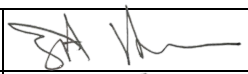
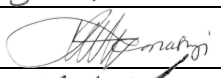
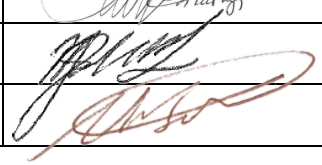
TE-IMS-PEMM P&E KDS-SPC-305 Specification

Description: (Specification for design, manufacturing, installation, testing and commissioning of new HVAC system and the removing of the existing system in Building E49 for the Power Electronic Business Koedoespoort)				
Compiled By:	F.A. Herselman		Date:	31/03/2022
Recommended By:	C. Ramasunzi		Date:	31/03/2022
Business Approval:	M. Slabbert		Date:	07/4/2022
Approved by:	M. Makgothokga		Date:	06-May-2022
Local Business:	Power Electronics			
Location:	Building E49 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:

This specification states the minimum requirements relating to the work and in no way absolves the contractor from responsibility for sound engineering practice. Any omissions or sub-standard requirements of this specification must be brought to the attention of Transnet Engineering KOEDOESPOORT at tender stage and optional prices for addressing such omissions must be provided.

The contractor shall supply all the labour, tools, material, equipment, consumables, facilities, testing and supervision required for the supply of the specified equipment at site during erection, pre-commissioning and commissioning activities.

2. Site Inspection

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

3. Information Required

Tenders shall be in duplicate and will not be considered if full particulars of all relevant equipment and works requested are not submitted at the tender stage, to ensure an objective assessment of the offer can be made. 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. 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.

5. 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.

6. Operational Parameters:

6.1 Environment:

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

7. Testing:

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

8. Specific Requirements:

ITEM NO.	REQUIREMENTS	DETAILS OF OFFER Comply (Yes) / Do not comply (No)
	Specification for design, manufacturing, installation, testing and commissioning of new HVAC system and the removing of the existing system in building E49 for the Power Electronic Business Koedoespoort.	
1.	**Scope of work:**	
1.1	Remove the existing air-conditioner system with ducting inside the building.	
1.2	Lock louvers in closed position and seal roof.	

ITEM NO.	REQUIREMENTS	DETAILS OF OFFER Comply (Yes) / Do not comply (No)
1.3	Remove all window air-conditioning units in test and assembly area in building.	
1.4	Repair window frames and fit new glass in open spaces.	
1.5	Replace damaged broken windowpanes.	
1.6	Painting of window frames at building.	
1.7	Design new HVAC with fresh air and humidifier system for test and assemble area.	
1.8	Install HVAC system in building.	
1.9	Cast foundations for HVAC system.	
1.10	Supply and install power for newly designed HVAC system.	
1.11	Documentation for newly designed system and electrical COC.	
1.12	Testing and commissioning of newly installed HVAC system.	
2.	**Removing of the existing air-conditioning system:**	
2.1	All existing units shall be removed from the old steam pipe inside the building.	
2.2	All ducting on the old system shall be removed from the building.	
2.3	The old control panels and electrical caballing shall be removed and isolated from the distribution board.	
2.4	Bidders to take note that that all metal material shall be handed over to the maintenance department and no metal material shall be removed from Transnet premises.	

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3.	**Locking of louvers and roof to be sealed:**	
3.1	Bidders to take note that there are roof louvers installed to the existing air-conditioning system. Once this system is removed the roof louvers must be properly locked in the closed position.	
3.2	Bidder to ensure that the roof is properly sealed where any ducting is removed. No roof leaks shall be permitted after completion of task at hand.	
3.3	It is also required that suppliers shall ensure that all electrical pipes, cables, etc. where they pass through the external walls to the adjacent areas be properly sealed with isolating material to ensure no heat could enter this area.	
4.	**Old Window air-conditioning units:**	
4.1	Remove the 3 x window air-conditioning units on the northern side of the building.	
4.2	Remove the 5 x window air-conditioning units on the southern side of the building.	
4.3	All steel frames and sheeting shall be neatly removed by means of grinding when removing these frames and sheeting from the window frames.	
4.4	Bidders to take utmost care not to damage any windowpanes during this process.	
5.	**Repair window frames:**	
5.1	The window frames where the window air-conditioning units have been removed shall be properly repaired.	
5.2	New steel shall be welded in place to ensure that the new glass sections is matching the existing glass panel sizes.	

ITEM NO.	REQUIREMENTS	DETAILS OF OFFER Comply (Yes) / Do not comply (No)
5.3	All welding shall be neatly grinded before any painting shall start on the window frames.	
5.4	Window frames shall be painted.	
6.	**Painting of window frames:**	
6.1	All window frames on the building as a hole shall be prepared for painting.	
6.2	All sections where there was welding, or grinding done shall first be treated against rust and painted one coat red oxide.	
6.3	All window frames shall be painted 2 final coats with high gloss enamel paint the colour white.	
7.	**Windowpanes:**	
7.1	Replace a total of ±10 existing cracked damaged windowpanes.	
7.2	Bidders to make provision for al windowpanes that need to be supplied where the old window air-conditioning units were removed.	
7.3	All windowpanes shall be installed using putty.	
7.4	Puttied areas shall also be painted.	
7.5	All new windowpanes shall be covered with filament. (The new ones where window units were removed and the cracked, damaged windowpanes that needed to be replaced).	
8.	**New HVAC System:**	
8.1	The new HVAC system shall be for the Test and Assembly area only. (This is the area between the automated glass sliding doors).	

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8.2	Bidders to design the unit to comply with the following minimum user requirements:	
8.2.1	Single new unit that can ensure an even temperature with temperature range of between 18°C to 22°C at floor level. (Single point for temperature control).	
8.2.2	The unit shall also be fitted with Humidifier to ensure that a humidity of 60% can be maintained inside the area.	
8.2.3	The unit shall be supplying fresh air to the building fitted with Pre-filters and Hepa filters at the cooled air inlet that will feed the test and assembly areas.	
8.2.4	All ducting sizing, layout with outlet points shall be included in the design.	
8.3	The following heat load must be taken in consideration when designing the new HVAC system for the test and assembly area:	
8.3.1	Maximum of 20 persons in this area at all times.	
8.3.2	No ovens or similar high heat generating equipment.	
8.3.3	Fairly large windows facing north.	
8.3.4	Assembly and test area are separated from the rest of the building by automated glass sliding doors to help maintain even temperature although these doors open on a regular basis.	
8.3.5	No harsh chemicals used in the areas.	
8.3.6	Total area and height of the test and assembly areas.	
9.	**Foundation:**	
9.1	The new HVAC preferred position shall be on the southern side of the building.	

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9.2	Bidders to ensure that if the existing concrete area is not sufficient for the unit that an additional concrete foundation shall be casted for the installation of the unit. (Bidders to make use of the existing concrete and just extend to accommodate the HVAC unit.)	
9.3	The design of the foundation if required shall be done by a professional Civil Engineer.	
9.4	Foundation shall fully comply with SANS 10400-H and earth works shall comply with SANS 2001-BE1.	
10.	**Building walls:**	
10.1	In the areas where the building wall shall be opened for the ducting to get through the bricks shall be neatly cut according to the ducting size.	
10.2	Ducting shall be sealed, and cement shall be neatly plastered around the ducting.	
10.3	Plastering shall fully comply with SANS 2001-EM1.	
10.4	Plastered banding shall be painted one under coat and then 3 final coats wash and wear paint colour white.	
11.	**Electrical Installation:**	
11.1	Bidders shall be responsible for the power supply from the main distribution board to the new HVAC control panel.	
11.2	Overload circuit breaker selected according to the amperage drawn by the newly installed HVAC unit shall be supplied and installed in the distribution board. (Northern side inside the assembly area).	
11.3	Supply cable shall be a 4 core SWA cable with a separate earth conductor. Cable size shall be selected according with SANS 10142 Part 1 latest Edition.	

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11.4	Supply cable shall be installed on cable tray against the wall of the building.	
11.5	Supply cable shall be fitted with the correct size glands and shrouds on both ends.	
11.6	Supply cable shall also be fitted with gland rings on both sides and the gland rings shall be bonded threw to the main earth conductor.	
11.7	Lockable Fused isolator with steel enclosure shall be installed next to the new HVAC unit control panel against the wall.	
11.8	Lockable fused isolator shall be with the following rating: IP 65.	
11.9	Lockable fused isolator shall be able to be locked in the open/Off position with minimum 3 padlocks.	
11.10	Fuses for the lockable fused isolator shall be selected according to the amps drawn by the HVAC unit.	
11.11	All cable entries to the lockable fused isolator shall be bottom entries.	
11.12	Neutral bobbin shall be installed inside the lockable fused isolator for the connection of the neutral wires.	
12.	**Documentation:**	
12.1	**The following documentation is required at tender stage from bidders:**	
12.1.1	Detailed project plan with all activities and time frames.	
12.1.2	Electrical contractor's registration with Department of Labour as Installation electrician.	

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12.2.3	Electrical contractor's accredited person's installation electrician registration. (Wiremen's licence).	
12.1.4	Accredited and registered as Category C; Designer – Commercial Air Conditioner & Refrigeration with SARACCA- SAQCC Gas. (Designer registration).	
12.1.5	Accredited and registered as Category B; Air Conditioning & Refrigeration Practitioner with SARACCA- SAQCC Gas. (Installers registration).	
12.1.6	Civil engineer qualification and registration with ECSA.	
12.2	**The following documentation shall be submitted from winning bidder before any installation starts:**	
12.2.1	Detailed design drawings regarding the ducting required for the installation. This shall include all sizes and type of material used for ducting and the positioning of all inlet and outlet points. Airflow and positioning of units.	
12.2.2	Detailed design calculations indicating how the size of the HVAC unit was selected to comply with the user requirements. (Cooling, fresh air and humidity).	
12.2.3	Detailed design drawings of the foundation requirements for HVAC if required.	
12.2.4	The total amperage drawn by the newly selected HVAC unit.	
12.2.5	The calculation to determine the supply cable size and the length required.	
12.2.6	All the above documents shall be handed over to the plant Engineer Koedoespoort for counter signature before commencing with the installation.	

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12.3	**The following shall be supplied on the day of commissioning:**	
12.3.1	**4 sets off hard copies each with a disc containing documentation in PDF Format.**	
12.3.3.1	Operating Manual.	
12.3.3.2	Maintenance Manual.	
12.3.3.3	Electrical Schematics.	
12.3.3.4	Mechanical Drawings.	
12.3.3.5	Parts List.	
12.3.3.6	Hard Copy of PLC Program.	
12.3.3.7	Hard copy of Parameters of all systems including PLC, CNC and Drives.	
12.3.3.8	Setup guides for Software on Computer.	
12.3.3.9	Passwords for all software.	
12.3.3.10	Backup of PLC Program.	
12.3.3.11	Backup Image for Computer.	
12.3.3.12	Install files for software on Computer.	
12.3.2	All documents required in 12.1.1 to 12.1.6.	
12.3.3	All counter signed design drawings and calculations as requested in 12.2.1 to 12.2.5.	
12.3.4	Certificate of Conformity (CoC) for the HVAC installation.	
12.3.5	Certificate of Compliance (COC) for electrical installation.	

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12.3.6	Calibration certificates for all instruments used for the issue of Electrical COC and used during final commissioning.	
13.	**Training.**	
13.1	The supplier shall conduct a hand-over and familiarization training when delivering the equipment and shall indicate the period required.	
13.2	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 and 4 x Maintenance personnel.) To Max 10 Maintenance personnel	
14.	**Maintenance**	
14.1	The supplier shall indicate the maintenance requirements and frequency of the equipment.	
14.2	Maintenance/servicing of the equipment during guarantee period shall be included in the price.	
15.	**Guarantee:**	
15.1	The supplier shall guarantee for a period 12 months after successful commissioning of the new HVAC fresh air 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.	
15.2	The supplier shall agree to replace at his/her cost any defective items discovered within the guaranteed period.	
15.3	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 no more than 24 hours. (Technicians to be on site).	

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15.4	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.	
16.	**General:**	
16.1	All material used shall be SANS approved, A-grade first class.	
16.2	All work delivered shall be of a high standard.	
16.3	All rubble shall be removed on a daily base.	
17.	**General Safety:**	
17.1	The correct PPE must always be worn. (Safety shoes, hardhat, Harnesses ropes, etc.)	
17.2	People working on heights shall be certified. Certification shall be required.	
17.3	All scaffolding and lifting tackle shall be certified and SANS approved.	
17.4	The service provider is required to produce a Safety, Health and Environmental (SHE) File before any contractor shall be allowed to perform any work on Transnet Premises. These files shall be approved by the safety office of Transnet Engineering.	
17.5	Installers shall fully comply with the latest COVID 19 regulations.	
18.	**Price Schedule:**	
18.1	Bidders to give a full price breakdown for the individual areas identifying all equipment that shall be supplied and work that they will perform.	

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19.	**Handover and Commissioning:**	
19.1	Handover of the newly installed HVAC and electrical installation shall be done by the service provider and a commissioning certificate shall be issued and be accepted by Transnet Engineering.	
19.2	As this project is "Turn-Key" the successful tenderer is responsible for all work needed. The complete project team and PEMM responsible persons will participate in final commissioning and handover.	

9. 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.