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COMMUNITY SERVICES: DIRECTOR'S OFFICE

ADDENDUM TO TENDER LIM473 ITL 1/2/14/009 SUPPLY AND INSTALLATION OF 1 FOUR PHASE TRAFFIC LIGHTS AND 2 TWO PHASE TRAFFIC LIGHTS

TECHNICAL SPECIFICATIONS AND BILL OF QUANTITIES

CLOSING DATE: 17 OCTOBER 2013

1. LOCATIONS FOR INSTALLATION

- 1.1. Four Phase lights : Jane Furse Crossing
- 1.2. One Three Phase Lights : First Jane Furse Mall entrance (intersection)
- 1.3. One Three Phase lights : Main Road Intersection to Makhuduthamaga Office

2. TRAFFIC SIGNAL CONTROLLERS - GENERAL INFORMATION

- 2.1. Traffic signals shall / must be microprocessor based
- 2.2. Must be configurable switch to a two phase plan and pedestrian E.C.O phases for all sides of the road
- 2.3. The units must also include an accurate real time clock to facilitate cableless linking.
- 2.4. The controller must be ready for upgrading with an Outstation Transmission Unit (O.T.U) to work within a GSM linked remote monitoring system

3. CONTROLLER CABINET

- 3.1. The unit shall be placed in a hot-dip galvanized, heavy duty steel cabinet.
- 3.2. Unit must lockable by a temper-proof padlock to be supplied by the successful bidder
- 3.3. The cabinet shall be weather-proof (Ten years Guaranteed against corrosion) and **stand alone unit** and weatherproof with cable entry points.
- 3.4. Shall be installed upon completion of the traffic lights installation.

4. POWER SUPPLY

- 4.1. The controller must be designed to operate from a 230volts, 50Hz power within a voltage range of -15% to +20% and a frequency range of 48 to 52 Hz.
- 4.2. Should there be power interruption /failure for 20 milliseconds or less, the controller must be able to function normally.
- 4.3. Should the interruption be greater than 29 milliseconds, the unit must shut down and be able to resume normal operation without reprogramming when power is re-established.

5. LIGHTNING PROTECTION

- 5.1. Lightning protector must be fitted to the mains input.
- 5.2. That shall include surge arrestors as well as an indoor lightning arrester on the live leg of the power supply.
- 5.3. All inputs to the controller shall be optically isolated
- 5.4. inputs connected to the interlinking cables shall b relay isolated.
- 5.5. All Output circuits shall be relay isolated from the signal switching triacs.

6. LOOP DETECTORS AND PEDESTRIAN INPUTS

- 6.1. The controller shall be fitted with a minimum of two loop detector jacks wired to suit single channel, self tuning loop detectors
- 6.2. Two input terminals must also be provided to accommodate demand from normally open pedestrian push-button stations.

7. COMPONENT LABELLING AND DOCUMENTATION

- 7.1. Bidders shall submit in their bids documents, a comprehensive manual showing schematic lay-out diagrams of the controller
- 7.2. This shall include configurations or designs for the intersections.

8. SIGNAL SWITCHING

- 8.1. Signal switching shall be solid state using a 16amp triac for each signal circuit.
- 8.2. Individual triacs shall be easy to replace and readily available on the market.
- 8.3. The standard software supplied with the controller shall be able to accommodate 2 vehicular phases and pedestrian E.C.O phases

9. OPERATING MODES

- 9.1. The controller shall be designed to operate in any of the following modes
 - Fixed time operation.
 - Semi vehicle actuated operation
 - Fully vehicle actuated operation
 - Fully vehicle actuated operation and in absence of demand, rest on the last phase demanded or on main road green.
 - Emergency flashing
 - Manual control by an officer. Under manual control, minimum green, amber and all red periods shall be pre-set to ensure safe operation
 - Manual control key switches shall be made available as part of this bid package.

10. SIGNAL SWITCHING PLANS

- 10.1. The standard controller software shall accommodate eight signal switching plans, each This shall be independently configured to switch any of the above-mentioned modes.
- 10.2. Plans shall be selected by the integral real time clock on a time of the day, day of the week, basis or from the central computer or remote monitoring system

11. CO-ORDINATION OF CONTROLLERS

- 11.1. Traffic signals must be upgradable to allow communication between the traffic signal controller and the remote control station

12. CONFLICT MONITORS

- 12.1. The controller shall be fitted with dual, hard wired conflict monitors with switch the intersections to emergency flashing should a conflict occur from an internal controller fault or from an external fault on the installation.
- 12.2. During emergency flashing, the red light signal shall be on a flashing mode, with pedestrian crossing off.

13. DELAYED PRESENCE

- 13.1. Time delays on presence loop shall be provided to prevent phases being called unnecessary.
- 13.2. The time delays shall be pre-set in the controller making the use of standard loop detectors

14. PROGRAMME STORAGE

13.1. Controller programmes shall be stored on a non-volatile RAM in the PLC.

15. TRAFFIC SIGNAL CONTROLLER SPARES

- A full range of spare parts for repair of installed traffic signals shall be made available by the successful bidder.

15.WARRANTIES AND GUARANTEES

- Traffic signal controllers supplied and installed, must comply with South African Bureau Of Standards = SANS 1547-2005
- Bidders shall submit documentary proof with their bids in this regard

B. LIGHT EMITTING DIODE TRAFFIC LIGHTS – LED

1. CONSTRUCTION

- The construction of the traffic light shall comply with SANS 1459 – 2004 and be modular design.
- The aspect design housings shall be fixed together by means of stainless steel screws for easy maintenance
- Each detachable aspect housing shall be dust proof and water tight.
- The traffic light shall be of composite design utilizing the following materials
 - UV stabilized nylon with a 30% glass fill for rigidity
 - High silicone aluminum where mechanical strength is required
 - Grade 304 stainless steel for clips, catches and screws
- The traffic light shall be weather-proof
- The LED compartment be easily accessible for maintenance by means of two quick release catches.
- The LED module, fixed within the reinforced nylon bezzel shall form a rigid compartment door to ensure the aspect remains water proof over an extended period.
- Aluminum mounting bosses on both the top and bottom of the traffic light shall be required for fixing to the pole
- The weight of a single aspect shall not exceed 1,7kg which include the LED module, visors and mounting hardware.
- The traffic light shall not corrode, crack, or distort after prolonged exposure to the harsh outdoor condition for at least five years.

2. LED MODULE

- LED modules shall be of robust sealed beam design.
- All internal circuitry shall be dust proof and resistant, heat resistant, moisture proof and high impact polymer.
- The lens of the module shall be of flat design
- The LED module must have a pluggable electrical connection, screw terminals will not be permitted.

3. LED OPTICS

- The signal shall be of a LED design
- A honeycomb diffuser-reflector shall be fitted to improve light-output efficiency and the lens shall also provide light diffusion without reducing the light intensity on the beam axis.
- The diffuser-lens / reflector, combination shall be designed to eliminate sun-phantom.
- The light intensity shall be uniform through-out the surface of the lens and the optics must display a full 200mm diameter disc.
- The design must be such that if a single LED fails, no more than 2% of the total light output is lost.
- LED signals must comply with **SANS 1459-2004** for LED traffic signals

4. POWER SUPPLY

- The LED power supply shall be of a switch mode design, fused and protected from surges
- The LED signal shall operate from a 50Hz, AC supply at input voltages ranging from 184Vac to 276Vac
- All LED modules must include active loading as part of power supply

5. MARKING AND DESIGN LIFE

- Each LED module shall be legibly and durably marked with the following information
 - The manufacture's name and product model
 - The maximum power consumption
 - The input voltage range
 - Serial number
 - Manufacture date and
 - It be noted that the complete LED module shall and must be guaranteed for a period of five years, excluding physical damage, including lightning damage

6. VISORS

- A Suitable black pigmented, polyethylene visor projecting 160mm from the signal face shall be fitted to each aspect
- The visor may not obscure the lens

7. CABLE ENTRY AND WIRING

- Cable entry shall be at the bottom of upper aspect's housing by means of a heavy-duty, reinforced PVC house
- The house diameter shall be 20mm and the length shall be as follows :
- 1 and 2 aspect traffic lights : 1250mm
- 3 and 4 aspect traffic lights : 610mm

Nb : Wire colour coding shall be as follows :

- Red Signal – Red wire
- Amber Signal - White wire
- Green Signal - Blue wire
- Additional signal - Grey wire
- Neutral – Black wire

8. EXTERNAL FINISH

- The signal head shall be pigmented matt black and any aluminum parts shall be powder coded

9. MOUNTING

- Each Traffic Light shall have a thread at the top and bottom of the assembly to facilitate mounting.
- Two 10mm set screws must be provided with each traffic light assembly
- A stud with nut leaving thread expose to the outdoor elements shall not be acceptable.
- Two right angle brackets including universal pole mounting straps designed to fit from 100mm to 170mm diameter shall be available to fix the traffic lights on the poles.
- Pole straps must be tensioned with a set screw and nut.
- Crimping or band-it strapping is not and shall not be accepted.

10.CONFIGURATIONS

The following traffic light configuration shall be available and shall be available for left, right and straight traffic movements.

- 3 aspect – S1, S2, S3 and S4
- 4 aspect – S5, S6 and S7
- 5 aspect – S8 and S9
- 2 aspect – S10 and S11 (PEDESTRIANS)

11.LEGISLATIVE REQUIREMENTS

- All the traffic lights, spares and fiving, must a stamp of approval from the South African Bureau of Standards. And comply with SANS 1459:2004 for LED traffic signals. Documentary proof must be submitted together with the bid documents, for authenticity verification of the letter/ or SABS approved and compliant documentary proof.. Failure to comply with this requirement, may lead to the disqualification of the tenderer that fails to submit the required documentary proof.

C. BACGROUNDS AND SCREEN

1. CONSTRUCTION

- The background screens shall be 500mm wide with a full radius on the top and bottom.
- Dimensions of the background screens shall comply with Volume4, Part 3 of the South African Road Signs Manual.
- The technical requirements are of **SANS 1459:2004**
- Background screens shall be of a modular construction to facilitate maintenance, but shall be supplied as a fully assembled unit for ease installation
- The unit shall fit directly onto the traffic light without the use of brackets, straps or clamps
- Background screens shall be shaped in such a manner that maximum strength is achieved with a light weight construction
- The screens shall be fitted to the lights with a sufficient number of screws to spread the windage load
- Screens shall be supplied complete with stainless steel mounting screws
- No visible daylight is allowed to pass between the lantern and the background screen.

2. MATERIAL

- Background screen shall be manufactured from a suitable,
- UV stabilized and
- Reinforced polymer compound

3. FINISH AND BORDER

- Background screens shall be machine molded and painted black
- All background screens shall be supplied with a 50mm wide, white, boarder

4. CONFIGURATIONS

The following standard background screens configurations shall be available

- 2 aspect – S10 and S112
- 3 aspect – S1, S2, S3 and S4
- 4 aspect – S5, S6 and S7
- 5 aspect – S8 and S9

D. POLE – TOP TERMINAL BOXES

- The base of the pole-top terminal box shall be made of UV stabilized nylon with a glass fill.
- Shall not distort or corrode a after prolonged exposure to outdoor conditions.
- Shall be designed to fit into a 114mm O.D pole with a wall thickness varying from 2mm to 6mm
- Shall be supplied complete with an adequate number of 6-way, 15 A terminal strips
- Six tapered knock-outs shall be provided in the base to accommodate the PVC conduit for traffic light mounted on the pole.
- The cover of the terminal box shall be manufactured from UV stabilized nylon with a 30% glass fill and be held in position with two quick release catches.
- Provision must be made for fastening of cables to the base terminal box

NB : All equipments, parts or spares shall be :

- corrosion proof
- shall be painted golden yellow

E. STANDARD TRAFFIC LIGHTS POLES

1. CONSTRUCTION

- The poles shall be 114 mm diameter by 3.3m long.
- When installed, the pole top shall be 3.3m from the pavement level.
- Foundation frame shall be installed below ground level
- A strong foundation frame complete with foundation bolts, nuts and leveling washers, shall be supplied with each pole
- The base of the pole must be designed to fracture on impact, without damaging the foundation or foundation frame to facilitate maintenance.
- Provision must be made to earth the top of the pole with an 8mm set screw and nut

2. MATERIAL AND FINISH

- The poles shall be manufactured from first grade steel
- No butt or longitudinal welds shall be permitted
- The poles must be cleaned and primed with red-ox primer

F. PEDESTRIAN PUSH BUTTONS STATIONS

1. CONSTRUCTION

- Pedestrian Push Buttons shall have a clearly visible rated green button, easily accessible by all pedestrians.
- Must be housed in robust reinforced nylon enclosure
- The enclosure shall have an indented walking-man emblem and shall be temper proof

In this regard,

- Screws shall have Allen keys drives to deter vandals
- Buttons with threaded rings, that can be loosened from the front housing, shall not be accepted
- The enclosure, shall not be easily bent or broken by hand.

2. MATERIAL

- The enclosure shall be made from UV stabilized nylon with a 30% glass fro rigidity
- Screws and nuts shall be made from a grade 304 stainless steel
- The indented emblem shall have a seven year , retro-reflective vinyl sticker

3. MOUNTING

- Each pedestrian push button shall be supplied with a universal pole mounting strap suitable for poles from 100mm in diameter to 170mm in diameter
- The enclosure must be designed in such a way that it does not distort when the pole strap is tightened.

4. CABLE ENTRY

- The pedestrian push buttons housing shall have the option of a threaded hole at the bottom to fit a NO 0 cable gland(20mm conduit thread)
- An alternative cable entry at the back of the push button housing must be provided.

5. FINISH

- The pedestrian push button station shall be pigmented matt black and not coated.
- The indented emblem shall be a yellow retro-reflective vinyl sticker

G. ENQUIRIES

Any Technical Enquiries on this BID must be directed to :

M. Phiri

Tel : 013 – 265 8681 (to 87)

E-mail : mcabangop@makhuduthamaga.gov.za

BILL OF QUANTITIES

BIDDERS MUST NOTE THAT :

- PRICING THE TENDER MUST INCLUDE SUPPLY AND INSTALLATIONS AS PER THE TENDER SPECIFICATIONS
- A SEPARATE COLUMN IS FOR THE THREE YEARS MAINTANANCE AND REPAIRS COSTS
- EVERY EQUIPMENT MUST BE NEW WITH THE NECESSARY GUARANTEES AND WARRANTES AND PROFF THAT THEY ARE SABS TESTED AND APPROVED.

Item no	DESCRIPTION	UNIT	QUANT ITY	PRICE VAT EXCLUSIVE	SUB-TOTAL PRICE VAT EXCLUSIVE
1	SUPPLY, INSTALLATION AND COMMISSIONING OF A 4 FACE TRAFFIC LIGHT		1		
2	LED Traffic Lights				
	ESA 10 Controller	Each	3		
	Pole for the controller c/w frame	Each	3		
	3,3m Pole c/w foundation frame	Each	24		
	Pole Top Terminal boxes	Each	8		
	a. 3 aspect (SARTISM S1) only	Each	30		
	b. 3 aspect background screens	Each	30		
	c, 2 aspect pedestrian signal (S11)	Each	20		
	d, Pole Straps	Each	100		
	e, Pedestrian push button c/w straps	Each	12		
	f, Loop detectors single channel	Each	3		
	g, Loop wire coil	Each	6		

3	SUPPLY, INSTALLATION AND COMMISSIONING OF 2 x Two Face TRAFFIC LIGHTs				
4	Terminal boxes	Each	16		
5	Pedestrian Push buttons stations	Each	8		
6	1. Cable SWA 2,5mm 7c Cu PVC SWA	m	200		
	2. Cable SWA 2,5mm 2c Cu PVC SWA	m	210		
	3. Bare Copper Earth Wire 2,5mm	m	250		
	Earth termination including Earth Spikes	Each	30		
7.	CABLING Cutting the road. No underground drilling.				
7	TOTAL VAT EXCLUSIVE				
8	TOTAL VAT INCLUSIVE NB : THIS TOTAL MUST BE CARRIED TO THE TENDER DOCUMENT ON PRICING				



 Municipal Manager (Moropa M.E)