

1. Scope Of Work

The scope of this project is for the appointment of a service provider for the supply, installation commissioning and testing of street and terrain lighting at the Sentech Head Office.

1. The contractor is responsible for replacing the luminaires in the following areas:
 - 1.1. Undercover parking bays
 - 1.2. Roadside post tops
 - 1.3. Perimeter lighting (high mast)
 - 1.4. Pathway lighting
 - 1.5. Floodlights
 - 1.6. Entrance Lights
 - 1.7. Some undercover building lights
 - 1.8. Photocells and timer switches
2. All work to comply with SANS 10142-1 (latest Revision).
3. All luminaires to be SABS approved and meet the relevant SANS standards in terms of testing and EMC and be ROHS compliant.
4. Earthing to comply with Sentech earthing specification.
5. **No services to be cut without prior notification and permission.**

Electrical Works

6. Contractor to disconnect and/or remove the existing electrical reticulation (where necessary and if applicable) between the Supply DB and the proposed areas of installation.
7. The contractor is responsible for the removal and disconnection of all post top lighting Poles. New Post top poles must be installed in the same position.
8. Position of new post top poles are according to drawing 0/OB/E022
9. The contractor is to pay careful attention to installation methods, in Annexure A (1.7) for Installation and placement of Poles (both for post tops and street lights - perimeter).
10. The contractor is to pay special attention to the technical details as outlined in the Lighting Schedule.
11. Remove all old luminaires in all areas highlighted in point 1 and according to the BOQ (see Appendix A for Lighting Schedule).
12. Purchase, supply and install all light poles as outlined in the BOQ. Civil works to apply.
13. Purchase, supply and install all luminaires and lighting as outlined in the BOQ.

14. Purchase, supply and install all electrical supply cables (where necessary) from the relative circuit breakers to the luminaries as per drawings 0OB/E/022.
15. Where deemed necessary, the contractor will be responsible for the removal and replacement of any damaged or worn-out equipment related to the terrain lighting i.e conduits, supply cables feeding the existing luminaires, etc.
16. The contractor is responsible for replacing the current photocells and timer switches connected to all external lighting.
17. Where applicable trenching of new cable-ways will be required. See drawing 0OB/E/022
18. Contractor to take note of the route of the cables to determine the length of all the cables. (cable lengths highlighted in the BOQ are approximate values and measurable quantities).
19. Should conduits need replacing, the electrical contractor is responsible to install the appropriately sized conduits for all luminaires and associated equipment. (conduit lengths highlighted in the BOQ are approximate values and measurable quantities).
20. Contractor to ensure that all metal light fittings and/or metal parts, must eventually be connected to the earth of the supply DB with the same potential.
21. The contractor is responsible for the testing and commissioning of all installed lighting. All test results must comply with the values specified in SANS (South African National Standards). A Test and Commissioning Report must be submitted upon completion of installation.
22. A lighting performance test must be conducted every six (6) months during the Defects Liability Period. Results must be documented and submitted for review.
23. At project completion, the contractor must provide the following documentation:
 - As-Built Drawings
 - Test Sheets
 - Product Data Sheets
 - Operation and Maintenance Manuals
 - Any other relevant documentation required for full system understanding and operation.
24. The contractor must cover routine servicing, repairs, and replacement of defective components.

General

1. Contractor to allow 10% for contingency if additional work is required.
2. The contingency amount will be carefully controlled by the project engineer. Any additional work will be issued in writing and no verbal instructions will be accepted.
3. Contractor to compile a safety file for the work to be done at SENTECH HEAD OFFICE.
4. Before commencement of work the safety file must be signed and approved by Sentech safety officer.

5. Herewith the contact details of Mr. Josias Radebe 011 471-4653 or radebej@sentech.co.za
6. All holes through walls where cable trays and cables pass through to be closed off with fire stopping material.
7. All cable tray, droppers, risers, cantilevers, etc. to be powder coated Electric orange unless otherwise stated.
8. Contractor to include own accommodation in quotation as no sleeping on site is permitted.
9. Contractor to supply own chemical toilet as the septic tank is very small and will not be able to accommodate the additional staff.
10. Contractor must work in close corporation with transmitter installation team and local Sentech staff to minimize down time on transmissions.
11. All work areas to be cleaned up and left in a tidy condition. All waste materials to be suitably disposed of, and not left strewn about site. Disposal of waste materials must comply to environmental safety standards.
12. Project Engineer to be given suitable advance notice to attend to commissioning prior to contractor leaving site. All snag list work to be carried out before Contractor vacates site.
13. Contractor to issue Certificate of Compliance to Project Engineer on completion of works.
14. Contractor to issue a schedule of works in order to give required notice and obtain permission to cut transmission services as and when required. No services to be cut without prior notification and permission.

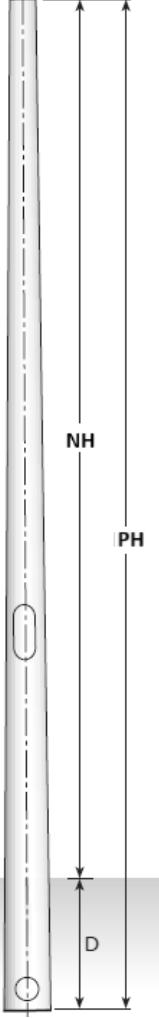
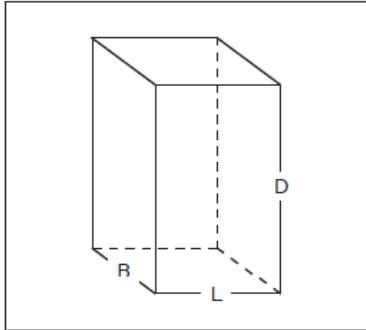
APPENDIX A

SPECIFICATIONS

1. The Poles that will hold the Post Top Luminaires and new Street Light luminaires must be adhere to the following conditions:
 - 1.1. For Post Tops – poles height (PH) must be 3.1 metres high (see Table 1) and match existing color (Paris Blue).
 - 1.2. For Street light luminaires (Perimeter lighting) – poles height must be 11.6 metres tall (see Table 1)
 - 1.3. Pole fittings should comprise of the following:
 - 1.3.1. Baseplate assembly
 - 1.3.2. Glandplate assembly
 - 1.3.3. Mcb circuitbreaker 10A/5kA
 - 1.3.4. All other accessories deemed necessary for complete installation
 - 1.4. Post top lighting Poles should be made up of glass fibre reinforced polyester (GRP).
 - 1.5. Perimeter lighting poles should be Hot-dipped galvanised steel.
 - 1.6. Poles to be vandal resistant i.e. low risk of theft.
 - 1.7. The pole should be versatile: offers a wide range of supplementary lighting equipment to be used, ensuring this pole can be used for almost every application
 - 1.8. For GRP Poles the following applies:
 - 1.8.1. Maintenance-free: surface coat of the pole must not require maintenance.
 - 1.8.2. Should provide a greater longevity: should be able to outlast wood, concrete, steel and aluminium under the same climatic conditions.
 - 1.8.3. Pole should be non-conductive
 - 1.8.4. High bending strength: Engineered to withstand a wind pressure of 500 Pa inclusive of 0.20m² luminaire area with less than a 5% deflection of the mounting height. This relates to a wind speed of 103.9km/h. Any higher wind speeds must be calculated separately.
 - 1.8.5. Pole should be sustainable: environmentally friendly.
 - 1.9. Table 1 outlines the dimensions related to buried poles as well as the excavation needed (also see Figure 1 and Figure 2:

Typical Head Weight and Wind Surface Area		Head weight: 13kg each Windage area: 0.045m ² each		
Type of Pole	Pole Height (PT) (m)	Net Height (NH) (m)	Depth (D) (m)	Length (L) & Width (B) (m)
Post Top	3.1	2.5	0.6	0.75
Streetlight (perimeter)	11.6	10.0	1.6	0.9

Table 1: Excavation dimensions for buried poles

		
<p>Figure 1: Dimensions of Buried Pole</p>		<p>Figure 2: Dimensions of excavated hole for buried poles</p>

1.7. Installation method for Backfilling of Buried Poles

This installation method describes how streetlight poles, supplied by the contractor, should be planted.

- Excavate a hole to a minimum depth indicated as per table 1.
- Compact the bottom of the excavation.
- Place the pole, with the base plate fitted, in the excavation.
- Ensure that the pole is vertical and support it so that it will not move while the excavation is being filled.
- Fill the excavation with 25MPa concrete until the bottom of the cable access hole(s) is reached.

- Allow the concrete to cure for at least 3 days.
- Feed the power cable through the access hole(s) if it is available.
- The backfilling mix should have a composition of soilcrete 1:10.
- Backfilling of holes should be done in layers of 150mm and compacted.
- The soil should be compacted evenly around the pole and care should be taken that the pole does not lean to one side during compacting, before the next layer is added.
- Continue until the natural ground level is reached.
- Remove the material used to hold the pole in the vertical position and dispose of any remaining soil from the excavation.

2. Luminaires to be IP65 rated.

3. All products should cover a life expectancy of greater than 20 years (Excluding LEDs and Drivers)

4. Parts should be independently replaceable i.e spigots, mountings, drivers, luminaire casings, LEDS should be easily removed and replaced without replacing the whole luminaire.

5. Lighting Schedule

Note 1: Values are approximate and can deviate to $\pm 5\%$.

	Post Top	Floodlight	Undercover Parking	Shaded Parking	High Mast	Bulkheads	Up/Downlights
Type	LED	LED	LED	LED	LED	LED	LED
Nominal Voltage (V)	230V $\pm 10\%$	230V $\pm 10\%$	230V $\pm 10\%$	230V $\pm 10\%$	230V $\pm 10\%$	230V $\pm 10\%$	230V $\pm 10\%$
Frequency (Hz)	50	50	50	50	50	50	50
Power Factor	>95% at full load	>95% at full load	>95% at full load	>95% at full load	>95% at full load	>95% at full load	>95% at full load
Total Lamp Lumens (lm)¹	5921	9948	4577	1630	11043	2250	988
Wattage (W)¹	≤ 38	≤ 81	≤ 27	≤ 13	≤ 72	≤ 15	≤ 7
Colour Temperature	4000K	4000K	4000K	4000K	4000K	4000K	4000K
CRI	≥ 70	≥ 70	≥ 80	≥ 80	≥ 70	≥ 80	≥ 80
IP Rating	66	66	65	66	65	65	65
Housing grade/ Colour	Aluminium / Ploypropylene / Acrylic Black	Aluminium / Black	Polycarbonate / Grey	Polycarbonate / Grey	Aluminium / High Impact Polycarbonate / Light grey	Aluminium / Ploypropylene / Acrylic Black	Aluminum / Grey
Mounting Angle	-	0° to 90°	-	-	-15 to 0° to +15° (Spigot)	-	-
Surge Protection	10kV/10kA	10kV/10kA	10kV/10kA	10kV/10kA	10kV/10kA	10kV/10kA	10kV/10kA
Lifetime of LEDs (h)	100000	100000	100000	100000	100000	100000	100000
Lifetime of Drivers (h)	100000	100000	100000	100000	100000	100000	100000
Operating Temperature¹	-35°C to +45°C	-35°C to +45°C	-35°C to +45°C	-35°C to +45°C	-35°C to +45°C	-35°C to +45°C	-35°C to +45°C
Dimensions (mm)¹	Dia = 480, H=540	LxWxD = 420 x 280 x 50	L= 4feet (1200mm)	LxWxD = 250 x 135 x 95	LxWxD = 500 x 210 x 95	Dia = 280	LxWxD = 210 x 80 x 80

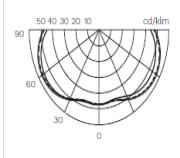
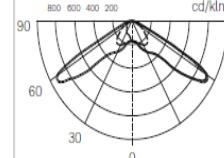
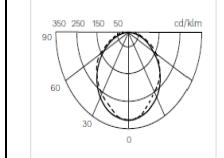
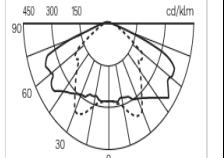
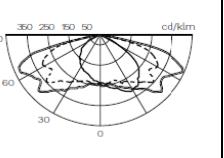
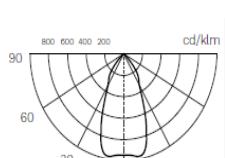
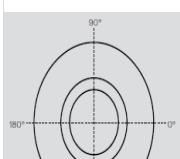
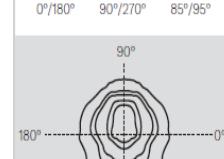
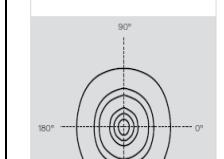
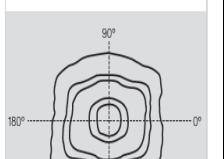
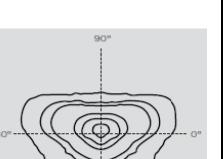
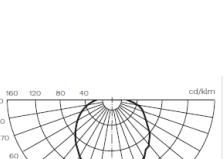
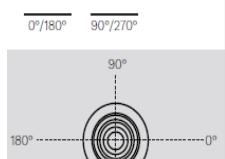
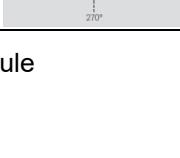
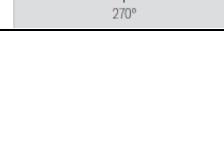
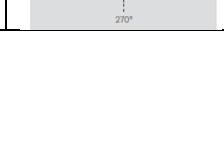
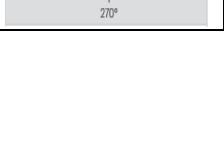
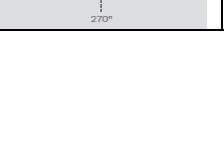
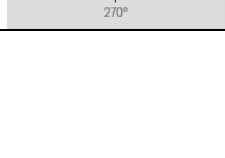
Appearance (Typical)							
Light Distribution	      	      	      				

Table 2: Light Schedule

