

PART 3: SCOPE OF WORK

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THE DESIGN, MANUFACTURING, AND INSTALLATION OF A NEW 400KV GIS, CONSTRUCTION OF A NEW CONTROL ROOM, MANUFACTURING, AND INSTALLATION OF A NEW 400KV TRANSFORMER, CONSTRUCTION OF A ROAD AROUND THE SUBSTATION, MANUFACTURING AND INSTALLATION OF PROTECTION SCHEMES, DESIGN, AND INSTALLATION OF AN AUTOMATIC CHOP OVER SCHEME, CONSTRUCTION, AND INSTALLATION 400KV AND 132KV AIS EQUIPMENT, COMMISSIONING AND ASSOCIATED WORKS.

C3.1: *EMPLOYER'S* WORKS INFORMATION

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1 Background

Eskom Transmission's current installed base of Protection, Telecommunications, Metering, (tele)Control and associated equipment (PTM&C equipment) has typically been procured through a 2-stage procurement mechanism:

- Development contract, where a supplier will develop a product to meet Eskom's requirements and the product undergoes substantial acceptance testing before being accepted by Eskom. This may run for periods of up to 2 years or more in certain instances;
- Supply contract, where a supplier will supply products to Eskom as developed, tested and accepted during the development contract.

Product standardisation forms the backbone of Eskom Transmission's efforts to reduce the burden associated with sustaining the infrastructure and as such the above contracting may typically be extended for periods up to 10 years. Manufacturer specific interfacing may also dictate that only specific supplier's products can be used for infrastructure extension projects to ensure compatibility with the existing installed base.

Eskom's specification and adjudication criteria for PTM&C equipment in this enquiry are based on Eskom's deemed optimal approach (time and cost) to procure / engineer accepted products that are compatible with existing infrastructure and is prescriptive only in this regard. Products other than those previously accepted, as discussed above, would necessitate an extensive testing and acceptance process as well as the development of associated design base documentation to support the configuration, operation and maintenance of the products. In addition, experience has shown that constructive involvement by Eskom during development greatly accelerates the development timeframes and, as such, this has also been specified where relevant in this scope of work.

Tenderers are advised that if they have alternative technology which they may deem appropriate for the current scope of works, they are at liberty to bring this to Eskom's attention as a proposal. The use of technology which has not been tested and accepted by Eskom may delay the project and may have cost implications, which delays will impact the delivery timelines, and which additional costs will be for the tenderer's account. No product which is proposed as an alternative technology as contemplated shall be supplied or used in respect of the works unless accepted by Eskom in writing.

Note: The above must be read in conjunction with Engineering Specifications and Evaluation Criteria.

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2 Description of the works

2.1 Executive overview

The Philippi Substation Extension works will be to establish a 400 kV busbar, cater for a future 3rd 400/132 kV 500 MVA transformer. The Philippi Substation Extension project is based on the City of Cape Town Strengthening (Philippi Substation Extension) Planning Report with the reference GP_14/01 and the addendum to the City of Cape Town Strengthening (Philippi Substation Extension) Planning Report with the reference GP_17/05. The project is required as additional mitigation measures to ensure security of supply for the City of Cape Town.

Philippi Substation is currently equipped with 2x500 MVA 400/132 kV line-banked transformers. A 400 kV busbar need to be installed to facilitate the installation of the third transformer and the connection to the planned Erica Substation. Due to space constraints, the 400kV bus bar and feeders will consist of Gas Insulated Switchgear (GIS).

2.2 Scope of work

The detailed scope of work document is attached hereto the works information **Annexure A**. The scope of work include the procurement, construction and commissioning of the Philippi Substation extension.

- Establish a 400 kV GIS busbar,
- Manufacture, supply and Installation of 3 x complete 400kV GIS diameters with associated GIS equipment,
- Manufacture, supply and Installation of a 3rd 400/132kV 500 MVA transformer (run as hot standby),
- Construct a new 400kV transformer plinth,
- Development and Installation of an automatic chop over scheme for the new transformer,
- Demolition of the existing pump house and relocation of existing services,
- Construction of a new control building,
- Construction of 132kV and 400kV equipment foundations,
- Installation of 132kV and 400kV (Air Insulated Switchgear) AIS equipment,
- Stringing and cabling of transformer bays to the GIS, through the transformer to the 132kV AIS equipment,
- The design, manufacturing, installation and terminations of a new 132kV XLPE cable on both the Eskom transformer side and the City of Cape Town 132kV GIS side,
- The upgrading of the 132kV City of Cape Town's Gas Insulated Switchgear Current transformer to a rating suitable to accommodate the Philippi substation third transformer,
- The decommissioning and scrapping of old protection equipment
- The construction of an access road around the substation and
- Provision of security during construction.

The PTM&C scope of work for the project is the provision of a complete turnkey protection, tele-control, remote-engineering / monitoring, measurements, metering, DC, teleprotection and telecommunications solution for the proposed Philippi substation (station electric diagram) below, aligned with Eskom's current methodologies in this regard. Further detail provided below.

Standard previously tested and Eskom approved solutions are to be utilised. Where specific schemes / solutions don't exist and development is required, this shall be kept to a minimum and based as much as possible on the existing platforms.

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The scope of works includes the:

- Engineering, to be accepted by Eskom.
- Sourcing of standard solutions
- Where standard solutions don't exist, scheme design, manufacturing, testing at works, in-situ testing, development of user documentation and training; to be accepted by Eskom
- Supply of all material,
- Delivery, off-loading, erection, installation, cabling, application of configurations and settings, commissioning; to be accepted by Eskom
- Provision of documentation, as-built drawings, configurations, protection settings; in Eskom standard format and to be accepted by Eskom
- Anything else deemed necessary by the tenderer for the provision of a working solution
- Decommissioning of all existing equipment in the existing control room with all associated works.

2.3 Employer's objectives and purpose of the works

The objective of the projects is the expansion and upgrade of the existing Philippi 400kV yard is to ensure firmness of the substation and to ensure that the current loads in the Peninsula Area, especially the supply of power to the CoCT's network can be accommodated, to create all Eskom connection assets, works and related activities to facilitate the expansion of Philippi MTS.

The objectives of the team to realise the Project Objectives are as follow:

- Complete the Philippi Extension project with the minimum impact on the normal day to day production and within the acceptable tolerance of outages.
- Complete the Philippi Extension project within the required time frame to limit the current risks associated with the existing supply as far as possible.
- Complete the Philippi Extension project as per approved Project Schedule.
- Complete the Philippi Extension project within the specified Cost Estimate.
- Develop and construct the project within the Health and Safety specification as to meet Eskom's Zero Harm goal.
- Construct the Philippi Extension project as per Environmental Management Plan and guidelines.

The purpose of the project would be to expand the existing 400/132kV Philippi MTS by establishing a 400kV busbar so that a third transformer can be accommodated. This will ensure that the substation is firm and will be able to supply the required load during N-1 contingencies. The firmness of the substation will ensure that the City of Cape Town can be supplied during outage events.

2.4 Interpretation and terminology

The following abbreviations are used in this Works Information:

| Abbreviation | Meaning given to the abbreviation |
|--------------|---|
| OPGW | Optical fibre ground wire |
| E/W | Earthwire |
| SHERQ | Safety, Health, Environmental, Risk and Quality |
| AFC | Approved for construction |
| B-BBEE | Broad Based Black Economic Empowerment |

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| DCP | Dynamic Cone Penetrometer |
| DOL | Department of Labour |
| EMP | Environmental Management Plan |
| HV | High Voltage |
| NCR | Non-Conformance Report |
| OBL | Outside battery limits |
| ROD | Record of Decision |
| SD&L | Skills Development & Localisation |
| SHE | Safety Health and Environment |
| SHEQ | Safety, Health, Environmental & Quality |
| TMH | Technical Methods for Highways |
| TOC | Top of Concrete |
| ARC | Auto re-closing (i.e. and O-CO operation under command of a relay) |
| BZ | Bus Zone |
| CB | Circuit breaker |
| CT | Current transformer |
| GIS | Gas Insulated Switchgear |
| I | Amps |
| KIPTS | Natural ageing and pollution performance test procedure for outdoor insulator products |
| EMC | Electro Magnetic Compatibility |
| M | Metering |
| MCB | Miniature circuit breaker |
| MR | Multi ratio |
| MVA | Mega Volt Amps |
| N/C | Normally Closed |
| N/O | Normally open |
| OEM | Original Equipment Manufacturer |
| OHS Act | Occupational Health and Safety (OHS) Act No 85 Of 1993, as amended, of the Republic of South Africa |
| P | Protection |
| FMECA | Failure Modes, Effects and Criticality Analysis |
| SF6 | Sulphur Hexafluoride |

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| | |
|------|---------------------|
| T | Turns |
| TRFR | Transformer |
| V | Volts |
| VT | Voltage transformer |

3 Management and start up.

3.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

| Title and purpose | Approximate time & interval | Location | Attendance by: |
|---|--|--|---|
| Risk Reduction Meeting | As per NEC 3 procedure | Site or where instructed by the <i>Project Manager</i> | Employer; Project Manager (Supervisor & SHE officer) optional Contractor; <ul style="list-style-type: none"> Project Director, Site Manager, Contract Manager, Site Supervisor/s, Scheduler and SHE Manager |
| Progress meetings | Monthly or as instructed by the <i>Project Manager</i> | Site or as instructed by the <i>Project Manager</i> | Employer; Project Manager (Supervisor & SHE officer) optional Contractor; <ul style="list-style-type: none"> Project Director, Site Manager, Contract Manager, Site Supervisor/s, Scheduler and SHE Manager |
| Integration Meeting | Monthly or as instructed by the <i>Project Manager</i> | Site or as instructed by the <i>Project Manager</i> | Employer; Project Manager Supervisor SHE officer Contractor; Project Director, Site Manager, Contract Manager, Site Supervisor/s, Scheduler and SHE Manager |
| Health, Safety and Environmental meetings | As stipulated in Form 74 (SHE specification) | Site or as instructed by the <i>Project Manager</i> | As stipulated in Form 74 (SHE specification) |

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Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings shall be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

The *Project Manager* prepares minutes of meetings for all meetings held between *Employer* and *Contractor*. The minutes of a meeting contain all significant aspects of the meeting recorded together with any actions placed and is presented to the *Contractor* for signature at the next project meeting. After the *Contractor* has signed the minutes of meeting, the minutes are to be officially published.

The *Contractor* shall attend regular site meetings with the *Project Manager* and *Supervisor* where the progress of construction will be reviewed. Such meetings shall be held monthly and may be attended by representatives of the *Employer*.

The *Contractor* shall also attend weekly meetings with the *Supervisor* and provide, prior to each meeting as required by the *Project Manager*, detailed programmes showing separately the various activities of the *Contractor* anticipated over the forthcoming two week period as well as the progress achieved over the preceding week relative to the programme applicable to that period.

As a result of travel restrictions and other measures to curb the COVID 19 pandemic some meetings will be convened via MS Teams.

3.2 Documentation control

The *Contractor* shall submit all documentation to the *Project Manager's* requirements. All relevant documentation and drawings, including revisions, will be issued to the *Contractor*, but control, maintenance and handling of these documents will be the *Contractor's* sole responsibility and at its expense, and managed with a suitable document control system developed by the *Contractor* and accepted by the *Project Manager*.

2.2.1) Contractual correspondence;

- Properly compiled letters on official Company letter head or forms attached to an e-mail and not as a message in an e-mail itself.
- Alpha numeric identification – Reference: Date / Philippi Substation Extension / Communication number e.g. 20200615/Phil/02.
- All correspondence to be addressed to the *Project Manager*.

Contractual form to be used (attached)

- ECC – instructions by the SS (*Supervisor*)
- ECC- instruction by the PM (*Project Manager*)
- ECC – Notification of Defects
- ECC – Risk Register
- ECC- Early warning by PM
- ECC – Early warning by *Contractor*
- ECC – Notification of CE (Compensation Event) by the *Contractor*
- ECC- Submission by *Contractor* for acceptance by the PM
- ECC – Completion Certificate
- ECC –Quotation for the proposed instruction of changed decisions

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2.2.2) Site communication;

- Site instructions issued by the *Supervisor*.
- Site Memorandums addressed to the *Supervisor*.
- *Contractor* Daily Site Diary (Minimum *Employer* requirements on *Contractor* Daily Site Diary are);
 1. Contract No.
 2. Date
 3. Work Hours – Start, Finish and Overtime
 4. Rainfall (mm)
 5. Temperature
 6. Visitors to site
 7. *Contractor* employees on site and description (Site Agent, Foreman, Skilled, etc.)
 8. List of Plant and Equipment
 9. Brief description of the day's activities
 10. Toolbox talk topic
 11. Diary signed daily by *Employer* Site Manager/*Supervisor* and *Contractor* – Contract Manager/Site Agent
 12. Daily *Contractor* attendance register to be attached to the Daily Site Diary.
 - Site instructions issued by the *Supervisor*.
 - Site Memorandums addressed to the *Supervisor*

Summary of the documentation required from the *Contractor* before and during construction includes the following:

| DOCUMENT | Before | During |
|--|--------|--------|
| Programme | X | X |
| Resource Schedule | X | X |
| Health and Safety Plan | X | |
| Quality Assurance Plan | X | |
| Method Statements | X | |
| Materials Inventory | | X |
| Drawing Register | | X |
| Progress Schedule | | X |
| Application for Payment | | X |
| Geotechnical and Foundation design reports | X | |
| Soil Test Results | X | |
| Concrete Batching note | | X |
| Cube Test Reports | | X |
| Weather Data | | X |
| Monthly Safety Report | | X |
| Inventory list of all materials | | X |
| Foundation photographs | | X |
| | | |

Communication

- All correspondence from the *Contractor* is signed by the *Contractor's* authorised representative.
- Correspondence from the *Project Manager* is issued and signed in the name of the *Project Manager* or his authorised representative.
- All formal correspondence from the *Contractor* is addressed to the *Project Manager* or his authorised representative and delivered to the *Project Manager* or his authorised representative.
- Emails and other forms of electronic communication (collectively referred to herein as *emails*) between the *Contractor* and the *Project Manager* are for the expedient transfer of preliminary technical data and non-contractual information only.

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- The *Contractor* provides all contractually required submittals, notifications and the like by means of official correspondence or formal document transmittal.
- Emails or documentation included therein, sent from the *Project Manager* to the *Contractor* do not, in themselves, constitute either acceptance of a proposal from the *Contractor* or an instruction under the terms of the contract either of which may be or may result in a compensation event to the contract.
- The *Contractor* does not act on any email that the *Contractor* believes results in a compensation event to the contract whether or not the email by the *Project Manager* stated that it constituted a compensation event. The *Contractor* requests formal written confirmation of any instruction that may be or may result in a compensation event and receives this confirmation through formal correspondence, document transmittal, and *Project Manager's* instruction or compensation event, before acting on such an instruction.
- Signature authorities
 - The *Contractor* provides, a "Signature Authorization Form", the names and specimen signatures of those individuals within the *Contractor's* organization authorized to sign documents on behalf of the *Contractor*. The *Contractor* also specifies the financial or other limits of authority for each individual.
 - The *Contractor* delegate's authority within its organization to home office and field office personnel as required for effective performance of the work.
 - The *Contractor's* Contract Signatory signs the "Signature Authorization Form".

Drawings and Document Transmittals Documentation Requirements

The *Contractor* submits all documentation conforming to the requirements of the *Employer and / or the Project Manager* applicable standards and specifications with the following specific requirements:

- When required, the *Contractor* transmits to the *Employer / Project Manager*, technical submissions, sketches or drawings, calculations and other pertinent data, in sufficient detail to enable the *Employer / Project Manager* to review the information and determine that the *Contractor* clearly understands the requirements of the contract.
- Documents and data provided by the *Contractor* under the contract are subject to the *Employer / Project Manager* review and accept prior to *Contractor's* start of procurement.
- Review and acceptance of drawings, documents and / or data, etc. by the *Employer / Project Manager*, does not absolve the *Contractor* from any responsibilities under this contract.
- The review by the *Employer / Project Manager* with or without comments does not relieve the *Contractor* of any obligations or requirements under the contract nor be construed as an authorization of, or consent to, any deviation from the contract. If the *Contractor* considers that the *Employer / Project Manager* comments constitute a compensation event to the contract, the *Contractor* requests a formal instruction.
- All drawings and other documents are in English and are sized in accordance with metric standard sizes and carry titles to indicate equipment numbers or any other identification number of the portion of work covered on the particular drawing and / or document.
- The revision number marks changes or additions to any document, at the point of a revision, and the revision is reflected in its title block or drawing number by an appropriate revision indication.
- An Aconex transmittal summarizing the content of the set accompanies multiple sheets with the same drawing number.

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- The format of electronic documentation conforms to the following requirements:

| Document | Native Format | Issued to Employer |
|---------------------|--------------------------------|--------------------|
| Specifications | MS Word 2007 | Native & PDF |
| Manuals | MS Word 2007 | Native & PDF |
| Datasheets | Microsoft Excel 2007 | Native & PDF |
| Programs | Primavera P6 or MS Projects | Native & PDF |
| Spreadsheets | MS Excel 2007 | Native & PDF |
| Drawings | AutoCAD Release 2004 or later | Native & PDF |
| Other Documentation | Microsoft Office 2007compliant | Native & PDF |

- The *Contractor* is, in interpreting the drawings and specifications, bound by the figures marked thereon and not by scaled measurements.
- If the *Contractor* believes that new or revised IFC (issued for construction) documents constitute a change to the Contract, the *Contractor* notifies *Employer / Project Manager* of the change and does not proceed with the changes until officially instructed to do so by the *Employer / Project Manager*.
- The *Employer / Project Manager* reviews engineering information or queries raised and returns comments to the *Contractor* within the period of reply. This review by the *Employer / Project Manager* does not relieve the *Contractor* of his responsibility to ensure that the package is in accordance with the requirements.
- The *Contractor* submits a written signed off As built as final issue of the "Handover" documentation.

Design Specifications

The following is a list of specifications and standards applicable to the Philippi Substation Extension project.

| Specification document | Specification number | Title |
|--------------------------|----------------------|---|
| 1 GIS MTS | 240-50807380 | Specification for Gas Insulated (GIS) Switchgear and Associated Auxiliary Equipment |
| 2 HV Transformers | 240-68973110 | Specification for Power Transformers Rated for 1.25MVA and Above and with Highest Voltage Of 2.2KV or Above |
| 3 PTM&C | 240-170000102 | High Level Scope of Work PTM&C Equipment for Philippi Substation |
| 4 SDL&I | 240-148918142 | Supplier Development, Localization and Industrialization (SDL&I) Strategy |
| 5 Earth and Civil Works | | Control room drawings, Concrete Road drawing and Transformer plinth drawing |
| 6 Building | WKoe11P01-SE-D53 | Functional Specification for the Design and Construction of the 400kV GIS Building for Philippi Substation |
| 7 Stringing, Cabling and | 240-82736997 | Stringing, Cabling, Earthing and Erection |

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| | | |
|----------------------|--|---|
| Electrical | | Specification for Transmission Substations |
| 8 132kV Cables | 240-170000106 | Philippi Substation 132kV Cable Systems from Trf3 to 132kV GIS |
| 9 Aux Transformers | 240-68973110 | Specification for Power Transformers Rated for 1.25MVA and Above and with Highest Voltage Of 2.2KV or Above |
| 10 Health and Safety | TPDMAN-SP-84 | Health and Safety Specification Philippi Substation |
| | TPD-BRA-240-70044602 | Baseline risk assessment |
| 11 Environmental | TPDMAN-ST-37 | Environmental Requirements for <i>Contractors</i> and/or Suppliers |
| 12 Quality | 240-105658000 Supplier Quality Management Specification | Quality Requirements for the Organizations |
| 13 Security | | Security Scope of Work |

3.3 Health and safety risk management

The *Contractor* shall comply with the health and safety requirements contained in Annexure (TPDMAN-SP-84-SHE Specification Philippi Substation Extension) to this Works Information and all the other documents the specification refers.

The *Contractor* shall also ensure and allow for in his pricing structure that all Personal Protective Equipment (PPE) issued to his employees are in accordance with the *Employer's* Personal Protective Equipment Specification (240-44175132).

In accordance with Eskom internal procedure and wherever Health and Safety Issues are concerned:

- The Executive projects manager, BU will induct the *Contractor* MD before commencement of work on site. This will assist in ensuring that the MD gets first-hand information of requirements
- Site managers, Site *Supervisors*, including site representatives shall be required to conduct 1 VFL per day.
- The *Contractor* shall allow for work stoppages as per the Health and Safety specification
- The MD is required to conduct 2 Visible Felt Leadership per month.
- Site *Supervisors* shall conduct behaviour based safety observation. The client will provide training on request.
- The *Contractor* shall present all lost time incident and medical incidents to the *Employer*, the presentation of all incidents shall be done within 30days of the incident. All incidents shall be presented by the *Contractor's* MD to the *Employer*.

In addition to the above, the following shall apply:

During construction, all workers on structures shall use the following:

- Full body harnesses
- Double Lanyards
- Double climbing hooks, alternatively fall arrest system approved by the *Employer*.
- The fall arrest system is to be installed and used prior to any erection, dressing or stringing operations.

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- When working on towers, only head protecting helmets that conform to Standard Reference Number EN 12492:2000 - Mountaineering equipment - Helmets for mountaineers - or EN 397:2000 Industrial Safety Helmets are acceptable. In addition, the requirements of SABS 0333:1999 part 3 and SABS 1833:1999 shall apply.

The *Contractor* shall supply his Health and Safety Plan in accordance with the Occupational Health and Safety Act and the latest revised Construction Regulations prior to the commencement of work on Site.

The *Contractor* shall supply the *Project Manager* with a monthly safety report indicating the total number of employees on site, the number of hours worked, the number of hours lost due to injury and details of any incidents/accidents.

Minutes of Safety Meetings are forwarded to the *Project Manager*.
Reporting of incidents shall be in accordance with *Employer's* procedure.

Termination due to Non-Compliance.

The *Employer* reserves the right to terminate the contract in the event that the *Contractor* is found to be consistently non-compliant to any SHEQ related issue.

Penalty for Health and Safety statistics

Should the LTIR at any stage during the contract exceed the *Employer's* target of 0,4 a penalty of R100,000.00 will be imposed by the *Employer*. This penalty will be refunded in the event that the LTIR drops below 0,3 at contract completion.

Penalties Health and Safety violations

The following penalties will apply for Health and Safety violations and are non – refundable:

- The *Employer's* Life Saving rules violation (1st Violation): R5, 000.00 per event, payable by the *Contractor*.
- The *Employer's* Life Saving rules violation (2nd Violation): Removal of repeat offender from Site and R10, 000.00 payable by the *Contractor*.

Penalties for Sub – Contractor management

- Sub-Contractors are to be managed in accordance with the requirements of the *Employer's* SHE Specification (TPDMAN-SP-08). Failure to comply will result in a fine of R10, 000.00 per non-compliance.

All the above penalties will be implemented by the *Project Manager* at his discretion after all necessary investigation has been finalised.

3.4 Environmental constraints and management

The *Contractor* shall comply with the environmental criteria and constraints stated in TPDMAN-ST-37 Environmental requirements for contractor and the EMP for the Philippi Substation Extension project.

The following penalties will apply for Environmental non-compliance and are non-refundable:

Penalties for Environmental related issues

- Legal contravention and non-compliance: R20, 000.00 per event.

Campsite Layout

- Campsite establishment and de-establishment is to be managed in accordance with the SHE specification.

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- The layout should be such that it facilitates a circular traffic route that eliminates the need to reverse when loading and offloading. There must be one point of entry and exit
- The *Contractor* shall comply with the environmental criteria and constraints stated in Annexures as per EMP.
- The *Contractor* must also comply with the following environmental procedures: Environmental requirements for *Contractors* and suppliers TPDMAN-ST-37.

3.5 Quality assurance requirements

The *Contractor* and all sub-*Contractors* shall comply with the requirements listed in the *Employer's* Quality requirement standard, 'Supplier Contract Quality Requirements Specification', document identifier 240-105658000 Supplier Quality Management Specification

The following penalties will apply for Quality and are non – refundable:

Penalties for Quality related issues

- NCR's not closed out satisfactorily within 30 days: R10, 000.00 per event.

In addition to the above, the following shall apply:

- The *Contractor* shall have a fully documented, implemented and maintained quality management system, which complies with the requirements of the ISO 9001:2015 or their quality management system shall carry valid certification from an acceptable QMS Certification body as indicated in the applicable PDP invitation. In this regard the *Supervisor* may instruct the *Contractor* to perform quality inspections prior to his own inspections, or to assist in inspections.
- The *Contractor* ensures that his staff and sub-*Contractors* are conversant with the content of the scope of work, quality control plans and work instructions.
- The involvement of the *Contractor's* Appointed Inspection Authority (AIA) is a requirement to ensure that all the conditions of the code are met, but this does not absolve the *Contractor* from any of his responsibilities for quality.
- The *Contractor* compiles, in conjunction with the *Project Manager* and his AIA, a product inspection and test plan. This document shows at which stages during the contract the AIA is required, and what types of inspection, testing, witnessing etc. are carried out to ensure that the requirements of the works information are met.
- The *Contractor* ensures that the works is carried out in accordance with the inspection and test plans, acceptance test procedures and other specifications in the works information.
- The *Contractor* ensures that all specifications and requirements are communicated to the relevant parties in his organisation. Copies of all relevant specifications and drawings must be available on site.
- All documentation has a clearly stated revision number and previously similar documentation is revoked.
- Any quality-related problems/issues are to be reported to the *Supervisor* immediately and resolved as soon as possible.
- All completed work is signed-off on inspection and test plans and control sheets on a daily basis and all the relevant signatures are on the documentation.

The *Contractor* must comply with the following quality procedure: 240-105658000 Supplier Quality Management Specification.

3.6 Programming constraints

The programme is to be submitted for acceptance in accordance with Core Clause 31 in the Engineering and Construction Contract, in terms of which resources to complete each activity must be clearly identified. The *Contractor* will allow two weeks of the starting date for compiling a schedule to be reviewed by Eskom every two weeks to ensure accuracy. The *Contractor* will be expected to use the allowed time from start date to

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prepare a proper schedule by interfacing with all relevant stakeholders. It is suggested that Gantt or bar chart formats be used for project planning, while progress graphs/schedules be submitted at monthly project meetings to monitor progress.

The programme is to include all the requirements of clause 31.2 of the Engineering and Construction Contract.

Progress

Eskom will monitor the process of compiling a schedule in the first three months of the contract on a weekly basis by means of a report from the *Contractor*. A weekly progress report is to be submitted to the *Project Manager* every Friday.

The *Contractor* monitors progress weekly in conjunction with the *Supervisor*. A weekly progress report is to be submitted to the *Project Manager* every Friday.

The *Contractor* submits his record of Work Done to Date (verified by the *Supervisor*) to the *Project Manager* on the 20th of each month. (The application is to have the same format as the relevant Activity Schedule, and show present, previous and total quantities to date).

3.7 Contractor's management, supervision and key people

The *Contractor* shall submit an organizational structure showing his human resources and their lines of authority/communication.

The *Contractor* shall ensure that they comply with the registration of identified personnel as per the requirements of the South African Council for the Project and Construction Management Professions (SACPCMP) as gazetted in Project and Construction Management Professions Act No. 48 of 2000, Section 18(1) (a) or (b) and (c).

The following are the categories that must be registered and their certificates be downloaded from privyseal (www.privyseal.com) and be submitted:

- Construction Manager (CM), reference to Construction Regulation GNR. 84 of 7 February 2014 section 8(1), in terms of appointment and registration in terms section 18(1) (c) of the Act 48 of 2000.
- Construction Health and Safety Manager (CHSM), registration in terms section 18(1) (c) of the Act 48 of 2000.
- Construction Health and Safety Officer (CHSO), reference to Construction Regulations GNR.84 of 7 February 2014 section 8(6), and in terms section 18(1)(c) of the Act 48 of 2000.

Note:

- Alternate Construction Manager, reference to Construction Regulations GNR.84 of 7 February 2014 section 8(1), shall be registered with SACPCMP should the person be appointed as Alternate Construction Manager.
- Consideration shall be made to those who are registered as Candidate in any of the categories mentioned above, provided that the individual candidate submit an agreement (appointment) between the candidate and the mentor. Both the candidate and the mentor shall submit their certificates downloaded from privyseal (www.privyseal.com)

The *Contractor* shall provide CV's for acceptance to Eskom for experienced and competent personnel in the following key positions:

- **Project Manager/s**
Minimum competency level: National Diploma Engineering/Construction Management. The resource will have a minimum of 15 years relevant experience.
- **Construction Manager/s**

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Minimum competency level: National Diploma Engineering/Construction Management or a minimum of 10 years relevant construction experience for the approval of the *Project Manager*.

- **Planner/Scheduler**

Minimum competency level: 10 years relevant construction **planning** experience for the approval of the *Project Manager* and Planning Manager. Primavera/MS projects competence.

- **Supervisors**

Minimum competency level: As specified in Form PDPMAN-FM-074 (SHE Specification) and the documents it is referring to.

- **Required SHE personnel**

Minimum competency level: As specified in Form PDPMAN-FM-074 (SHE Specification) and the documents it is referring to.

3.8 Invoicing and payment

Within one week of receiving a payment certificate in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the payment certificate.

The *Contractor* shall address the tax invoice to

Eskom Holdings SOC Limited
P O Box 1091
Johannesburg
2000

and include on each invoice the following information:

- Name and address of the *Contractor*;
- The contract number and title;
- *Contractor's* VAT registration number;
- The *Employer's* VAT registration number **4740101508**;
- Description of service provided for each item invoiced based on the Price List;
- Previous, present and to date values per payment certificate;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- Any other information as may be required.

An original invoice must be sent to the Accounts Payable Department and a copy to the *Project Manager*.

The *Contractor* must submit an FRI within 1 week of contract award.

Details on how to submit invoices and additional information:

The *Contractor* must ensure that the Eskom order number is clearly indicated on your invoice together with the line number on the order you are billing for.

All Electronic invoices must be sent in PDF format only.

Each PDF file should contain one invoice; or one debit note; or one credit note only as Eskom's SAP system does not support more than one PDF being linked into workflow at a time.

The *Contractors* E-mail may contain more than one PDF file (e.g. 2 invoices on 2 separate PDF files in one e-mail)

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Send all invoices in PDF to the following email addresses:

1. For local invoices: invoiceseskomlocal@eskom.co.za
2. For foreign invoices: Invoicesgrpcapital@eskom.co.za

The *Contractor* can request a park invoice from the Finance Shared Services (FSS) contact center which can then be followed up and corrected. The *Contractor* is welcome to forward the details of invoices to the FSS contact center.

All queries and follow up on local invoice payments should be made by contacting the FSS contact center

Tel: 011 800 5060

e-mail: fss@eskom.co.za

For Foreign invoices, the *Contractor* will still be required to physically deliver hard copies of original documents to the respective documentation management centers even though you have e-mailed those invoices (Eskom is still seeking clarity from the South African Reserve Bank regarding e-invoicing for Foreign Invoices or invoices in foreign currency. Current requirements are that these manual invoices should still be submitted.

The *Contractor* can send the invoice copy to the email addresses indicated below).

Tax Requirement

A PDF file that was created directly from a system meets the definition of original document and is allowed (including saving documents from excel to PDF, word to PDF etc.)

An Invoice that was printed and then scanned to PDF by the Vendor is not acceptable as this is not an original tax invoice by SARS definition but a copy.

The following wording needs to appear on the invoice: "Your invoice is encrypted in order to comply with SARS requirements that invoices and statements sent electronically are tamperproof."

If there is Cost Price Adjustment (CPA) on your invoice we recommend that the *Contractor* issue a separate invoice for CPA so that if there are any issues on the CPA the rest of the invoice can be paid while resolving the CPA issues.

Introduction of electronic invoicing does not guarantee payment but will ensure visibility of all invoices and ensure that no invoices get lost. If the goods receipt is not done the invoice will be parked and the system will automatically send an e-mail to the end user to do the goods receipt. This is also tracked by Eskom through the park invoice report.

The *Contractor* can request a park invoice report from the Finance Shared Services (FSS) contact center which can then be followed up and corrected. The *Contractor* is welcome to forward the details of invoices corrected to the FSS contact center.

Email addresses for invoice submission:

Group Capital Power Delivery Projects (PDP): invoicesgrpcapitalPDP@eskom.co.za

Procedure for invoice payment:

Work done is assessed by Quantity Surveyor (QS), after which the Eskom QS and the *Contractor* agree on the assessment and the amount to be invoiced. The Eskom QS will then generate an assessment and payment certificate aligning to the *Contractor's* invoice that was agreed based on the assessment.

Assessment is scanned and sent to project officer and *Project Manager*. Originals to be filed in project file. Ensure that *Project Manager* signs off or approves the payment certificate before a Good Receipt (GR) is created. Goods receipt will be created on SAP and the goods receipt number emailed to the supplier. For

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work done GR number will be on payment certificate sent to supplier. Invoice is recorded and receipted as per the finance invoice receipting procedure.

3.9 Insurance provided by the *Employer*

As stipulated in the Contract Data.

3.10 Contract change management

As per NEC

3.11 Provision of bonds and guarantees

The form in which a bond or guarantee required by the *conditions of contract* (if any) is to be provided by the *Contractor* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Contractor* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Contractor* by the *Project Manager* to receive and accept such bond or guarantee. Such withholding of payment due to the *Contractor* does not affect the *Employer's* right to termination stated in this contract.

3.12 Records of Defined Cost, payments & assessments of compensation events to be kept by the *Contractor*

A risk register is to be kept by the *Contractor* in which all events are recorded. Records of events that could give rise to Compensation Events are to be kept up to date for inspection by the *Supervisor* and/or *Project Manager* at all times and this is to be kept in a risk register. This is not for inspection purposes but for management as per core clause 16.

3.13 Training workshops and technology transfer

The supplier shall provide training of an international standard on the supplied equipment by OEM accredited instructors. The training shall be in accordance with the Eskom training standard 240-56065202, and organised on the following levels:

- Orientation and basic functioning
- Operational and first line maintenance
- Installation, testing and commissioning of the GIS and circuits (controls)
- Specialized maintenance on all aspects of the GIS which must include major intrusive work, repair and testing

4 Engineering and the *Contractor's* design

4.1 *Employer's* design

In accordance with the *Employer's* specifications which are provided to the *Contractor*.

4.2 Parts of the works which the *Contractor* is to design

Where the *Contractor* is to do designs, the *Contractor* shall submit designs for acceptance well in advance of construction in accordance to issued specifications with the tender.

The *Contractor* is responsible for the design of the 400kV GIS with associated building in accordance to (240-50807380) Specification for (GIS) and Associated Auxiliary Equipment and (WKoe11P01-SE-D53) Specifications for the design of Philippi substation GIS Buildings, the design of the automatic chop over scheme, the design of the 132kV cable terminations as per Philippi Substation 132kV Systems from

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Transformer 3 to 132kV GIS (240-170000106) and the design of all other associated works as stipulated in the specifications.

4.3 Procedure for submission and acceptance of *Contractor's* design

As per specifications

4.4 In accordance with the *Employer's* specifications and tender returnables which are provided to the *Contractor*. Other requirements of the *Contractor's* design

- In accordance with the *Employer's* specifications which are provided to the *Contractor*.

INTELLECTUAL PROPERTY RIGHTS

The following provisions pertaining to the intellectual property rights regarding the Works will be applicable:

- "Intellectual Property" means (a) patents, trademarks, service marks, rights in designs, trade names, copyrights and topography rights, in each case whether registered or not; (b) applications for registration of any of them; (c) rights under licences and consents in relation to any of them; (d) all forms of protection of a similar nature or having equivalent or similar effect to any of them which may subsist anywhere in the world.
- All Intellectual Property rights, contained in any developed materials which are created by the *Contractor* or on behalf of the *Contractor*, for the purposes of and in support of the provision of the works vests with the *Contractor*. The *Contractor* retains the Intellectual Property rights in and to the *Contractor's* Intellectual Property made by or on behalf of the *Contractor* as part of the works.
- The *Contractor* gives to the *Employer* a non-terminable, transferable, non-exclusive, royalty-free licence, to copy, use and communicate the *Contractor's* documents containing Intellectual Property relating to the works (the "IP Documents"), including making and using modifications of them.
- This licence (a) applies throughout the actual or intended working life (whichever is longer) of the works; (b) entitles any person in proper possession of the relevant part of the works, to copy, use and communicate the IP Documents for the purposes of completing, operating, using, maintaining, altering, adjusting, repairing, refurbishing and demolishing the works (the "Purposes"); and (c) in the case of IP Documents which are in the form of computer programs and other software, permit their copying, use and communication for the Purposes.
- The IP Documents are not, without the *Contractor's* written consent, used, copied or communicated to a third party by or on behalf of the *Employer* for any purpose other than the Purposes.
- The *Contractor* procures that each SubContractor executes all and any IP Documents and take all and any other actions as may be required, in order to give effect to this licence. The *Employer* retains all Intellectual Property rights in all documents made by or on behalf of the *Employer* including all documents and requirements provided prior to or during the execution of the works. The *Contractor* does not, without the written consent, of the *Employer*, copy, use or issue to a third party any of these document and requirements except for the purposes of executing the works.

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- **Either party procures that any third party executes confidentiality undertakings not to disclose to any other third parties, any of the *Employer's* documents and requirements at all, in respect of the *Employer*, or the IP Documents other than for the Purposes, in respect of the *Contractor*.**

4.5 Design of Equipment

The *Contractor* submits particulars of the design of an item of equipment for the *Project Manager* for review and acceptance if the design meets the *Employer's* specification.

4.6 Use of Contractor's Design

The Contractor to allow the Employer to use detailed designs, drawings, and all relevant documents for operational, maintenance purposes and for future developments whenever required. Copy rights to remain with the Employer.

4.7 Equipment required to be included in the works

The *Contractor* shall submit a list of all equipment and machinery required to execute the Works.

The *Contractor* shall use prequalified HV plant equipment suppliers as per below list

| 400kV | |
|--------------------------------|---|
| Name of Equipment/ Material | Description of the Equipment/ Material |
| Post Insulator | 400kV, Classification C6-1550, 31mm/kV, PCD Top 127 & Bottom 254, Reference Spec 240-56030435 Rev 5 |
| Earth Switch | 400kV 63kA 31mm/kV (1550kV BIL) 6500mm phase centre spacing, Reference Spec 240-56063815 |
| Capacitive Voltage Transformer | Nominal System Voltage $420/\sqrt{3}kV$, Rated Secondary Voltage $110/\sqrt{3}V$ Reference Spec NRS030 |
| Surge Arrester | Station Class Surge Arresters For 400kV System 31mm/kV, Reference Spec 240-75540566 |

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| 132kV | |
|-----------------------------|---|
| Name of Equipment/ Material | Description of the Equipment/ Material |
| Post Insulator | 132kV, Classification C4-550, 31mm/kV, Top & Bottom PCD 127, Reference Spec 240-56030435 |
| Earth Switch | 132kV, 31mm/kV, 40kA, phase centre spacing 3000mm, Reference Spec 240-56063815 |
| Current Transformer | 132kV, Post Type, 31mm/kV, 2 Buszone (1/1200) (PX), 2 Protection (PX), 2 Metering (0.2), rated secondary current: 1A, rated primary current 2500A, 40kA, Reference Spec 240- 56062862 |
| Conventional Isolator | 132kV, 2 earth switch, 31mm/kV, rated primary current 2500A, 40kA, Reference Spec 240-56063815 |
| Voltage Transformer | Nominal System Voltage $132/\sqrt{3}kV$, Rated Secondary Voltage $110/\sqrt{3}V$ Reference Spec 240-56062765 in accordance with NRS030 Standard |
| Surge Arrester | 132kV, Type - Metal Oxide, IEC Line discharge class: 2, 31mm/kV, method of mounting: earthed, Reference Spec 240-42193474 |

4.8 As-built drawings, operating manuals and maintenance schedules

In accordance with the *Employer's* specifications which are provided to the *Contractor*.

Upon Completion the *Contractor* is to provide final "as built" records in accordance with the requirements as laid out below.

Two copies of Construction Records are to be compiled by the *Contractor* at the end of the project in a hard copy format. In addition, the *Contractor* is to supply a Compact Disk of the records to the *Project Manager*.

The Construction Records consists of the following information which originates from various parties as indicated below:

The *Contractor* compiles the document and submits copies to the *Employer* within four weeks after receipt of the relevant information.

5 Procurement

5.1 People

5.1.1 Minimum requirements of people employed on the Site

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People employed on site shall have all relevant documents as required by law for employment within the country, i.e. relevant work permits and Identifications.

5.1.2 BBBEE and preferencing scheme

The table below will be used as a scoring mechanism with regards to B-BBEE compliance which will account for 10% of the weightings for each package associated with this project.

| B-BBEE | Number of Points (90/10 system) |
|---------------------------|------------------------------------|
| 1 | 10 |
| 2 | 9 |
| 3 | 8 |
| 4 | 5 |
| 5 | 4 |
| 6 | 3 |
| 7 | 2 |
| 8 | 1 |
| Non-compliant contributor | 0 |

5.1.3 SUPPLIER DEVELOPMENT LOCALISATION AND INDUSTRIALISATION (SDL&I)

SDL&I mandate is to achieve maximum and sustainable local development impact through leveraging Eskom's procurement spend in a manner that allows flexibility within the business in order to accommodate government local development initiatives and policies.

As a State-Owned Enterprise, ESKOM supports Government's socio-economic development initiatives that it addresses through Supplier Development and Localisation objectives, which include enterprise development, transfer of skills, job creation, incubation, localisation of procurement initiatives and industrialisation.

For the purposes of tendering, the *tenderer* must demonstrate the manner in which the SD&L requirements will be met in due course in an implementation program. If the *tender* is awarded all SD&L undertakings (the *Contractor's* SD&L Obligations) must be made by the *Contractor* at the time of contracting.

SDL&I Undertaking

- The SDL&I undertaking generally identifies the following areas for SDL&I evaluation. These are procurement from EMEs, QSEs, LMEs (Generic); local content of the tender as a whole; Job creation and Skills Development commitments of the *tenderer*.
- Targets and weighting are set for each individual project.
- Tenderers who complete and submit the undertaking as required, but who do not meet Eskom's targets, will not be disqualified. SDL&I undertakings do not form part of scoring but commitments will form part of contractual obligations.

Definitions and Interpretation

The definitions below shall be referred to in the interpretation of this document. The targets for EMEs, and QSEs are a percentage of the local content portion of the tender only.

Exempted Micro Enterprise (EME)

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- In terms of the Generic Codes of Good Practice, an enterprise including a sole propriety with annual total revenue of R10 million or less qualifies as an EME.
- In instances where Sector Charters are developed to address the transformation challenges of specific sectors or industries, the threshold for qualification as an EME may be different from the generic threshold of R10 million. In such instances, the relevant Sector Charter thresholds will therefore be used as a basis for a potential bidder to qualify as an EME. (For example the approved thresholds for EMEs for the Tourism and Construction Sector Charters are R2.5 million and R1.5 million respectively).
- An EME automatically qualifies as a level 4 contributor with B-BBEE recognition level of 100% in terms of the Codes of Good Practice.
- An EME with at least 51% black ownership qualifies as Level 2 Contributor with B-BBEE level of 125% in terms of the Codes of Good Practice.
- An EME with 100% black ownership qualifies as a Level 1 contributor with B-BBEE level of 135% in terms of the Codes of Good Practice.
- An EME that is regarded as a specialized enterprise with at least 75% black beneficiaries qualifies as Level 1 contributor with B-BBEE level of 135% in terms of Codes of Good Practice.
- An EME that is regarded as a specialized enterprise with at least 51% black beneficiaries qualifies as a Level 2 contributor with B-BBEE level of 125% in terms of the Codes of Good Practice.
- An EME is required to submit a sworn affidavit confirming their annual total revenue of R10 million or less and level of black ownership to claim points as prescribed by regulation 6 and 7 of the Preferential Procurement Regulations 2017.

Qualifying Small Enterprises (QSE)

- The Codes define a QSE as any enterprise with annual total revenue of between R10 million and R50 million.
- A QSE with at least 51% black ownership qualifies as a Level 2 contributor.
- A QSE with 100% black ownership qualifies as a Level 1 Contributor.
- A QSE that is regarded as a specialized enterprise with at least 75% black beneficiaries qualifies as a Level 1 contributor with B-BBEE level of 135% in terms of the Codes of Good Practice.
- A QSE that is regarded as a specialized enterprise with at least 51% black beneficiaries qualifies as a Level 2 contributor with B-BBEE level of 125% in terms of the Codes of Good Practice.
- A QSE is required to submit a sworn affidavit confirming their annual total revenue of between R10 million and R50 million and level of black ownership or a B-BBEE level verification certificate to claim points as prescribed by regulation 6 and 7 of the Preferential Procurement Regulations 2017.

Large Measured Entity (LME) /Generic

- A generic Enterprise's B-BBEE compliance is measured using the Generic Scorecard. The Generic scorecard is based on five elements each of which has an assigned weighting which correlates with the importance of that specific element and a set target.

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- A generic Enterprise has a annual turnover that is more than R 50 million rands.

SDL&I Progress Report

Means the *Contractor's* SDL&I progress report contemplated in clause 7 of this annexure.

Local Content

- Goods made in South Africa (from local raw materials).
- Only good that are made within the borders of SA can be claimed to be local content.
- Local Content (is mainly based on local manufacturing, there must be value addition to the product.
- LC is measured on the product which must be manufactured in South Africa at a specified minimum threshold (LC).
- LC percentage is determined based on the availability of input materials.
- Assembly of products is considered to have some level of local content.
- Example where 100 local content is required, no imports are allowed all materials including the production process must be local.
- If local content is less than 100 imported raw materials can be used without any Exemption.
- Key to protect local industry against imports, build industrial capacity, create jobs and contribute to the economic growth in South Africa.

Local Procurement

- Goods and services purchased locally irrespective of where they were made or produced.
- It is based on geographical area, may be a region/district/province.
- Local procurement is based on the location of the business.
- Imported goods are considered.
- Using local resources to stimulate growth and development.
- Simply buying from a local supplier.

Imported Goods and Services

"Imported goods and services" means, but is not limited to:

Goods and services directly imported into South Africa;

Goods which although stored in South Africa are produced and/or wholly manufactured outside the borders of South Africa and/or have a minimum of 50% (fifty percent) of production costs (including labour) incurred outside of South Africa and payable to foreign residents and/or foreign registered entities;

Goods that have been "substantially transformed" outside of South Africa. Substantially transformed refers to the irreversible incorporation of imported components in the goods, with the labour costs and profit content earned by foreign residents and/or foreign registered entities exceeding 50% (fifty percent) of the Contract Amount and/or the significant assembly and manufacture of the goods occurring outside of South Africa's borders; and/or

Services with at least 50% (fifty percent) of the labour cost incurred outside of South Africa's borders and/or with at least 50% (fifty percent) of the service fee payable to foreign residents and/or foreign registered entities, regardless of whether the service involves domestic capital goods or other domestic costs

Final Review

Final Review means the review (to be conducted at the *completion* date of the whole of works by the *Project Manager*) of the *Contractor's* performance in respect of the *Contractor* SDL&I Obligations.

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Skills Development

This is the requirement that *tenderers* commit to train certain individuals in specified trades.

The requirement is that the targeted numbers of individuals are trained and complete practical tasks to achieve the outcome of passing a trade test and qualifying as an artisan, or the equivalent for any other required skill.

Contractor's SDL&I Commitments

Means those commitments regarding local content, skills development, Job creation and procurement from EMEs and QSEs made by the *Contractor* in his tender submission and used by the *Employer* for the purposes of calculating the *Contractor's* SD&L score in the tender evaluation process.

Contractor's SDL&I Obligations

Means those obligations of the *Contractor* regarding local content, skills development and procurement from QSEs and EMEs derived from *Contractor's* SDL&I Commitments and agreed between the *Contractor* and the *Employer*.

Certificate of Fulfilment

Means the certificate issued by the *Employer* after the Final Review as evidence of the *Contractor's* successful fulfilment of the *Contractor* SDL&I Obligations.

SDL&I Progress Reports

The *Contractor* shall submit monthly SDL&I progress reports to the *Project Manager*. SDL&I progress reports shall be submitted by the 7th (seventh) day of the month following the months to which the report relates. Each report shall include:

An executive summary;

Charts and detailed descriptions of the progress in narrative format, including each stage of progress of the *Contractor* SDL&I Obligations, the meeting (or delay in the meeting) of anticipated dates and targets (as set out in the program) and any documents, statistics or other form of verification of the dates and targets to be provided in respect thereof;

Percentage progress and the actual or expected dates of commencement of any of the major stages making up the *Contractor* SDL&I Obligations;

Schedule of forecast and actual, together with a 3 (three) month look-ahead of major activities and events;

Comparisons of actual and planned progress in terms of the Implementation Program;

Details of actual and planned resources;

An Affidavit from the sub-*Contractors* stating the work that has been subcontracted to meet the *Contractor's* SDL&I obligations;

A schedule identifying all details of persons in the process of undergoing or who have successfully completed the Skills Transfer for the relevant period (including details of their personal information and certified copies of their test results and certificates received);

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A risk register and assessment dealing with all areas of concern which may cause delays to the fulfilment of the SDL&I obligations and details of the corrective or other measures being adopted, or to be adopted to mitigate or overcome such delay; and such other matters and information (including schedules and charts) as the *Project Manager* may require to be included in the SDL&I progress report from time to time.

An electronic copy and two hard copies of each SDL&I progress report shall be submitted to the *Project Manager*.

Additional Reports

The *Project Manager* shall be entitled to request the *Contractor* to provide additional reports when in his opinion they are warranted to monitor the progress of the fulfilment of the *Contractor* SD&L obligations.

The Final Review

The parties' record that the purpose of the final review is for the *Project Manager* to determine whether the *Contractor* has fulfilled the *Contractor's* SDL&I obligations as at *completion date*.

The *Contractor* shall provide the *Project Manager* with the following documentation to be used by the *Project Manager* as a basis for the final review:

A consolidated SDL&I progress report recording all steps taken to meet the *Contractor's* SD&L obligations from the *starting date* to the *completion date* including all information and documentation referred to in clause 8.1 above;

All of the SDL&I progress reports provided by the *Contractor* during the course of the contract and any other additional report, documentation or information that the *Project Manager* deems to be reasonably relevant to the conduct of the final review (to be provided by the *Contractor* at least 21 (twenty one) business days prior to the final review). The *Project Manager* shall notify the *Contractor* of such request by way of written notice at least 30 (thirty) business days prior to the final review.

The *Employer* shall, in its reasonable discretion, conduct the final review by comparing those *Contractor's* SDL&I obligations actually fulfilled by the *Contractor* as at the time of the final review against with the *Contractor's* SDL&I obligations as a whole.

The *Project Manager* shall notify the *Contractor* of its findings on the final review by way of written notice within 30 (thirty) business days of the final review. The notice shall contain the *Project Manager's* reasons for its findings.

Should the final review reveal that the *Contractor* has not fulfilled and/or complied with any of the *Contractor's* SD&L obligations as at the *completion date*:

The *Contractor* shall be in breach of a material obligation under the contract and the *Employer* shall be entitled to have immediate recourse to and make a claim against the whole of the retention as the penalty for the *Contractor's* breach of the *Contractor* SDL&I obligations.

Should the final review reveal that the *Contractor* has fulfilled and/or complied with all of the *Contractor's* SDL&I obligations as at the *completion date*, the *Employer* shall issue a certificate of fulfilment.

SDL&I Penalty and Performance Security

As security for the fulfilment of all SDL&I obligations, Eskom will apply a penalty of 2.5% of every invoice amount (excluding VAT) for failure to submit SDL&I performance reports every quarter; or failure to meet the SDL&I obligations in a contract.

5.2 Subcontracting

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5.2.1 Subcontract documentation, and assessment of subcontract tenders

The *Contractor* shall manage his sub-*Contractors* in the same way that the *Employer* manages the *Contractor*. Special attention must be given to the management of the sub-*Contractors*' SHEQ compliance.

The *Contractor* will be required to subcontract a minimum of 30% of the contract and the following designated groups will be targeted and this will be a condition of tender:

- an EME or QSE which is at least 51% owned by black people;
- an EME or QSE which is at least 51% owned by black people who are youth;
- an EME or QSE which is at least 51% owned by black people who are women;
- an EME or QSE which is at least 51% owned by black people with disabilities;
- an EME or QSE which is 51% owned by black people living in rural or underdeveloped areas or townships;
- a cooperative which is at least 51% owned by black people;
- an EME or QSE which is at least 51% owned by black people who are military veterans;
- an EME or QSE.

5.2.2 Limitations on subcontracting

Proof of a sub-contract agreement will be required as proof of meeting the 30% minimum requirement.

5.3 Plant and Materials

5.3.1 Quality

5.3.2 The *Contractor* shall comply with the 240-105658000 Supplier Quality Management Specification "free issue" by the *Employer*

No Plant and material will be provided "free issue" to the *Contractor* for this Contract. All Plant and Material is to be provided by the *Contractor*

5.3.3 *Contractor's* procurement of Plant and Materials

All transportation to site of plant and material required for this project will be by means of road transport. The *Contractor* must familiarise himself with the road conditions to site.

The *Contractor* must prepare a fenced off storage yard on or off-site for the off-loading and safekeeping of all plant and material delivered to site. Material must be off loaded and stored separately in areas allocated for this purpose. The *Contractor* must manage such storage areas as to ensure safety compliance as well as security of the plant and material.

The *Contractor* shall comply to document "240-105658000 Supplier Quality Management Specification in works information during fabrication, supply and delivery of foundation steelwork, reinforcing, earthing devices and all other foundation related material. All copper will be supplied by the *Contractor*.

5.3.4 Spares and consumables

In accordance with the *Employer's* specifications which are provided to the *Contractor*.

The *Contractor* shall supply an extra amount of 10 cable trench covers over and above the amount required per substation for the total of the *Works*.

5.4 Tests and inspections before delivery

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All the testing as required by the relevant specifications as indicated in the document shall be done by the *Contractor*.

5.5 Marking Plant and Materials outside the Working Areas

The *Contractor* shall mark all Equipment, Plant and Material which is outside of the working area destined for the works.

5.6 Contractor's Equipment (including temporary works).

The *Contractor* shall ensure the provision of suitable construction equipment for the construction of the works.

6 Construction

6.1 Temporary works, Site services & construction constraints

6.1.1 Employer's Site entry and security control, permits, and Site regulations

Security control and entry will be done in accordance to the security scope of work for Philippi Substation Extension. The *Contractor* will ensure that the *Contractor's* staff complement undergoes screening by SAPS to access Philippi substation.

The *Contractor* will have to adhere to Eskom's High Voltage regulations. *Contractor's* personnel will be expected to have completed the necessary High Voltage Regulations (ORHVS) modules in order to be issued with a permit to work in the live yard.

The *Contractor* will meet requirements for working in the City of Cape Town 132kV GIS in accordance to **Annexure A**.

6.1.2 Restrictions to access on Site, roads, walkways and barricades

Where the restrictions are applicable, the *Contractor* shall be required to comply with these. The *Contractor* will ensure the following are adhered to for access to site:

- Security/police clearances not more than a year old are submitted to the *Employer*
- Certified ID/ Passport copies and work permit for foreign employees are submitted to the *Employer*
- Tool/equipment list with serial numbers if available are submitted to the *Employer*
- People with criminal records depending on the seriousness of the charges will not be accepted at Eskom sites.

6.1.2.1. Positive identification at all times:

- Eskom Employee only by means of Eskom Id Card, No Eskom ID card employee will be treated as a visitor.
- Visitor and *Contractors* access by means of SA ID, passport, drivers licence
- Recording of visitors details electronically or manually.

6.1.2.2. Visitor confirming process.

- Visitors must be accompanied by a host at all times.
- Declaration, recording and movement control of equipment and material.
- Screening of persons and articles/parcels through the use of electronic equipment ensuring prohibited items are not brought on site.
- Alcohol testing to be conducted at Eskom sites.
- Safety inductions to be conducted at Eskom sites.

6.1.3 People restrictions on Site; hours of work, conduct and records

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The *Contractor* must clearly indicate its proposed working hours in the Tender and specifically in the programme provided with the Tender. After award the *Contractor* will adhere to these agreed working hours and keep detailed and accurate records of compliance herewith. The *Contractor* ensures that the *Supervisor* must sign these records daily and the *Project Manager* and *Supervisor* must have access to these records at any time.

The *Contractor* indicates any shift work or extended working hours required in order to meet with the required completion dates of the Package Order. The *Project Manager* and SHEQ manager's permission to work these hours are obtained prior to working such hours. Permission will only be granted if the longer hours worked have been accepted in writing by the Department of Labour.

The *Contractor* keeps records of his people on Site, including those of his SubContractors which the *Project Manager* or *Supervisor* have access to at any time. These records will be needed when assessing compensation events.

6.1.4 Health and safety facilities on Site

Refer to the SHE specification, EMP, South African Government Guidelines and Directions on Management of COVID-19 and other epidemic outbreaks, World Health Organisation Guidelines, the latest Disaster Management Act and applicable government regulations. The *Contractor* shall appoint the security for the site camp and plant and material.

6.1.5 Environmental controls, fauna & flora, dealing with objects of historical interest

The *Contractor* shall comply with all the requirements of the EMP, TPDMAN-ST-37 and all other statutory requirements.

6.1.6 Title to materials from demolition and excavation

The *Contractor* shall make his own arrangements, to the approval of the *Supervisor* and the Local Authorities, for the disposal of all surplus material and construction waste resulting from the works. Disposal of all waste (Building, Hazardous and Domestic) must be in accordance with the EMP and TPDMAN-ST-37. Steel, copper and all other high value materials will be disposed of by the *Employer*

6.1.7 Cooperating with and obtaining acceptance of Others

The *Contractor* will be required to integrate with Eskom personnel during construction. It is expected that cooperation will be given when this happens during the project construction.

6.1.8 Publicity and progress photographs

As agreed with the *Employer's Project Manager*.

6.1.9 Contractor's Equipment

Records are to be kept of Equipment on Site including whether it is owned or hired. This includes any scaffolding, rigs, heavy lifts and cranes.

The *Contractor* shall inform the *Project Manager* prior to the removal of any equipment during the contract period from the Working Areas.

6.1.10 Equipment provided by the Employer

No equipment shall be provided by the *Employer*.

6.1.11 Site services and facilities

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The *Contractor* shall conduct site inspection and establish what facilities (i.e. power supply, water, waste disposal, tele-coms, ablutions, fire protection and lighting) are required or necessary for providing the Works

The *Contractor* shall provide everything else necessary for providing the Works Any measures which the *Contractor* may require to maintain continuity and quality of supply shall be arranged by him at his own expense.

6.1.12 Facilities provided by the *Contractor*

Contractor shall provide all facilities necessary for providing the Works

The *Contractor* is to provide the following items to facilitate the *Employer's* site *Supervisors* and project administration team within four weeks of contract award:

Facilities for Employer

- a) Establishment of *Employer* facilities on site i.e. Site office, sheds, toilets including plumbing, electricity, air conditioning, internet connections, copying and printing facilities etc.
- b) Portable water and toilet facilities for sole use of Clients Representatives.

Facilities for the Contractor

- c) Establishment of facilities on site ie. Site office, sheds, toilets including plumbing and electricity, including internet connections, copying and printing facilities etc.
- d) Staff accommodation
- e) Access to site & permits
- f) Establishment of equipment, tools and plant
- g) Allow the sum for hiring of standby generator including transport to site, working on site, diesel fuel and removing from site at contract completion. (ON EMPLOYER'S INSTRUCTION)
- h) Name boards
- i) Dealing with water during construction
- j) Removal of the site Establishment

The *Contractor* shall negotiate with landowners for the erection of any construction camp(s) and accommodation for his personnel, and ensuring compliance with all by-laws and requirements of the relevant authorities **after contract award**. All necessary services - water, electricity, sewerage, toilet facilities, telephones, etc. are to be provided by the *Contractor* to suit his needs.

All evidence of construction camp(s), batching plants, etc. are to be removed upon completion, and such areas rehabilitated to the satisfaction of the landowner and the *Supervisor*.

The *Contractor* shall provide sanitary amenities, first aid and firefighting facilities as required by the Occupational Health and Safety Act.

The *Contractor* keeps records of the following and submits copies of these records to the *Supervisor* weekly:

- Number of personnel by category and/or trade on site on a daily basis.
- Detailed list of equipment by category on site on a daily basis with an indication of its working condition i.e. working order, under repair, working but standing idle etc.
- A site diary is to be kept by the *Contractor* in which all events are recorded. Records of events that could give rise to Compensation Events are to be kept up to date for inspection by the *Supervisor* and/or *Project Manager* at all times.

6.1.13 Existing premises, inspection of adjoining properties and checking work of Others

Refer to Construction Environmental Management Plan and Site Information.

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6.1.14 Survey control and setting out of the *works*

Set out points/beacons will be identified by the *Supervisor*. All Top of Concrete (TOC) and specified levels will be provided to the *Supervisor* by a Professional Land Surveyor. The *Supervisor* may request at various intervals for the *Contractor* to verify certain of the works. These costs will be to the *Contractor* and should be included in the rates.

6.1.15 Excavations and associated water control

Refer to the SHE specification, EMP and any other statutory requirements.

6.1.16 Underground services, other existing services, cable and pipe trenches and covers

Should there be any underground services that may require relocating; this should be discussed with the *Supervisor* who will discuss it with the *Project Manager* and the designers.

6.1.17 Control of noise, dust, water and waste

Refer to the SHE specification, EMP and any other statutory requirements.

6.1.18 Sequences of construction or installation

As per approved Project Schedule reflecting the key milestone dates.

6.1.19 Giving notice of work to be covered up

After construction the *Contractor* is to rehabilitate any damage caused to the environment to the satisfaction of the *Supervisor*. The remedial works are to be "signed-off" by both parties before acceptance.

6.1.20 Hook ups to existing works

Hook ups to existing works will be done in accordance to the GIS specification 240-87340147. The 132kV City of Cape Town hook up will be designed and installed by the *Contractor*.

6.2 Completion, testing, commissioning and correction of Defects

6.2.1 Work to be done by the Completion Date

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

| | Item of work | To be completed by |
|--|-------------------|---------------------------------|
| | As built drawings | Within 10 days after Completion |
| | | |

6.2.2 Use of the *works* before Completion has been certified

THE DESIGN, MANUFACTURING, AND INSTALLATION OF A NEW 400KV GIS, CONSTRUCTION OF A NEW CONTROL ROOM, MANUFACTURING, AND INSTALLATION OF A NEW 400KV TRANSFORMER, CONSTRUCTION OF A ROAD AROUND THE SUBSTATION, MANUFACTURING AND INSTALLATION OF PROTECTION SCHEMES, DESIGN, AND INSTALLATION OF AN AUTOMATIC CHOP OVER SCHEME, CONSTRUCTION, AND INSTALLATION 400KV AND 132KV AIS EQUIPMENT, COMMISSIONING AND ASSOCIATED WORKS.

The existing works (Transformer 1 and Transformer 2) will be taken over as soon as they hooked up and commissioned to the new works (400kV GIS and control equipment) for continuity of supply, as the existing transformers are the only source of supply to the Mitchell's Plan area.

6.2.3 Materials facilities and samples for tests and inspections

The *Contractor* shall be responsible for the strength and quality of all materials used and workmanship employed. The *Contractor* shall be responsible for the stability of the permanent works and the temporary works. The fact that the *Employer* has not objected during the construction period to any materials and/or workmanship employed by the *Contractor* and even though such materials and/or workmanship has been inspected by the *Supervisor* shall not relieve the *Contractor* of such responsibility.

6.2.4 Commissioning

The assets shall be commissioned to Eskom's standards and specifications. This is intended to protect the safety, integrity, and security of the Transmission system.

The pre-commissioning and commissioning activities shall be the responsibility of the *Contractor*, and shall be witnessed and the results verified, accepted and approved by the Eskom Transmission Western Grid representative(s). The *Contractor* shall utilise the Eskom approved pre-commissioning and commissioning procedures and shall compile the required documentation for handover purposes prior energisation.

The *Contractor* shall submit to Eskom, the pre-commissioning and commissioning test plans and program, which shall comply with the Eskom requirements, for approval.

Eskom Transmission has test routines for most of the protection IEDs and these shall be obtained from Eskom and shall be used by the *Contractor* during commissioning, where applicable. Test routines that are not available for IEDs within the schemes that will be designed by the appointed *Contractor* shall be developed by the *Contractor*.

The following standard shall be used:

- 240-54615413 – Standard for Commissioning Protection Assets.
- 240-55197966 – Standard for the commissioning of metering installations (HV and MV).
- 240-137465740 – Standby Battery storage and commissioning in Eskom

Commissioning options

The OEM shall make provision for the two commissioning options:

Option 1

- The commissioning of Philippi substation extension shall be commissioned by the OEM and Eskom (Western Grid Secondary Plant and PTM&C) commissioning teams shall oversee and witness the commissioning.
- The OEM shall submit a detailed training program and provided training that will include the installation, maintenance, operation of all the equipment.
- The commissioning training shall be provided by the OEM during the commissioning of the Philippi substation.
- Commissioning at the remote ends will be executed by Eskom (PTM&C and Western Grid secondary plant) teams as integrated with the Philippi substation GIS commissioning.

Option 2

- The commissioning of Philippi substation extension shall be commissioned by the Eskom (Western grid secondary plant and PTM&C) commissioning teams. The OEM shall oversee and witness the commissioning.
- The OEM shall submit a detailed training program and provided training that will include the installation, maintenance, operation of all the equipment.

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- Commissioning at the remote ends will be executed by Eskom (PTM&C and Western Grid secondary plant) teams as integrated with the Philippi substation GIS commissioning.

After the evaluation of the tender, Eskom will advise which option will be selected for the commissioning the new GIS.

The final switching of the equipment and lines shall be with the carried under the permission of the National Control (Approved commissioning plan and outages).

Commissioning sequence

The commissioning sequence of Philippi substation extension shall follow the following sequence:

1. Test and Commission transformer 3
2. Start disconnecting either transformer 1 or transformer 2 at a time depending on network constraints then;
3. Start connecting either transformer 1 or transformer 2 based on the disconnection sequence, to the new GIS

The commissioning sequence may change based on the network constraints and requirements from the nation control.

6.2.5 Start-up procedures required to put the *works* into operation

As per specifications

6.2.6 Take over procedures

Take-over of The Works will be in accordance NEC procedures in conjunction with Eskom Tx procedure TST 41 - 638. The *Contractor* advises the *Supervisor* when the *Works* is available for final inspection, and provides assistance.

6.2.7 Access given by the *Employer* for correction of Defects

Clause 43.4 of the NEC will apply as well as normal ORHVS procedures for getting permits.

6.2.8 Performance tests after Completion

The *Contractor* shall do testing in accordance to the GIS specification 240-50807380 section 7 for the GIS and section 13 of the PTM&C scope of work document number 240-170000102 for protection equipment.

6.2.9 Training and technology transfer

The supplier shall provide training of an international standard on the supplied equipment by OEM accredited instructors. The training shall be in accordance with the Eskom training standard 240-56065202, and organised on the following levels:

- Orientation and basic functioning
- Operational and first line maintenance
- Installation, testing and commissioning of the GIS and circuits (controls)
- Specialized maintenance on all aspects of the GIS which must include major intrusive work, repair and testing

6.2.10 Operational maintenance after Completion

The Supplier shall provide a Reliability Availability Maintainability Programme Manual within 2 months after *Notification of Acceptance*

Reliability

THE DESIGN, MANUFACTURING, AND INSTALLATION OF A NEW 400KV GIS, CONSTRUCTION OF A NEW CONTROL ROOM, MANUFACTURING, AND INSTALLATION OF A NEW 400KV TRANSFORMER, CONSTRUCTION OF A ROAD AROUND THE SUBSTATION, MANUFACTURING AND INSTALLATION OF PROTECTION SCHEMES, DESIGN, AND INSTALLATION OF AN AUTOMATIC CHOP OVER SCHEME, CONSTRUCTION, AND INSTALLATION 400KV AND 132KV AIS EQUIPMENT, COMMISSIONING AND ASSOCIATED WORKS.

The reliability programme shall include:

- An evaluation of the GIS equipment throughout the design, the production and the test procedures used;
- An estimate of the failure rates expected for the various system devices during their useful life based on component history of factory failure rates, in service failure rates and references.
- Document Classification: Controlled Disclosure SPECIFICATION FOR GAS INSULATED SWITCHGEAR (GIS) AND ASSOCIATED AUXILIARY EQUIPMENT Unique Identifier: 240-50807380 Revision: 5 Page: 54 of 82
- **ESKOM COPYRIGHT PROTECTED** When downloaded from the WEB, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorized version on the WEB.
- An assurance that the material and the components selected for this application enable the GIS installation to perform in compliance with the specified requirements;
- De-rating and safety factors used in the design of each item to enhance the reliability of the entire system; and
- Test data that support the performance capability as well as the quality of parts and materials supplied.

Availability

The GIS installation shall be designed to meet the following guaranteed values of availability:

- Scheduled outages, which involves planned inspection and maintenance, not be more than once per year; and
- Forced outage also not to be more than once per year.
- The overall GIS availability to be 99,8 % per year per feeder bay. This availability to be calculated on a yearly basis.

The maximum outage time to be limited to 8 hours with the understanding that only one feeder bay to be switched out at a time for scheduled maintenance activities. The outage time allowed for scheduled maintenance might only be during weekends.

Maintainability

The GIS installation shall be designed to meet the following maintainability requirements:

- The *Contractor* shall design the equipment to minimise both repair and maintenance effort and the need for special skills and tools;
- The *Contractor* shall include as a minimum the following factors in the maintainability design plan:
- analysis and allocation of scheduled maintenance effort required to keep the equipment in proper working order;
- for each repair or maintenance work, quantitative estimates shall be made of repair frequency, duration, man-hour's and parts requirements;
- spare parts provision and logistic support;
- personnel safety requirements;
- Recommendation on the quantities of spare parts or units required. Technical information concerning spare parts shall include reasons for selection, information on storage and supply of parts for the repair and maintenance of equipment during the nominal operating life; and
- Provide installation, operation, repair and maintenance manuals in compliance with the *Employer's* requirements.

7 List of drawings

7.1 Drawings issued by the *Employer*

THE DESIGN, MANUFACTURING, AND INSTALLATION OF A NEW 400KV GIS, CONSTRUCTION OF A NEW CONTROL ROOM, MANUFACTURING, AND INSTALLATION OF A NEW 400KV TRANSFORMER, CONSTRUCTION OF A ROAD AROUND THE SUBSTATION, MANUFACTURING AND INSTALLATION OF PROTECTION SCHEMES, DESIGN, AND INSTALLATION OF AN AUTOMATIC CHOP OVER SCHEME, CONSTRUCTION, AND INSTALLATION 400KV AND 132KV AIS EQUIPMENT, COMMISSIONING AND ASSOCIATED WORKS.

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

| Drawing number | Revision | Title |
|------------------|----------|--|
| 0.03-8178-0 | | Foundation-Trench-Earth mat |
| 0.03-8224 | | Existing water tank pump house building |
| WPhil12PO1-SE-D7 | | Philippi Key Plan |
| Phi12P01-SE-D16 | | Bay layout Sheet 2 Transformer 2 |
| Phi12P01-SE-D16 | 3 | Bay layout Sheet 3 Transformer 3 |
| Phi12P01-SE-D16 | 4 | 132kV Bay layout Sheet 4 Transformer 3 |
| Phi12P01-SE-D42 | 0 | Access Concrete Layout and Details |
| Phi12P01-SE-D44 | 0 | Transformer 3 Plinth Drawing |
| Phi12P01-SE-D50 | 1 | Control Building Plan |
| Phi12P01-SE-E47 | 1 | Control Building Plan |
| Phi12P01-SE-E47 | 11 | Control Building General Arrangement |
| Phi12P01-SE-E47 | 12 | Control Building HMI Office |
| Phi12P01-SE-E47 | 2 | Control Building Elevations and Sections |
| Phi12P01-SE-E47 | 3 | Control Building Floor Slap Layout, Levels and Details |
| Phi12P01-SE-E47 | 4 | Control Building Sections and Details |
| Phi12P01-SE-E47 | 5 | Control Building General Finishes |
| Phi12P01-SE-E47 | 6 | Control Building Finishes Schedule |
| Phi12P01-SE-E47 | 7 | Control Building Finishes Schedule |
| Phi12P01-SE-E47 | 9 | Control Building Purpose Made Steel Doors |
| Phi12P01-SE-E48 | 1 | Control Building Electrical Installations |
| Phi12P01-SE-E48 | 2 | Control Building Ventilation Installations |
| Phi12P01-SE-E48 | 3 | Control Building AC Schematic and Cable Block |
| Phi12P01-SE-D13 | 0 | Steelwork Marking Plan |
| WPhil12PO1-SE-D6 | 0 | Station Electric Diagram |
| 0.54/1150 | 25 | Battery Room Wash up Sink, Drainer and Shower |
| 0.54/1150 | 31 | Control Room-Cabinets |
| 0.54/5578 | 0 | Standard Stairs and Handrail Details |
| 0.54/308 | 9 | Medium Equipment Support Foundation Detail |

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| | | |
|------------------|---|--|
| 0.54/1596 | 2 | Medium Equipment Support 5000 High |
| 0.54/306 | 6 | Small/Medium Equipment Support Cap 'M1' Adjustable fixing centres |
| 0.54/3626 | 0 | Double Row Single Tier Battery Stand |
| 0.54/4358 | 3 | Medium Equipment Support Pad Type Foundation Detail |
| 0.54/8315 | | Out Door Post Insulator |
| 0.54/303 | 2 | Medium Equipment Support 3000 High |
| 0.54/306 | 6 | Small/Medium Equipment Support Cap 'M1' Adjustable fixing centres |
| 0.54/304 | 2 | Medium Equipment Support 3500 High |
| 0.54/6603 | 0 | Medium Equipment Support Surge Arrester, Earth Strap Insulator Mounting bracket |
| 0.54/5676 | 0 | 132/88/66kV Cable Sealing End Support Foundation Detail |
| 0.54/5675 | 0 | 132/88/66kV Cable Sealing End Support Detail 2500 High |
| 0.54/8739 | 2 | 132kV Support Medium Equipment Support Top Cap with SA Bracket |
| 0.54/7512 | 0 | 132kV Actom Isolator (3m Phase) Foundation Details |
| 0.54/302 | 2 | Medium Equipment Support 2500 High |
| 0.54/401 | 8 | Label 1 Frame and Post Support Foundation |
| 0.54/5876 | 1 | 400MVA Reactor Plinths Concrete Fire Walls 11m Long Concrete and Reinforcement Details |
| 0.54/390 68 | 1 | Detail of Sand Filled Cable Trench Inside a Transformer Bund Wall |
| 0.54/390 15 | 5 | Single Cable Trench |
| 0.54/2089 | 6 | N.E.C Or Aux TRFR Support 1500 High Foundation Details |
| 0.54/3568 | 6 | Junction Box and Dstri. Board Foundation Detail |
| 0.54/710 | 7 | HV Yard Plug Box Foundation |
| 0.54/390 46 | 3 | Transformer Plinth Typical Section Through PIT Wall Brick |
| 0.54/390 49a/49b | 4 | Cable Trench Entry |
| 0.54/390 15a | 1 | Cable Trench Modification detail |
| 0.54/390 15c | 0 | Single Cable Trench (600X450 SVC) |
| 0.54/390 15b | 0 | Narrow Cable Trench 300mm Wide |
| 0.54/390 70 | 1 | Typical Section Through Grated Channel Inside Transformer Bund Area |
| 0.54/390 71 | 0 | Grated Channel Sump Detail Inside Transformer Bund Area |

THE DESIGN, MANUFACTURING, AND INSTALLATION OF A NEW 400KV GIS, CONSTRUCTION OF A NEW CONTROL ROOM, MANUFACTURING, AND INSTALLATION OF A NEW 400KV TRANSFORMER, CONSTRUCTION OF A ROAD AROUND THE SUBSTATION, MANUFACTURING AND INSTALLATION OF PROTECTION SCHEMES, DESIGN, AND INSTALLATION OF AN AUTOMATIC CHOP OVER SCHEME, CONSTRUCTION, AND INSTALLATION 400KV AND 132KV AIS EQUIPMENT, COMMISSIONING AND ASSOCIATED WORKS.

| | | |
|---------------|---|-----------------------------|
| 0.54/390 1 | 4 | Manhole Detail Depth 0-4m |
| 0.54/390 1a | 1 | Manhole Locking Bar |
| 0.54/390 1b | 4 | Manhole Detail Depth 4-8m |
| 0.54/390 1c | 0 | Manhole Slab Without Cover |
| 0.54/390 1d | 0 | Manhole Anti-Intrusion Grid |
| 0.54/390 69 | 0 | Sump Detail |
| 0.54/390 40 | 4 | Expansion Joints |
| 0.54/390 38a1 | 1 | 6m Wide Concrete Road |
| 0.54/390 38a | 4 | 6m Wide Concrete Road |

C3.2 *CONTRACTOR'S* WORKS INFORMATION

This section of the Works Information will always be contract specific depending on the nature of the *works*. It is most likely to be required for design and construct contracts where the tendering *Contractor* will have proposed specifications and schedules for items of Plant and Materials and workmanship, which once accepted by the *Employer* prior to award of contract now become obligations of the *Contractor* per core clause 20.1.

Typical subheadings could be

- a) *Contractor's* design
- b) Plant and Materials specifications and schedules
- c) Other

This section could also be compiled as a separate file.

Annexure A

1. Key personnel

The *Contractor* must have the following key personnel in its permanent employment or alternatively, a signed undertaking from a specialist company having the required personnel, stating that they will undertake the necessary work on behalf of the tenderer in terms of a sub-*Contractor* agreement, will be acceptable.

The *curriculum vitae* of all key personnel (including sub-consultants), must be submitted

Key personnel will be expected to operate out of the local office, as the exigencies of this project require.

| Item No | Evaluation Area | Quantity | Evaluation Criteria |
|---------|-----------------|----------|---------------------|
|---------|-----------------|----------|---------------------|

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| | | | |
|---|--|---|-----------------------------|
| 1 | NRS 040 Responsible Person. (Name, Certificate, CV and contactable references) Refer to Schedule 23 | 1 | Valid NRS 040-3 certificate |
|---|--|---|-----------------------------|

2. Cable Terminations

- a. All cable terminations shall be of approved design and an approved jointing technique shall be adopted. The terminations shall be designed to restrict the voltage gradients both inside and outside the terminations to safe values and shall be complete with suitable supporting and lifting arrangements.
- b. The terminations shall be designed to permit easy cleaning and to withstand all atmospheric conditions due to weather, ozone, acids, alkalis, dust, sandstorms or rapid changes of temperature under the working conditions existing on site. The design shall be such that stresses due to expansion and contraction in each part of the insulator and fittings shall not lead to the development of defects.
- c. Where the cables are to be terminated in gas insulated switchgear or oil-filled transformer cable boxes the *Contractor* shall be responsible for the design, testing and supply of the insulating interface barrier which provides the seal between SF₆ or oil and air as well as between SF₆ or oil and the cable insulation. This barrier shall be designed to suit the sealing end termination chamber provided by the switchgear or transformer manufacturer and shall be in line with the requirements of IEC 62271-209. The *Contractor* shall be required to liaise with the switchgear or transformer manufacturer to ensure that the cable boxes, corona shields and relevant accessories are suitably designed to accommodate the cable sealing ends.
- d. Where specified, the terminations shall be the plug-in type. The termination shall be type tested with the cable system offered. The *Contractor* shall supply and install the female bushing where specified. Where specified extension connection pieces shall be supplied to increase the effective length of the pug-in type termination to match the longer conventional termination length.
- e. Each termination shall be supplied with an adequate quantity of jointing material and shall be complete with all necessary fittings including tapered or stepped wiping gland, filling hole, air vent holes and an expansion dome, where applicable.
- f. The *Contractor* shall be responsible for ensuring that a proper oil or gas seal is provided and that the barrier for use in oil or SF₆ immersed applications shall be of material which shall not degrade under the influence of oil or SF₆ and shall be suitable for the direct or differential pressure applied under working and maintenance conditions.
- g. Corona shields and arcing rings or horns shall be provided at the top of each open type termination and a horn or ring at the base. The base itself shall be insulated from supporting steelwork by pedestal type porcelain insulators. Corona shields shall also be supplied with the transformer terminations.
- h. Outdoor sealing ends shall be of the composite polymeric type and mounted on approved galvanised steel support structures. Clearance to ground and other equipment will be according to NRS 060.
- i. All terminations shall incorporate sheath gland insulators or insulated glands. The insulation provided shall be capable of withstanding the specified routine dc test voltage to be applied on site to the anti-corrosion covering.
- j. An earth terminal of adequate dimensions shall be provided to facilitate the earthing arrangement required.

3. Wayleaves, Permissions and Permits

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- a. The *Contractor* shall be responsible for obtaining all of the necessary wayleaves, permissions or permits applicable to working near any existing services or other infrastructure on Site, and shall ensure that any wayleaves, permissions or permits obtained by the *Employer's* Agent prior to the award of the contract are transferred into the *Contractor's* name.
- b. The *Contractor* shall abide by any conditions imposed by such wayleaves, permissions or permits.
- c. The *Contractor* shall ensure that all wayleaves, permissions and permits are kept on site and are available for inspection by the relevant service authorities on demand.
- d. The *Contractor* shall also ensure that any wayleaves in respect of electricity services are renewed timeously every three months.
- e. The *Contractor* shall appoint a Construction *Supervisor* who shall be a competent person in terms of the OHS Act and shall have at least 5 years relevant construction experience. A permit will be issued to the Responsible Person. The Responsible Person shall have completed the Operational Regulations for HV Systems Course in accordance with NRS 040. All work shall be undertaken under the direct supervision of the Competent Person and the permit conditions.
- f. Provided that the *Contractor* has submitted an acceptable Responsible Person and an acceptable health and safety plan, the site will be handed over to the *Contractor*. Thereafter, the *Contractor* will be entirely responsible for the safety of his staff and any other person on the site, and the public in the area in close proximity to the site.
- g. Should the Responsible Person leave the Site, all work will cease, and all *Contractor's* Staff will be removed from the Site unless a suitable replacement Responsible Person is provided by the *Contractor*.