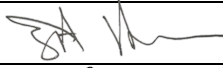


TE-IMS-PEMM P&E KDS-SPC-191 Specification

Description: (Specification for design, manufacturing, installation, testing and commissioning of new automated extraction, filtration (Pollution Control), stacks and emission monitoring system for the Foundry Business at Koedoespoort)				
Compiled By:	F.A. Herselman		Date:	27/06/2022
Recommended By:	K. Phalime		Date:	27 June 2022
Risk:	C. Manana		Date:	06-07-2022
Approved by:	M. Makgothokga	PP 	Date:	05 July 2022
Local Business:	O.M. Maart		Date:	06.07.2022
Local Business:	Foundry Business.			
Location:	KOEDOESPOORT			

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1. Scope of Work

This specification requirement covers all the requirements that will be needed to inform the supplier/vendor/manufacture to carry out what is expected from him/her: The contract will be awarded as a turnkey project and the contractor will be responsible for all the work specified.

This specification states the minimum requirements relating to the work and in no way absolves the contractor from responsibility for sound engineering.

2. Site Inspection

Tenderers must visit the site to familiarize themselves with all the aspects involved relating to the project that must be done. The site inspection certificate will be counter-signed by the Contract Manager on day of the site clarification. The tender documents must only be submitted if the site inspection certificate has been signed.

3. Information Required

Tenderers shall confirm that the items that they are offering comply at a standard not less than the minimum required requirement asked for in the specifications. Tenderers must comply with these specifications, but alternative offers may, in addition, also be submitted. Such alternative offers must be fully motivated and substantiated.

4. Specific Requirements:

- Occupational Health & Safety Act (Act 85 of 1993) and its Regulations, as amended
- Adhere to the Construction Regulation
- Compensation of Occupational Injuries and Diseases Act (Act 130 of 1993) as amended
- Transnet Contractor Management Procedure (TRN-IMS-GRP-PROC 014)
- Transnet Engineering IMS Compliance Policy Statement

- The contractor shall undergo Safety, Health and Environmental **(SHE) Induction**, and be issued with Induction certificate and valid permits authorising him/her to enter Transnet premises for the duration of the contract.
- The contractor is required to produce an approved **Compliance File or SHE File** and **Site Instruction Book** on site at all **times**.
- All measurements and amounts must be stipulated in quote.
- Contractor's name board will always be visible.
- A supervisor will always be on site.
- Comply with Transnet Engineering Waste Management Standard.
- The correct PPE must always be worn. (Harnesses ropes, etc.)
- During and on completion of the project, there will be SHE inspections and Risk assessments done on the site that the supplier/vendor is working on, which will be reported to the project manager.
- Failure to comply will result in a stop certificate being issued and the supplier will be required to leave the site until the situation is rectified.
- All scaffolding used to be SANS approved.
- All employees who will be working at height to have medical fitness certificate and proof of competency training thereof.
- Valid letter of good standing with Compensation commissioner.

5. Technical Requirements:

All equipment and installation whether detailed in this specification or not shall comply with the requirements of the Occupational Health and Safety Act 85 of 1993 as amended. Sudden power losses will not have an adverse effect on equipment and shall not unduly delay return to operation after power is restored.

6. Codes of Practice, Regulations & Standards:

The tenderer shall specify which statutory, or industry rules will be applied for the equipment to be working successfully and safely and shall indicate the designed life span.

7. Loads and Duty Cycles:

The tenderer shall describe all duty cycles that the equipment would be required to perform. The duration and the number of cycles per day/week/month/year must also be stipulated.

8. Dimensional Parameters:

The tenderer shall describe the major physical dimensions that are required for ease of operation and installation.

9. Operational Parameters:

9.1 Environment:

The equipment will be required to operating in the climatic conditions of Pretoria:

Foundry with ambient temperature of 43°C:

Heavy polluted dusty environment.

9.2 Safety Features:

The tenderer shall indicate all the safety features installed on the equipment and describe fully its operational standard/s.

9.3 Special Requirements:

The tenderer shall indicate any tooling, lifting attachments etc. which is not considered to be standard accessories for the equipment at hand and will be required to operate the equipment effectively and safely.

9.4 Controls:

The tenderer shall indicate the type of controls and layout to operate the equipment. This must also include backup and emergency systems.

9.5 Markings:

The tenderer shall conspicuously mark the equipment with following info as a minimum: all PPE to be worn, technical data, dates of manufacture, manufacturer's details etc.

10. Power Supply & Services:

The tenderer shall indicate the electrical power supply and air (if applicable) required operating the equipment.

11. Foundation:

The tenderer shall indicate the foundation design required for the equipment.

12. Documentation:

All design documentation with calculations regarding extraction and monitoring system, electrical caballing. This shall include the proposed area where unit shall be located, the operation of the unit, power consumption and the efficiency regarding the unit.

13. Testing:

The tenderer shall indicate the performance/s standard which the equipment will be subjected to.

14. Training:

The tenderer shall supply the high-level training scope for the operators, millwrights, electricians and electronics technician. The supplier shall indicate if the training is accredited and furnish with such accreditation number or reference quote and the body that is issuing such accreditation.

15. Specific Requirements:

ITEM NO.	REQUIREMENTS	DETAILS OF OFFER Comply (Yes) / Do not comply (No)
	Specification for design, manufacturing, installation, testing and commissioning of new automated extraction, filtration (Pollution Control), stacks and emission monitoring system for the Foundry Business at Koedoespoort.	
1.	Scope of work:	
1.1	Assessment of the operations taking place at the Foundry Business Koedoespoort.	
1.2	Design of automated extraction, filtration (Pollution Control), stacks and monitoring system at Foundry Business at the two induction furnaces. (Filtration “Pollution control” shall only be for Particulate matter and monitoring system shall be for Particulate matter, Sulphur dioxide and Oxides of nitrogen).	
1.3	Manufacturing of automated extraction, filtration (Pollution Control), stacks and monitoring system for the two induction furnaces.	
1.4	Installation of automated extraction, filtration (Pollution Control), stacks and monitoring system for the two induction furnaces.	
1.5	Documentation regarding newly installed automated extraction, filtration (Pollution Control), stacks and monitoring system at foundry.	
1.6	Training on newly installed automated extraction, filtration (Pollution Control), stacks and monitoring system.	
1.7	Testing and commissioning of newly installed automated extraction, filtration (Pollution Control), stacks and monitoring system.	
1.8	Maintenance on newly installed automated extraction, filtration (Pollution Control), stacks and monitoring system.	

ITEM NO.	REQUIREMENTS	DETAILS OF OFFER Comply (Yes) / Do not comply (No)
2.	Assessment of area and operations:	
2.1	Bidders to assess all operations for the smelting and pouring process at the two induction furnaces at the foundry. AIR QUALITY ACT, 2004 (ACT NO.39 of 2004). Part 3 Category 4: Metallurgical Industry (Subcategory 4.7: Electric Arc Furnaces (Primary and Secondary)).	
2.2	Bidders to also assess the area around the foundry business to identify the best possible area where the unit shall be installed.	
3.	Design of new automated extraction, filtration and monitoring system:	
3.1	Design a fume extraction system with a stack, The system shall be designed by a ECSA professional Mechanical Engineer/Technologist/Technician with ventilation and extraction experience.	
3.2	This emission monitoring system if it's made in South Africa, we require an ECSA professional registration from an Electronic Engineer/Technologists. Note: If the monitoring system is designed and manufactured from overseas, the contractor should stipulate the standard used for the contractors and the electronic professional engineer in South Africa will have to sign it off.	
3.3	The system design shall consist of the following:	
3.3.1	Automated Extraction system.	
3.3.2	Filtration system.	
3.3.3	Stack (with 2 orifices, one will be for an automated monitoring system and the other will be for cases where manual monitoring shall be done)	
3.3.4	Automated monitoring system (should be positioned before exit of the stack)	

ITEM NO.	REQUIREMENTS	DETAILS OF OFFER Comply (Yes) / Do not comply (No)
3.4	Bidders to design a cost-effective automated fume extraction, filtration system with an emission monitoring device for the process that are performed at the foundry that shall meet the minimum requirements in according with the AIR QUALITY ACT, 2004 (ACT NO.39 of 2004). Measurements shall comply with Part 2: General Compliance time frames section 10 (Existing plant must comply with minimum emission standards for new plant as contained in Part 3 by 01 April 2020, unless where specified. The emissions shall be as mentioned in Part 3 Category 4: Metallurgical Industry (Subcategory 4.10: Foundries).	
3.5	The system designed by the bidder should direct emissions from the furnaces to the outside of the foundry into the atmosphere through emission stacks.	
3.6	The temperatures at furnaces are anything between 0°C and 1720°C. Bidders to ensure that all material used for the manufacturing of the extraction and filtration system can handle these temperatures.	
3.7	The design system shall include all major components and their operation purpose.	
3.8	Full details regarding the efficiency of the designed system shall be indicated.	
3.9	Full details regarding where and how air quality and temperature shall be measured in accordance with AIR QUALITY ACT, 2004 (ACT NO.39 OF 2004) Part 2. Emission measurement. Section 5, 6 and 7, as well as 17, 18 and 19 of GN 893 of 22 November 2013. Particulate matter: Sulphur dioxide: Oxides of nitrogen: Temperature: Monitoring shall be remotely. (Monitor shall be placed in the office inside the foundry business at operators' desk). The system shall capture data indicating the date and time when furnaces are operational and capture all data for the duration of	

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	the process.	
3.10	The design shall include the process on how the air quality shall meet the maximum allowed at the desired temperatures. Temperature of < 200°C shall be achieved at the emission point into the atmosphere.	
3.11	The automated extraction, filtration and monitoring system shall be 98% available.	
3.12	The automated extraction, filtration and monitoring system shall be fully interlinked with the induction furnaces. (The automated extraction, filtration and monitoring system must only be operational if the furnaces are in operation and no additional starting or shutting down operations need to take place for the system to operate).	
3.13	Bidders to also install a sampling port on the stack that could be used by external personnel that will be conducting random test to ensure the system meet minimum requirements.	
3.14	Bidders also to indicate the minimum lifespan of the proposed system that will be installed.	
3.15	Full details about the maintenance intervals and cost implications.	
3.16	Bidders also to indicate if all spares, equipment will be readily available in the Republic of South Africa.	
3.17	Full details regarding power and air requirements shall be indicated on the design.	
3.19	The design shall be done in conjunction with Transnet Engineers and once Transnet are convinced that the system will meet the minimum requirements the design shall be countersigned and used for manufacturing and installation of the accepted system. This shall in no way absolve the contractor from professional responsibility. Designer's engineers shall be used for monitoring the manufacturing, installation and commissioning of the system in conjunction with Transnet.	

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4.	Manufacturing of automated extraction, filtration and monitoring system:	
4.1	The designer's engineers shall be responsible to ensure that the manufacturing of all components meet the required design specifications and quality records of all material used during the manufacturing process, welding process and NDT testing shall be recorded and handed over to Transnet.	
5.	Methods for Sampling and Analysis:	
5.1	The methods for sampling and analysis shall be according with ANNEXURE A of the AIR QUALITY ACT, 2004 (ACT NO.39 OF 2004).	
5.1.1	ISO Standards:	
5.1.1.1	ISO 7935: Stationary source emissions – Determination of the mass concentration of sulphur dioxide – Performance characteristics of automated measuring method.	
5.1.1.2	ISO 10155: Stationary source emissions – Automated monitoring of mass concentration of particles – Performance characteristics, test methods and specifications.	
5.1.1.3	ISO 10849: Stationary source emissions – Determination of the mass concentration of nitrogen oxides – Performance characteristics of automated measuring systems.	
5.1.2	EPA METHODS:	
5.1.2.1	Method 5 – Particulate Matter (PM).	
5.1.2.2	Method 6 – Sulphur Dioxide (SO ₂)	
5.1.2.3	Method 7 – Nitrogen Oxide (NO ₂)	
5.1.3	British Standards:	
5.1.3.1	BS 3405:1983 Method for measurement of particulate emission including grit and dust (simplified method).	
5.1.3.2	BS EN 14181:2004 Stationary source emissions. Quality assurance of automated measuring systems.	

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5.1.3.3	BS EN 15259: Air quality. Measurement of stationary source emissions. Measurement strategy, measurement planning, reporting and design of measurement sites.	
5.1.3.4	BS EN 15267-1: Air quality. Certification of automated measuring systems. General principles.	
5.1.3.5	BS EN 15267-2: Air quality. Certification of automated measuring systems. Initial assessment of the AMS manufacturer's quality management system and post certification surveillance for the manufacturing process.	
5.1.3.6	BS EN 15267-3: Air quality. Certification of automated measuring systems. Performance criteria and test procedures for automated measuring systems for monitoring emissions from stationary sources.	
6.	Installation of the automated extraction, filtration and monitoring system:	
6.1	Bidders shall be fully responsible for the installation of the automated extraction, filtration (Pollution control) and monitoring system.	
6.2	All equipment supplied for monitoring shall be calibrated and calibration certificates shall be handed over on day of commissioning.	
6.3	Bidders to take note of the following:	
6.3.1	No welding or drilling shall be allowed to any structural steel on the existing foundry building structure. Supporting brackets shall be bolted to the existing structure.	
6.4	Foundations:	
6.4.1	Any foundations needed for the installation shall be designed and the design shall be approved by Transnet before any work shall commence. The design shall indicate the force required to properly secure any structure or equipment on the foundation.	

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6.4.2	The design of any foundation shall indicate the following:	
6.4.2.1	Depth of excavation and size of foundation.	
6.4.2.2	Ground compaction of soil.	
6.4.2.3	Reinforcing size and the bending schedule.	
6.4.2.4	Concrete strength used for foundation.	
6.5	Electrical requirements:	
6.5.1	All electrical installations shall only be done by accredited electrical contractor. Certification regarding their accreditation shall be required.	
6.5.2	All cables used for the installation shall be steel wired armoured cables. When cables are selection for the installation the selection of each cable shall be accommodated by full calculations of how the cable size have been arrived to and this must be verified and approved by Transnet before the installation could start.	
6.5.3	All cables shall be neatly installed on cable ladders/trays or in trunking.	
6.5.4	No cables shall be laid directly on the ground.	
6.5.5	No cable shall course an obstruction to personnel.	
6.5.6	All cables buried shall be buried at a depth of 500mm.	
6.5.7	All caballing shall be labelled on both ends.	
6.5.8	Control panel and wiring shall be done according to the electrical schematics. All components shall be identified by labels and wiring shall be labelled accordingly to wiring diagram.	
7.	Documentation:	
7.1	Documentation at tender stage:	
7.1.1	Design Engineer registration and credentials with ECSA. (Mechanical engineer).	

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7.1.2	Electrical contractor's registration with Department of Labour as Installation electrician.	
7.1.3	Electrical contractor's accredited person's installation electrician registration.	
7.2	Documentation before any work can commence:	
7.2.1	Design drawings for the automated extraction, filtration (Pollution control) and monitoring system with calculations.	
7.2.2	Foundation design drawings with calculations. (Soil compaction, bending schedule for reinforcing, concrete strength, etc.).	
7.2.3	Electrical schematics, single line diagram and the selection of cable sizes, cable lengths, way of installation with detailed calculations from designer or electrical contractor.	
7.3	Documentation while work in progress:	
7.3.1	Compaction results of soil for foundation before concrete could be casted.	
7.3.2	Batch concrete test results for concrete poured from accredited SANAS laboratory.	
7.4	Documents on the day of testing and commissioning:	
7.4.1	4 sets off hard copies each with a disc containing documentation in PDF Format.	
7.4.1.1	Operating Manual.	
7.4.1.2	Maintenance Manual.	
7.4.1.3	Electrical Schematics.	
7.4.1.4	Mechanical Drawings.	

ITEM NO.	REQUIREMENTS	DETAILS OF OFFER Comply (Yes) / Do not comply (No)
7.4.1.5	Parts List.	
7.4.1.6	Hard Copy of PLC Program.	
7.4.1.7	Hard copy of Parameters of all systems including PLC, CNC and Drives.	
7.4.1.8	Setup guides for Software on Computer.	
7.4.1.9	Passwords for all software.	
7.4.1.10	Backup of PLC Program.	
7.4.1.11	Install files for software on Computer.	
7.4.2	Design drawings of extraction and monitoring system.	
7.4.3	Foundation design drawings.	
7.4.4	Electrical schematics, single line diagram, and cable selection calculations.	
7.4.5	COC for electrical installation.	
7.4.6	Calibration certificates for test equipment used for testing of electrical installation.	
7.4.7	Monitoring devise calibration certification.	
8.	Training.	
8.1	The supplier shall offer formal training to Operators and maintenance artisans according to the training manuals of the equipment supplied. The supplier shall indicate if this training is accredited by SAQA. (2 x Operators, 2 x mill wrights, 2 x electricians).	
9.	Maintenance.	
9.1	The supplier shall indicate the maintenance requirements and frequency of the equipment.	

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9.2	Maintenance/servicing of the equipment during guarantee period shall be included in the price.	
10.	Guarantee:	
10.1	The supplier shall guarantee for a period 36 months after successful commissioning and excepted by Transnet that the new extraction, filtration and monitoring system that all components, plant equipment and material are new and fit for the specific purpose which they are purchased, and free from any defects in design, workmanship and material, and are in strict accordance with the contract, unless otherwise agree in writing.	
10.2	The supplier shall agree to replace at his/her cost any defective items discovered within the guaranteed period.	
10.3	The supplier shall clearly stipulate the nature of the guarantee and how long it will take their maintenance staff to be on site. Transnet Engineering requires a response time of not more than 24 hours. (Response time shall be the time from receiving a call until the time the company technicians arrive on site to attend to situation).	
10.4	Should the supplier fail, when called upon, to make good or remedy a defect (under guarantee or declared inherent) within a reasonable time, Transnet Engineering may affect the repair and thereafter recover from the supplier all cost and expenses associated with the supplier.	
11.	General:	
11.1	All material used shall be SANS approved, A-grade first class.	
11.2	All work delivered shall be of a high standard.	
11.3	All rubble shall be removed on a daily base.	

ITEM NO.	REQUIREMENTS	DETAILS OF OFFER Comply (Yes) / Do not comply (No)
12.	Price Schedule:	
12.1	Bidders to give a full price breakdown for the individual areas identifying all equipment that shall be supplied and work that they will perform.	
13.	Testing and Commissioning:	
13.1	The tenderer shall indicate the performance/s standard which the equipment will be subjected to.	
13.2	It shall be required that the service provider shall be responsible for a separate (actual) test at the test port from an independent test authority to proof that the readings received from his monitoring system correspond to the test results of the independent test authority. This shall be done on the day of commissioning in the presence of Transnet project team.	
13.3	Commissioning and testing of the newly installed extraction, filtration and monitoring system shall be done by the service provider and a commissioning certificate shall be issued and be accepted by Transnet Engineering.	
13.4	The service provider shall be fully responsible for any damage caused to all supplied equipment and to Transnet Engineering's assets during the installation, testing and commissioning. The service provider shall conduct a risk assessment as to identify anything that might hinder the installation of the equipment.	
13.5	As this project is "Turn-Key" the successful tenderer is responsible for the repair, supply, testing and commissioning of the equipment. The complete project team, Risk, Local Business and PEMM responsible persons will participate in final testing and commissioning.	

16. Painting:

The supplier shall indicate the code of practice to which painting, and surface preparation will conform to.

17. Quality Control:

The contractor shall provide a quality control plan with the tender indicating how quality will be assured.

18. Installation and Commissioning:

A detailed program (project-plan/Gantt-chart) shall be submitted with the tender, indicating the main activities and periods necessary up to handover. The bidder shall submit with their tender a detail erection and installation procedure.

The contractor shall be fully responsible for any damage caused to all supplied equipment and to Transnet Engineering's assets during the installation, testing and commissioning. The supplier shall conduct a risk assessment as to identify anything that might hinder the installation of the equipment.

19. After Sales Support:

Tenderers shall state whether all essential renewable parts for the equipment will be readily available in the Republic of South Africa.

The tenderer shall guarantee the supply of spares for a minimum of 10-years after commissioning.

Tenderers shall state what after-sales service can be offered.