REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF PUBLIC WORKS

SPECIFICATION
FOR THE
SUPPLY AND DELIVERY

OF

ONE CONVEYOR TYPE X-RAY INSPECTION UNIT

AND

ONE WALK THROUGH TYPE METAL DETECTOR

AT

.....

PART F

QUANTITY SURVEYORS
Name
Address
Address
Address
Tel:
Fax:
Contact Person:
Cell:

ARCHITECTS
Name
Address
Address
Address
Tel:
Fax:
Contact Person:
Cell:

ELECTRICAL ENGINEERS
Name
Address
Address
Address
Tel:
Fax:
Contact Person:
Cell:

DEPARTMENT OF PUBLIC WORKS

CENTRAL GOVERNMENT OFFICES
MADIBA ROAD
PRETORIA 0002
PRIVATE BAG X 65
PRETORIA 0001

APRIL 2018

TABEL OF CONTENTS

TECHNICAL SPECIFICATION
FOR
X-RAY INSPECTION UNIT

CLAUSE	DESCRIPTION	STATE DETAILS OF OFFER
1.1	**GENERAL**	
1.1.1	A licence for the X-ray machine, issued in terms of the Hazardous Substances Act (Act 15 of 1973), must be submitted with the tender, failing which the tender will not be considered. Plus the ID No's and SANS BIN No. of the service technicians registered to carry out the servicing of the X-ray machines in accordance with the requirements of the SANS.	_____
		_____
	Name and tel. No. of the tenderer's contact person to make arrangements with: Name: _____ Tel. No. _____	
1.1.2	The X-ray inspection unit shall complete with:	
	- Dual Energy Detector system (Multi Energy Imaging)	_____
	- Colour monitor (remotely operated)	_____
	- Conveyor belt	_____
	- Screening for full profile of inspection tunnel	_____
1.2	**GENERAL SPECIFICATION**	
1.2.1	**Construction Details**	
1.2.1.1	The unit must incorporate a facility to be controlled either from the right or the left-hand side.	_____
1.2.1.2	In addition a facility must be incorporated so that, the operating keyboard and monitor can be operated remotely, at least 5m from the unit.	_____
1.2.1.3	Maximum height including the tunnel shall not exceed 1400mm from the floor level.	_____
1.2.1.4	The unit must be quiet when in operation.	_____
1.2.1.5	X-ray high voltage generator, shall be rated at 160kV and operate at 140kV	_____
1.2.1.6	Ambient conditions, under which the unit must operate: -0°C to 40°C	_____
	-relative humidity 95%, non-condensing	_____
1.2.1.7	Control elements (pushbuttons, switches, etc.) are to be of sturdy design, selected for severe operating conditions.	_____
1.2.1.8	The unit must be of steel base construction on roller castors and not exceeding 700kg in total weight.	_____

1.2.1.9 Discharge rollers to be included with the unit. The discharge roller platform shall be long enough to prevent articles being X-rayed from falling off before it is recovered by the owner. _____

1.2.1.10 The conveyor belt must be designed for 24 hour, heavy-duty operation. _____

1.2.1.11 The unit shall not be longer than 900mm wide and 2600mm in overall length, including the conveyor belt platform. _____

1.2.2 **Power ratings**

1.2.2.1 The unit has to operate from 230V ±5%, 50 Hz, single phase power supply. _____

1.2.2.2 The maximum running current shall be less than 5A. _____

1.2.2.3 A suitable power point will be provided on the site by others. _____

1.2.3 **Image presentation**

1.2.3.1 Objects of the following dimensions must be able to be passed through the tunnel without any obstruction:

- Height: at least 400mm _____
- Width: at least 600mm _____
- Length: unlimited _____

Monitor display shall cover not less than 500mm of the object length. _____

Full scan volume must be seen on the screen, without any corner cut-off. This is a firm requirement. _____

1.2.3.2 Imaging scale of all objects should be constant with the minimum distortion. _____

1.2.3.3 A zoom facility is essential. The optimum requirement is for the push-button selection of at least 9, independent zoom sectors. The selected sector must be identified by light frame before zoom is activated. _____

1.2.3.4 A colour monitor (non-interlaced), screen size of at least 34cm, is required. Parallel operation of additional monitors, without modification to the unit, must be available. _____

1.2.3.5 The image on the monitor screen must be flicker free. _____

1.2.3.6 Control of brightness and of contrast must be provided on the front panel of the monitor. _____

1.2.3.7 Possibility of switching over from “POSITIVE” to “NEGATIVE” image should be available as an option. _____

1.2.3.8 A digital memory is essential. _____

1.2.3.9 The capacity of the digital memory must exceed 1Mbyte. _____

1.2.3.10 The number of solid state detectors shall be not less than 1152. _____

1.2.3.11 Dual (Multi) energy colour system with a four (4) colour (Industry Standard) is a firm requirement. _____

1.2.3.12	Organic/Inorganic colour stripping.	_____
1.2.3.13	High and low penetration.	_____
1.2.3.14	Variable colour stripping and variable gamma edge enhancement.	_____
1.2.3.15	Automatic density (variable) threat alert.	_____
1.2.3.16	Automatic organic material threat alert.	_____
1.2.3.17	Operator log-in identification facility.	_____
1.2.3.18	Video output capabilities for recording of images shall be included.	_____
1.2.3.19	Voltage stabiliser must be included.	_____
1.2.3.20	UPS shall be included to provide 10 – 15 minutes back-up.	_____
1.2.4	**Resolution and penetration**	
1.2.4.1	A sample wire with diameter of 0.16mm (AWG 34) must be distinguished on a monitor, and 30AWG wire must be visible behind 21mm of aluminium.	_____
1.2.4.2	The image quality on the monitor must be uniform, without distortion in the centre or the edges.	_____
1.2.4.3	Penetration of 25mm steel minimum must be guaranteed.	_____
1.2.4.4	A pre-selectable density threat level must be a feature of the equipment, with a visual and/or audible alarm if any item being screened exceeds that pre-selected density.	
1.3	**CONTROL OPERATION – MINIMUM REQUIREMENTS**	
1.3.1	**Controls**	
1.3.1.1	A mains key switch for 230V main power supply is required.	_____
1.3.1.2	Push button – power “ON”.	_____
1.3.1.3	3 Push buttons for conveyor control, “GO”, “STOP” & “REVERSE”.	_____
1.3.1.4	As a minimum, 9 push button keyboard for zoom sector selection and a separate push button for zoom activation is required.	_____
1.3.1.5	A robust, RED, emergency stop push button, fitted in a prominent position on the keyboard, as well as on the X-ray unit.	_____
1.3.1.6	Light symbols indicating “X-ray on”.	_____
1.3.1.7	X-ray warning signs, in accordance with the requirements of the SA Radiation Board, must be attached to each end of the tunnel in a visible position.	_____
1.3.1.8	Easy operation of the unit is essential.	_____

1.3.2	**Passage of luggage through X-ray unit**	
1.3.2.1	Objects must be able to be conveyed through the unit in any orientation.	
1.3.2.2	All objects, also those which is only partially lying flat on the conveyor belt (e.g. guitars, etc.) must be fully screened.	
1.3.3	**Object representation**	
1.3.3.1	The conveyor belt speed should be such that each point of an object, when passing through the unit, will be visible for at least 5 seconds	
1.4	**CONVEYOR BELT**	
1.4.1	**Loading**	
1.4.1.1	At least 75kg overall weight	
1.4.1.2	The conveyor belt must be driven by an almost noiseless drum-motor.	
1.4.2	**Dimensions**	
1.4.2.1	Belt length: < 2100mm	
1.4.2.2	The height of the top of the conveyor belt above floor level shall be not less than 600mm, but shall not exceed 800mm	
1.4.3	**Speed and duty cycle**	
1.4.3.1	Conveyor belt speed: approximately 0.2 m/sec.	
1.4.3.2	Up to 2400 objects must be screened per hour.	
1.4.4	**Operation**	
1.4.4.1	Normal: Continuous operation in forward direction.	
1.4.4.2	Stop:	
1.4.4.3	Reverse: Intermitted operation by pressing the reverse button.	
1.4.4.4	Duty cycle: no warm-up period will be accepted.	
1.5	**SAFETY**	
1.5.1	**X-ray dose: Screened object**	
1.5.1.1	Standard –0.1 mrem per inspection. Lower dose units may be offered as an alternative.	
1.5.2	**Radiation leakage to surrounding**	
1.5.2.1	Less than 0.5 mrems/h at any point on the surface, 5cm from the surface	
1.5.2.2	The unit must comply with all ruling international safety regulations such as the German TUV, Swiss SEV, UK NRPB or USA FDA.	

1.5.3 **Conveyor belt**

1.5.3.1 The feed and discharge ends of the conveyor belt are to be of such design that fingers, etc. cannot be caught during normal operation. _____

1.5.4 **Operation under fault conditions**

1.5.4.1 The X-ray tube shall be automatically de –energised when conveyor belt is stopped. _____

1.5.4.2 X-ray radiation shall only be switched on with the moving conveyor belt, before the object passes through the unit. _____

1.5.4.3 X-ray radiation shall be automatically switched off if the radiation shielding covers are removed. _____

1.5.5 **Film safety**

1.5.5.1 Tenderers must guarantee the unconditional safety of photographic material of professional quality. _____

1.5.5.2 Typical standards must allow for highly sensitive films of 1000 ASA to be irradiated at least 30 times without damage. _____

1.6 **PLACING IN POSITION AND ASSEMBLING**

1.6.1 The unit shall be placed in position and assembled on site by the successful tenderer.
NOTE: The final placing will be determined on site. _____

1.7 **BROCHURES**

1.7.1 Brochures, furnishing description and technical specification, etc. of the unit offered, shall be submitted with the tender. If the brochures have information, which does not comply with the specification, the tenderer must submit a covering letter listing all brochure items, which do not comply and confirm that the equipment offered will comply with the specification, referring to these items. _____

1.7.2 The following information is also required:

Manufacturer: _____

ISO Rating: _____

Country of origin: _____

Model number of the unit offered _____

Date of manufacture _____

1.8 **MAINTENANCE, SERVICE AND REPAIR**

1.8.1 The unit design must be of the low maintenance type and with minimum future service. **A statement confirming this is required from the tenderer, together with a copy of the service/maintenance schedule.** _____

1.8.2 An overall design of modular type is preferred. _____

1.8.3 Electronic modules must be easily exchanged. _____

1.8.4 All sub-assemblies in the unit must be of such a design that, maintenance and repair can be carried out by a single person, including removal and exchange of the X-ray generator tanks. _____

1.8.5 Spare parts must be locally stocked and availability guaranteed for a ten-year period, starting from the date of delivery. _____

1.9 **GUARANTEE AND SERVICE**

1.9.1 The successful tenderer shall guarantee and service the complete unit for a period of twelve (12) months from the date of delivery to site, and successful commissioning of the unit. _____

1.9.2 During the period of guarantee, the successful tenderer shall, at his own expense, carry out all necessary repair work, including material and labour, (excluding work required due to damage by others) in order to maintain the unit in a working condition. _____

1.9.3 The successful tenderer shall, during the period of guarantee, repair the unit to the satisfaction of the Department, within 24 hours after he has been notified that the unit is not operating. _____

1.10 **TRAINING**

1.10.1 The successful tenderer shall thoroughly train and instruct all the operators and supervisors, designated by the User Department in the operation of the unit. _____

1.11 **ONBOARD COMPUTER**

1.11.1 Video Memory: at least 64MB

1.11.2 Processor Speed: at least 3.2GHz

1.11.3 Storage Capacity: At least 160GB

1.11.4 A two part training programme must be incorporated in the system.

1.11.4.1 Part 1 – Initial training
Pre-loaded images must be recalled by the computer, some without and some with threats. The operator must detect the threats and his progress is logged.

1.11.4.2 Part 2 – Ongoing training
The system must merge fake threat images into real time images and the performance of the operator must be logged.

1.12 **MANUALS**

Three complete sets of manuals, each with the following information shall be handed over to the Department when the unit is delivered to site:

(a) Operating instructions _____

(b) Technical description with diagrams and instructions for maintenance and repairs. _____

1.13 **DEVIATIONS FROM SPECIFICATION AS ALTERNATIVE (STATE BRIEFLY)**

_____

_____

_____

_____

1.14 **DELIVERY ARRANGEMENTS/ADDRESS**

Delivery arrangements shall be co-ordinated with

Contact Person:
Tel:

And the unit to be delivered to: -

Address

2. **TECHNICAL INFORMATION**

State the following information of the unit offered:

2.1 Total height above floor level _____

2.2 Maximum X-ray voltage _____

2.3 Dimensions of the unit
- Height _____
- Width _____
- Length (including conveyor belt) _____

2.4 Total running current _____

2.5 Maximum dimensions of objects:
- Height _____
- Width _____
- Length _____

2.6 Number of detectors _____

2.7 Capacity of digital memory _____

2.8 Number of shades of grey _____

2.9 Maximum over-all loading on conveyor belt _____

2.10 Conveyor belt speed _____

2.11 X-ray dose per inspection _____

2.12 Radiation leakage at any point, 5cm away from surface _____

2.13 Multi-Energy mode – State colours for material discrimination _____

TECHNICAL SPECIFICATION
FOR
ITEM - 2: ONE METAL DETECTOR

CLAUSE	DESCRIPTION	STATE DETAILS OF OFFER
3.1	**GENERAL**	
3.1.1	In addition to complying with the specification, the metal detector shall meet the requirements of this Specification. Name and tel. no. of the tenderer's contact person to make arrangements with: Name: _____ Tel. No.: _____	_____
3.1.2	The metal detector shall consist of a free standing walk-through frame with an integral control unit, and shall be suitable to detect metallic objects on a person by means of the magnetic field principle.	_____
3.1.3	The metal detector shall be suitable to detect ferrous and non-ferrous metals.	_____
3.1.4	The metal detector shall be equipped to eliminate false alarms.	_____
3.1.5	The metal detector shall scan the entire area of the walk through area and detect metal objects on a person passing through to the levels as specified.	_____
3.1.6	The metal detector will incorporate self-test button to confirm that the system is operating correctly.	_____
3.1.7	The metal detector shall be completely tamper proof.	_____
3.1.8	The programme and sensitivity push buttons shall be so arranged that tampering by unauthorised persons is entirely eliminated.	_____
3.1.9	The metal detector shall not be adversely affected by stationary metal bars or structures in the vicinity of the unit or moving metal near the archway.	_____
3.1.10	The metal detector shall be capable of operating adjacent to an X-Ray inspection unit.	_____
3.1.11	The detector is intended for indoor use at an altitude of up to 1800m above sea level.	_____
3.1.12	The detector shall be capable of operating in the following conditions:	
3.1.12.1	Min. temperature: 0ºC	_____
3.1.12.2	Max. temperature: 40ºC	_____
3.1.12.3	Max. relative humidity:80%	_____

3.1.13	The operation of the metal detector shall not be adversely affected by repositioning of the frame within certain limits of its original adjusted position.	_____
3.2	**CONSTRUCTION**	
3.2.1	The metal detector shall comprise a free standing walk-through frame containing the detector coils and the control unit, complete with a 5m length of flexible cable and 16A 3-pin plug top. The cord and plug top shall comply with the relevant SABS specifications.	_____
3.2.2	The frame and the control unit shall be of robust construction and the base of the frame shall be designed to ensure rigidity.	_____
3.2.3	The unit shall be able to execute a full body scan and detect metal objects down to the lower feet level within the settings specified.	_____
3.2.4	The finish shall be durable and maintenance free.	_____
3.2.5	The type of material used for the construction of the frame and control unit must be stated by tenderers.	_____
3.2.6	The colour range in which the metal detectors are available must be stated by tenderers. The Department will select a colour finish to suit the environment.	_____
3.2.7	All material consisting of metal shall be treated against corrosion.	_____
3.2.8	The approximate internal dimensions of the frame shall be as follows:	
3.2.8.1	Walk-through height : 2m	_____
3.2.8.2	State Walk-through width	_____
3.3	**CONTROL SYSTEM**	
3.3.1	The system shall operate by means of automatic level control adjustable to environmental changes, Without the need to reset.	_____
3.3.2	The control unit shall be equipped with the following:	
3.3.2.1	"ON-OFF" main switch and "MAINS ON" indicator light.	_____
3.3.2.2	Selector switch with at least ten sensitivity settings, with a maximum sensitivity to consistently detect metal at least the size of a R5, 00 coin.	_____
	The sensitivity settings shall be consistent at average walking speed.	_____

3.3.2.3	Visual indication in the form of an LED Bar graph indicator having at least five green lights and five red lights representing the "PROCEED" and "ALARM" zones respectively. The indicator shall give an indication of the volume of metal on a person in accordance with the sensitivity settings of the selector switch. When the "ALARM" zone is activated it shall simultaneously activate an audible alarm having a continuous tone and adjustable volume. The alarm system will automatically reset after the metal has passed through the frame.	
3.3.2.4	The system shall be modular to facilitate maintenance and repairs.	
3.4	**SAFETY FEATURES**	
3.4.1	All electronic and electrical components shall be protected by lockable panels.	
3.4.2	The detectors shall not have any effect on heart pacemakers.	
3.4.3	The detector shall not effect magnetic storage media or camera film.	
3.5	**ELECTRICAL SUPPLY SYSTEM**	
3.5.1	The detectors shall be designed for connection to a 230V +/-5%, 50Hz, single phase, three wire (phase, neutral and earth) power supply.	
3.5.2	The existing connection points on site comprises standard 16A, 3-pin, socket outlets.	
3.5.3	A suitable and efficient battery back-up system to facilitate power failures of up to 1 hour must be incorporated in the detectors.	
3.6	**THROUGHPUT**	
	The system shall accept a passage of at least 50 persons per minute without functional overload.	
3.7	**PLACING IN POSITION AND TESTING**	
3.7.1	The detector shall be placed in position, tested, commissioned and adjusted to the user Department's requirements by the successful tenderer. NOTE: The final positioning will be determined on site.	
3.7.2	The system must be arranged so that the traffic-flow is channelled through the metal detector.	
3.8	**BROCHURES**	
3.8.1	Brochures furnishing descriptions and technical specifications, etc., of the unit offered shall be submitted with the tender.	

3.8.2 The following information is also required:

Manufacturer _____

Year of manufacture _____

Country of origin _____

Model number _____

3.9 **MAINTENANCE**

3.9.1 The unit must be relatively maintenance-free and with minimum future service. A statement confirming this is required from the tenderer. _____

3.9.2 Electronic modules must be easily exchangeable. _____

3.9.3 Spare parts must be locally stocked and availability guaranteed for a ten year period starting from date Of delivery. _____

3.10 **GUARANTEE AND SERVICE**

3.10.1 The successful tenderer shall guarantee and service the complete unit for a period of twelve (12) months from date of delivery of every unit to site. _____

3.10.2 During the period of guarantee the successful tenderer shall at his own expense, carry out all necessary repair work including material and labour (excluding work required due to damage by others) in order to maintain the unit in a working condition. _____

3.10.3 The successful tenderer shall, during the period of guarantee, repair the unit to the satisfaction of the Department within 24 hours after he has been notified that the unit is not operating. _____

3.10.4 After the lapse of the initial twelve-month period of servicing under the guarantee, the successful tenderer may be required to enter into a service agreement with the Department. _____

3.11 **TRAINING**

The successful tenderer shall thoroughly train and instruct operators designated by the user Department in the operation of the unit. _____

3.12 **MANUALS**

Two complete sets of manuals, each with the following information shall be handed over to the Department when the unit is delivered to site:

(a) Operating instructions _____

(b) Technical description with diagrams and Instructions for maintenance and repairs. _____

3.13 **DEVIATIONS FROM SPECIFICATION AS ALTERNATIVE (STATE BRIEFLY)**

_____

_____

_____

_____

_____

3.14 **DELIVERY ARRANGEMENTS**

Delivery arrangements shall be co-ordinated with

Contact Person:
Tel:

And the unit to be delivered to: -

Address

PRICE SCHEDULE FOR ITEM 1 & 2

ITEM 1 – ONE X-RAY INSPECTION UNIT

LOCAL CONTENT	R
IMPORTED CONTENT	R
LABOUR	R
TRAINING	R
TRANSPORT AND DELIVERY	R
TENDER PRICE (EXCLUDING VAT)	R

ITEM 2 – ONE WALK-THROUGH TYPE METAL DETECTOR

LOCAL CONTENT	R
IMPORTED CONTENT	R
LABOUR	R
TRAINING	R
TRANSPORT AND DELIVERY	R
TENDER PRICE (EXCLUDING VAT)	R

Summary

Item 1 + Item 2 (Excluding VAT) R……

Total Tender Price carried to Final Summary in Part A R……

TENDERER'S SIGNATURE_____ DATE _____