Internal review and approval routines and authorities
  - How it is ensured that the correct revisions of documents are available at the point of use including retention periods for all documentation.

### **5.2.2 Design Control**

Where the Supplier/Contractor is responsible for any aspect of design related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these design activities.

### **5.2.3 Procurement**

Where the Supplier/Contractor is responsible for any aspect of procurement related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these activities.

## **5.3 Supplier/Contractor Audits**

The Supplier/Contractor shall:

- Carry out audits in accordance with its Quality System at its own and Sub-Supplier/Sub-Contractor's facilities to ensure project quality requirements are being achieved
- Include a QA Audit Schedule in the Supplier/Contractor PQP submitted to TPT prior to commencement of the Scope of Work. The Audit Schedule shall include all audits to be implemented by the Supplier/Contractor and Sub-Supplier/Sub-Contractor during the execution of the Contract
- Where stipulated in the Contract, perform an audit within three months after the Contract start date and thereafter at a minimum frequency of three months. Audit reports shall be submitted to TPT at the completion of each Audit. Where unsatisfactory performance is evident, additional audits shall be performed by the Supplier/Contractor as directed by TPT.

## **5.4 Transnet Port Terminals Audit**

TPT reserves the right to perform quality audits or participate as an observer in Supplier/Contractor audits to verify compliance with the Contractual requirements. The Supplier/Contractor shall within a time frame as agreed upon, correct any adverse audit finding advised by TPT.

# **6. Inspection and Testing**

## **6.1 General**

TPT may, at its discretion perform surveillance inspection at the Supplier/Contractor's premises, SubSupplier/Sub-Contractor's premises or at the location of the Scope of Work.

Dependent on the nature of the Scope of Work and the frequency of inspections TPT may elect to have inspection personnel resident at the place of manufacture, fabrication, or assembly.

The Supplier/Contractor shall ensure free entry and access is given to TPT, certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and quality records at all parts of the Supplier/Contractor's and Sub-Supplier/Sub-Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

The Supplier/Contractor shall provide TPT with all necessary tools, calibrated measuring equipment, safety equipment and workspace to verify or witness tests in progress.

While TPT is at the Supplier/Contractor's premises, the Supplier/Contractor shall provide, free of charge, reasonable facilities including office facilities and reasonable access to a telephone, facsimile machine and computer connection point.

The Supplier/Contractor shall provide notice in writing in within a time frame time as agreed upon, to allow the attendance of TPT and other representatives at nominated witness and hold points.

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## 6.2 Quality Control Plans

The Supplier/Contractor shall prepare and submit QCP's to TPT for review in accordance with the requirements of the Contract and PQP.

QCP's shall identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, witness and hold points.

The Supplier/Contractor shall not commence fabrication or manufacture prior to review and approval of the applicable QCP by the TPT.

QCP's shall include reference to all tests specified in the Contract Document.

A typical format for an QCP is shown in Appendix A. The Supplier/Contractor may use its own format providing all information shown in Appendix A is included.

## 6.3 Inspection Points

The QCP shall identify points in the fabrication, manufacturing and/or installation process that are selected for inspection and shall be denoted by the following inspection codes:

- Hold Point (H)                      Inspection point in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Holding points require written notification to TPT.
- Witness Point (W)                  An inspection point in the manufacturing cycle that will be witnessed or verified. If TPT confirms it is unable to attend after being provided with the written notification then manufacture may proceed. Witness points require written notification to TPT.
- Review Point (R)                      A point at which products and quality records are verified and endorsed. Review points are not notifiable points.
- Surveillance (S)                      An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.

The Supplier/Contractor shall maintain the status of testing and inspection by progressively having the QCP's signed off.

## 6.4 Revision to Quality Control Plans

Revision of the QCP shall be subject to the same submission, review and acceptance routines as described for the original QCP issue

## 6.5 Kick Off Meeting

After the Contract start date, and prior to manufacture, TPT will require a Kick Off Meeting with the Supplier/Contractor to discuss fully the implications of meeting TPT quality requirements. This meeting may be held as part of the Contract kick-off meeting for each package or may be a separate meeting, subject to the critical or complex nature of the work. This requirement for a pre-inspection meeting may be repeated when sub-Supplier/Contractors of key equipment are engaged.

After mobilization of the Contractor, and prior to the commencement of any construction activities, TPT will arrange for a Quality kick-off meeting to discuss fully the implications of meeting the projects' quality requirements. This meeting may be held as part of the formal kick-off meeting for each contractor, or may be a separate meeting subject to the critical or complex nature of the work.

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## **6.6 Schedule of Inspection**

The Supplier/Contractor shall submit a Schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The Schedule shall be regularly updated with progress and issued to TPT to show the current inspection and test status.

## **6.7 Field Inspection Checklists**

For site installation and construction activities, the Supplier/Contractor shall prepare Field Inspection Checklists (FIC's) to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCP's.

FIC's shall be provided to TPT for initial review, and shall be used to record the results of inspection and testing (where applicable), and on completion be submitted to TPT to confirm satisfactory completion of the tests and inspections at nominated QCP witness and hold points.

## **6.8 Inspection Notification**

The Supplier/Contractor shall notify TPT in writing at least two calendar weeks prior to the advent of inspections or tests that require witnessing.

For inspections or tests within the country, arrangements shall be confirmed at least two working days before the event. For inspection and tests outside of the country, arrangements shall be confirmed at least seven working days before the event.

Inspection notifications shall include the following essential information:

- Contract Number
- Location of Inspection or Test
- Nature of Inspection or Test
- Date and Time of Inspection or Test
- Name and telephone number of the Supplier/Contractor's Representative.

## **6.9 Inspection and Testing**

The Supplier/Contractor is responsible for the conduct of all Supplier/Contractor inspections and tests, and includes:

- Documenting inspection and tests result in the QCP's and relevant FIC's
- Progressively inspecting the quality of the Scope of Work performed, including that of all Sub-Supplier/Sub-Contractors
- Inspecting to meet all Contractual requirements, in number, type and form
- Inspecting day to day activities, material receipts, issue of material for installation, in-process inspections, and final inspections.

Completed original QCP's and FIC's shall be submitted to TPT in the DP

## **6.10 Inspection Release**

At completion of the Scope of Work, either in total or in phases, TPT may issue an Inspection Release Report (IRR) or a waiver of inspection.

The issue of either an inspection release or waiver of inspection does not relieve the Supplier/Contractor of its obligations under the Contract. The Supplier/Contractor shall ensure a copy of the release note and final expediting release note for transport, where appropriate, is attached to the delivery docket and accompanies the Work to the designated destination indicated in the Contract. Items delivered to TPT without a copy of these documents may not be accepted.

A copy of the inspection release or waiver of inspection shall be included in the DP.

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## **6.11 Special Processes**

It is the Supplier/Contractor's responsibility to ensure that all processes which require prequalified procedures and/or work methods are tested and qualified before work begins. This typically covers such activities as welding, non-destructive testing, special fabrication techniques and painting. Unless specified such procedures are the Supplier/Contractor's responsibility and do not require submission to TPT before work begins. When such procedures are requested, no work shall commence until procedures are approved by TPT.

It is the Supplier/Contractor's responsibility to ensure all operators are qualified for the processes in accordance with the procedure and/or applicable standards. Records of qualification of operators shall be maintained by the Supplier/Contractor and made available to TPT when requested.

Records of qualification of procedures and processes shall be maintained by the Supplier/Contractor in accordance with the applicable procedure or code.

## **6.12 Welding Procedures**

Where the Supplier/Contractor's Scope of Work includes fabricated weldments, Welding Procedure Specifications (WPS) defining the method, preparation and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of the Supplier/Contractor's Scope of Work. The procedure shall only be submitted to TPT when requested in the Contract.

WPS shall include all welding essential and non-essential variables for each process used, including appropriate test results and shall comply with the standard or code pertaining to welding required in the execution of the Supplier/Contractor's Scope of Work.

When requested in the Contract a suitably marked "weld map" shall be completed by the Supplier/Contractor for all items to be fabricated. A summary of WPS shall be prepared and when used, shall be identified on the weld map.

Where TPT approval is required, fabrication shall not commence until written approval of WPS and Welding Procedure Qualification Records (WPQR) is received by the Supplier/Contractor. No welding fabrication will be accepted that is not covered by an TPT approved WPS/WPQR.

Welding Procedure Qualification (WPQ) tests may be witnessed by TPT and/or an independent inspection authority. Testing of the specimens prepared during the WPQ Tests shall be carried out by an independent approved testing laboratory independent of the Supplier/Contractor. In certain instances, a certificate to EN 10204 3.1 B may be required which will be clarified at Tender review and clarification stage.

Where actual weld deposit analysis and weld metal physical properties are required for procedure qualification, the information shall be taken from the procedure qualification tests. Data listed in the catalogues of the manufacturer of welding consumables is not acceptable.

Welders/welding operators shall be qualified in accordance with the relevant welding code prior to commencing production fabrication. Specific Welder Qualifications (WQ's) records will be reviewed by TPT in the Supplier/Contractor's works and should NOT be submitted for review.

A register of welders qualified to work shall be maintained by the Supplier/Contractor.

## **6.13 Material Traceability**

Where, and to the extent that material traceability is required, the Contractor shall provide its procedures for the maintenance of material identification throughout all phases of manufacture. Methods of identification, routines for re-stamping or stencilling as appropriate shall be defined and agreed with the Employer.

Adequate records shall be maintained throughout construction enabling traceability of key materials from final product back to original material certificates. The material traceability records shall form part of the DP

The Contractor shall prepare a schedule of materials and equipment that are subject to traceability requirements.

## **6.14 Material Certification**

Where specified in the Contract the following certificates shall be provided to TPT and included in the DP.

Type A:	A Supplier/Contractor's certificate of compliance with the Contract. This certifies that the goods or services are supplied in compliance with the Contract without mention of any test results (EN10204 certificate 2.1).
Type B:	A certificate issued by a laboratory or test facility independent of the Supplier/Contractor's works. It shall quote test results carried out on the product supplied and state whether compliance with the relevant technical standard, code etc has been complied with. (EN 10204 certificate 3.1 B).
Type C:	The same as Type B, the tests are to be witnessed by a third party (EN 10204 certificate 3.1C).

## **7. Non Conforming Products**

### **7.1 General**

The Supplier/Contractor shall establish and maintain procedures to control material or products that do not meet the specified requirements.

All Supplier/Contractor product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- If the Supplier/Contractor discovers material or product which is not in accordance with the requirements of the Contract, i.e. a non conformance (NCR), the Supplier/Contractor shall promptly initiate the non-conformance procedure in terms of the Supplier/Contractor's Quality Management System, advise TPT promptly, and provide a copy of the NCR to TPT
- If TPT or it's agent identifies a non conformance an TPT NCR may be raised.
- Originals of all closed out NCR's shall be included in the DP.

### **7.2 Corrective and Preventative Action**

If the Supplier/Contractor proposes a disposition of any non conforming materials or product which varies from the requirements of the Specification or Contract, such a proposal shall be submitted in writing to TPT whose decision on the proposal shall be obtained in writing before the non conforming material or product is covered up or incorporated into the Works, or is the subject of any other disposition.

The disposition of non-conformances which do not vary the requirements of the Contract, specification or drawings may be approved by the Supplier/Contractor following discussion and agreement with TPT.

## **8. Concession Requests and Technical Queries**

### **8.1 Concession Requests**

Where a Supplier/Contractor requests a Concession to deviate from the requirements of the Contract or specified requirements, the Supplier/Contractor shall raise the request with TPT using the format as shown in Annexure B.

The Concession Requests shall clearly identify all elements of the proposed deviation together with any resulting technical, commercial and/or schedule impacts.

Completed original Concession Requests shall be included in the DP.

### **8.2 Technical Queries**

For clarification of technical issues (only), Supplier/Contractor may submit a Technical Query Note (TQN) to TPT in accordance with the Contract.

The TQN shall clearly identify all elements of the query, and all supporting documentation and/or drawings shall be attached where appropriate.

Completed original TQN's shall be included in the DP.

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## **9. Inspection, Measuring and Test Equipment**

### **9.1 Calibration**

The Supplier/Contractor, including its Sub-Supplier/Sub-Contractors shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant Supplier/Contractor procedures and/or the equipment manufacturer's specifications.

Where calibration is required by an external laboratory, the Supplier/Contractor shall ensure that the facility selected for calibration possesses current certification. Calibration certificates shall contain a statement that the test equipment is accurate to within specified tolerances.

The Supplier/Contractor should establish the frequency of calibration for each item of equipment (including jigs, fixtures or templates) and record the details in a 'Measuring and Test Equipment Register' (or similar).

### **9.2 Use of Inspection, Measuring and Test Equipment**

The Supplier/Contractor shall ensure that authorised equipment users:

- Use the equipment in accordance with manufacturers instructions, and accepted industry practices
- Ensure the equipment is covered by a current calibration certificate
- Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
- Prior to commencement of each inspection or test activities:
  - Identify the measurements to be made
  - Determine the accuracy required
  - Select the appropriate inspection, measuring or test equipment for the scope of work.

### **9.3 Verification of Previous Test Results**

Where the calibration status of the equipment is unknown, expired or has doubtful accuracy, the equipment shall immediately be quarantined, and tagged according to Supplier/Contractor's Quality System procedures. The Supplier/Contractor shall then arrange for either in-house or external calibration, and:

- review all previous test results associated with the suspect equipment
- identify the inspections, measurements or tests required to re-validate the results
- ensure that suitable re-testing is performed with calibrated equipment
- document the results of the re-testing on the respective inspection and test documentation.

## **10. Quality Records**

Supplier/Contractors shall maintain Quality Records necessary to provide objective evidence that demonstrates and verifies achievement of the QA / QC requirements associated with the Scope of Work. All Quality Records, including original source material test certificates and non destructive test reports, shall be retained by the Supplier/Contractor during the project, and be provided to TPT at the times, and in the quantities specified in the Contract.

The Supplier/Contractor shall collate all quality records in the DP and submit the DP to TPT in accordance with the Contract and all referenced standards and specifications. This DP shall be compiled progressively, and shall be available for review at all phases of manufacture or construction activities.

The Scope of Work shall not be complete until the Supplier/Contractor's DP including the quality records from Sub-Supplier/Sub-Contractors have been reviewed and accepted by TPT.

The DP shall be compiled progressively during the execution of the Scope of Work and shall be made available for review by TPT as required.





### Annexure A - Sample Quality Control Plan

Quality Control Plan No.:	Rev:	Date Issued:
Contract No.:	Description:	Item No.:
Supplier / Contractor:	Location:	


[illegible]

## **Annexure B - Request for Concession**

<b>Request for Concession</b>				<b>No: _____ of 2</b>	
<b>A. SUPPLIER/CONTRACTOR SUPPLIED INFORMATION</b>					
SUPPLIER/CONTRACTOR NAME:			CONTRACT NO.:		
SUPPLIER/CONTRACTOR CONCESSION NO.:			DATE:		
Required concession applicable to: (Item/Material/Equipment/Area)					
Description of Concession — Revised Requirements:					
Justification:					
(NOTE: This concession will be rejected if the following information is not provided):					
(i) VALUE OF BENEFIT TO CLIENT	(ii) AGREE TO AN EXTENSION OF THE WARRANTY	YES	NO	(iii) ANY IMPACT ON SCHEDULE?	NO
S/R	IF "YES" WHAT PERIOD?			CF "YES" \ WHAT PERIOD?	
References:					
Original Requirements		reference:			
Drawing No.:	Rev.:	Specification	N	Rev.:	
Drawing No.:	Rev.:	Specification	O.	Rev.:	
Drawing No.:	Rev.:	Specification	:	Rev.:	
Attached applicable		documentation:		N	
Requested by:					
(Supplier/Contractor) Name:			Signature		D

Note: Sections B to F on Page 2

<b><i>Request for Concession No:</i></b>			
<b>B. SITE ADMINISTERED CONTRACT?</b>	Yes <input type="checkbox"/>	Nn <input type="checkbox"/>	Go to "D"
Possible QC implications:			
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Recommendations</div> <div style="border: 1px solid black; padding: 5px;">Recommendations</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; padding: 5px;"></div>	Rejected	
Site Construction Manager:		Signature:	Date:
Site Engineer:		Signature:	Date:
<b>C. RECOMMENDATION BY CONTRACT ADMINISTRATOR: Name:</b>			
Signature		Date:	
<b>D. RECOMMENDATION BY ENGINEERING:</b>			
<input type="checkbox"/> Recommended	<input type="checkbox"/> Rejected	<input type="checkbox"/> Conditional, with the following	
recommendations:			
Package Engineer:		Signature:	Date:
Lead Discipline Engineer:		Signature:	Date:
Engineering Manager:		Signature:	Date:
Comments:			
<b>E. PROJECT MANAGER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			
Name:		Signature	Date:
<b>F. EMPLOYER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			

<b>REVISION</b>  0		<b>REFERENCE</b>  EEAM-Q-008																																				
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<b>TITLE:</b> SPECIFICATION FOR CORROSION PROTECTION				<b>PAGE</b> 0 of 13																																		
<b>COMPILED BY:</b> QUALITY MANAGER (COE) KRIS NAIDOO  _____ Date:		<b>REVIEWED BY:</b> ENGINEERING MANAGER (COE) JESSENDRAN PILLAY  _____ Date:		<b>REVIEWED BY:</b> PRINCIPAL ENGINEER (COE) ROFHIWA TAKALANI  _____ Date:																																		
<b>REVIEWED BY:</b> CHIEF ENGINEER (COE) SABELO MZIMELA  _____ Date:			<b>AUTHORIZED BY:</b> GENERAL MANAGER ENGINEERING JOSHIAH MPOFU  _____ Date:																																			
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<b>KEYWORDS</b> SPECIFICATION			<b>DATE OF LAST REVIEW:</b> N/A <b>DATE OF NEXT REVIEW:</b> 2019-02-01																																			

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**1. SCOPE**

- 1.1. This specification covers Transnet Port Terminals requirements for protective coating of iron and steel structures, electrical motors, gear boxes etc. against corrosion and must be read in conjunction with the main specification as well as the following (latest editions):-

BS EN ISO 8502 "Preparation of steel surfaces for coating"

BS EN ISO 1461 "Hot-dip (galvanized) zinc coatings"

BS 5252 "National colour standards for paint"

BS 5493 "Code of practice for protective coating of iron and steel structures against corrosion"

**2. TYPES OF CORROSION PROTECTION TO BE USED**

- 2.1. The coatings specified in this specification are chosen according to BS 5493 Table 3, part 9, to ensure that the condition of the surface will be at least RE2 on the European scale of degree of rust, after 10 years in a environment of frequent salt spray, chemicals and polluted coastal atmosphere. During the 10 years, the normal maintenance painting will be done.
- 2.2. The paint manufacturer shall guarantee the paint for at least 10 years.
- 2.3. Should a tenderer wish to offer coating systems other than those specified, as an alternative, he shall submit full technical details and a list comparing all appropriate details of the alternatives proposed, with the original specified.
- 2.4. Tenderers must ensure that the different coats they offer in their tenders are compatible with each other.
- 2.5. The coating of proprietary items must be done according to Clause 3.
- 2.6. All galvanized components including bolts and nuts but excluding walkway gratings, must be painted with the specified system, unless otherwise approved.

The following coating systems must be used unless otherwise specified in the main specification:-

Substrate	Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
3CR12 steel (EN 10088)	1	Surface tolerant epoxy primer	DULUX /SIGMA Sigmacover primer 7413 INTERNATIONAL (PLASCON) Intergard 269  STONCOR (CHEMRITE COATINGS) Carboline 193 Primer	65-75
	2	Two component recoatable, polyurethane finish (Gloss)	DULUX / SIGMA Sigmadur gloss 520 INTERNATIONAL (PLASCON) Interthane 990  STONCOR (CHEMRITE COATINGS) Carboline 134	65-75
Galvanized Steel	1	Surface tolerant epoxy primer	DULUX /SIGMA- Sigmacover primer 7413 INTERNATIONAL (PLASCON) Intergard 269  STONCOR (CHEMRITE COATINGS) Carboline 193 Primer	65-75
	2	Two component recoatable, polyurethane finish (Gloss)	DULUX /SIGMA- Sigmadur gloss 520 INTERNATIONAL (PLASCON) Interthane 990  STONCOR (CHEMRITE COATINGS) Carboline 134	65-75
Substrate	Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
Mild steel	1	Two component self curing inorganic zinc ethyl silicate OR two component zinc rich polyamide cured	DULUX /SIGMA- Sigma Sigma zinc 160 OR Sigma-cover primer	65-75

	epoxy primer	INTERNATIONAL (PLASCON) Interzinc 52	
		STONCOR (CHEMRITE COATINGS) Carbo Zinc 11 OR Carbo- Zinc 658 Primer	
2	Flexible recoatable high build polyamide cured MIO epoxy	DULUX/SIGMA – Sigmacover CM 456	125-150
		INTERNATIONAL (PLASCON) Interseal 670	
		STONCOR (CHEMRITE COATINGS) Carboline 193	
3	Two component recoatable, polyurethane finish (Gloss)	DULUX/SIGMA Sigmadur gloss	65-75
		INTERNATIONAL (PLASCON) Interthane 990	
		STONCOR (CHEMRITE COATINGS) Carboline 134	



- 2.7. The paint manufacturer's recommendations for the application of the different coating systems, curing time before handling or application of subsequent coats, health and safety recommendations etc. must be carefully adhered to.
- 2.8. Paint contractors must have a quality management system which must be submitted to the Engineer for approval before commencement of the work.
- 2.9. Galvanizing shall be done to BS EN ISO 1461 heavy duty hot dip galvanizing to a thickness of at least 85µm. Electroplated components in zinc or cadmium are not acceptable.
- 2.10. All mounting bolts, nuts, washers and brackets as well as all fixing bolts, studs nuts and washers, less than 12mm, shall be of stainless steel. Fixing rivets shall be of either stainless steel or brass.
- 2.11. High tensile bolts for friction grip joints must not be galvanised and must be primed and painted after installation. High tensile bolts must be certified.
- 2.12. The full paint system shall be applied to all surfaces except for wear pads, linings etc., which are to be covered with appropriate protection.
- 2.13. For steelwork which will be transported over long distances and erected on site the two pack epoxy primers is preferred.

### 3. **PROPRIETARY ITEMS**

- 3.1. Proprietary items such as gearboxes, motors, brakes etc. must either be painted according to this specification or where the coating system is equal to or exceeds this specification sufficient proof of the coating system applied must be provided. Items which are nearly equal to this specification shall be given a finishing coat according to this specification's thicknesses and final colours and to the following procedure:-
  - 3.1.1. A cross cut test must be done to BS EN ISO 2409 to determine if the original coating adheres correctly to the substrate;
  - 3.1.2. The original coating shall be rubbed down to remove any smooth finishing to form a suitable key for the finish coat and any damaged areas prepared and patch primed with a suitable primer;
  - 3.1.3. The item must then be detergent washed to remove any foreign matter, taking care that no dust, solvent etc. contaminates any working part of the item;
  - 3.1.4. A test shall be done on the existing coat to ensure that the finish coat will not react with and cause undue dissolving and lifting of the existing coat. This can be done by applying a small quantity of the finishing coat thinners.
    - 3.1.4.1. Should any undue dissolving or lifting occur, a suitable intermediate or barrier coat must be applied before the finishing coat is applied.
  - 3.1.5. Proprietary items which failed the cross cut test and which generally have inadequate protection shall be dismantled and the full corrosion protection specification applied.

#### **4. SURFACE PREPARATION**

- 4.1. All steel surfaces shall be detergent washed and fresh water rinsed to remove all oil, grease and surface contaminants before shot blasting.
- 4.2. Sharp edges shall be radiused and major roughness of welds shall be removed by grinding. Welding spatter and flux shall be removed.
- 4.3. Components manufactured from hot rolled steel sections and steel plate shall be blast cleaned to base metal in accordance with Swedish Standard SSPC SP10 grade SA2½ - very thorough blast cleaning, to remove all mill scale, rust, weld spatter etc.
  - 4.3.1. "Sharp" chilled iron shot, chilled iron grit, or granular abrasive slag is to be used to produce a proper degree of surface roughness.
  - 4.3.2. Blast profile shall be determined by micrometer profile gauge, Keane-Tator surface profile comparator or Testex press-o-film.
  - 4.3.3. The profile height shall be between 40 and 50µm at any point.
- 4.4. Good quality blast cleaning and spray painting equipment shall be used. Air used for spraying and blast cleaning shall be free from all traces of oil, water and salinity. Water and oil traps must be fitted to all equipment.
- 4.5. Wheel abrading equipment shall not be used unless an angular profile the same as clause 4.3.3 is achieved.
- 4.6. When wet blasting is done the primer shall be applied before oxidization starts or surface contamination occurs.
- 4.7. Components manufactured from 3CR12 steel shall be lightly abraded. The components shall then be passivated by using a mixture of 10 - 15% nitric acid in water which is rinsed off after 10 - 15 minutes. The surface shall be neutralized to pH 7 before it is coated.
- 4.8. Hot-dip galvanized components, galvanized bolts and nuts etc. shall be lightly abraded with a galvanizing pre-cleaner. The components shall then be washed with detergent and water and washed down with clean water until a water break free surface is achieved. Allow to dry thoroughly.

#### **5. JOINTS AND MATING SURFACES OF MEMBERS**

- 5.1. Mating (faying) surfaces of members which have to be joined by high tensile steel bolts in friction grip shall be cleaned according to Clause 4 and painted with primer only.
  - 5.1.1. After being assembled joints so formed shall be seal welded and painted or after the intermediate coat was applied the edges shall be sealed with an approved brand of paintable flexible sealant or mastic (e.g. Butyl rubber, polyurethane sealer or two component epoxy), by means of a suitable caulking gun.
- 5.2. All rivets, bolts, welds, sharp edges etc. must be covered with a "stripe coat" of the primer or intermediate coat specified to ensure the correct dry film thickness on sharp edges, as well as sealing of bolt threads to head etc.
- 5.3. All other mating surfaces must be sealed with an approved brand of flexible Butyl rubber, paintable Silicone, polyurethane sealer or two component epoxy sealer, and joined while still wet. All excess compounds must be completely removed.

#### **6. PAINTING PROCEDURES**

- 6.1. Directly before the application of paint, the area to be painted shall be degreased with a suitable degreaser and left to dry.

- 6.2. Paint shall only be applied under the following conditions:-
  - 6.2.1. There is adequate light.
  - 6.2.2. The steel temperature is between 5 and 50°C and at least 3°C above the dew point of the air.
  - 6.2.3. The relative humidity of the air is between the limits specified by the paint supplier.
  - 6.2.4. Wind does not interfere with the method used and sand and dust cannot be blown onto wet paint.
- 6.3. Steelwork shall be supported on trestles, at least 900 mm off the ground for painting purposes.
- 6.4. An adequate number of test readings shall be taken per square meter in order to determine the dry film thickness.
  - 6.4.1. The paintwork shall be acceptable if the average of the test readings taken falls within or exceeds the ranges given.
  - 6.4.2. Paintwork shall not be acceptable if any single test reading is less than the specified minimum thickness.
- 6.5. An ultrasonic or electronic magnetic flux thickness measurement gauge shall be used, but in case of dispute, destructive testing shall be applied. The painted steelwork shall present a clean, neat appearance of uniform colour and gloss as applicable to the paint used. Each coat of paint shall be applied as a continuous, even film of uniform thickness. More than one application of paint may be required to achieve the dry film thicknesses specified or to obliterate the colour of the previous coating.
- 6.6. The use of thinners or solvents at any stage of the work is prohibited, unless specified by the paint manufacturer.
- 6.7. Precautions shall be taken to prevent coatings from being applied to equipment nameplates, instrument glasses, signs etc.

## 7. COLOUR CODES

Machinery and equipment shall be painted in the following final colours:-

	Area	Colour	Code No. [091 BS 5252 and International No's]
7.1.1	Mobile equipment (cranes, loaders etc.)		
	a) Structure, machinery and electrical houses, operator's cabins, chutes, hoppers etc.	Transnet Red	RAL 3020
	b) Undercarriage, travel bogies, rubber tyred rims	Transnet Red	RAL 3020
7.1.2	Industrial buildings, conveyor structures		
	a) Roofs and canopies	Pantone cool grey 10	RAL 7037 (Staubgrau)
	b) Painted walls	Pantone cool grey 3	RAL 7035 (Lightgray)
	c) Steel columns, rafters, trusses	Pantone cool grey 5	RAL 7004 (Signalgray)
7.1.3	General		
	a) Guards	Golden yellow	RAL 1003
	b) Sheaves	Orange	RAL 2008
	c) Cable reels (Stainless steel)	Orange	RAL 2008
	Machine buffers and parts of machine which could constitute a serious hazard	Golden Yellow (High Gloss) with Luminous green stripes in chevron pattern	SABS B49 and Luminous green

Area	Colour	Code No. [BS5252 and International No's]
e) Any exposed rotating part of machinery, electrical Switch-gear (other than starting and stopping devices and emergency stop control), electrical services e.g. conduit and allied fittings	Light Orange (High Gloss)	SABS 1091 B26 BS 381C-557 RAL 2007
f) Low voltage switchgear panels where orange is not aesthetically acceptable	Light grey	RAL 7035
g) Medium voltage cable trays, switchgear and motors (3,3 kV and up)	Saphire Blue	RAL5003
h) Starting devices, low voltage cable trays and switchgear	Moss Green	RAL6005
i) Transnet Logo	Transnet Red (Traffic Red)	RAL 3020 on White (RAL 9010) Background
j) Parts of stationary machinery (Electrical, motors, gearboxes, brakes, transformers, etc.)	Light Grey	RAL 7035
k) Hand levers, hand wheels, oiling points, handrails on walkways, ladders	Golden Yellow (High Gloss)	RAL 1004
l) Stopping devices, grease points, motor fan covers and danger signs (not symbolic safety signs for which see SABS 1186)	Signal red (High Gloss)	RAL3001
m) Walkways (non slip surfaces) (galvanized gratings not to be painted)	Shop floor green or black	
n) Informatory signs and notices (not symbolic safety signs for which see SABS 1186)	White on Emerald Green (High Gloss)	White on RAL 6001

Area	Colour	Code No. [SABS 1091 and International No's]
7.1.4 Pipe lines		
a) Reclaim water piping	Aluminium	
b) Slurry pipe lines	Iron Grey	RAL 7011
c) Fire protection piping	Signal red	RAL 3001
d) Washwater drain pipes	Light grey	RAL 7035
e) Instrument air	White with Strong blue band	White RAL 5005
f) Plant air	White with Flag blue band	White RAL 5015
g) Potable water	Grass green	RAL 6010

7.1.5 Colour bands for pipes shall be 75 mm wide for pipe sizes up to 150 mm diameter and 100 mm wide for 150 mm and above. The colour bands shall be applied to the pipe flanges, valves, junctions, walls or structures etc. in such a manner that the pipe may be easily identifiable. On straight sections the maximum spacing shall be 100 x the pipe diameter.

## 8. FIELD TOUCH-UP PAINTING

8.1. Damaged and unpainted areas, fasteners, welds, etc. shall be cleaned by wire brushing with hand tool or power tool in a manner which will minimize damage to sound paint. Grinding will not be allowed. Rust spots shall be cleaned to bright metal. Thick edges of old paint abutting on bare metal surfaces shall be feathered by scraping and sanding.

8.1.1. Where welding is required on areas already coated with the coating system, the coat should be stepped back for  $\pm 30$ mm around the weld area.

8.2. The paint shall be applied to match the original coats in accordance with the manufacturer's recommendations for the specific paint system.

Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.

8.3. Areas of damaged galvanizing shall be repaired with an approved cold galvanizing product or metal sprayed by the wire spraying process with Zinc, and then touched up with the specific paint system.

## 9. GENERAL

9.1. All walkways, floors, maintenance platforms etc. must be painted with a durable, non skid coating of the appropriate colour.

9.2. Exposed machined surfaces must be coated with a strippable corrosion inhibitor (e.g. Tectyl).

9.3. Where different materials will be in contact with each other and galvanic corrosion can occur the contact areas of the materials must be isolated from each other or the joints made water proof to prevent ingress of moisture.

9.4. All components must be designed with corrosion prevention in mind and specifically the following:-

- 9.4.1. No entrapment of dirt, product, moisture etc.
- 9.4.2. No areas must be inaccessible for maintenance such as too narrow gaps etc.
- 9.4.3. Large flat areas rather than complicated shapes and profiles.
- 9.4.4. No sharp corners and discontinuous welds.

9.5. Parts of equipment which are exposed to high temperatures must be coated with the following system:-

Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
1	Two component self curing inorganic zinc ethyl silicate	DULUX /SIGMA-Sigma Xinc 160  INTERNATIONAL (PLASCON) Interzinc 52  STONCOR (CHEMRITE COATINGS) Carbo Zinc 11	65-75
2	Single component high temperature moisture curing silicone with aluminuim flakes	DULUX/SIGMA – Sigmatherm Silicate  INTERNATIONAL (PLASCON) Intertherm 50  STONCOR (CHEMRITE COATINGS) Thermaline	40

## 10. MAINTENANCE PAINTING OF STRUCTURES

10.1. Areas which are only lightly corroded must be cleaned by means of high pressure water blasting or wire brushing by power tool and the following system applied:-

Coat No	Generic Description	Approved Brand Products	Dry Film Thickness (µm)
1	Surface tolerant two pack epoxy primer with aluminuim pigments	Dulux/SIGMA Aluprimer  STONCOR (CHEMRITE COATINGS) Carbomastic 15  INTERNATIONAL (PLASCON) Intergard 242	125-150
2	Same as first coat OR micaceous iron oxide (MIO) epoxy	DULUX/SIGMA – Sigmacover 456  INTERNATIONAL	125-150

		(PLASCON) Interseal 1052	
		STONCOR (CHEMRITE COATINGS) Carboline 193	
3	Two component recoatable, polyurethane finish (Gloss)	DULUX/SIGMA Sigmadur gloss  INTERNATIONAL (PLASCON) Interthane 990  STONCOR (CHEMRITE COATINGS) Carboline 134	65-75

10.1.1. Alternatively, the Noxyde paint system can be used, consisting of two to three coats of water based Noxyde paint to achieve a DFT of 350 to 400 microns. Where the Noxyde system is used on areas other than slightly corroded structural areas, the following additional requirements must be observed:

10.1.1.1. Very smooth surfaces (e.g. 3CR12, stainless steel or hot-dip galvanized components, bolts, nuts and fittings, and HT bolts): Parts must be thoroughly degreased using OptiDegreaser, washed down with potable water, and immediately when dry, a single coat of OptiPrimeAqua applied.

10.1.1.2. Paintable flexible sealant/mastic: Only sealant approved by the paint manufacturer may be used, and an initial coat of OptiPrimeAqua applied over it before the further coats of Noxyde are applied.

10.1.1.3. Bolted/rivited connections: After blasting or and/or cleaning as required, apply a coat of OptiPrimeAqua and an additional stripe coat of Noxyde, in contrasting colour, to all bolt/nut and plate edges and crevices.

10.2. The adhesion of old coatings must be verified by doing a cross cut adhesion test on selected areas.

10.3. The compatibility of the new paint system on the old coating must be tested and guaranteed in writing by the paint supplier.

10.4. The work and coating system must be guaranteed for a minimum of 12 months.

10.5. All heavily corroded areas must be shot blasted to minimum SA2 and the three coat system indicated in clause 2.6 applied.


10.6. Areas where the old coating is still sound need only be high pressure cleaned with a suitable solvent and coated with one of the primers suggested in clause 10.2 (as tie coat) and then with one of the top coats suggested in clause 2.6 to get the appropriate colour and finish. The minimum dry film thickness of this tie coat must be 75 microns and top coat must be 50 microns, but the previous coating colour shall be completely obliterated to present a uniform colour.

Note: Inorganic zinc primers shall not be re-covered with an inorganic primer, but only with an organic zinc primer.



- 10.7. Repairs to the insides of all the enclosed sections of the booms as well as the insides of the crane legs, sill beams, cross beams, pylon cross bracing members etc. shall be done as above but the top coat need not be applied.

**\*\*\* END OF SPECIFICATION HE 9/2/8 [Version 17] \*\*\***

 <p>Transnet Port Terminals</p>	<p align="center"><b>REFERENCE</b></p> <p align="center"><b>EEAM-Q-016</b></p> <p align="center"><b>(ORIGINAL SPECIFICATION –HE9.2.2 Ver7)</b></p>	<p align="center"><b>REVISION</b></p> <p align="center"><b>1</b></p>																																				
<p><b>DOCUMENT TYPE:</b></p> <p align="center"><b>SPECIFICATION</b></p>																																						
<p><b>TITLE:</b></p> <p align="center"><b>SPECIFICATION FOR GENERAL REQUIREMENTS AND CONDITIONS</b></p>		<p align="center"><b>PAGE 0 of 16</b></p>																																				
<p><b>COMPILED BY:</b></p>  <p><b>PROJECT ENGINEER ( )</b></p>	<p><b>REVIEWED BY:</b></p>  <p><b>CAPITAL PROJECTS MANAGER (DAN REDDY)</b></p>	<p><b>REVIEWED BY:</b></p>  <p><b>ASSET MANAGER/SHEQR MANAGER ( )</b></p>																																				
<p><b>AUTHORISED BY:</b></p> <p align="center"><b>GENERAL MANAGER – EQUIPMENT ENGINEERING &amp; ASSET MANAGEMENT (HAMILTON NXUMALO)</b></p>																																						
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**1. SCOPE**

- 1.1. This specification covers Sapo's general requirements and conditions for the design, supply, erection and commissioning of port equipment and structures and must be read in conjunction with the main specification.

**2. GENERAL**

- 2.1. Each Tenderer shall provide Sapo with sufficient proof of having suitable experience regarding the designing and/or manufacturing of similar equipment, proven in practise and applied in circumstances similar to those intended by Sapo. To this end, complete and detailed reference lists shall be submitted with the tender.
- 2.2. The equipment in general and the intended operation of the equipment to be supplied, shall be in full compliance with the Occupational Health and Safety Act, Act 85 of 1993, as amended.
- 2.3. The tenderer must submit an offer in accordance with the main specification, and may only then submit alternative offers. Full details as requested in these tender documents should be submitted for each alternative offer. Full details of the differences or deviation from the main offer shall also be submitted.
- 2.4. The Tenderer shall submit a complete list of proposed sub-contractors and suppliers of major components with his tender.
  - 2.4.1. The list of sub-contractors must contain sufficient detail to enable SAPO to grant approval for the respective sub-contracting.
- 2.5. A complete list of major components shall be submitted with the tender, containing sufficient details like make, description, rating, standard of design and manufacture, etc. to enable Sapo's Engineers to decide about its suitability in terms of local conditions, availability, past experiences, etc.
- 2.6. To enable Sapo to apply life-cycle costing in comparison of offers, a complete list of major components to be replaced during the life of the equipment shall be submitted, indicating for each item the expected mean time between failures, based on past experience, and total cost of replacement, including labour and material. Any additional material that can assist Sapo to apply life cycle costing can be submitted by the Tenderer.
- 2.7. The equipment as made and supplied shall be complete in every respect, of modern design using most advanced technology extensively supported by reputable local companies, and be designed and built to applicable recognised standards and good engineering practices.
- 2.8. All components to be fitted shall have been tested for reliability and extended lifetime in conditions to be expected.

- 2.9. The Tenderer shall complete the Schedule of Prices. The lump sum quoted for each category shall be deemed to cover all costs of the design, materials, plant and labour of each item to complete the work according to the drawings and specifications.
- 2.10. All special tools, software and devices essential for the effective operation and/or maintenance of the plant and equipment, shall be listed, detailed and quoted for separately in the Schedule of Prices.
- 2.11. Further to clause 11 of the E5M (1980), the Contractor shall comply with all Municipal regulations regarding the inspection of any portion of the Works. The Contractor shall further provide the Engineer with documented proof of compliance when so requested by the Engineer.
- 2.12. All handbooks, training manuals, wording on drawings and equipment designation labels shall be in English and the Contractor shall ensure that the correct and accurate translation of English is used throughout.
- 2.13. The works will only be accepted (and the certificate of acceptance issued) when the works has been successfully commissioned and tested, and all final drawings, manuals and other documents required in terms of the contract has been delivered to SAPO and accepted by SAPO
- 2.14. Where "tonne", "ton" or the abbreviation "t" is used, it shall be taken as meaning "metric ton" which is equivalent to 1 000kg or approximately 2 204,62 pound mass.

### **3. STATEMENT OF COMPLIANCE**

- 3.1. All tenders are to be accompanied by a separate clause by clause statement of compliance to the requirements of the main specification, as well as to all its annexures, completed and signed by the Tenderer. A general statement that equipment offered is in compliance with the specification is not acceptable.
- 3.2. Every statement of non-compliance or partial compliance shall be fully defined by the Tenderer.
- 3.3. Where a simple statement of compliance against a particular clause could be insufficient to describe exactly what is being offered, a description, fully explaining the Tenderer's offer, shall be submitted with the tender.

### **4. COPYRIGHT OF PLANS, DIAGRAMS AND DOCUMENTS**

- 4.1. The contractor will grant to Sapo a non-exclusive licence, in accordance with the provisions of section 22 of the Copyright Act 1978 (Act 98 of 1978), (a) to copy any plan, diagram, drawing, specification, bill of

quantities, design calculation or other similar document made other than under the direction or control of Sapo, by the Contractor in connection with the installation, (b) to make free and unrestricted use thereof for its own purposes, (c) to provide copies thereof to consultants to be used by them for the purpose of the consultancy and (d) to provide other parties with copies for tenders invited by it. The Contractor, further more, if any plan, diagram, drawing, specification, bill of quantities, design calculations or other similar document made, other than under the direction or control of Sapo, by any principal or sub-contractor of the Contractor, is used in connection with the installation, shall cause such principal or sub-contractor to grant to Sapo a similar non-exclusive licence in respect of such plan, diagram, drawing, specification, bill of quantities, design calculation or other similar document. The provisions of this clause shall not apply to documents made, in the case of equipment to be supplied in connection with the manufacturing process of the equipment supplied but only to the equipment supplied itself. No separate or extra payment shall be due by Sapo in respect of any non-exclusive licence granted in terms of this clause.

## **5. DESIGN CALCULATIONS**

- 5.1. Tenders must be accompanied by a preliminary design analysis and drawings for structural work. The design calculations and drawings shall be sufficiently comprehensive for Transnet Engineers to make a fair and accurate assessment of the essential details and general qualities of the scheme offered. The various loading combinations used for the analysis of the structure must be detailed and submitted with the tender.
- 5.2. At the completion of the Works, the Contractor shall supply as part of the contract, one set of clearly set out, edited and bound, final complete design, stability and stress analysis for all structural items.
- 5.3. Designs based on computer analysis must include properly drawn up, indexed and reference diagrams of all bending moments, shear and axial forces and deflections for all the loading cases. A number reference drawing to facilitate reading of computer printouts must be included.

## **6. CERTIFICATION**

- 6.1. Where applicable, the Contractor shall for each piece of equipment fully completed and taken over by Sapo, submit the necessary certificate of classification and/or certification by a recognised testing authority in compliance with requirements of applicable standards and rules.

## **7. CONTRACT MANAGEMENT**

- 7.1. The Tenderer shall submit a full set of financial statements, as required in terms of the Companies Act, for the last three financial years. This shall

include the financial statements, auditor's report and chairman's report of the Tenderer and proposed main sub-contractors.

- 7.2. The Tenderer shall submit an organogram of the company with his tender which shall show all posts down to supervisory level for all personnel who will be directly involved with this contract and down to managerial level for all other posts in the Tenderer's organisation.
- 7.3. The Tenderer shall submit a C.V. of all personnel who will be directly involved with the management and execution of this contract down to supervisory level. This shall include qualifications and past experience.
- 7.4. The successful Tenderer shall be prepared to commit himself in writing to providing Sapo with an adequate, experienced and stable project team for the duration of the contract. Every effort must be exercised by the Contractor to minimise replacement of individual project members in order to ensure optimum contract management continuity. Prior advice and full motivation must be submitted to Sapo before the replacement of any of the Contractor's key personnel involved with the project.
- 7.5. The Tenderer shall submit a detailed barchart showing all major activities and identifying all major milestones to be achieved in this contract. This barchart will be critically analysed by Sapo as it will show whether Tenderers are able to plan the project efficiently. This barchart will be taken into account when evaluating offers received.
- 7.6. The Contractor shall submit a fully detailed schedule within two weeks after the official contract showing all activities from a Work Breakdown Structure commencing from date of contract to the final commissioning and acceptance based on the initial barchart submitted with the tender.
- 7.7. The Tenderer shall submit details of resource management which will be applied to this contract for:
  - 7.7.1. Manpower
  - 7.7.2. Finance
  - 7.7.3. Equipment
  - 7.7.4. Material supply
- 7.8. This should be in sufficient detail to establish where the above resources will be obtained and how they will be managed during the duration of the contract.
- 7.9. It is a requirement of this contract that the Contractor will employ a full time, fully experienced site manager who has been delegated sufficient authority to manage the contract efficiently on site during erection and commissioning.

## **8. QUALITY MANAGEMENT**

- 8.1. The Contractor shall be required to install and operate a quality



management system which conforms to the requirements of SABS ISO 9001/9002.

- 8.2. The Tenderer must submit a detailed statement of his quality system with this tender which shall include the following:-
  - 8.2.1. Statement of quality management policy and objectives.
  - 8.2.2. Statement of the design control system with emphasis on design review procedures and customer requirements evaluation.
  - 8.2.3. Statement of the documentation and change control procedures.
  - 8.2.4. Statement of the quality control procedures that will apply to purchased materials.
  - 8.2.5. Statement of the quality control plan for all components manufactured or supplied so that inspection is carried out to ensure conformance to the specification.
  - 8.2.6. Statement of the quality control procedure that will apply to installation and painting on site.
- 8.3. The sole responsibility for ensuring that the components supplied conform to the specification shall rest with the Contractor.
- 8.4. The Contractor shall notify the Engineer of all inspections at least 3 working days in advance of such inspections. The Engineer reserves the right to have an inspector present at such inspections. The Contractor shall have the relevant quality control plans available at such inspections. The Engineer shall give the Contractor 24 hour notice in writing of his intention to attend the inspections.
  - 8.4.1. Where the contract provides for tests on the premises of the Contractor or of his sub-contractor, the Contractor shall provide such assistance, labour, materials, electricity, fuel, stores, apparatus and instruments as may be a requisite and as may be reasonable demanded to carry out such tests efficiently. All gauges, templates, tools and other equipment required to check the accuracy of the work shall be calibrated at regular intervals by a laboratory approved by the National Calibration Services of the Council for Scientific and Industrial Research of South Africa, or by the respective authority in the country of origin of the equipment
  - 8.4.2. As and when the equipment has passed these tests, the Engineer shall furnish the Contractor a certificate in writing to this effect.
  - 8.4.3. If as a result of such an inspection, examination or test the Engineer decides that such equipment is defective or not in accordance with the requirements, he shall notify the Contractor accordingly, stating in writing his objections and reasons therefore. The Contractor shall timeously make good the defect

to ensure that the equipment complies with the requirements. Thereafter, if required by the Engineer, the tests shall be repeated under the same terms and conditions save that all reasonable expenses to which Sapo may be put by the repetition of the tests will be deducted from the contract sum.

- 8.4.4. Unless the Engineer otherwise directs, no equipment or materials are to be delivered to site until the Engineer issues an inspection certificate in respect of such equipment. The Contractor shall be responsible for the reception on site of all equipment delivered for the purpose of the contract.
- 8.5. SAPO reserves the right to conduct a quality assurance audit on the Contractor's quality control system at regular intervals.
- 8.6. If required by the Engineer the Contractor shall produce evidence to show that both his welding procedures and welders have passed all the relevant tests required in terms of BS 5135 and SABS 044 Parts III and IV.
- 8.7. The Contractor shall hold design review meetings during the planning phases of this contract. This will be to establish all customer requirements and to provide approval in principle for design interfaces for all designs and specifications to ensure that quality is designed into the final product.
- 8.8. The Contractor shall not change any design or specification feature which has any of the following impacts without formal approval by the Engineer:
  - 8.8.1. Financial
  - 8.8.2. Interface with other equipment or installations
  - 8.8.3. Safety
  - 8.8.4. Departure from customer requirements

## **9. SITE SURVEY BY CONTRACTOR**

- 9.1. Immediately after award of the contract, and prior to final design, the successful Tender shall survey the complete site of final operation of the equipment tendered for. This survey shall serve to confirm dimensions and for relative positions of all items and equipment that will interface with the equipment tendered for, e.g. rail gauges, conveyor position relative to rails, location of electrical power supply points, location and dimensions of any obstacle protruding into the operations envelope, etc.
- 9.2. It will be the contractor's responsibility to ensure that equipment supplied in terms of the contract will interface successfully with existing items and equipment.
- 9.3. Any major deviation from data supplied by Sapo in the tender documents shall be brought under the attention of the Engineer. Any potential impact

of a commercial or technical nature shall be discussed and finalised with the Engineer, prior to final design of the equipment.

- 9.4. The Tenderer shall allow in all respects in his tender for this requirement to survey the operation site and confirm tender data.

## **10. DRAWINGS AND SCHEMATICS**

- 10.1. On the contract being placed, the Contractor shall at once prepare and must submit two copies of black line paper prints of the general arrangements, working drawings and schematics for approval by the Engineer. These drawings and schematics must be submitted in a systematic manner, accompanied by an index sheet of all the drawings and schematics in question. Approval in principle by the Engineer must be obtained prior to commencement of fabrication or construction. Time required for preparation and approval of these drawings must be included in the Tenderer's program.
- 10.2. Drawings which are submitted for the Engineer's formal approval shall bear the signature and designation of the Tenderer's "responsible professional Engineer".
- 10.3. General arrangement drawings shall show the complete structural layout arrangements with plan views, elevations, cross sections, location and sizes of members, erection details, cladding details, services where applicable, etc.
- 10.4. Notwithstanding any formal approval in principal of drawings and schematics submitted to Sapu, the sole responsibility for the adequacy of the design, fabrication and installation or erection as well as accuracy of workmanship and quality of all materials, shall rest entirely with the Contractor who will be required to rectify any defects.
- 10.5. The Contractor's fabrication shop drawings and detailed drawings are not required for approval except when the Engineer requests such drawings specifically for approval or to assist him in the inspection of the structure at any stage.
- 10.6. At the completion of the Works, the Contractor shall supply as part of the contract two sets of paper prints and a set of latest AUTOCAD version files in the DXF format of the general arrangement, manufacturing and detailed working drawings and schematics, showing every portion of the work as actually made for the equipment, giving all wording in English and all dimensions in Metric units.
- 10.7. The drawings and schematics shall comply with the applicable SABS, British, VDE or ISO standards. The official Sapu title block with the Sapu serial No. and numbering system must be included in the lower right hand corner.
- 10.7.1. The Contractor will be advised regarding numbering and detailing of drawings.

- 10.8. Prints and CAD files must be delivered not later than 2 months after completion of the commissioning of the equipment.

## **11. SITE BOOKS**

- 11.1. The Contractor shall supply and have available at the site office at all times, the following site books:

11.1.1. Site instruction book:

This shall be a suitable carbon copy book, size A4, with two detachable sheets for receiving and recording instructions in triplicate issued by the Engineer or his authorised representative.

11.1.2. Site diary book:

This shall be a suitable carbon copy book, size A4, with two detachable sheets for a page to a day and all events affecting the Works, such as arrivals of plans, breakdown of machinery, weather conditions etc., must be entered. The plant, labour and material on site must be recorded as well as work performed.

Entries will be made by the Contractor (or his appointed agent) and signed by both parties daily. The diary may be used to establish the validity of claims for extension of time.

- 11.2. These site books will remain the property of Sapo and will be used for reference purposes and during the guarantee period.

## **12. CO-OPERATION WITH OTHER PARTIES**

- 12.1. Departments of Transnet and other contractors may be working in the confines of the contract work site and in the general area surrounding it during the course of the contract. The Contractor shall make reasonable allowance in all tendered rates for the necessity to interface with the activities of other contractors and Transnet, and to allow for access and safe working conditions.

- 12.2. The success of the project depends on the effective co-operation of all contractors on site, and the Contractor will if necessary be required to discuss his programme on a day to day basis with the Engineer's Deputy to ensure effective co-ordination.

## **13. CUSTOMS AND PORT REGULATIONS**

- 13.1. The Works are situated within a Customs controlled area and the Contractor and his staff shall observe all Customs regulations within the

port area.

- 13.2. The Works are sited within a promulgated port area and the Contractor and his staff shall observe all Port Regulations within the port area. Copies of the Harbour Regulations are obtainable from the Port admin offices.
- 13.3. The fullest collaboration between the Contractor, Sapo and the Engineer is essential in regard to the working of the port.

#### **14. INSTRUCTION OF SAPO'S PERSONNEL**

- 14.1. Sapo's personnel concerned with operating, and maintenance will be made available for instruction by the Contractor in their various functions at the Port concerned.
- 14.2. The necessary formal lecturing on the working, adjustment, maintenance and fault finding procedures shall be arranged for at the Port concerned.
- 14.3. Details of alternative and additional official courses offered shall be specified at tender stage i.e. full procedures, duration, place of training, competence and qualifications of personnel to be trained.

#### **15. OPERATING AND MAINTENANCE INSTRUCTION MANUALS AND PARTS CATALOGUE**

- 15.1. The Contractor will be required to furnish three final copies of each manual/handbook supplied in terms of the contract.
- 15.2. One copy of the preliminary set of manuals/handbooks must be available on site one month prior to commissioning.
- 15.3. One copy of the final set of handbooks will be kept in the workshop and the Contractor must cover every page of this set with translucent plastic.
- 15.4. The following manuals shall be supplied as part of the contract:
  - 15.4.1. Maintenance Instruction Manual.
  - 15.4.2. Workshop Reference Manual.
  - 15.4.3. Operator's Manual.
  - 15.4.4. Parts Catalogue.
  - 15.4.5. Training Manual.
- 15.5. The *Maintenance Instruction Manual* shall include:
  - 15.5.1. Safety instructions to be observed by maintenance and operating personnel.

- 15.5.2. A general description with illustrations and flow diagrams of the works, indicating all major items, with a functional description of these items.
- 15.5.3. Full detail of all faultfinding procedures (electrical and mechanical).
- 15.5.4. Detailed periodic maintenance programmes in respect of the whole of the works, including electrical components and structural work.
- 15.5.5. Comprehensive data and procedure descriptions (suitably illustrated) on routine maintenance, including intervals, tasks, wear tolerances and lubrication detail.
- 15.5.6. A list of all equipment that require lubrication must be compiled under the following headings.
- 15.5.7. Name, description, location.
- 15.5.8. Recommended lubricant.
- 15.5.9. Frequency of lubrication.
- 15.5.10. A list of all PLC fault codes and their probable causes.
- 15.5.11. Diagrams of all electrical, pneumatic and hydraulic circuits.

15.6. The *Workshop Reference Manual* shall include:

- 15.6.1. Safety instructions to be observed by maintenance and operating personnel.
- 15.6.2. Complete data and procedures on the repair and overhaul of all items of the works.
- 15.6.3. Detailed diagrams of all electrical, pneumatic and hydraulic circuits.
- 15.6.4. A list of all PLC fault codes and their probable causes.
- 15.6.5. A complete listing of the PLC programs.
- 15.6.6. Data necessary for condition monitoring purposes, like the number of teeth on gears, number of balls/rollers in bearings etc.
- 15.6.7. Detailed Supplier data sheets on all standard equipment that forms part of the works.
- 15.6.8. Design, installation, inspection and performance or load test certificates as required by law (including Act 85 of 1993).
- 15.6.9. Completed commissioning document for the works.

- 15.7. The *Operator's Manual* must detail the safe and efficient operation of the works, and must include the following:
  - 15.7.1. Safety instructions to be observed by the operating personnel.
  - 15.7.2. Start-up procedure.
  - 15.7.3. Shut-down procedure.
  - 15.7.4. Storm anchoring procedure if applicable.
  - 15.7.5. Diagram showing the lay-out of controls and operator meters and displays.
  - 15.7.6. Detail of the use of the controls and interpretation of the meters and displays.
  - 15.7.7. Detailed check-lists for the daily, weekly and monthly inspections to be performed by the operator.
  - 15.7.8. A list of all fault codes that could be displayed at operator, with a description and detail of what action should be taken by operator when such a code is displayed.
- 15.8. The *Parts Catalogue* shall comprehensively list all parts of the works with full descriptions, locations, re-order numbers and supplier, and will include illustrated diagrams of assemblies showing all parts of the assembly. A list of suppliers and their contact detail shall also be included.
- 15.9. The *Training Manual*:
  - 15.9.1. Comprehensive pictures and text shall be provided to enable SAPOt Academy (NPA's division responsible for training) to compile final training manuals for operator training, including first line maintenance.
  - 15.9.2. Pictures and text shall be in digital format supplied on CD Rom to enable Sapo to edit the content.
  - 15.9.3. To assist the Contractor in compiling the necessary information, the following requirements must be complied with for all major parts of the equipment.
    - 15.9.3.1. Identify (i.e. description and picture of) the part and describe where the part can be found on the equipment.
    - 15.9.3.2. Explain the function of the part; and
    - 15.9.3.3. Describe what the operator has to do to keep the part in good working order.
- 15.10. All final manuals shall be supplied by the Contractor as soon as possible after the works has been successfully commissioned, in order for the works to be accepted (see clause 2.13).

## **16. RECOMMENDED SPARES**

- 16.1. A complete priced list of recommended mechanical and electrical spares to enable SAPO to operate and maintain the installation efficiently for its useful life and to obtain spares as required must be submitted by the Contractor not later than one month after the finalisation of the design. This list of recommended spares must include full details on the source or supplier in each and every case.
- 16.2. Spares for the equipment must be classified as:
  - 16.2.1. Initial spares which are the major assemblies and critical single items that have been established from experience as being necessary to maintain the installation fully operational after commissioning for a period of twelve months.
  - 16.2.2. Recommended maintenance spares which are the spares that the Contractor recommends as necessary for the maintenance of the installation over and above the initial spares described above, and include all wearing items and slow moving contingency (insurance) spares.
- 16.3. Each spare part must be comprehensively described, and Contractors must furnish the manufacturer's part number as well as any applicable international item number.
- 16.4. Tenderers shall state:
- 16.5. Whether all essential renewable parts for all the equipment will be readily available in the Republic of South Africa.
- 16.6. What after sales service and operational instruction can be offered to Sapo.

## **17. GUARANTEE AND GUARANTEE PERIOD**

- 17.1. The Contractor shall guarantee that all components and material supplied are new and fit the specified purpose for which they are purchased and are free from any defects in design, workmanship and material and are in strict accordance with the specifications and drawings, unless otherwise agreed in writing by Sapo.
- 17.2. The Contractor shall agree to replace without charge to Sapo any defective items discovered within 12 months from the date of acceptance, provided that the equipment has been operated and maintained in accordance with the Contractor's written operating instructions; normal wear and tear excluded.
- 17.3. During the guarantee period the Contractor shall have a branch or local agent at or near the Port with full time personnel available for guarantee




repairs. Spare parts and equipment must also be available from the branch or agent.

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***END OF SPECIFICATION HE 9/2/9 [Version 7]***

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REVISION  0	REFERENCE  EEAM-Q-009			
DOCUMENT TYPE SPECIFICATION			AUTHORISATION DATE: Date signed by CEO	
TITLE: QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION			PAGE 1 of 14	
COMPILED BY:	REVIEWED BY:	REVIEWED BY:		
SENIOR MANAGER (QUALITYMANAGER)	SENIOR MANAGER (PROJECT MANAGER)	SENIOR MANAGER (GENERAL MANAGER)		
ACCEPTED BY:		AUTHORIZED BY:		
CHIEF FINANCIAL OFFICER		CEO		
FUTURE REVISION RECORD NUMBER	DESCRIPTION OF REVISION	APPROVAL	DATE 01/03/2010	
-1-				
<p style="text-align: center;"><b>CONTENTS</b></p> <p>1.0 QUALITY MANAGEMENT SPECIFICATION FOR SUPPLIER/CONSTRUCTION</p>				

KEYWORDS SPECIFICATION	DATE OF LAST REVIEW: N/A
	DATE OF NEXT REVIEW: 01/03 2010

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## 1. Introduction

This Specification outlines the minimum requirements to ensure that products and services supplied to Transnet Port Terminals are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in the Contract, all associated specifications, drawings, codes and standards.

## 2. Definitions

<b>Term, Abbreviation</b>	<b>Meaning</b>
Data	All drawings/documents/data/information and DP's required to be supplied under the Contract
Data Pack (DP)	A compilation of manufacturing data, certification, inspection and testing records prepared by the Supplier/Contractor to verify compliance with the Contractual requirements.
Employer	For the purposes of this document, the term Employer has the same meaning as applied to the term Client.
Field Inspection Checklist (FIC)	A document that details the checks, requirements and test parameters for each type of equipment to permit field installation and pre- commissioning of the equipment.
TPT	Transnet Port Terminals is the Employer's Nominated Agent in terms of the Conditions of Contract.
Inspection Release Report (IRR)	A document issued to the Supplier/Contractor by TPT advising release of the Materials for shipment. This does not relieve the Supplier/Contractor of its obligations in accordance with the Terms and Conditions of the Contract.
Inspection Waiver Report (IWR)	<p>A document issued to the Supplier/Contractor by TPT advising that TPT has waived final inspection for the materials listed in this document. The issue of this Report does not preclude further inspection by TPT, is issued without prejudice and does not relieve the Supplier/ Contractor from the guarantees and obligations included in the Contract/ Contract.</p> <p>A document prepared by the Supplier/Contractor providing relevant information applicable to the installation and maintenance of the specific equipment, including consumables (eg. oils etc)</p>
Project Quality Plan (PQP)	A document that outlines the Supplier/Contractor's strategy, methodology, resources allocation, Quality Assurance and Quality Control coordination activities to ensure that Goods and Services supplied meet or exceed the requirements defined in the Contract, drawings, codes and standards.
Quality Control Plan (QCP)*	<p>A document outlining specific manufacturing / construction inspection and testing requirements, including responsibilities, test acceptance criteria, nomination of witness and hold points.</p> <p>For the purposes of this document, the term Supplier/Contractor has the same meaning as applied to the term Sub-Supplier/Sub-Contractor</p>
Supplier/Contractor	This refers to the documentation required to be submitted by the relevant Supplier / Contractor in terms of the Contract.
Supplier/Contractor Data Requirements	These requirements are generally tailored to suit the particular Scope of Work, although it also addresses the manner in which the documentation is required to be submitted, eg Hard copy, Electronic copy etc
Technical Query Note (TQN)	This refers to a document used by the Supplier/Contractor to formally clarify a Technical Query related to the scope of supply. This should not be used where a non-conformance has already been initiated.

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### **3. Applicable Documents**

#### **3.1 General**

All work performed shall comply with the requirements of this Specification, the documentation referenced in the Contract and the latest revision/edition of the relevant Codes and Standards referenced herein.

#### **3.2 Statutory Regulations**

Occupational Health & Safety Act, Act No 85, of 1993 and Regulations as amended.

#### **3.3 Codes and Standards**

<b>Document No.</b>	<b>Title</b>
ISO 9001	International Standard Series Quality Systems
EEAM-Q-013	Punch Listing Standard

### **4. Quality System**

#### **4.1 General**

The Supplier/Contractor shall be responsible for all quality activities necessary to ensure the Work meets the requirements specified in the Contract, and shall manage and coordinate all Quality aspects of Work in accordance with the requirements of this Specification, and the Supplier/Contractor's PQP and QCP's once reviewed and approved by TPT.

The Supplier/Contractor shall ensure that all Sub-Suppliers/Sub-Contractors also conform with the requirements of this Specification.

#### **4.2 Supplier/Contractor Quality System Requirements**

The Supplier/Contractor shall have, maintain and demonstrate its use to TPT, its documented Quality Management System. The Supplier/Contractors Quality Management System should be in accordance with the International Standard ISO 9001.

The Supplier/Contractor shall submit its Quality System documentation to TPT at the time of tender and at Contract Phases as detailed below:

- Project Quality Plan
- Quality Policy
- Index of Procedures to be used
- Programme of internal and external audits

#### **4.3 Supplier/Contractor Documentation Requirements**

The Supplier/Contractor shall develop and maintain a comprehensive register of documents that will be generated throughout the project, and shall include all quality related documents. The register shall be submitted to TPT for review.

TPT shall indicate those documents required to be submitted for information/review and/or acceptance and this shall be indicated in the Supplier/Contractors' Document Register. The register shall indicate the dates of issue of the documents taking into account sufficient time to allow TPT review/acceptance cycle prior to the document being required for use.

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## **5. Quality Assurance**

### **5.1 Project Quality Plan**

Where specified, the Supplier/Contractor shall submit a PQP to TPT within 28 days after the Contract start date. The PQP shall detail how the Supplier/Contractor's Quality System will be applied to the Scope of Work specified in the Contract, and shall address the following:

- Satisfying the technical and quality requirements of the Supplier/Contractor's Scope of Work, and relevant elements of the applicable ISO 9001 standard
- include all quality activities relevant to the Scope of Work, identifying all procedures, reviews, audits, controls and records used to control and verify compliance with the specified Contractual requirements

Include a listing of all special processes (eg. welding and non-destructive testing, cube testing etc) envisaged for use, including confirmation of personnel certification as required

- Include all proposed method statements (for site based work activities)
- Include a description of the Supplier/Contractor's project organisation, with key positions and responsibilities identified and individuals named. The organisation structure shall also indicate the resources committed to the management / coordination of QA / QC activities
- Include a listing of all Quality Control Plans (QCP's), and associated Field Inspection Checklists (FIC's), as applicable
- Identify in the Project Quality Plan any Sub-Supplier/Sub-Contractor work. Sub-Supplier/Sub-Contractor plans shall be approved by the Supplier/Contractor, and a copy forwarded to the TPT
- Include the proposed Authorised Inspection Authority (where applicable - for pressurised equipment and systems)
- Include a schedule of proposed quality records

The PQP shall be controlled and re-submitted for approval when required to incorporate any change necessary during the Contract duration to ensure that the document is maintained as an effective control, change management and records. The change management will be done to an agreed policy or procedure.

Note: Where the Supplier/Contractor is required to provide a PQP, no work shall commence until the PQP is approved by TPT.

### **5.2 Procedures**

The Supplier/Contractor's PQP and procedures shall address the system elements and activities appropriate to the Scope of Work, in compliance with the specified Quality Standard.

Where specified, the Supplier/Contractor shall submit copies of Quality Procedures for review. In addition, the Supplier/Contractor shall ensure that copies of all Procedures relevant to the Scope of Work are available for reference by TPT at each work location.

These will include, as applicable, the following:

#### **5.2.1 Document Control**

The Supplier/Contractor's Project Quality Plan shall provide a description of how TPT provided, Supplier/Contractor and Sub-Supplier/Sub-Contractor documents are to be managed. The description shall address as a minimum:

- Management tools and databases
- Receipt, registration and maintenance
- Internal and external distribution to Employer, third parties and Sub-Contractors
- Management of Codes, Standards and Specifications

- 
- Internal review and approval routines and authorities
  - How it is ensured that the correct revisions of documents are available at the point of use including retention periods for all documentation.

### **5.2.2 Design Control**

Where the Supplier/Contractor is responsible for any aspect of design related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these design activities.

### **5.2.3 Procurement**

Where the Supplier/Contractor is responsible for any aspect of procurement related to their Scope of Work, the Quality Plan shall describe the Supplier/Contractor's methods and procedures for the control of these activities.

## **5.3 Supplier/Contractor Audits**

The Supplier/Contractor shall:

- Carry out audits in accordance with its Quality System at its own and Sub-Supplier/Sub-Contractor's facilities to ensure project quality requirements are being achieved
- Include a QA Audit Schedule in the Supplier/Contractor PQP submitted to TPT prior to commencement of the Scope of Work. The Audit Schedule shall include all audits to be implemented by the Supplier/Contractor and Sub-Supplier/Sub-Contractor during the execution of the Contract
- Where stipulated in the Contract, perform an audit within three months after the Contract start date and thereafter at a minimum frequency of three months. Audit reports shall be submitted to TPT at the completion of each Audit. Where unsatisfactory performance is evident, additional audits shall be performed by the Supplier/Contractor as directed by TPT.

## **5.4 Transnet Port Terminals Audit**

TPT reserves the right to perform quality audits or participate as an observer in Supplier/Contractor audits to verify compliance with the Contractual requirements. The Supplier/Contractor shall within a time frame as agreed upon, correct any adverse audit finding advised by TPT.

# **6. Inspection and Testing**

## **6.1 General**

TPT may, at its discretion perform surveillance inspection at the Supplier/Contractor's premises, SubSupplier/Sub-Contractor's premises or at the location of the Scope of Work.

Dependent on the nature of the Scope of Work and the frequency of inspections TPT may elect to have inspection personnel resident at the place of manufacture, fabrication, or assembly.

The Supplier/Contractor shall ensure free entry and access is given to TPT, certifying authorities and statutory authorities to inspect the Scope of Work and review procedures and quality records at all parts of the Supplier/Contractor's and Sub-Supplier/Sub-Contractor's premises, or at the location of the Scope of Work while any work or test is in progress.

The Supplier/Contractor shall provide TPT with all necessary tools, calibrated measuring equipment, safety equipment and workspace to verify or witness tests in progress.

While TPT is at the Supplier/Contractor's premises, the Supplier/Contractor shall provide, free of charge, reasonable facilities including office facilities and reasonable access to a telephone, facsimile machine and computer connection point.

The Supplier/Contractor shall provide notice in writing in within a time frame time as agreed upon, to allow the attendance of TPT and other representatives at nominated witness and hold points.



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## 6.2 Quality Control Plans

The Supplier/Contractor shall prepare and submit QCP's to TPT for review in accordance with the requirements of the Contract and PQP.

QCP's shall identify all inspection, test and verification requirements to meet the Contractual obligations, specifications, drawings and related details including destructive and non-destructive testing, witness and hold points.

The Supplier/Contractor shall not commence fabrication or manufacture prior to review and approval of the applicable QCP by the TPT.

QCP's shall include reference to all tests specified in the Contract Document.

A typical format for an QCP is shown in Appendix A. The Supplier/Contractor may use its own format providing all information shown in Appendix A is included.

## 6.3 Inspection Points

The QCP shall identify points in the fabrication, manufacturing and/or installation process that are selected for inspection and shall be denoted by the following inspection codes:

- Hold Point (H)                      Inspection point in the manufacturing cycle, beyond which work shall not proceed without the specified activity, work or function being witnessed. Holding points require written notification to TPT.
- Witness Point (W)                  An inspection point in the manufacturing cycle that will be witnessed or verified. If TPT confirms it is unable to attend after being provided with the written notification then manufacture may proceed. Witness points require written notification to TPT.
- Review Point (R)                      A point at which products and quality records are verified and endorsed. Review points are not notifiable points.
- Surveillance (S)                      An inspection point in the manufacturing cycle during which any activity, work or function is observed. No formal notification is required.

The Supplier/Contractor shall maintain the status of testing and inspection by progressively having the QCP's signed off.

## 6.4 Revision to Quality Control Plans

Revision of the QCP shall be subject to the same submission, review and acceptance routines as described for the original QCP issue

## 6.5 Kick Off Meeting

After the Contract start date, and prior to manufacture, TPT will require a Kick Off Meeting with the Supplier/Contractor to discuss fully the implications of meeting TPT quality requirements. This meeting may be held as part of the Contract kick-off meeting for each package or may be a separate meeting, subject to the critical or complex nature of the work. This requirement for a pre-inspection meeting may be repeated when sub-Supplier/Contractors of key equipment are engaged.

After mobilization of the Contractor, and prior to the commencement of any construction activities, TPT will arrange for a Quality kick-off meeting to discuss fully the implications of meeting the projects' quality requirements. This meeting may be held as part of the formal kick-off meeting for each contractor, or may be a separate meeting subject to the critical or complex nature of the work.

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## **6.6 Schedule of Inspection**

The Supplier/Contractor shall submit a Schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The Schedule shall be regularly updated with progress and issued to TPT to show the current inspection and test status.

## **6.7 Field Inspection Checklists**

For site installation and construction activities, the Supplier/Contractor shall prepare Field Inspection Checklists (FIC's) to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCP's.

FIC's shall be provided to TPT for initial review, and shall be used to record the results of inspection and testing (where applicable), and on completion be submitted to TPT to confirm satisfactory completion of the tests and inspections at nominated QCP witness and hold points.

## **6.8 Inspection Notification**

The Supplier/Contractor shall notify TPT in writing at least two calendar weeks prior to the advent of inspections or tests that require witnessing.

For inspections or tests within the country, arrangements shall be confirmed at least two working days before the event. For inspection and tests outside of the country, arrangements shall be confirmed at least seven working days before the event.

Inspection notifications shall include the following essential information:

- Contract Number
- Location of Inspection or Test
- Nature of Inspection or Test
- Date and Time of Inspection or Test
- Name and telephone number of the Supplier/Contractor's Representative.

## **6.9 Inspection and Testing**

The Supplier/Contractor is responsible for the conduct of all Supplier/Contractor inspections and tests, and includes:

- Documenting inspection and tests result in the QCP's and relevant FIC's
- Progressively inspecting the quality of the Scope of Work performed, including that of all Sub-Supplier/Sub-Contractors
- Inspecting to meet all Contractual requirements, in number, type and form
- Inspecting day to day activities, material receipts, issue of material for installation, in-process inspections, and final inspections.

Completed original QCP's and FIC's shall be submitted to TPT in the DP

## **6.10 Inspection Release**

At completion of the Scope of Work, either in total or in phases, TPT may issue an Inspection Release Report (IRR) or a waiver of inspection.

The issue of either an inspection release or waiver of inspection does not relieve the Supplier/Contractor of its obligations under the Contract. The Supplier/Contractor shall ensure a copy of the release note and final expediting release note for transport, where appropriate, is attached to the delivery docket and accompanies the Work to the designated destination indicated in the Contract. Items delivered to TPT without a copy of these documents may not be accepted.

A copy of the inspection release or waiver of inspection shall be included in the DP.

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## **6.11 Special Processes**

It is the Supplier/Contractor's responsibility to ensure that all processes which require prequalified procedures and/or work methods are tested and qualified before work begins. This typically covers such activities as welding, non-destructive testing, special fabrication techniques and painting. Unless specified such procedures are the Supplier/Contractor's responsibility and do not require submission to TPT before work begins. When such procedures are requested, no work shall commence until procedures are approved by TPT.

It is the Supplier/Contractor's responsibility to ensure all operators are qualified for the processes in accordance with the procedure and/or applicable standards. Records of qualification of operators shall be maintained by the Supplier/Contractor and made available to TPT when requested.

Records of qualification of procedures and processes shall be maintained by the Supplier/Contractor in accordance with the applicable procedure or code.

## **6.12 Welding Procedures**

Where the Supplier/Contractor's Scope of Work includes fabricated weldments, Welding Procedure Specifications (WPS) defining the method, preparation and sequences to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of the Supplier/Contractor's Scope of Work. The procedure shall only be submitted to TPT when requested in the Contract.

WPS shall include all welding essential and non-essential variables for each process used, including appropriate test results and shall comply with the standard or code pertaining to welding required in the execution of the Supplier/Contractor's Scope of Work.

When requested in the Contract a suitably marked "weld map" shall be completed by the Supplier/Contractor for all items to be fabricated. A summary of WPS shall be prepared and when used, shall be identified on the weld map.

Where TPT approval is required, fabrication shall not commence until written approval of WPS and Welding Procedure Qualification Records (WPQR) is received by the Supplier/Contractor. No welding fabrication will be accepted that is not covered by an TPT approved WPS/WPQR.

Welding Procedure Qualification (WPQ) tests may be witnessed by TPT and/or an independent inspection authority. Testing of the specimens prepared during the WPQ Tests shall be carried out by an independent approved testing laboratory independent of the Supplier/Contractor. In certain instances, a certificate to EN 10204 3.1 B may be required which will be clarified at Tender review and clarification stage.

Where actual weld deposit analysis and weld metal physical properties are required for procedure qualification, the information shall be taken from the procedure qualification tests. Data listed in the catalogues of the manufacturer of welding consumables is not acceptable.

Welders/welding operators shall be qualified in accordance with the relevant welding code prior to commencing production fabrication. Specific Welder Qualifications (WQ's) records will be reviewed by TPT in the Supplier/Contractor's works and should NOT be submitted for review.

A register of welders qualified to work shall be maintained by the Supplier/Contractor.

## **6.13 Material Traceability**

Where, and to the extent that material traceability is required, the Contractor shall provide its procedures for the maintenance of material identification throughout all phases of manufacture. Methods of identification, routines for re-stamping or stencilling as appropriate shall be defined and agreed with the Employer.

Adequate records shall be maintained throughout construction enabling traceability of key materials from final product back to original material certificates. The material traceability records shall form part of the DP

The Contractor shall prepare a schedule of materials and equipment that are subject to traceability requirements.

## **6.14 Material Certification**

Where specified in the Contract the following certificates shall be provided to TPT and included in the DP.

Type A:	A Supplier/Contractor's certificate of compliance with the Contract. This certifies that the goods or services are supplied in compliance with the Contract without mention of any test results (EN10204 certificate 2.1).
Type B:	A certificate issued by a laboratory or test facility independent of the Supplier/Contractor's works. It shall quote test results carried out on the product supplied and state whether compliance with the relevant technical standard, code etc has been complied with. (EN 10204 certificate 3.1 B).
Type C:	The same as Type B, the tests are to be witnessed by a third party (EN 10204 certificate 3.1C).

## **7. Non Conforming Products**

### **7.1 General**

The Supplier/Contractor shall establish and maintain procedures to control material or products that do not meet the specified requirements.

All Supplier/Contractor product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- If the Supplier/Contractor discovers material or product which is not in accordance with the requirements of the Contract, i.e. a non conformance (NCR), the Supplier/Contractor shall promptly initiate the non-conformance procedure in terms of the Supplier/Contractor's Quality Management System, advise TPT promptly, and provide a copy of the NCR to TPT
- If TPT or it's agent identifies a non conformance an TPT NCR may be raised.
- Originals of all closed out NCR's shall be included in the DP.

### **7.2 Corrective and Preventative Action**

If the Supplier/Contractor proposes a disposition of any non conforming materials or product which varies from the requirements of the Specification or Contract, such a proposal shall be submitted in writing to TPT whose decision on the proposal shall be obtained in writing before the non conforming material or product is covered up or incorporated into the Works, or is the subject of any other disposition.

The disposition of non-conformances which do not vary the requirements of the Contract, specification or drawings may be approved by the Supplier/Contractor following discussion and agreement with TPT.

## **8. Concession Requests and Technical Queries**

### **8.1 Concession Requests**

Where a Supplier/Contractor requests a Concession to deviate from the requirements of the Contract or specified requirements, the Supplier/Contractor shall raise the request with TPT using the format as shown in Annexure B.

The Concession Requests shall clearly identify all elements of the proposed deviation together with any resulting technical, commercial and/or schedule impacts.

Completed original Concession Requests shall be included in the DP.

### **8.2 Technical Queries**

For clarification of technical issues (only), Supplier/Contractor may submit a Technical Query Note (TQN) to TPT in accordance with the Contract.

The TQN shall clearly identify all elements of the query, and all supporting documentation and/or drawings shall be attached where appropriate.

Completed original TQN's shall be included in the DP.

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## **9. Inspection, Measuring and Test Equipment**

### **9.1 Calibration**

The Supplier/Contractor, including its Sub-Supplier/Sub-Contractors shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant Supplier/Contractor procedures and/or the equipment manufacturer's specifications.

Where calibration is required by an external laboratory, the Supplier/Contractor shall ensure that the facility selected for calibration possesses current certification. Calibration certificates shall contain a statement that the test equipment is accurate to within specified tolerances.

The Supplier/Contractor should establish the frequency of calibration for each item of equipment (including jigs, fixtures or templates) and record the details in a 'Measuring and Test Equipment Register' (or similar).

### **9.2 Use of Inspection, Measuring and Test Equipment**

The Supplier/Contractor shall ensure that authorised equipment users:

- Use the equipment in accordance with manufacturers instructions, and accepted industry practices
- Ensure the equipment is covered by a current calibration certificate
- Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
- Prior to commencement of each inspection or test activities:
  - Identify the measurements to be made
  - Determine the accuracy required
  - Select the appropriate inspection, measuring or test equipment for the scope of work.

### **9.3 Verification of Previous Test Results**

Where the calibration status of the equipment is unknown, expired or has doubtful accuracy, the equipment shall immediately be quarantined, and tagged according to Supplier/Contractor's Quality System procedures. The Supplier/Contractor shall then arrange for either in-house or external calibration, and:

- review all previous test results associated with the suspect equipment
- identify the inspections, measurements or tests required to re-validate the results
- ensure that suitable re-testing is performed with calibrated equipment
- document the results of the re-testing on the respective inspection and test documentation.

## **10. Quality Records**

Supplier/Contractors shall maintain Quality Records necessary to provide objective evidence that demonstrates and verifies achievement of the QA / QC requirements associated with the Scope of Work. All Quality Records, including original source material test certificates and non destructive test reports, shall be retained by the Supplier/Contractor during the project, and be provided to TPT at the times, and in the quantities specified in the Contract.

The Supplier/Contractor shall collate all quality records in the DP and submit the DP to TPT in accordance with the Contract and all referenced standards and specifications. This DP shall be compiled progressively, and shall be available for review at all phases of manufacture or construction activities.

The Scope of Work shall not be complete until the Supplier/Contractor's DP including the quality records from Sub-Supplier/Sub-Contractors have been reviewed and accepted by TPT.

The DP shall be compiled progressively during the execution of the Scope of Work and shall be made available for review by TPT as required.



### Annexure A - Sample Quality Control Plan

Quality Control Plan No.:	Rev:	Date Issued:
Contract No.:	Description:	Item No.:
Supplier / Contractor:	Location:	

[illegible]

## **Annexure B - Request for Concession**

<b>Request for Concession</b>				<b>No: _____ of 2</b>	
<b>A. SUPPLIER/CONTRACTOR SUPPLIED INFORMATION</b>					
SUPPLIER/CONTRACTOR NAME:			CONTRACT NO.:		
SUPPLIER/CONTRACTOR CONCESSION NO.:			DATE:		
Required concession applicable to: (Item/Material/Equipment/Area)					
Description of Concession — Revised Requirements:					
Justification:					
(NOTE: This concession will be rejected if the following information is not provided):					
(i) VALUE OF BENEFIT TO CLIENT	(ii) AGREE TO AN EXTENSION OF THE WARRANTY	YES	NO	(iii) ANY IMPACT ON SCHEDULE?	NO
S/R	IF "YES" WHAT PERIOD?			CF "YES" \ WHAT PERIOD?	
References:					
Original reference:					
Requirements	Rev.:	Specification	N	Rev.:	
Drawing No.:	Rev.:	Specification	O.	Rev.:	
Drawing No.:	Rev.:	Specification	:	Rev.:	
Attached documentation:			N		
applicable					
Requested by:					
(Supplier/Contractor) Name:			Signature		
			: _____ D		
Note: Sections B to F on Page 2					

<b><i>Request for Concession No:</i></b>			
<b>B. SITE ADMINISTERED CONTRACT?</b>	Yes <input type="checkbox"/>	Nn <input type="checkbox"/>	Go to "D"
Possible QC implications:			
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Recommendations</div> <div style="border: 1px solid black; padding: 5px;">Recommendations</div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"></div> <div style="border: 1px solid black; padding: 5px;"></div>	Rejected	
Site Construction Manager:		Signature:	Date:
Site Engineer:		Signature:	Date:
<b>C. RECOMMENDATION BY CONTRACT ADMINISTRATOR: Name:</b>			
Signature		Date:	
<b>D. RECOMMENDATION BY ENGINEERING:</b>			
<input type="checkbox"/> Recommended	<input type="checkbox"/> Rejected	<input type="checkbox"/> Conditional, with the following recommendations:	
Package Engineer:		Signature:	Date:
Lead Discipline Engineer:		Signature:	Date:
Engineering Manager:		Signature:	Date:
Comments:			
<b>E. PROJECT MANAGER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			
Name:		Signature	Date:
<b>F. EMPLOYER DISPOSITION:</b> Accepted <input type="checkbox"/> Rejected <input type="checkbox"/>			