



Description of the Works: Design, Manufacture, Supply and Install a Chemical Injection Skid System

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CHEMICAL INJECTION SKID SYSTEM**FOR DESIGNING, MANUFACTURING, SUPPLYING AND INSTALLING A CHEMICAL INJECTION SKID SYSTEM**



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ANNEXURES

- Annexure A - Sites Information
- Annexure B - SHE File Review- Guidelines
- Annexure C - Baseline Risk Assessment
- Annexure D - Induction Indemnity Form
- Annexure E - Transnet Contractor Management Procedure
- Annexure F - Operational Safe Work Permit Form
- Annexure G - Personal Protective Equipment Standard

ABBREVIATIONS

The following abbreviations are used in this document:

- AIA - Approved Inspection Authority
- AIM - Additive Injection Module
- cFAT - Client Factory Acceptance Test
- ac - Alternating Current

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CE	-	Compensation Event
COC	-	Certificate of Compliance
DAC	-	Divisional Acquisition Council
DB	-	Distribution Board
dc	-	Direct Current
EA	-	Employer's Agent
EDS	-	Engineering Design Specification
EW	-	Early Warning
Exd	-	Flameproof
FAT	-	Factory Acceptance Test
FEED	-	Front End Engineering & Design
FDS	-	Functional Design Specification
GA	-	General Arrangement
GCIA	-	Transnet Group Capital Investment Assurance
HAZOP	-	Hazard and Operability Study/Assessment
HSE	-	Health, Safety, Environmental
Hz	-	Frequency
I/O	-	Input – Output
IOP	-	Input Output Panels
iFAT	-	Internal Factory Acceptance Test
IFCR	-	Issued for Client Review
JMP	-	Junction Jameson Park
JB	-	Junction Box
KDL	-	Junction Kendal
LPM	-	Litres per Minute
LV	-	Low Voltage
MCC	-	Master Control Centre
MC&I	-	Metering, Control and Instrumentation
MDS	-	Metering Database System
MIS	-	Management Information System
mL	-	Millilitres
NKP	-	National Key Point
OHS ACT	-	Occupational Health and Safety Act

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O&M	-	Operating and Maintenance
ph	-	Phase
P&ID	-	Piping and Instrument Diagram
PLC	-	Programmable Logic Controller
PEP	-	Project Execution Plan
PLP	-	Project Lifecycle Process
POC	-	Proof of Concept
PPM	-	Procurement Procedures Manual
ppm	-	parts per million
PrEng	-	Professional Engineer
PrTech	-	Professional Engineering Technologist
PRV	-	Pressure Regulating Valve
PSR	-	Project Status Report
SEC	-	Secunda
QC	-	Quality Control
QCP	-	Quality Control Plan
QMP	-	Quality Management Plan
QMS	-	Quality Management System
RFC	-	Ready for Commissioning
RFO	-	Ready for Operation
RFI	-	Request for Information
RFP	-	Request for Proposal
RFQ	-	Request for Quotation
RACI	-	Responsible/Accountable/Consult/Inform
SANS	-	South African National Standards
SAT	-	Site Acceptance Test
SCADA	-	Supervisory Control & Data Acquisition
SOC	-	State Owned Company
TEAR	-	Tender Evaluation and Recommendation
TPL	-	Transnet Pipelines
UPS	-	Uninterruptible Power Supply
URS	-	User Requirement Specification
WAO	-	Waltloo

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WIR - Witbank

WBS - Work Breakdown Structure

1. DESCRIPTION OF THE WORKS

1.1 Project Objectives

The purpose of the project is to design, manufacture, supply and install a chemical injection skid system.

1.2 Introduction

The *Employer*, Transnet Pipelines (TPL) intends to install a chemical injection skid system at identified TPL depots. The table below provides the *Works* Information for the designing, manufacturing, supplying and installing the injection skid system with the following considerations;

Table 1: The injection skid dosing flowrate per depot

Section	Description	Line size (inch)	Flowrate (LPM)	Dosing rate (mL/min)	No. of injection skids	Design pressure kPag	Max. operating pressure kPag
1	Secunda intake	16	12 500	125	1	10 000	9 100
		12	7 500	75	1	10 000	9 000
		20	10 500	105	1	10 000	9 000
2	Jameson Park intake	18	10 500	105	1	10 020	9 000
3	Jameson Park delivery	16	12 500	125	1	10 000	9 000
4	Waltloo delivery	16	12 500	125	1	10 000	8 000
5	Witbank delivery	12	7 500	75	1	10 000	8 000

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1.3 Detail description of the scope of work

The *Works* entail the design, manufacture, supply, testing, installation, commissioning and handover of a chemical injection skid system. The scope of the *Works* extends to successful delivery and execution of the following;

1.3.1 Development of detailed design for the injection skids

The works include the following:

- a) Design of seven injection skids with associated equipment;
 - Injection skid base framework;
 - 7 x 1000L metallic tanks fitted with isolation valves and dry break couplers;
 - Flow meter designed for flow rate and pressure required;
 - 2 x Additive Injection Modules for each skid with dosing rate accuracy of 95% as minimum;
 - 2 x suitably sized dosing pumps including Exd rated motors for each injection skid.
 - The injection skid system shall have redundancy;
 - PRVs at the pump outlet to relieve excess pressure;
 - Fixed piping, tubing, strainers and valves connecting all associated equipment;
 - Communication equipment to interface with SCADA;
 - Flame proof enclosure
 - Consumables required to test and commission the skid system;
- b) Develop and provide skid designs and arrangement drawings;
- c) Provide onsite viewing of similar type designed skids currently in operation or provide 3D model viewing of the designed skids to be installed;
- d) Inject the chemical to high pressure manifold. The operating and design pressures are given in Table 1;
- e) Design the skid electrical wiring diagrams;
- f) Design the skid interconnecting hoses;
- g) Conduct skid controller configuration and AIM calibration;
- h) Skid control system that maintains a 10 ppm dosing concentration. The controller shall start and stop automatically upon mainline flow detection and/or digital input.
- i) Skids shall have the capability to adapt to varying flowrates;

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- j) All equipment shall be suitably rated as specified in the Hazardous Area Classification and local IA certification as required in South Africa;
- k) All piping, isolation valves and check valves between skid and TPL manifold injection point to be procured and installed as part of the *Works*;
- l) Commissioning spares list as well as maintenance spares lists required for future maintenance and breakdowns to be included;

The *Contractor* shall ensure that all detailed designs and drawings of the skids are submitted to the *Employer* for acceptance prior to procurement, manufacture, supply and commencement of any work. The *Employer* will require a minimum of seven (7) working days to review and respond to all documentation, designs and drawings.

1.3.2 Manufacture and supply of the injection skids

The contractor shall manufacture and supply the seven injection skids with associated equipment and system according to the approved designs. The contractor shall conduct FAT (Factory Acceptance Testing) of the injection skids.

1.3.3 Site installation works

This includes all civil, mechanical, electrical, control and instrumentation site works according to TPL specifications and standards;

1.3.3.1 Mechanical

The works include the following:

1.3.3.1.1 Piping and equipment

- a) Dismantling, removal and temporary on-site storage of existing piping and equipment to allow for connection of new piping and equipment to tie-in the injection skid system;
- b) Supply, fabricate, test, inspect and install new piping, fittings and equipment to connect to the injection skids;
- c) The *Contractor* allows for detailing and preparation of shop fabrication drawings with clear indication of site welds required;

- d) Shop fabrication, supply and delivery to site, off-loading, installation, inspection, testing and corrosion protection of all piping systems in accordance with the latest, approved Piping and Instrumentation Diagrams (P&IDs);
- e) The *Contractor* allows for all bolts, gaskets and miscellaneous fasteners and jointing materials;
- f) All pipe, fittings, flanges, valves and miscellaneous items procured meets the requirements of the relevant specifications listed under Applicable Codes and Standards;
- g) All new required interface equipment shall be procured by the *Contractor*.
- h) The *Contractor* is responsible for the compilation and issue of all quality control plans, welding procedures and method statements for acceptance;
- i) The *Contractor* shall install, test and commission the supplied equipment;

1.3.3.1.2 Welding

Welding shall comply with API 1104. The *Contractor* submits welding procedures, specifications, welders' qualifications and weld repair procedures for approval by the *Employer* prior to commencement of welding. A quality control plan is established to ensure that welding is performed within the parameters of the approved welding procedures. Welding electrodes are used and stored in accordance with the manufacturer's specifications and recommendations.

1.3.3.1.3 Flanged Joints

The *Contractor* ensures that all flanged joints are correctly assembled in accordance with the requirements of ASME PCC-1 to ensure tightness and that there are no leaks at the joints when the system is pressurized.

1.3.3.2 Civil

The works include the following:

- a) Build a plinth to carry the pump and skid
- b) Fabricate, supply and install permanent pipe supports
- c) Demolish existing bund wall (where applicable);
- d) Supply plinth, bund wall and floor construction material (concrete, rebars, formwork, rammer, expansion joint sealant);

- e) Build the bund wall and floor extension to match the existing wall and floor design, this includes the preparation of the in-situ material (rip and re-compact to 93% Mod AASHTO);
- f) Modify the oily water system to cater for extended bund area (where applicable).
- g) Cast, cure and test concrete cubes

1.3.3.2.1 Scaffold Access Platforms

The *Contractor* allows for the design, supply and erection of temporary scaffold access staircases and platforms. All scaffold is supplied, erected and maintained in accordance with SANS 10085 Part 1, the Occupational Health and Safety Act as well as the relevant health and safety specifications forming part of the *works*.

The *Contractor* allows for the following activities to be completed at the facility locations:

- Removal of all site establishment equipment, materials and utility connections
- Removal of all scaffold access platforms

1.3.3.3 Electrical

The electrical works include the provision of the following:

- a) Acknowledgment of the Hazardous Area Classification related to the areas of work and ensuring that all electrical equipment used in the implementation of this project are rated as per the relevant Hazardous area classification e.g. flameproof and Exd;
- b) Provision of all electrical Pr.Eng or Pr.Tech approved updated drawings (single line diagrams, hookup and general arrangement drawings) affected by the project.
- c) Develop and provide a 3 phase 400VAC appropriately sized power supply for the injection skids entailing the following:
 - An appropriate sized blue stripe, 4 core, armoured cable. This cable must be in compliance with TPL PL727 specification. This cable is to be fed from a dedicated circuit breaker from the substation LV panel.
 - The Contractor shall ensure that a single core, 16mm² green and yellow earth cable is used for all earthing and bonding and that all earthing and bonding must be in compliance with TPL PL727 specification.

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- The Contractor shall ensure that all other material used except for cables and angle Iron must be Ex rated such as glands, terminals and M20 plugs. The glands must also be CCG armortex.
 - The Contractor shall ensure that all fittings, fasteners and any other metal parts shall be hot dipped galvanised as per SANS 121 standard.
 - The Contractor shall ensure that all circuits and equipment are labelled according to TPL PL727 specification.
 - The Contractor shall ensure that all cables are labelled at both ends according to TPL PL727 specification. (laser engraved 316 stainless steel tags, tied with stainless steel cable ties).
 - The Contractor shall have in his employment a trade tested Electrician who shall be responsible for all work done onsite.
 - The Contractor shall have in his employment a registered Master Installation Electrician who shall be responsible for general supervision, testing and issuing electrical Certificate of Compliance (COC) for all work done onsite. Tests must also include SANS 60079-17 table 1 & table 2.
- d) The Contractor is to ensure that all electrical cables are routed on the existing electrical cables trenches that have electrical sleeves, on existing electrical power cable racking. If no power cable racking is available in the manifold, suitable angle Iron which is to be supplied by the contractor and approved by TPL shall be used. That all racking must be in compliance with TPL PL727 specification. Where it is not possible to use the existing electrical cable trenches and there is a need for new trenching and excavations. The Contractor shall ensure that all excavations and trenching are done and completed by hand (machines not permitted). Allowance is to be included to detect services along a route prior to trenching. Any existing services damaged during excavation will be repaired at the Contractor's cost. The Contractor shall ensure that all excavations and trenching across road crossings/hardened surfaces are re-instated such that the previous finish and all layer works are matched. The excavations and trenching are to comply with the TPL PL727 specification.
- e) The Contractor shall ensure that all site hot work is conducted in the presence of fire standby.
- f) The Contractor shall ensure that all metal items other than stainless steel or other non-ferrous metals are hot dipped galvanised. The Contractor shall ensure that precaution is

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taken against electrolytic corrosion where different metals are used on items of equipment.

- g) The Contractor shall be responsible for issuing detailed COC's on completion of the work. (Classification certificates are required for all equipment installed in hazardous areas).

All material and equipment are earthed to the nearest functional earth point per site. Electrical equipment to be used within the Hazardous Area shall be connected to earth internally through the earth conductor of the power supply cable as well as externally through an equipotential earth bonding connection.

The Contractor shall provide the necessary electrical equipment, plant and material required for the execution of the Works. The requirements covers the detail installation design, equipment, manufacturing, machinery, labour, fabrication, factory acceptance testing and inspection, quality assurance, transport to site, delivery, off-loading, installation, site acceptance testing and commissioning. .

1.3.3.4 Metering, Control, and Instrumentation

The works for the control system and instrumentation include the provision of the following:

- a) The installation and interface of the Skid injection instruments with already installed pipeline meters to maintain a constant injection rate of 10ppm as per Table 1.
- b) The Skid shall be able to maintain the injection rate during line start-up, fluctuations of flow rate during the running of the pipeline and stop of the pipeline.
- c) The Skid shall also be able to handle all TPL operations during the locking and unlocking of the product;
- d) The Skid control system shall allow an end user to manually enter the flow rate of the chemical dosage by increasing or decreasing the dosage
- e) The skid control system shall be interfaced with the already installed SCADA (Supervisory Control and Data Acquisition) control system (PCS 7, LSX, and OASyS Pipeline Control/Management System) to maintain the correct flow rates of the chemical dosage when marking and unmarking the product as per Employer operations requirements;
- f) The Skid Control System shall be compatible with the Simatic S7 & M580 Schiender PLC, for the frequency output signals required to the skid injector;

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- g) Supply and install Multi-function Control Panels:
 - PID Controller for Flow Control;
 - PID Controller for Level Control;
- h) Supply and install all related field instrumentation to the system;
- i) Update the relevant pump stations and MCC SCADA graphics to include a control and view for the injection skid;
- j) Update P&IDs, loop diagrams, data sheets, functional design specification and engineering design specification;
- k) The *Contractor* supplies and installs suitable instrumentation cables as per the requirement for each electronic instrument to be installed and wired to the relevant control panels;
 - All cables shall conform to *Employer* Specification and Standards listed under section 10 (Quality Management)
 - All cables shall be labelled with tags according to *Employer* approved tag naming standards listed under section 10 (Quality Management)
 - The Skid shall have its termination junction box for cabling
- l) Configure instrumentations for measuring, controlling, and monitoring the injection skid;
- m) Conduct FAT (Factory Acceptance Testing) and SAT (Site Acceptance Test) of the control system including the injection skid to Employer standards
- n) Conduct and provide support of testing and commissioning of the skids;
- o) *Employer* shall provide natives of all documentation and drawings required to be updated;
- p) All drawings shall conform to requirements listed under section 10 (Quality Management).

The Contractor shall provide the necessary control and instrumentation equipment, plant and material required for the execution of the *Works*. The requirements cover the detail installation design, equipment, manufacturing, machinery, labour, fabrication, factory acceptance testing and inspection, quality assurance, transport to site, delivery, off-loading, installation, site acceptance testing, and commissioning. The supply, design, manufacture, testing, and delivery of the equipment and material comply with the specifications provided in this *Works* Information.

1.3.4 Site Testing, Certification and Commissioning

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- a) It shall be the responsibility of the Contractor to compile a complete Site Acceptance Test and Commissioning Schedule to be used for site acceptance testing, certification and commissioning of the all equipment and systems to be installed by the Contractor.
- b) The Site Acceptance Test and Commissioning schedule shall be comprehensive and shall cover all aspects of the equipment to be tested and commissioned and shall be submitted to the Project Manager for acceptance, prior to commencement of Site Acceptance Testing (SAT).
- c) The Contractor shall be responsible for providing all test equipment and facilities required for the period of the SAT such as the Project Manager may deem necessary, and to produce a report of the tests completed.
- d) The Project Manager reserves the right to add or delete any item or test on the Site Acceptance Test and Commissioning schedule in order to verify that the installed equipment complies with the applicable specification.
- e) The contractor shall commission the chemical injection skid system at each depot.

1.3.5 Supply of all required documentation and data packs

The *Contractor* allows for the compilation of data packs as required and the presentation to the *Employer* for signing of Mechanical Completion (MC), Instrumentation Completion (IC), Civil Completion (CC) and Electrical Completion (EC). Data Packs to include material certificates, as-built drawings, test certificates, Certificates of Conformity, operational and installation manuals.

1.4 Experience Requirements

The following roles have been identified as key resources for the project. The *Contractor* shall submit CVs, detailing experience and qualifications of each resource as listed below.

1.4.1 Project Manager

The Project Manager shall have as a minimum;

- 5 years of industrial project coordination experience;
- Experience in managing engineering multi-disciplinary projects;
- Experience in large project execution (>5 Rmillion);
- BEng/BSc or BTech/qualification in engineering

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1.4.2 Engineering manager and project engineer

The project engineer and engineering manager shall have as a minimum;

- 5 years of petroleum pipeline experience in a project development environment;
- Experience working with multiple discipline projects;
- BEng/BSc or BTech/Diploma in engineering;
- ECSA registration as PrEng or PrTech;

1.4.3 Safety Officer

The Safety Officer shall have as a minimum;

- 5 years of experience in a project development environment for the oil industry;
- Registered with SACPCMP as CHSO

1.4.4 Substitution of Key Personnel

No substitution of any “Key Personnel/Employees” essential for the successful completion of the project will be allowed by Transnet Pipelines in terms of this Contract, without prior written approval. Before any “Key Personnel/Employee” substitution can take place, the *Contractor* shall submit a written request to the *Employers Agent* and this substitution request shall include the following:

- A request in writing for a No Cost Contract Modification;
- Detailed written justification;
- The qualifications and experience of any proposed “Key Personnel/Employee” replacement;
- A written statement assuring the *Employer* that the project scope of work will not be affected by this substitution;

1.5 Sufficiency of Tender

The *Contractor acknowledges* by signing this contract that he has a clear understanding of the project scope of work, and further acknowledges that the Offer made by the *Contractor based* on the terms and conditions of this service contract, provide adequate professional fees and installation for the *Contractor* to provide the required services. No increase in fees to the *Contractor* will be allowed unless there is material change made to the project scope of work and the scope of work change is accepted and approved in writing by the *Employer’s Agent*. The Contractor shall immediately inform

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the *Employer's Agent* in writing whenever it is anticipated that the authorised contract value may be in jeopardy of being exceeded.

1.6 Transnet Pipelines Project Execution Strategy

All of the capital projects in the Transnet Capital Projects portfolio are managed according to the Project Lifecycle Process (PLP) methodology. The PLP is the methodology for the effective management of Capital Investment projects within Transnet to ensure that all projects are managed with a consistent approach.

The PLP is broken up into 4 sequential phases namely;

- Concept Phase: Completed for this project;
- Pre-feasibility Phase: Completed for this project;
- Feasibility and Bankable Feasibility Phases: A POC is completed for this project and therefore the solution to be implemented is known. Tie-in designs and implementation are required for this project.
- Execution Phase: This implementation phase includes all developing designs for tie-in, installation of the skids and related equipment, testing and commissioning of all required systems for the project.
- Close-out Phase: This is the final phase and includes commercial, financial and technical closure of the project.

The scope of the *Contractor* is to design, manufacture, install and commission the chemical injection skid system. The *Contractor* shall participate in and manage the Project Lifecycle Processes as identified in Bankable Feasibility, Execution and Close-out Phases and any Works arising therefrom.

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1.7 General Definitions Associated with the Works

Definitions of activities related to the works are provided below.

Table 2: Definitions

Term	Definition
<i>Employer</i>	Transnet Pipelines, or their nominated representative.
<i>Contractor</i>	The <i>Contractor</i> executes the <i>Works</i> involving the design, development, engineering, supply, fabrication, testing, installation, commissioning and handover of the chemical injection skid system at Witbank, Waltloo, Secunda and Jameson Park.
PLP: Feasibility Phase	This project lifecycle phase develops and defines the selected project option from Pre-Feasibility and provides a control basis for implementation of the project. Typically, comprehensive basic engineering is required in order to produce a project definition package whereby a high level of confidence is attained regarding project implementation in terms of safety, quality, cost and schedule.
PLP: Bankable Feasibility Phase	This project lifecycle phase is the phase during which engineering is completed to the level required to execute the Works.
PLP: Execution & Closeout Phase	This project lifecycle phase is the phase during which the Works are executed and closed out. In the context of this RFP, the activity includes scope of work detailed in this Works Information document; including but not limited to software engineering and development, manufacture, installation and construction, commissioning, handover and close-out.
System	Hardware, software and firmware comprising a defined scope of operation and functional objective.

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3. PRE-ENTRY SURVEY

3.1 Security Screening

The contractor will be expected to go through security screening prior to be given access to Transnet premises. The following documents are needed from the company;

1. Company registration number.
2. CIPC registration.
3. Company TAX clearance TCS Pin.
4. Copies of ID of directors.
5. Fingerprints of directors (Use SAP 91) to be found at local SAPS. Original fingerprints must be submitted.
6. Copies of ID of employees who will be working on site.
7. Fingerprint of employees who will be working on site (Use SAP 91) to be found at local SAPS. Original fingerprints must be submitted.
8. The contractor must make a copy of the extra departmental documents and take it to SAPS which prevents them from paying.

Note: Please take note that SSA takes 2 weeks for screening

3.2 Condition of manifold

The *Contractor* completes a pre-entry survey at all facilities where *works* are to be performed. The pre-entry survey is completed in the presence of the *Employer* and is limited to the locations within the facilities where *Works* are to be performed. The condition of the existing equipment and infrastructure in these areas is recorded. A report with photographic evidence is presented to the *Employer* for acceptance. The accepted pre-entry survey report will be used to determine the condition of equipment prior to the works commencing, for any reason where such information is required.

4. GENERAL CONSTRAINTS

4.1 Operational Depots/Pump Stations

The *Contractor* takes note that all depots are operational National Key Points.

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4.2 Confidentiality

All information obtained by the *Contractor* in connection with activities under the project is held in confidence and is not to be used by the *Contractor* for any purpose other than authorized by TPL.

4.3 Existing Structures

The *works* are performed in close proximity to the existing operational infrastructure forming part of the facilities as well as other third-party infrastructure. The infrastructure includes amongst others, piping, equipment, tanks, instrumentation, electrical and instrumentation cables and conduits, buildings and civil infrastructure.

The *Contractor* takes care not to damage the existing infrastructure during the execution of the *works*. The *Contractor* repairs any damage to existing infrastructure as soon as possible. Where existing operational TPL equipment is damaged, the equipment is repaired or replaced immediately. The infrastructure is reinstated to a condition similar to that prior to the damage occurring, and in accordance with the requirements and specifications prepared by the *Contractor* and approved by the *Employer*.

4.4 Consideration of Others

The sites are accessible to the *Employer* and Others to perform works as required. The *Contractor* ensures that access is available to the *Employer* and others when so required. The *Contractor* ensures that he does not limit access to the existing operational equipment during the execution of the *works*.

Equipment to which access needs to be maintained will be identified by the *Employer* during establishment. The *Contractor* considers and plans for operational access to this equipment during the execution of the works. These measures are included in the *Contractor's* method statement which is to be prepared for the execution of the works.

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4.5 Site Cleanliness

The *Contractor* is responsible for the housekeeping, including waste handling and removal, of the sites during the execution of the *works*. The sites are maintained in a manner compliant to the requirements of the Health and Safety specifications.

Plant, equipment, materials and waste are stored in a position that does not impact the daily operations of facilities. The *Contractor* obtains prior approval from the *Employer* for the placement and positioning of all plant, equipment, materials and waste.

4.6 Deleterious and Hazardous Materials for Own Use

Fuel storage and handling required for the execution of the works will be in accordance with the legal requirements. It is the duty of the *Contractor* to ensure that his fuel storage equipment complies with legal requirements. Gas storage and installations will be done in accordance with the legal requirements and applicable standards, including the project Health and Safety requirements.

The storage of fuel within the perimeter of the site establishment area is limited to the volume required for the operation of the *Contractor's* site establishment area and the completion of the works only. The *Contractor* obtains prior approval, from the *Employer*, for the storage of any fuel sources within the perimeter of the facilities.

4.7 Hazardous Area Classification

The site areas are classified in accordance with the applicable SANS codes and standards (SANS 10089/10108) and the requirements of API RP505. The hazardous area classification is based on Petrol rather than Diesel due to the properties of Petrol. The fuel properties are listed in Table 3.

Table 3: Fuel properties

FLAMMABLE MATERIAL CHARACTERISTICS								
	Name	Ignition Temperature	Flammable Limits		Group and Temp. Class	Boiling Point	Flash Point	Specific Gravity
			Upper	Lower				
1	Diesel	225 °C	6% Vol	1.3% Vol	IIA T3	160°C	>55°C	0.82 – 0.86
2	Petrol	250 °C	7.1% Vol	1.3% Vol	IIA T3	38 °C	-20°C	0.71 – 0.78

The material safety data sheets are available if required. The mixtures of flammable vapour in accordance with SANS 10108 are:

- Group IIA

The maximum allowable surface temperature will depend on the auto ignition temperature of the fuel vapour which is >200°C. The temperature class is:

- T3

For Petrol vapour the site shall be classified for Zone 1 and Zone 2 as indicated on the Hazardous Area Classification data sheet attached in the Annexures. All equipment to be installed in these areas shall be duly classified and certified for use in such areas:

- a) Explosion Proof Ex-d IIA T3
- b) Intrinsic Safe Ex-i IIA T3
- c) Increased Safety Ex-e IIA T3
- d) Non-sparking Ex-n IIA T3

The site is to be considered as a hazardous area. Then the *Contractor* ensures that all personnel that work under this Contract, do not:

- a) Use uncertified equipment in the hazardous areas.
- b) Smoke in the hazardous areas.
- c) Carry cell phones into hazardous areas.

Construction work required on site in the hazardous areas will be subject to the issuing of Hot Work Permits by the Employer.

5. FACILITIES

5.1.1 Ablution, Latrine, Eating & Changing Facilities

The *Contractor* will supply a sufficient number of toilet and changing facilities at depots for the *Contractor* to use. The *Contractor* will evaluate the number of employees present at each work area and provide eating facilities or sheltered areas that can be used by his employees during their lunch break. Changing facilities will be required if employees are required to change their clothes in the workplace. The *Contractor* will comply with the legislative requirements with regards to facility management.

5.1.2 Tools and Equipment

The *Contractor* provides all tools and equipment that he deems necessary for the completion of the *works*.

5.1.3 Water Supplies

5.1.3.1 Water Supplies at Depots

The *Employer* supplies potable water at the depots. The contractor collects water at *Employer's* existing offices at each facility as required. The *Contractor* supplies water dispensers at his site facilities and fills the dispensers with water obtained from the *Employer's* existing offices at each facility.

5.1.4 Electrical Power at Depots

The *Employer* makes an existing electrical power supply connection point available to the *Contractor* at all depots for site establishment. Electricity supply connections made available by the *Employer* are located within the perimeter of the existing sites. The electricity supplied through the connection is for temporary area lighting, site establishment operations (*Contractor* and *Employer*) and for the completion of the Works.

Electrical power supplied by the *Contractor* to supplement the power supply provided by the *Employer* if required, is by diesel driven generators only. No petrol driven generators are allowed at any facility. Electrical power supplied by the *Contractor* if required includes the power supply requirements to operate all necessary equipment during the displacement and cleaning operations. The *Contractor* allows for the completion of an electrical connection between the site establishment area and the supply tie-in made available by the *Employer* as well as the *Contractor's* generator facility where applicable. The *Contractor* provides his proposed design for the tie-in as well as supply cabling to the *Employer* for acceptance prior to completing the connection. The *Contractor* allows for the following:

- a) The tie-in to be completed in a manner that will not affect the existing electrical supply to the *Employer's* facilities.
- b) Isolation at the location of the tie-in.

- c) The routing of cabling to be completed in a manner that will ensure the protection thereof from possible damage and wear. Additional protection is provided where required.
- d) All materials provided are fit-for-purpose.

All electrical installations and connections are provided with a certificate of compliance (CoC) in terms of South African legislation. The CoC is provided to the *Employer* for acceptance prior to the use of the equipment and/or facilities associated with the CoC. The electrical supply to the Electrical Main Distribution Panel will be by means of connection to the portable diesel driven generator supplied by the *Contractor and/or Employer* provided electrical power supply connection point.

6. SAFETY, HEALTH AND ENVIROMENTAL REQUIREMENTS

The *Contractor* will conduct his activities in such a manner as not to endanger health and safety of employees or third parties. The *Contractor* will implement and maintain an Occupational Health and Safety Management system in line with the scope of work that will ensure the safety of employees and third parties.

The *Contractor* complies with the South African Occupational Health, Safety and Environmental legislation. The *Contractor* acknowledges that the Construction Regulations issued in terms of the Occupational Health and Safety Act will apply to the scope of the project. The *Contractor* performs the works safely as per the requirements of the Works Information and the Transnet Contractor Management Procedure– attached hereto in the Annexures.

6.1 Legal Requirements

The *Contractor* will comply with the requirements of the South African Occupational Health, Safety and Environmental legislation. The *Contractor* will identify the applicable legislation and have access to such legislation. A project specific legal register will not be required for the project.

6.2 Inspections

The *Contractor* and the *Employer* will perform daily Occupational Health and Safety inspections at the work area of the *Contractor*.

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6.3 Client Requirements

6.3.1 Control of Site Personnel

The *Contractor* is notified that all personnel entering the sites are subject to a breathalyser alcohol test. The *Employer* maintains a zero-tolerance policy in this regard and a personnel member will not be allowed access to any facility following a positive alcohol test result.

6.3.2 Legal Appointments

The *Contractor* will ensure that the legally required appointments in terms of the Occupational Health and Safety Act, and the Construction Regulations are made for all relevant positions.

6.3.3 Risk Management

The *Contractor* accepts the content of the *Employer* baseline risk assessment (attached hereto in the Annexures) that is issued with the works information. The *Contractor* will incorporate the risks into the project risk assessments and will develop additional control/mitigation measures related to such risks. The *Contractor* will have a recognized risk management system in place that will be adjusted according to the scope of work. A process of continuous risk assessment will be implemented by the *Contractor*. Risk assessments may be performed on a format / system chosen by the *Contractor* with the understanding that the system conforms to the minimum industry standard of such risk assessment model. The *Contractor* will conduct a project specific risk assessment that will include all the risks that will form part of the *Contractor* activities.

The *Contractor* will include the subcontractor SHE information in his SHE file, when a subcontractor will be performing work for such *Contractor*.

6.3.4 Project SHE File Approval

The *Contractor* will compile a SHE file in a format prescribed in the *Contractor* SHE File Review-Guidelines attached hereto in the Annexures. The SHE file will be submitted electronically to the *Employer* for evaluation. The *Contractor* SHE file will be approved by the *Employer*. Written confirmation of such approval will be issued to the *Contractor*. Activities, including site establishment, will not commence unless written approval was issued by the *Employer*.

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6.3.5 Project SHE resources

The *Contractor* will appoint a full time Safety Officer for each facility where work will be performed. No activities will be performed unless the full-time safety officer is available on site.

A safety representative appointed in terms of the Occupational Health and Safety Act will be present at all work areas regardless of the number of employees working on such site.

The *Contractor* will provide competent resources whenever shift work is required. The *Contractor* will not exceed the maximum allowable working hours stipulated in the Basic Conditions of Employment Act.

6.3.6 Access to site

The *Contractor* will allow for time for induction training for each work area as per Induction Indemnity Form document (included hereto in the Annexures). It remains the responsibility of the *Contractor* to arrange and manage the project inductions of the employees.

6.3.7 Permit to work

The *Contractor* will comply with the Transnet permit to work requirements. The *Contractor* will allow for time for permit applications as per the Operational Safe Work Permit Form document (included hereto in the Annexures).

6.3.8 PPE Requirements

The *Contractor* will comply with the minimum PPE requirements as listed in the Personal Protective Equipment Standard document (included hereto in the Annexures). The *Contractor* will identify additional Personal Protective Equipment as control measure and will ensure that such requirements are incorporated into the project SHE management system. PPE may include breathing apparatus or any other equipment that may be necessary to perform the activities safely.

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6.3.9 Hydrocarbon and Gas Testing

The *Contractor* will conduct hydrocarbon and gas testing at all work areas.

6.3.10 Medical Certificate of Fitness

The *Contractor* will ensure that all employees are declared medically fit for work by an Occupational Medical Practitioner. An exit medical examination will not be required.

6.3.11 Reporting of Incidents

The *Contractor* will report all incidents to the *Employer* with immediate effect. The *Employer* will be given the opportunity to attend the incident investigation proceedings.

6.3.12 Reference Documentation

The *Contractor* will comply with the requirements of the following documents that are included in the *Works Information*.

Table 4: Reference documentation

Num	Document
1	Contractor Management Procedure
2	Induction Indemnity Form
3	Operational Safe Work Permit Form
4	SHE File Review- Guidelines
5	Personal Protective Equipment Standard
6	Baseline Risk Assessment

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7. MANAGEMENT OF THE WORKS

7.1 Communication

All communication initiatives shall be approved by the *Employer*. The Contractor shall abide to all communication requirements imposed upon them by Transnet Pipelines. Any communication received, produced or issued by the *Contractor* shall first be reviewed by Transnet Pipelines before being transferred onto another party. This covers but is not limited to; engagement with market place, advertisements, communications with Transnet Clients, industry forums, magazines, websites or blogs.

The engagement, communication (timing and context) templates and formats shall be agreed and signed off by the *Employer's Agent* before any deliverables are started. Time spent correcting incomplete and incorrect documentation will be for the Contractor `s own cost. All communications direct, indirect, 3rd party or other shall be captured in the relevant document control system agreed upon start of the project.

7.2 Documentation Control

The *Contractor's* documentation shall comply with the *Employer's* standards and requirements. The *Employer* will issue all relevant documentation to the *Contractor*, however the control, maintenance and handling of these documents will be the *Contractor's* sole responsibility, at the *Contractor's* expense, and managed with a suitable document control system. At agreed periods throughout the development of the project, the *Contractor* will be required to transfer/migrate documentation to the TPL document management system. The format of these documents shall be agreed up front and shall be fully usable and in native & PDF format. All the relevant links and supporting documents shall be provided.

All documents issued to 3rd Party Contractors and to the *Employer* must be submitted as per the TPL's Document policy. Any contractual communication between Transnet Pipelines and the *Contractors* shall be issued by the Contractor on behalf of Transnet Pipelines. These communications shall be similarly recorded through the Contractor's Document Control System.

Documents issued by the Contractor as part of a review cycle shall have clear evidence of any comments received on the document and the disposition thereof in a comments resolution table.

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The *Contractor* shall ensure that all documentation issued to the *Employer* and 3rd party Contractor is of good quality, and terms used and layouts of documentation shall be kept consistent throughout the project.

7.3 Meeting Requirements

- The *Contractor* attends fortnightly early warning and compensation event meetings.
- The *Contractor* attends weekly safety meetings on Site. This meeting is attended by the *Contractor's* safety officer and the *Employer*.
- The *Contractor* attends weekly technical meetings on Site as required by *Employer*. Site meetings may involve others so that the progress of the work on Site and other work may be reviewed. Such meetings are held weekly.
- The *Contractor* shall attend any other project related meetings as required by the *Employer*.

The *Contractor's* representatives attending the meetings shall have the required delegated authority to make decisions at the meetings regarding all aspects of the project, including planning, change management, health and safety and commercial issues.

7.4 Reporting Requirements

Apart from daily construction diaries to be kept, the *Contractor* submits the following reports to the *Employer*.

7.4.1 Monthly Reports

The *Contractor* prepares and submits a monthly progress report to the *Employer* at the end of each month. The report covers the previous month cycle. The first report covers the period up to the end of the first month following contract award. This report is submitted with the revised programme.

The report is structured with the following headings:

- a) Executive summary;
- b) Charts and detailed descriptions of the status of each section of the works identified in the accepted programme;
- c) Comparisons of actual and planned progress per section;

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- d) Main activities for the past period;
- e) Previous activities not met;
- f) Main activities for next period;
- g) Areas of concern;
- h) Areas of opportunity;
- i) Procurement actions completed and future actions;
- j) Schedule performance index & cost performance index using earned value principles
- k) A summary register of all early warnings raised and status thereof;
- l) Concession Status;
- m) Non-Conformance Reports Status;
- n) Security report;
- o) Updated risk register;
- p) Such other matters and information (including schedules and charts) as the *Employer* may require to be included in the progress report from time to time.

7.4.2 SHE Reporting

The *Contractor* submits monthly SHE reports.

7.4.3 Daily Reports

Following mobilization on the site, the *Contractor* submits to the *Employer* daily reports. Daily activity reports for each section summarizing the main activities to be undertaken each day, noting any special activities that require witnessing, together with full particulars and details of obstructions, modified or additional work, incidents, health and safety matters and the number of the *Contractor's* and each Subcontractor's personnel employed in each of the several portions of the work in progress.

7.4.4 Additional Reports

The *Employer* may request the *Contractor* to provide additional reports when in his opinion they are warranted to monitor the progress of the *works*.

8. MANAGEMENT OF SUB-CONTRACTORS

The *Contractor* ensures that work performed by a Subcontractor appointed by the *Contractor* complies with the requirements of the *Employer* with special reference to Occupational Health and Safety requirements. The *Contractor* will approve the Subcontractors' SHE file according to the same requirements of the *Employer*. The *Contractor* will notify the *Employer* whenever a new Subcontractor has been appointed and will submit the SHE plan approval document to the *Employer* before work commences.

8.1 Acceptance Procedures

The *Contract* includes a list of Subcontractors proposed by the *Contractor* at award. The *Contractor* follows the guidelines of the *Contract* if he wishes to replace a previously proposed Subcontractor.

9. PROGRAMME

9.1 Programme Requirements

The programme complies with the following requirements:

- a) The programme is prepared in Microsoft Projects or similar approved by the *Employer*. The programme is submitted for acceptance in Microsoft Project or similar approved as well as in Adobe Acrobat (pdf) format;
- b) Actual start and completion dates of all work packages are to be reported;
- c) The *Contractor* provides a programme, which includes all activities and actions, including review and acceptance periods which form part of the works as a whole;
- d) The programme must take cognisance of the legal requirements relating to working hours.

9.2 Work of The *Employer* and Others

During the execution of the *works* the *Contractor* will be required to work with the *Employer* and Others. This will include but is not limited to:

- a) The *Employer* will perform operational activities and maintenance at the facilities.
- b) The *Employer* may collect material and equipment identified for reclamation from the facilities during the *works*.
- c) Surveys completed by the *Employer* and others relating to future operations and designs.
- d) Sharing the working area with others

9.3 Co-ordination

The *Contractor* shall coordinate work with the *Employer* and Others to minimize time loss. The *Contractor* takes specific note of the *Employer's* operational requirements and ensures that the execution of *works* does not impact on these operations. The *Contractor* plans and coordinates the sharing of the work area with the *Employer* and his inspectors, TPL operations as well as others and coordinates all the construction activities.

9.4 Revised Programme

The *Contractor* clearly indicates on each revision of the programme the proposed changes in terms of the previous accepted revision.

9.5 Methodology Statement

The *Contractor* shall compile a Work Method Statement for all activities. All task risk assessments, including mitigation and emergency measures, will be accompanied by a Work Method Statement describing in sufficient detail how the specific activity is to be performed in a logical and sequential manner.

The *Contractor* may execute the Contract in accordance with his own standard work execution plans and procedures to the extent that they do not conflict with the provisions of this Contract. The *Contractor* submits execution plans and procedures to the *Employer* for acceptance before work may commence. Without limitation, method statements show how the technical and safety requirements of this Contract will be satisfied by the methods to be adopted.

The *Contractor* submits details of the resources, principal equipment, arrangements and methods which the *Contractor* proposes to adopt for providing the *works*, for acceptance by the *Employer*, prior to the *works* commencing.

No alteration to these resources, arrangements and/or methods is made unless the *Employer* accepts the revised method statement.

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10. QUALITY MANAGEMENT

10.1 Quality Management System

The *Contractor* shall have a well-organized quality control and assurance system based on ISO 9000 Series (or equivalent acceptable to the *Employer*) to assure that the *works*, including subcontracted items and services, comply with this Works Information. The *Contractor* incorporates and adheres to the requirements, methodology and standards as detailed in this Works Information.

10.2 Quality Statement

Within the time stated in the Contract Data, the *Contractor* submits his complete quality control and assurance system (with all quality control and assurance procedures) for review and acceptance by the *Employer*. The procedures include pro-forma checklists for all requirements of the *Contractor's* quality control and assurance program and those called for in the Works Information.

Acceptance by the *Employer* of the *Contractor's* quality control and assurance system, or of those of his Subcontractors will not relieve the *Contractor* of his obligation to provide the *works* which meet the requirements of the Contract.

10.3 Quality Documentation Templates

Before any work commences, detailed Quality Control Plans (QCP) are developed by the *Contractor*. The Quality Control Plans covers all portions of the *works*. All inspection sheets and check lists forming part of or referenced in the Quality Control Plans are also developed. A copy of the developed documentation is presented to the *Employer* for acceptance prior to the *works* commencing.

Workmanship is subject to acceptance by the *Employer* and subjected to tests as specified in the QCP or as requested by the *Employer*. The *Contractor* submits any part of the *works* for acceptance when ready.

The following minimum required hold points are indicated on the *Contractor's* Quality Control Plans:

- a) Acceptance of safety documentation and risk assessments;

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- b) Acceptance of quality documentation and method statements;
- c) Acceptance of site establishment layout;
- d) Completion of pre-entry survey;
- e) Facility site preparations, specific for each facility;
- f) Welders qualifications;
- g) Weld repair procedure;
- h) Approved in-service welding method statements
- i) Complete Data packs;
- j) Review Data packs and Handover;
- k) Review of *Contractor's* design for electrical reticulation for site establishment;
- l) Review of Instrumentation and equipment data sheets to evaluate suitable equipment selection;
- m) Review of Quality Control Packs for all electrical and instrumentation equipment;
- n) Review of Quality Control Packs for civil engineering works;
- o) Contractor Internal Testing of all new functional equipment and panels;
- p) Factory Inspection Testing attended by the *Employer*;
- q) Site Acceptance Testing of equipment delivered and installed on site.

10.4 Notice of Completion Templates

The *Contractor* allows for the development of notice of completion documents associated with each discipline associated with the works. Notice of completion documents records acceptance of the completion of the works and makes allowance for the recording of any punch items preventing the completion of the works. As a minimum the following notice of completion documents are developed:

- a) Practical Completion – for the completion of civil activities.
- b) Mechanical Completion – for the completion of mechanical and piping activities.
- c) Electrical Completion – for the completion of electrical activities.
- d) Instrumentation Completion – for the completion of instrumentation/control systems activities.

The punch lists supporting the notice of completion documents allow for the categorization of defects identified as part of the inspection of the works. The following minimum categories are allowed for:

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- a) Category 1 – Records defects associated with integrity related concerns which will prevent the system from being considered complete.
- b) Category 2 – Records defects associated with safety related concerns which will prevent the system from being considered ready for operation.
- c) Category 3 – Records defects associated with cosmetic concerns which will prevent the responsibility for the system being transferred to the Employer.

Notice of completion documents will only be certified once no Category 1 or 2 defects are recorded during the inspection of the system being considered for operation.

Final completion of the works will only be certified once all Category 1, 2 and 3 defects associated with the system considered for completion is certified. Responsibility for the system and associated works is transferred to the *Employer* upon certification of final completion and the issuing of a completion certificate by the *Employer*. All Notice of Completion documents are signed by the *Contractor* and the *Employer*.

10.5 Applicable Codes and Standards

The *works* shall be designed, fabricated, erected and installed as a minimum, in strict compliance with the following codes, standard and specifications:

Table 5: Applicable Codes and Standards

Code/ Standard	Revision	Description
OHS Act	Act 85 / 1993	Occupational Health and Safety Act and Regulations as amended
SANS 1200	Latest Edition	Standardized specifications for civil engineering construction
SANS 2001	Latest Edition	Construction works
ISO 9001	2008	Quality Management
ASME B31.4	2016	Pipeline Transportation for Liquid Hydrocarbons and Slurries
API 1104	2013 21st Edition, Includes Errata 1 (2013), Errata	Welding of Pipelines and Related Facilities

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Code/ Standard	Revision	Description
	2 (2014), Errata 3 (2014), Errata 4 (2015), Errata 5 (2018) and Addendum 1 (2014), Addendum 2 (2016)	
ASME B36.10M	2018	Welded and Seamless Wrought Steel Pipe
ASME B16.5	2017	Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard
ASTM A106	2014	Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
ASTM A105	2019	Standard Specification for Carbon Steel Forgings for Piping Application
ASTM A193	2018	Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194	2017	Standard Specification For Carbon Steel, Alloy Steel, And Stainless Steel Nuts For Bolts For High Pressure Or High Temperature Service, Or Both
SANS 1431	2018	Weldable structural steels
ASME B16.20	2019	Metallic Gaskets for Pipe Flanges
API RP 520 Part 1	2014	Sizing, Selection, and Installation of Pressure-relieving Devices, Part I - Sizing and Selection, Ninth Edition
API 610	2021	Centrifugal Pumps for Petroleum, Petrochemical, and Natural Gas Industries
SANS 10142 Part 1	2017	The wiring of Premises Part 1: Low-voltage installations
SANS 10086	2014	Installation, inspection and maintenance of equipment used in explosive atmospheres
SANS 1019	2014	Standard Voltages, Currents and Insulation levels for Electricity Supply
SANS 10089 Part 1	2008	The petroleum industry Part 1: Storage and distribution of petroleum products in above-ground bulk installations
SANS 10089 Part 2	2017	The petroleum industry – Part 2: Electrical and other installations in the distribution and marketing sector
SANS 10199	2016	Design and installation of earth electrodes
SANS 10292	2013	Earthing of Low Voltage Distribution System
SANS 60079 (IEC 60079)	2014 (2013)	Explosive atmospheres

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Code/ Standard	Revision	Description
SANS 10108	2017	Classification of hazardous locations and selection of electrical apparatus use in such location
SANS ARP 0108	2007	Recommended practice: Regulatory requirements for explosion protected apparatus
SANS 62305	2011	Protection against lightning
SANS 60934	2013	Circuit breakers for equipment (CBE)
SANS 60439 Part 1	2004	Low voltage switchgear and control gear assemblies Part 1: Type-tested and partially type tested assemblies
SANS 60439 Part 3	2006	Low voltage switchgear and control gear assemblies Part 3: Particular requirements for assemblies for construction sites (ACS)
SANS 60439 Part 4	2005	Low voltage switchgear and control gear assemblies Part 4: Particular requirements for low-voltage switchgear and control gear assemblies intended to be installed in places where unskilled persons have access for their use – Distribution boards
SANS 60947:1-7	2017 (2016)	Low voltage switchgear and control gear – Parts 1 to 7
SANS 60529	2013	Degrees of protection provided by enclosures (IP Code).
SANS 61643	2012	Surge protection device connected to low voltage power distribution systems

10.6 Employer's Specifications

The *works* shall comply with the *Employer's* specifications listed below. The *Contractor's* work shall be executed and implemented in strict accordance with the *Employer's* Specifications. Deviations from the requirements of the following specifications are subject to approval of concessions by the *Employer*.

Table 6: Employer's Specifications

Title	Doc No.
Drawing Standard Document	PL100
Plant & Equipment Tag Numbering Standards	PL101
Equipment, Instrument & Electrical Symbology Standards	PL102
General Drawing Standards	PL103
Specification for Low Voltage Distribution Boards and Switchgear	PL631

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Title	Doc No.
Electrical Design Criteria	PL666
Measurement and Payment	PL667
Specification for Cable, Racking, Trenching & Earthing Reticulation	PL727
Specification for Equipment Cabinets to House Electronic Equipment	PL711
General welding specification	PL804
Automation standard	PL723

10.7 Tests and Inspections

During construction, the *Contractor* will conduct all tests and inspections as detailed in the *Contractor's* accepted QCP and as stipulated in the relevant codes and standards.

10.7.1 Management of Tests and Inspections

The *Contractor* is responsible to manage and perform all tests required as part of the Quality Control System. All tests are performed in accordance with the guidelines, methods and procedures detailed in the relevant codes and standards.

10.8 Documentation Submission

The *Contractor's* designs, drawings and documentation are submitted to the *Employer* for acceptance. The *Contractor* submits an electronic PDF copies to the *Employer* for acceptance. As part of his review, the *Contractor* will distribute the designs, drawings and documentation to the *Employer* for comment. Any comments by the *Employer* are clarified or incorporated into the *Contractor's* design, drawings and documentation and resubmitted for acceptance prior to implementation.

10.9 Approved Inspection Authority

The *Employer* appoints the Approved Inspection Authority (AIA).

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11. SECURITY

The *Employer* provides security inside the boundaries of the depots. The security provided is limited to the protection of personnel, equipment, plant and materials within the existing perimeter of the depots. The *Contractor* is responsible to ensure that equipment and materials are locked up where practicable.

12. FIRE PROTECTION

The *Contractor* provides a Fire Standby or Fire Watch at the facilities during the execution of the works as detailed herein.

12.1 Fire Standby

The *Contractor* provides a Fire Standby during the execution of hot works

Hot Works Definition: Hot work is a task/work process that can be a source of ignition when flammable material is present or can be a fire hazard regardless of the presence of flammable material in the workplace. These can be tasks involving welding, grinding, friction and any work where heat or sparks is generated. Hot work includes the following:

- a) All hot work where fuel/product is exposed to the environment.
- b) All hot work in the existing TPL bund area on a live plant/manifold.
- c) All hot work by their nature, deemed to be risk activity by TPL representative, Depot Manager or the risk assessment.
- d) All lifting work in the live manifold/plant.
- e) In a case where the permit issuer is uncertain whether a Fire Standby or Fire Watch is required, and work performed is hot by nature, a Fire Standby shall be specified.

The fire Standby shall be a professional fire fighter with a Fire Fighter 1 and 2 professional qualification.

12.2 Fire Watch

The *Contractor* provides a Fire Watch during the execution of hot works where the presence of flammable substance is absent and the risk of fire is low in terms of the risk assessment. The

Contractor conducts gas testing to confirm that flammable substances are not present prior to the execution of the works. There will be no flammable material where the works will be executed. Examples where a Fire Watch is required includes the following:

- a) Building scaffold.
- b) Drilling/Jack hammering concrete
- c) Grinding and welding at the laydown area.
- d) Welding work

The Fire Watch shall have basic fire training with a safety background as an advantage.

12.3 Precautions

All reasonable precautions to prevent any outbreak of fire shall be taken. The grass and debris, which can cause fire must be cleaned and good housekeeping maintained

The *Contractor* provides any additional fire protection he deems necessary for the protection of his equipment used during the execution of displacement and cleaning activities.

13. REMOVAL OF SITE ESTABLISHMENT

De-establishment of the established site facilities is performed upon completion of the works at each facility. As part of de-establishment, the *Contractor* allows for:

- a) Removal of all infrastructure placed on site as part of establishment;
- b) Removal of all utility connections, where applicable, and reinstatement of the tie-in location to its original condition;
- c) Removal of all waste from site to a permitted disposal facility;
- d) The *Contractor* repairs any defects or damage caused by the *Contractor* to the equipment, materials and instruments and any property of the *Employer*.

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14. COMPLETION

14.1 Completion Definition

Completion is achieved when the *Contractor* has completed all works as specified in this *Works Information* and all defects are rectified.

- a) All works contained in the *Works Information* have been completed according to the specifications and codes.
- b) All required Practical Completion (PC), Mechanical Completion (MC), Instrumentation Completion (IC), Civil Completion (CC) and Electrical Completion (EC) have been achieved and signed off by the *Contractor* and *Employer*. All punch items identified have been completed and signed off.
- c) All 'End of Job' documents, to be supplied by the *Contractor*, have been accepted by the *Employer* and handed over.
- d) All site establishment areas have been de-established and equipment removed from site.
- e) All reinstatement activities have been completed as detailed herein.

14.2 Correcting Defects

Defect corrections will be done under the *Employer's* permit conditions at operation facilities. It is expected of the *Contractor* to fully comply with the *Employer's* safety and permit requirements.