# SOUTH AFRICAN REVENUE SERVICES (SARS)

# PROPOSED HATFIELD OFFICE

**SPECIFICATION AND SCHEDULES**

**FOR**

**PRIME DIESEL GENERATOR PLANT INSTALLATION**

## SECTION D: PARTICULAR SPECIFICATION

**INDEX**

1. **PROJECT OVERVIEW**

1. **ELECTRICAL SERVICES & SYSTEMS SCOPE OF WORKS**

1. **BRIEF DESCRIPTION OF THE GENERATOR WORKS**

1. **SERVICE CONDITIONS**

1. **MANUFACTURER’S RECOMMENDATIONS**

1. **ELECTROMAGNETIC INTERFERENCE**

1. **CONSTRUCTION PERIOD**

**1.0 PROJECT OVERVIEW**

**1.1** The South African Revenue Service (SARS) intends to install a 150kVA prime generator set at their office in Hatfield Gardens**.**

**1.2 THE SITE**

The site is Hatfield Gardens for Office in Gauteng Province.

1. **ELECTRICAL SERVICES & SYSTEMS SCOPE OF WORKS**

**2.1** This specification covers the supply, delivery, installation, testing and commissioning of the complete electrical installation and reticulation to the entire satisfaction of the Employer and Consulting Engineer

**2.2 Overall Scope of Electrical Works**

The full range of electrical installations for a 150kVA prime generator. This includes the following;

* Prime Power (Diesel Generator)
* Power Distribution
* Earthing and Lightning Protection Systems.

**2.3 Design Standards**

The design and installation of the electrical systems will be strictly in accordance to the relevant local and international regulations, standards and design guides including the following;

* IEE Wiring Regulations – Seventeenth Edition (BS 7671)
* South African National Standard SANS 10142 – The Wiring of Premises.
* Occupational Health and Safety Act
* BS 4999 General requirements for Rotating Electrical Machines
* Fire Detection And Fire Alarm Systems For Buildings – BS 5839 Part 1: 2002

**2.4 Procurement of Electrical Packages**

This document pertains to the **Prime Diesel Generator Plant sub contract.**

**2.5 Scope of Works included in the Prime Diesel Generator Plant Contract**

* Prime Generator Plant : 150kVA unit output at 400V/50 Hz at 0.85 Power Factor
* Control Panels
* Mains Failure sensing & control cabling
* Communication interface module
* Earthing
* Remote Alarm and Indication panel/s
* Fuel System and fuel Tank/s
* Exhaust and Silencer Systems
* Batteries and Battery Chargers
* Cooling System
* Heaters
* Louvres
* Sound Attenuators
* Signs, Notices and Labelling
* Painting of Equipment
* Workshop Drawings and Samples
* Provision of own Hoisting and Lifting
* Removal of own Waste
* Testing, Commissioning & Handover
* 12 months Free Maintenance and Services
* 12 months Guarantee

1. **BRIEF DESCRIPTION OF THE GENERATOR WORKS**
   1. **Overview**

The Prime Generator Installation Works shall comprise the manufacture, works testing, supply and delivery to site, moving into position, erection, connecting up, site testing, witness testing, commissioning, demonstrating to the Employer and maintenance of the Installation as outlined in these specifications and drawings and Bill of Quantities.

A 150kVA, 400 V 50 Hz prime generator set shall be supplied and installed complete with the necessary control panels, wiring and interconnecting wiring.

The Prime Generator plant supply shall give100% power back-up to the office building load which includes Lighting load, computer & other electronic load (via UPS units), Air conditioning and other mechanical load. The plant shall be installed in outside the office building as shown on the drawings.

* 1. **Associated Works**

The provision of the Automatic Changeover Switchgear and Cables between the Generator and the switchgear shall be made by the Contractor. The appointed Contractor shall conduct site audit whereby all the existing and proposed components of the supplied drawings are identified and understood. Any discrepancies encountered by the Contractor on the supplied drawings by shall be communicated in writing with the Engineer before the commencement of work.

* 1. **Civil Works**

The following civil works associated with the Generator works shall be carried out by the Contractor:

* Laying of sleeves for cables
* Openings through structural elements/walls
* Lead cables at building entry/exit points
  1. **Fencing**

This specification covers material requirements and installation of security fencing and gates, for the generator enclosure. Nothing in this specification shall lessen the obligation of the contractor. The contractor shall be fully responsible for the perimeter fence and gates installation.

* The risk assessment report shall be submitted to the Engineer for review prior to commencement of any work.
* All steel materials shall be galvanized or zinc coated steel and smooth with no joints.
  + 1. **Normative References**

The following documents contain provisions that, through reference in the text, constitute requirements of this specification. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

SANS 0222-3, Electrical Security Installations, part3: Electrical Security Fences

SANS 1222, Protection of Enclosures

SANS CKS 451, Specification for anti-intruder fences

SANS 121 / SANS ISO 1461:2000, Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods

SANS 675 / SANS 675:1997, Zinc-coated fencing wire (plain and barbed)

SANS 10044-3 / SANS 044-3: 1983, Welding Part 3: The fusion welding of steel (including stainless steel): Tests for the approval of welding procedures and production welds

SANS 10044-4 / SANS 044-4:1963, Welding Part 4: The fusion welding of steel (including stainless steel): Tests for the approval of welders working to approved welding procedures

SANS 10044-5 / SANS 044-5:1963, Welding Part 5: The fusion welding of steel (including austenitic stainless steel): Tests for the approval of welders where weld procedure approval is not required

SANS 10162-1 / SANS 0162-1, the structural use of steel

SANS 1431 / SANS 1431:2003, Weldable structural steels

* + 1. **Post/ Intermediate posts**

The materials used for straining posts, extension arms; stays and fixing rails shall be one of the following;

* All structural steel shall conform to SANS 0162. The grade of steel shall be 300WA as defined according to SANS 1431.
* The lengths of posts and stays shall be 1.8m
* The length of extension arms shall be 600mm or 450mm for angular extension.
* The extension arm shall be welded to the top of a post.
  + 1. **Panel**

The materials used for straining posts, extension arms; stays and fixing rails shall be one of the following;

* 3.3.1. All structural steel shall conform to SANS 0162. The grade of steel shall be 300WA as defined according to SANS 1431.
* 3.3.2. The panel dimensions shall be of 3m width and 2m in height.
* 3.3.3. Panel aperture size (centres) shall be in the range of ±76mm x 12mm and wire diameter will be 3mm.
* The panel shall be reinforced deep 'V' formation horizontal recessed bands (rigidity).
* Panel shall have flanges along sides internal fixtures, all fixtures shall be on the inside.
* Panel post shall have a flush panel post finish with no climbing aid.
* The fence configuration should not have any sharp corners.
  + 1. **Removable sections**
* A removable panel on the perimeter fence shall be a ±1.8m double swing gate with a Lock as specified in the Bill of Quantities.
  + 1. **Fixings**
* Strain eye bolts, hinge bolts, bolts and nuts shall comply with the requirements of SANS 135. Galvanised bolts shall be used for removable sections of fence. Galvanised bolt hinges with lock nut and washer shall be used for gate hinges.
* Bolts used shall be galvanized cup square security bolts with anti-vandal shear off nuts and washers.
* Screws shall be counter sunk stainless steel with anti-vandal shear off nuts. The length of bolt as well as the size of nuts and washers used shall be appropriate for its application.
  + 1. **Gates**

The height of the gate shall be the same as that of the fence.

* 1. **Mechanical Works**

The following mechanical works associated with the Generator works shall be carried out by the Contractor:

* Application for generator installation and usage at the relevant Fire Department.
* Supply and installation of fire extinguishers as specified on the BOQ.
  1. **Contractor’s Drawings**

Contract Drawings

The Contract Drawings are listed in Schedule of Information in Section A.

**Contractors Installation Drawings**

The general requirements for installation drawings are set out in the Preliminary & General Conditions and shall be strictly adhered to. The Generator Contractor is reminded that he will be required to produce installation drawings prior to commencing any work or procurement of materials.

**Schematics & Details**

Full installation schematic drawings are required for the following systems:

* Generator Supply Reticulation showing full details including cable sizes, circuit breakers, isolators/fuse switches, etc.
* Details of co-ordination between all protective devices shall be submitted including graphical co-ordination plots on full scale log-log graph paper defining the types of protective device offered and giving tap, time dial and pick-up settings.
* Wiring Schematics

Coordinated details at a scale of no less than 1:20 shall be produced for all service intensive areas. The Generator Contractor is reminded that any clashes or unacceptable work caused by failure to detail part of the installation in this manner shall be rectified at his own expense.

Specific areas where details are suggested include:

* Fixing details of Equipment onto concrete bases

**Revisions & Updating Drawings**

It is the Generator Sub-Contractor’s responsibility to maintain his installation drawings up to date, incorporating all new information as it becomes available and agreed.

Minor design amendments will typically be issued in the form of sketches which the Generator Sub-Contractor will incorporate into his Installation Drawings and reissue.

**4 SERVICE CONDITIONS**

Altitude 1,000 meters

Peak Annual Average Temperature 29°C

Minimum 15°C

Vermin Proof All electrical equipment shall be vermin proof.

1. Manufacturer’s Recommendations

Certain items of equipment may carry particular requirements of the manufacturer or installer. Where this is the case, the manufacturers requirements shall be adhered to during all delivery, assembly, storage, installation and commissioning works.

1. electromagnetic interference

All equipment shall be immune from, and shall not radiate, signals exceeding the limits of BS 800 and the appropriate parts of BS 6667 and BS EN 60801.

**7 CONSTRUCTION PERIOD**

The construction period and programme will be provided by the Generator Contractor.