

Document reference

No of
pages

Document reference	Title	No of pages
C3.1	This cover page <i>Employer's Works Information</i>	1
C3.2	<i>Contractor's Works Information</i>	
	Total number of pages	40

C3.1: EMPLOYER'S WORKS INFORMATION

Contents

Part 3: Scope of Work	1
C3.1: Employer's works Information	2
1 Description of the works	5
1.1 Executive overview	5
1.2 <i>Employer's</i> objectives and purpose of the <i>works</i>	5
1.3 Interpretation and terminology	6
2 Management and start up.	6
2.1 Management meetings	6
2.1.2 Regular Progress Review Meetings	6
2.1.3 Minutes of Meeting	6
2.2 Documentation control	7
<i>At the end of the project, material to be returned to stores is quantified in conjunction with the Supervisor and a detailed schedule submitted to the Project Manager.</i>	9
2.3 Health and Safety Risk Management	15
2.4 Environmental constraints and management	16
2.5 Quality assurance requirements	19
2.6 Programming constraints	20
2.7 <i>Contractor's</i> management, supervision and key people	21
2.8 Invoicing and payment	21
2.9 Insurance provided by the <i>Employer</i>	24
2.10 Contract change management	24
2.11 Provision of bonds and guarantees	24
2.12 Records of Defined Cost, payments & assessments of compensation events to be kept by the <i>Contractor</i>	24
2.13 Training workshops and technology transfer	24
3 Engineering and the <i>Contractor's</i> design	25
3.1 <i>Employer's</i> design	25
3.2 Parts of the <i>works</i> which the <i>Contractor</i> is to design	25
3.3 Procedure for submission and acceptance of <i>Contractor's</i> design	25
3.4 Other requirements of the <i>Contractor's</i> design	26
3.5 Use of <i>Contractor's</i> design	26
3.6 Design of Equipment	26
3.7 Equipment required to be included in the <i>works</i>	26
3.8 As-built drawings, operating manuals and maintenance schedules	26

4	Procurement	27
4.1	People	27
4.1.1	Minimum requirements of people employed on the Site	27
4.1.2	Supplier Development Localisation & Industrialisation SDL&I	27
4.8	Subcontracting	29
4.8.1	Preferred subcontractors	29
4.8.2	Subcontract documentation, and assessment of subcontract tenders	29
4.8.3	Limitations on subcontracting	29
4.8.4	Attendance on subcontractors	29
4.9	Plant and Materials	29
4.9.1	Quality	29
4.9.2	Plant & Materials provided “free issue” by the <i>Employer</i>	29
4.9.3	<i>Contractor’s</i> procurement of Plant and Materials	30
4.9.4	Spares and consumables	30
4.10	Tests and inspections before delivery	30
4.11	Marking Plant and Materials outside the Working Areas.....	30
4.12	<i>Contractor’s</i> Equipment (including temporary works).....	30
5	Construction	30
5.1	Temporary works, Site services & construction constraints	30
5.1.1	<i>Employer’s</i> Site entry and security control, permits, and Site regulations	31
5.1.2	Restrictions to access on Site, roads, walkways and barricades	31
5.1.3	People restrictions on Site; hours of work, conduct and records.....	31
5.1.4	Health and safety facilities on Site	31
5.1.5	Environmental controls, fauna & flora, dealing with objects of historical interest	31
5.1.6	Title to materials from demolition and excavation.....	31
5.1.7	Cooperating with and obtaining acceptance of Others	32
5.1.8	Publicity and progress photographs	32
5.1.9	<i>Contractor’s</i> Equipment	32
5.1.10	Equipment provided by the <i>Employer</i>	32
5.1.11	Site services and facilities	32
5.1.12	Facilities provided by the <i>Contractor</i>	32
5.1.13	Existing premises, inspection of adjoining properties and checking work of Others	33
5.1.14	Survey control and setting out of the <i>works</i>	33
5.1.15	Excavations and associated water control.....	34
5.1.16	Underground services, other existing services, cable and pipe trenches and covers	34
5.1.17	Control of noise, dust, water and waste.....	34
5.1.18	Sequences of construction or installation	34
5.1.19	Giving notice of work to be covered up.....	34
5.1.20	Hook ups to existing works	35
5.2	Completion, testing, commissioning and correction of Defects.....	35

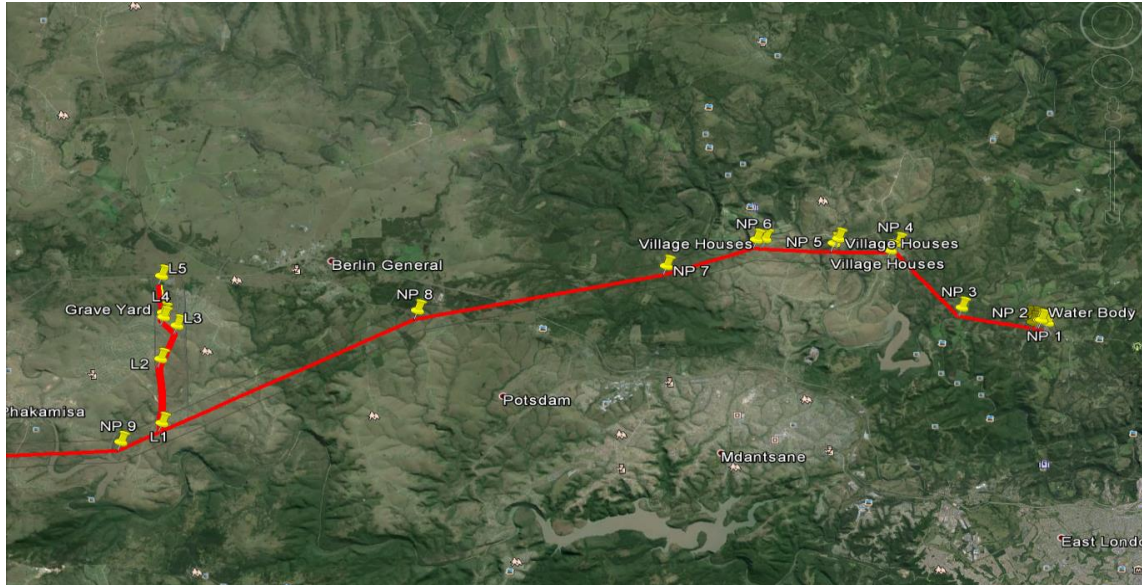
5.2.1	Work to be done by the Completion Date	35
5.2.2	Use of the <i>works</i> before Completion has been certified	35
5.2.3	Materials facilities and samples for tests and inspections	35
5.2.4	Commissioning	35
5.2.5	Start-up procedures required to put the <i>works</i> into operation	35
5.2.6	Take over procedures	35
5.2.7	Access given by the <i>Employer</i> for correction of Defects	36
5.2.8	Performance tests after Completion	36
5.2.9	Training and technology transfer	36
5.2.10	Operational maintenance after Completion	36
6	Plant and Materials standards and workmanship	36
6.1	Investigation, survey and Site clearance	36
6.2	Building works.....	36
6.3	Civil engineering and structural works	36
6.4	Electrical & mechanical engineering works	36
6.5	Process control and IT works	36
6.6	Transfer of Real Ownership.....	36
7	List of drawings.....	37
7.1	Drawings issued by the <i>Employer</i>	37
7	Specifications.....	37
8	Stability and Security Management	39
C3.2	Contractor's Works Information	40

1 Description of the works

1.1 Executive overview

The construction of approximately 40km of 400kV Single Circuit line namely, Neptune – Pembroke Transmission line. The line runs from Neptune substation in East London to Pembroke substation near King Williams Town area in the Eastern Cape.

The scope includes the construction from tower 01 to tower 92 as per the relevant profiles and line route map, including the closing spans between Gantry–T01 & T92–Gantry respectively.



The proposed works include but are not limited to the following:

- Bush clearing for access and construction purposes
- Repairing existing access, creating and maintaining access for construction purposes
- Survey and pegging of towers
- Design and installation of concrete tower foundations in various soil/rock conditions.
- Manufacture, transport, Assembly and Erection of galvanised steel
- Stringing/regulation with 3 Tern ACSR phase conductor
- Stringing/regulation earth conductors where applicable
- Installation of OPGW and associated hardware
- Installation of line labels, bird-guards, bird-diverters and aerial warning devices
- Rehabilitation of groundwork damage and implementation of environmental requirements
- Labelling and Re-numbering of the full lengths of a typical project

1.2 Employer's objectives and purpose of the works

The construction of approximately 40km of 400kV Single Circuit line namely, Neptune – Pembroke Transmission line. The line runs from Neptune substation in East London to Pembroke substation near King Williams Town area in the Eastern Cape.

The scope includes the construction from tower 01 to tower 92 as per the relevant profiles and line route map, including the closing spans between Gantry–T01 & T92–Gantry respectively.

Refer to the Project Line Design Specification, TRMSCAAC6 and all Employers requirements as part of or referred to in this tender package to ensure compliance to all requirements.

There will be no claims payable due to access constraints within a 20kms radius, provided that the contractor can work on other parts of the line.

1.3 Interpretation and terminology

Not Applicable

2 Management and start up.

2.1 Management meetings

In addition to formal and informal communications between the Project Manager and the Contractor, frequent formal routine meetings are necessary throughout the duration of the Contractor's performance in order to assure continued communication and record such interfaces for the future.

All safety meetings shall be conducted in accordance with document: Safety, Health and Environmental Specification form.

2.1.1 Pre-Construction Kick-off Meeting

The first activity to take place before the Work begins is the preconstruction kick-off meeting between Employer/Project Manager and the Contractor.

More than one such meeting may be necessary when the work is to be performed in several locations (e.g. design work in an engineering office prior to commencement of construction). The meeting introduces all personnel involved in the Work from both organisations, addresses details necessary to commence the work, establishes and records the ground rules or conditions under which the work will take place, and sets a cooperative professional tone for the future working relationship.

The pre-construction kick-off meeting takes place prior to the Contractor mobilising to site.

2.1.2 Regular Progress Review Meetings

Progress review meetings are held on a regular scheduled basis, usually once in a month. These meetings provide a forum for review of the Contractor's operations, assessment of progress and schedule, discussion and resolution of problems facing the Contractor and the Project Manager, and coordination of the activities of all parties concerned. In general, these meetings require a minimum of participation to achieve the maximum positive results.

2.1.3 Minutes of Meeting

The Project Manager prepares minutes of meeting for all meetings addressed above.

The Minutes of Meeting contain all significant aspects of the meeting recorded together with any actions placed and is presented to the Contractor for signature as soon as practicable after the meeting.

After the Contractor has signed the Minutes of Meeting, they are officially published.

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 register and compensation events	Weekly on _Monday	Eskom Offices	<i>Employer, Contractor and other representatives as required</i>

Overall contract progress and feedback	Monthly on the last week of the month_ at 09:30	Contractors Campsite	Employer, Supervisor, and Contractor, other representatives as required.
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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.

2.2 Documentation control

Summary of the documentation required from the contractor before and during construction which includes the following:

Document	Before	During
Programme	x	x
Resource Schedule	x	x
Health & Safety Plan	x	
Quality Assurance Plan	x	
Environmental Management Plan	x	
Forecast Rate of Payment	x	x
Materials Inventory	x	x
Drawing Register	x	
Progress Schedule		x
Application for Payment		x
Soil Type Nominations		x
Soil Test Results		x
Concrete Batching Note		x
Cube Test Reports		x
Stringing Records		x
OPGW Joint Tests		x
Tower Resistance Readings		x
Soil Resistivity Test readings		x
Weather Data		x
Monthly Safety Report		x
Inventory list of all materials	x	x
Foundation photographs		x

CONSTRUCTION

Programme and Resources

The Construction 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 programme is to be submitted within two weeks of the *starting date*. It is suggested that Gantt or bar chart formats be used for project planning, while progress graphs/schedules be submitted at monthly meetings to monitor progress.

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

Stringing programmes and separate Power Line Crossing Schedules are to be submitted to the *Project Manager* 40 days prior to the first planned crossing to allow for the lead times required. The Line Crossing Schedule must be aligned with the Construction Programme.

Progress

The *Contractor* monitors progress weekly in conjunction with the *Supervisor*. A weekly progress report in a similar format as attached is to be submitted to the *Project Manager* every Monday.

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

TECHNICAL INFORMATION

- Where foundations or hardware are to be designed or supplied by the Contractor, a Drawing Register for all foundation designs and hardware assemblies is to be compiled and submitted for acceptance prior to installation.
- A Soil Nominations Register is updated by the Contractor in conjunction with the Supervisor and submitted to the Project Manager. The Site Manager/Supervisor verifies the nomination of each foundation excavation.

Prior to the casting of concrete, a suitable mix design is to be submitted to the Project Manager for acceptance. Each concrete batch delivered to site is to be accompanied by a Concrete Batching Note containing dispatch date & time, batch volume, slump test result, total amount of cement and total amount of water in the mix.

A minimum of one set of cubes should be cast per day. Where the Contractor uses his own testing equipment, or whether use is made of an independent facility, Cube Test Reports must be completed by the Contractor to ensure correct timing of tests and tracing of defective concrete. Results are made available weekly.

During stringing operations, the Contractor keeps a suitably detailed Stringing Record indicating the location of drums, joints, and duration of stringing. Clearances over railways, roads, power lines, telephone lines etc. are to be measured and submitted to the Project Manager, when sagging of that section is complete.

Where OPGW is installed, documentation indicating test results for joints is to be submitted by the Contractor performing OPGW jointing in accordance with TRMSCAAD6. The records consist of

- a) Pre-Installation Drum Tests – performed upon delivery
- b) Post-Installation Joint Tests – performed during installation, and
- c) End-to-end power and light source tests – performed after installation

The Contractor compiles and submits a Tower Footing Resistance Schedule before commencement of stringing.

Weather Data is recorded in accordance with the Contract Data and submitted to the Supervisor daily.

MATERIALS MANAGEMENT

Where the *Employer* supplies Material

1. The Project Manager supplies the Contractor with a Materials Schedule indicating the total material requirement for the project. The Contractor verifies and updates the inventory for submission at monthly meetings.
2. Upon delivery of material, the Contractor verifies each material consignment in terms of quantity and quality. If such verification cannot be performed upon delivery, the Contractor indicates on the delivery note the date by which the inspection will be made. This date is not more than seven days after receipt of the material.
3. The Contractor records the results of the inspection on the delivery note, makes two copies of each delivery note, and submits the original plus one copy to the Supervisor. The Contractor submits detailed material schedule to the Project Manager on a monthly basis.

At the end of the project, material to be returned to stores is quantified in conjunction with the Supervisor and a detailed schedule submitted to the Project Manager.

Where the *Contractor* supplies Material priced for in the Contract

- The Contractor includes quantities of material delivered during the month on the application for payment which is submitted on the 20th day of each month.

SUMMARY OF DOCUMENTATION REQUIRED FROM CONTRACTOR DURING CONSTRUCTION

- Programme
- Resource Schedule
- Health & Safety Plan
- Quality Assurance Plan
- Environmental Management Plan
- Forecast Rate of Payment
- Materials Inventory
- Drawing Register
- Progress Schedule
- Application for Payment
- Soil Type Nominations
- Soil Test Results
- Concrete Batching Note
- Cube Test Reports
- Stringing Records
- OPGW Joint Tests

- Tower Resistance Readings
- Soil Resistivity Test readings
- Weather Data
- Monthly Safety Report

CONSTRUCTION RECORDS

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:

ITEM	DATA:	INFORMATION SUPPLIED BY
	Cover and Index	Project Manager
1.	General line data	Project Manager
2.	Summary of Project	Project Manager
3.	Foundation and Tower Schedules	Contractor
4.	Stringing records	Contractor
5.	OPGW Installation	OPGW Contractor
5.1	Schematic Layout	
5.2	Cable Colouring and Fibre Coding	
5.3	Power Meter and Light Source Results	
5.4	Splice Performance <i>Summary</i> (detailed report submitted separately)	
6.	Drawings	
6.1	Foundation Drawings	Contractor
6.2	Tower Outline Drawings	Project Manager
6.3	Hardware Drawings Inc. OPGW hardware	Supplier/Contractor
6.4	Insulator Drawings	Supplier/Contractor
7.	Line Profiles	Project Manager

The *Project Manager* submits relevant information as detailed above to the *Contractor* within two weeks of Take-over. The *Contractor* compiles the document and submits copies to the *Employer* within four weeks after receipt of the relevant information.

WORK AND THINGS FOR THE WORKS SUPPLIED BY THE *EMPLOYER*

This section describes what the *Employer* supplies specifically for the purpose of the *works*. The *Contractor* is to supply everything else required to provide the *works*.

DESIGN

Supply of line profiles - Construction profiles will be issued within two weeks of the *starting date*.

Servitude gate and game gate drawings.

The *Employer* will supply shop drawings for all towers to be used in this contract on request. All towers' designs specified have Eskom copyright.

Supply of conductor sag/tension data.

Details/drawings of "Free Issue Materials" on delivery.

Foundation designs for:

Self-Supporting type towers:

- Pad and Column foundations
- Piles

Guyed type towers:

- Pad and Plinth foundations
- Deadman Anchors
- Piles

Foundation prices may be based on foundation systems engineered by the *Contractor*, as determined by equipment available to him, and on the information contained in the Towers, Foundations & Earthing specification. To facilitate the pricing of foundations, however, the *Employer* will provide basic design dimensions, concrete volumes, excavation volumes and reinforcing steel weight, based on suitable complete designs. (No drawings will be made available.)

The *Employer* will bear the responsibility for the adequacy of his designs; however, the responsibility for installation as per the design will rest with the *Contractor*, in accordance with TRMSCAAC6.

This provision has been included to facilitate the pricing of foundations, and no limitation will be placed on the *Contractor* to provide his designs.

SURVEY

The *Employer* marks the line route with iron pegs at each bend point. Co-ordinates of each bend point will be provided.

ACCESS

The *Employer* and *Contractor* representatives will negotiate access with respective landowners. Written records shall be kept. The *Contractor* is reminded that access will not necessarily be continuous along the line, both from a physical and negotiated point of view. In addition, vehicular access may be restricted, prohibited or impossible in certain areas.

SUPERVISION

The *Supervisor* will monitor and co-ordinate all construction activities in accordance with the Contract and relevant specifications.

The *Supervisor* records cube test results and other activities from inspections as required.

The *Supervisor* verifies the *Contractor's* soil/rock nomination at each foundation position, before submission to the *Project Manager*.

The *Supervisor* will arrange and co-ordinate access to Eskom premises, the de-energisation of overhead powerlines (where possible) and substation electrical fences, crossings of national highways, railway lines and telecommunication lines, in accordance with TRMSCAAC 6.

NOTE: This is not the "Supervisor" as contemplated in the OHS Act Construction Regulation 6.

MATERIALS

The *Employer* will supply and deliver to the *Contractor's* camp, the following. The *Contractor* is to take delivery thereof, check for completeness, provide suitable off-loading and secure storage facilities and implement an efficient material management system.

- Phase conductor.
- Earthwire.
- Line Insulators.
- Line hardware and fittings.
- Aircraft warning devices, bird-guards and bird-diverters.
- OPGW

The *Employer* will deliver the first batch of the above materials to enable the *Contractor* to commence stringing, as per arrangement between the two parties.

TESTING

The *Employer* will perform corona and di-electric tests on hardware assemblies and insulators as deemed necessary.

PROGRAMME

The tenders will be evaluated with due consideration to the resources (both personnel and equipment) committed to the project as indicated in the tender programme. All proposed Subcontractors and Suppliers are to be identified at tender stage and will be included in the evaluation process.

A detailed proposed construction programme is to be submitted with the tender. The programme is to include:

- Safe working procedures/Method statements which identifies the Equipment and other resources which the *Contractor* plans to use

- Planned completion of each section of the *works*
- The order and timing of the operations which the Contractor plans to do in order to Provide the Works
- Provisions for:
 - float
 - time risk allowances
 - health & safety and environmental requirements
- The dates when, in order to provide the Works in accordance with his programme, the *Contractor* will need: Plant and Materials and other things to be provided by the *Employer*.

The *Contractor* shall submit the first programme to the *Project Manager* for acceptance within two (2) weeks of the *starting date*. The programme is to conform strictly to the requirements of Core Clause 31 and the Contract Data.

The *Contractor* revises the programme as required in accordance with Core Clause 32. Each time the programme is revised, the *Contractor* is to submit a revised Forecast Rate of Payment / Invoicing.

COMPLETION

The Contractor advises the Supervisor when sections (± 50 towers) of the line are available for final inspection and helps if required.

By the Completion Date in the Contract Data, the Contractor shall complete all work required for the commissioning of the line. All other work (rehabilitation, installation of retaining walls, groundworks, removal of temporary works, removal of construction camps, batching plants etc.) shall be completed within four (4) weeks of Take-Over. The Supervisor and/or landowner prior to the release of any retention moneys held against this contract shall approve such work.

The Contractor maintains the works until the defects date regarding making good erosion caused by his operations, shrinkages, imperfections, settlements, etc.

QUALITY MANAGEMENT

The attached Eskom Transmission Standard – Supplier Quality Management Systems shall apply. The requirements of this Standard are contractual and are applicable to this Request for Quotation.

Documentation required in this section shall be submitted under separate cover marked: “Quality Assurance”. Copies of ISO 9001:2000 certificates (if registered) shall also be included in this section.

Tenderer's submissions:

- An uncontrolled copy of the supplier's quality manual.
- An example of a typical quality product/process inspection and test plan.
- Copies of ISO 9001:2000 certificates (if registered) shall also be included in this section.

NOTE: In addition to the above documentation the supplier is to submit the following information/documentation for evaluation purposes and may include any additional information as proposed by the supplier for the Project Scope of Works.

1.	Interface with Quality System	State if no system in place, what SANS and international standards are complied with.
2.	Communication	As per contract – project organogram and responsibility matrix.
3.	Suppliers	How monitoring will be carried out.
4.	Quality Planning	Submission and approval of product inspection and test plans.
5.	Specifications/Drawings	As per contract requirements and “off the shelf” items.
6.	Special Processes	What special controls are required for special processes – foundations, concrete, welding, etc.
7.	Quality Records	This should state your method of control of records – your procedure.
8.	Management Representative	Name your management representative and quality site/manufacturing representatives.
9.	Document Submissions	What docs will you submit on completion of contract – Contract Quality Plan, ITP's, Test Certificates, Release Notes, Inspection Notification Forms where applicable
10.	Post Award Quality Programme	As per contract e.g., Statutory Requirements, Inspection and Test Plans as per supplier's system.

The cost breakdown structure for quality assurance below should be used to determine the amount for Item 2.6 of the Preliminary and General Bill of Quantities.

ITEM
General Quality Management obligations not mentioned below
Test equipment for measurement and control activities for this project
Contract Quality Plan specific to this project
Special processes Method Statements/Work Instructions as per the applicable specifications (per statement)
Method Statements/Work Instructions specific to this project as per all technical specifications applicable to the works (per statement)
Internal audits on manufacturing
Internal audits on site
Auditing, monitoring and control of sub-contractors and suppliers
Compilation, completion and submission of Quality and Technical Records (dossier) as defined
QA/QC Representative overall responsible for this project
QA/QC Representatives responsible for site

Non-destructive examination or testing
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2.3 Health and Safety Risk Management

Contractor Health and Safety Requirements Document 32-136, together with the HEALTH AND SAFETY SPECIFICATION (Section 6) shall apply. Also see Section 18 of Part 1 of the Contract Data. The requirements of this Standard and Specification are contractual and are applicable to this Request for Quotation.

Documentation required in this section shall be submitted under separate cover marked: "Health and Safety". Copies of OHSAS 18001 certificates (if registered) shall also be included in this section. The Cost Breakdown Structure for Health and Safety Expenditure below should be used to determine the amount for item 2.7 of the Preliminary and General Bill of Quantities.

COST BREAKDOWN STRUCTURE FOR HEALTH AND SAFETY EXPENDITURE

To be priced in health and safety portion of the Bill

ITEM
General Health and Safety obligations not mentioned below (fixed charge)
Hazard Identifications and Risk Assessments
Establishment of Health and Safety Plan specific to this project
Health and Safety training
Operators training
Induction training
Health and Safety Representatives
First Aiders
First Aid Kits
Development of Method Statements specific to this project
Physical and psychological assessments
Eskom ORHVS certificates
Full body harnesses
Double shock-absorbing lanyards
Double climbing hooks
LadderLatch tm units
Lifelines and other safety ropes
Head protecting helmets for climbers
Normal hard hats for workers on the ground
Hearing protection
Safety shoes or boots
Dust protection
Protective clothing
Other PPE
Employee Health and Wellness Programme

Medical Surveillance Programme

The *Contractor* shall comply with the health and safety requirements, Safety, Health and Environmental specifications for the construction of Neptune Pembroke 400kV line with SHE specification.

2.4 Environmental constraints and management

The *Contractor* shall comply with the environmental criteria and constraints by having an environmental management system in place that will ensure that the requirements of the environmental management plan are effectively implemented and managed. Adherence will be in-line with the following standards and procedures Neptune Pembroke Environmental Authorisation (EA) 12/12/20/1439, EMPr DEAT/EIA4622/2009 and 12/12/20/1439, Environmental Requirements for Contractors and/or Suppliers TDPMAN-ST-37, Contractor Environmental Requirements Proforma TPDMAN-FM-57 and not limited to Waste Management Plan TPDMAN-PN-53

Campsite establishment and dis-establishment are to be managed in accordance with specification PDPMAN-PC-49 (Construction site establishment and Dismantling).

The layout should be that it facilitates a circular traffic route that eliminates the need to reverse when loading and off-loading.

The *Contractor* is required to ensure that all goods, services or works supplied in terms of the tender/contract/order conform to all applicable environment legislation, Environmental Impact Assessment (EIA), Environmental Authorisation (EA) and Project Specific Environmental Management Programme (EMPr).

The *Contractor* is reminded that adherence to Eskom Standard for Maintenance Strategy for Vegetation 240-89383921, TRMSCAAC 6– “Transmission Line Towers and Line Construction” is mandatory. Deviations from these policies, standards and specifications will be regarded as a Defect.

THE CONTRACTOR’S ENVIRONMENTAL OFFICER (EO)

The contractor shall give and provide all necessary environmental superintendence during the execution of the works. The contractor shall appoint a dedicated person as Environmental Officer (EO), approved of in writing by the Project Manager (which approval may at any time be withdrawn). The EO shall be always on the works. The employer shall be at liberty to object to and require the contractor to remove from the works any person who in the Project Manager’s opinion, misconducts himself or is incompetent in the proper performance of his duties.

The EO’s sole responsibility will be to implement the EA, Project Specific EMPr, environmental legislation as well as relevant procedures and monitor and adjust environmental quality of work performed on the site. The EO is to carry out or relay any requirements that may be deemed necessary by the ECO, to ensure that such activities are undertaken and to report back to the ECO accordingly.

The EO is responsible to manage all affected landowner’s concerns, complaints and special requirements with the assistance of the ECO where necessary.

The EO is to ensure that sensitive areas are demarcated within or alongside the construction areas i.e. sites identified in the EMPr and EA. All personnel are to be informed of such sites and the reason the site is demarcated.

Minimum requirements for appointment as EO are:

- Tertiary qualification in a natural science or appropriate field
- 2 years' work-related experience
- The EO portfolio will not be shared by any other portfolio or responsibility.

ENVIRONMENTAL CONTROL OFFICER (ECO)

The ECO is a competent and independent representative. The ECO will undertake inspections of the site and full compliance auditing against the EMPr and EA. The audit reports will be submitted to the project manager and be made available to the relevant authorities, on their request.

The ECO will check the following:

- The record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken.
- The public complaints register in which all complaints are recorded, as well as actions taken; and
- Results from the environmental monitoring programme (air, noise, water quality).

Further duties of the ECO will be the following:

- Monitoring of compliance with the EA, EMPr and the Project Specification.
- Make recommendations on how to best apply the environmental requirements on site and advise the Contractor on the site instructions required to facilitate effective environmental compliance.
- Participate in the quality management system by issuing non-conformances when there are areas of the project environmental requirements that are not being met.

SITE SERVICES AND PROCEDURES

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. All necessary services - water, electricity, sewerage, ablution facilities, telephones, Wi-Fi 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 daily.
- Detailed list of equipment by category on site daily with an indication of its working condition i.e., working order, under repair, working but standing idle etc.
- Weather conditions as agreed with the Supervisor daily.

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 always kept up to date for inspection by the Supervisor and/or Project Manager.

RESTRICTIONS APPLICABLE TO THE CONTRACTOR

Vehicular access to certain areas and tower positions may be restricted, impossible or prohibited. The *Contractor* will, in these areas, be required to use alternative methods of construction.

Entry to private property is to be planned and arranged with landowner well in advance as access could be delayed due to hunting, harvesting or other constraints. All personnel are to be made fully aware of the proximity of adjacent live lines and the presence of induction.

The *Contractor's* senior representative on site is to be aware of and be duly authorised by Eskom in terms of Eskom's High Voltage Regulations. This will entail having attended Eskom's HV Regulations (ORHVS) course and being so authorised. In addition, the *Contractor* is to appoint "Responsible Persons" as required by the Occupational Health and Safety Act.

TITLE TO SITE MATERIALS

The conditions of Core Clause 7 will apply.

RAIN AND THE EFFECTS ON THE SCHEDULE

The Contractor must allow for 10 days of rain above the trigger of 15mm (and the effects of rain) on the critical path of the foundation activities. Allow a further 10 days for rain above the trigger of 15mm (and the effects of rain) on the critical path of the tower assembly and erection activities. Lastly, allow a further 10 days for rain above the trigger of 15mm (and the effects of rain) on the critical path of the stringing activities.

The above allowances must run sequentially and should be priced as part of the tender submission in the applicable rates. The sequential 30 days forms part of the contract duration and must be clearly indicated in the contract schedule as 3 critical path activities.

SHEQ RELATED NON-PERFORMANCE

TERMINATION DUE TO NON-COMPLIANCE

ESKOM reserves the right to terminate the contract if 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 ESKOM target of 0, 4 a penalty of R100, 000.00 will be imposed by the client. This penalty will be refunded if the LTIR drops below 0, 4 at contract completion.

FINES FOR HEALTH AND SAFETY VIOLATIONS

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

Lifesaving rule violation (1st Violation): R10, 000.00 per event, payable by the Contractor.

Lifesaving rule violation (2nd Violation): Removal of repeat offender from site and R10, 000.00 payable by the Contractor.

Risk assessment and / or method statement not in place or available at activity: R15, 000.00 per event

Non-compliance to Legislation: R 20,000.00 per event

FINES FOR ENVIRONMENTAL VIOLATIONS

For fines relating to Environmental violations please refer to the document titled "Environmental Requirements for Contractors working on Transmission Projects Delivery.

FINES FOR QUALITY RELATED ISSUES

NCRs not closed out satisfactorily within 30 days: R10, 000.00 per event.

FINES FOR SUB – CONTRACTOR MANAGEMENT

Sub-contractors are to be managed in accordance with the requirements of Form 74. Failure to comply will result in a fine of R50, 000.00 per non-compliance.

All the above fines and penalties will be implemented by the Project Manager at his discretion.

CAMP SITE LAYOUT

Campsite establishment and dis-establishment should be managed in accordance with specification PDPMAN – WN – 09 (Construction site Establishment and Dismantling).

The layout should be such that it facilitates a circular traffic route that eliminates the need to reverse when loading and off-loading.

ENVIRONMENTAL MANAGEMENT SYSTEM

The Contractor shall have an Environmental Management System in place that will ensure that the requirements of the EA and EMP are effectively implemented and managed.

2.5 Quality assurance requirements

The Contractor shall comply with the quality criteria stated in the "Quality Assurance Requirements for the Procurement of Assets Goods and Services", attached to this *works* information. The Contractor is to provide a quality inspection and test plan for the design, manufacture, delivery and installation as stated in the Scope of work, for approval.

The Contractor shall comply with the quality requirements, criteria and constraints stated in document: 240-105658000 (Supplier Quality Management Specification).

In addition to the above, the following shall apply:

- The Contractor implements and maintains a quality management system in order to ensure compliance with the works information and as a minimum meets the requirements of the ISO 9000 series for quality management systems. 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 Supervisor 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. A weekly status report of completed work/activities is made available to the Project Manager, if required.

2.6 Programming constraints

The Construction 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 programme is to be submitted within two weeks of the *starting date*. It is suggested that Gantt or bar chart formats be used for project planning, while progress graphs/schedules be submitted at monthly meetings to monitor progress.

The Contractor must allow for 10 days of rain above the average rain fall per annum and the effects of rain on the critical path of the foundation activities. Allow a further 10 days for rain above the average rain fall and the effects of rain on the critical path of the tower assembly and erection activities. Lastly, allow a further 10 days for rain above the average rain fall and the effects of rain on the critical path of the stringing activities.

The Contractor must allow an additional 10 days for mist and fog per annum. No compensation event will be considered before this period has lapsed.

The contractor should obtain a weather data from SA weather services for the following closest to the Site Camp. The contractor should familiarise himself/herself with the minimum and maximum temperatures, monthly average rainfall, wind, fog and snow fall around the area using the 10 year weather data from SA Weather Services and price or make allowance in his tender quotation

Only the difference between more adverse whether recorded and the equivalent measurement given above is taken into consideration when assessing the compensation event

The above allowance must run sequentially and should be priced as part of tender submission in the applicable rates

No compensation will be considered for rain, wind fog and snow fall outside the ten-year average). Should there be a claim the *Contractor* will need to prove conclusively that this is over and above the norm, should they not be able to do so, any claim will be declined.

In addition to clause 64.1 assessment of Compensation Events approvals will be subject to the Compensation Events Committee.

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

2.7 Contractor's management, supervision and key people

The *Contractor* submits an organogram showing his human resources and their lines of authority / communication/ roles and responsibility.

The *Contractor* provides experienced and competent personnel with proven track record of previous projects in the following key positions and submits their CV's: **(refer to C1.2 Contract Data Part two)**

- Project Manager/s
- Site Manager/s
- Qualified Rigger/s
- Quality Assurance Manager
- Foundation Supervisor/s
- Tower Erection Supervisor/s
- Stringing Supervisor/s
- Environmental Control Officer/s
- Quality Control Officer/s
- Safety Officer/s
- Geotechnical specialist

Interviews could be carried out with key position personnel (by the *Employer*) prior to them taking up relevant positions.

The *Contractor* shall provide experienced and competent personnel in the following key positions:

- **Contracts/Projects Manager/s**

Competency level: Civil Engineering/Construction Management/Quantity Surveying.

The Contracts Manager shall be registered as a Professional Construction Project Manager (Pr CPM) with the South African Council for Project and Construction Management Professions (SACPCMP) (or equivalent internationally recognised body) as the one point of responsibility for the management of the project from conception to completion, which includes the management of related professional services. This registration must remain valid for the duration of the contract. The *Contractor* must provide proof of registration to the *Project Manager*.

- **Site Manager/Agent**

Competency level: Civil Engineering/Construction management/Quantity Surveying or a minimum of 10 years relevant civil construction experience.

The Site Manager shall be registered as a Professional Construction Manager (Pr.CM) with the South African Council for Project and Construction Management Professions (SACPCMP). This registration must remain valid for the duration of the contract. The *Contractor* must provide proof of registration to the *Project Manager*.

- **Supervisors**

Competency level: As specified in SHE Specification.

- **Required SHE personnel**

Competency level: As specified in SHE Specification.

Including but not limited to SACPCMP, registered as a Construction Health and Safety Manager (CHSM) & Construction Health and Safety Officer (CHSO). The *Contractor* shall discuss these appointments and the number of appointments with the *Project Manager*.

2.8 Invoicing and payment

Within one week of receiving a payment certificate from the Service Manager 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 Service Manager's payment certificate. All relevant banking details should be provided to the Employer.

Local invoice:

The tax invoice should be submitted via e-invoice to: InvoicesgrpcapitalPDP@eskom.co.za

Invoices submitted in any other manner will not be considered for payment e.g invoices sent directly to the Project Manager.

Once the invoice has been sent to InvoicesgrpcapitalPDP@eskom.co.za, it will be paid in line with payment terms which will start to count from the date the invoice is submitted to the correct email address.

The invoice should have the following details:

Addressed to:

Eskom Holdings SOC Limited
Department: Power Delivery Projects
Physical address: Megawatt Park, 1 Maxwell Drive, Sunninghill, 2197

Other information to be reflected on the invoice:

- Name and address of the Contractor and the Service Manager,
- The contract number and title,
- Contractor's VAT registration number,
- Contractor's VAT number,
- The Employer's VAT registration number 4740101508,
- Description of service provided for each item invoiced based on the Price List,
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT,
- Retention monies to be deducted from the invoice.

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.
- Your E-mail may not contain more than one PDF file.

Send all invoices in PDF to Transmission Projects Delivery (TPD): invoiceseskomlocal@eskom.co.za

Foreign invoices

- For Foreign invoices, suppliers will still be required to physically deliver hard copies of original documents to PDP Consolidation/Document Centre by making arrangement for delivery by contacting Esther Bogopa (Financial Clerk Consolidation Team) +27 11 516 7024, Andisiwe Sikwebu (Financial Clerk Consolidation Team) +27 11 800 3838, or Shumani Mamphodo (Manager Consolidation Team) +27 11 800 2007. The South African Reserve Bank requirements are that the manual invoices should be submitted. Once the original invoices have been hand delivered, you can also send the invoice copy to invoicesgrpcapitalPDP@eskom.co.za).

The foreign invoice should be sent together with relevant shipping documents and the supplier shall ensure that the commercial invoice has been used previously and therefore funds are not exhausted. The shipping documentation is as follows:

1. Tax invoice
2. Commercial invoice
3. SARS Release notification
4. SAD 500
5. Custom worksheet
6. Bill of lading.

If the supplier does not furnish the supporting documents, the payment cannot be made, and the supplier will charge the cost of moving the Forward Exchange Cover (FEC) that Eskom has incurred in managing the risk of currency movement.

Tax Requirement

- In case of a local invoice 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.) In case of the foreign invoice the hard printed version is considered an original invoice, hence, the payment terms start to count once the hard print of the original invoice (not an e-mailed invoice) has been received by Power Delivery Projects Consolidation Team.
- 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 you 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.
- Your company can request a park invoice report from the Power Delivery Projects Finance Team which can then be followed up and corrected. You are welcome to forward the details of invoices corrected to the FSS contact center.

Once the invoice has been sent; all communication regarding the payments should be addressed with the Project Manager and Project Finance Team, Niah Maseko (MasekoNi@eskom.co.za), Project Accountant) No communication regarding payment should be sent by the Contractor/Supplier directly to Accounts Payable.

PAYMENT

In order to facilitate payment for work done, the *Contractor* is to submit his Schedule of Work Done (verified by the *Supervisor*) for payment to the *Project Manager* by the 20th day of each month, in a similar format to the *bill of quantities*. The *Project Manager* will determine the value of the work done in accordance with Core Clause 5 and changes to Core Clause Z (A) clause 50.2.

- Payment for Preliminary and General Items will be proportional to the duration of the contract.
- Payment for foundations will be due upon completion of backfilling.
- Payment for tower steel will be due after the successful release inspection from the manufacturer's plant and delivery to site.
- Payment for tower erection will be due as per the *Supervisor's* verification.
- Payment for stringing will be due upon regulation, installation of line hardware, accessories, jumpers, anti-climbing devices and line inspection complete and accepted by the *Supervisor*.
- Payment for minor works, access and environmental work items will be due as per the *Supervisor's* verification.
- One half of retention money will be paid on the satisfactory completion of groundwork rehabilitation (including Phase II bush-clearing), to be completed no later than four weeks after the issue of the Take-over Certificate.

- The balance of retention will be paid on the *defects date* i.e., on the issue of the Completion Certificate.

2.9 Insurance provided by the *Employer*

This is a **Format A contract**. The contractor needs to obtain a copy of the latest edition available on http://www.eskom.co.za/Tenders/InsurancePoliciesProcedures/Pages/EIMS_Policies_From_1_April_2014_To_31_March_2015.aspx
(See Annexure B for basic guidance)

2.10 Contract change management

Not Applicable

2.11 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.

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

In order to facilitate payment for work done, the *Contractor* is to submit his Schedule of Work Done (verified by the *Supervisor*) for payment to the *Project Manager* by the 20th day of each month, in a similar format to the *bill of quantities*. Payment for Preliminary and General Items will be proportional to the duration of the contract.

- Payment for foundations shall be due upon completion of backfilling and completion of compaction.
- Payment for tower steel shall be due after the successful release inspection from the manufacturer's plant, delivery to site and verification by both Eskom and the contractor *Supervisor's*.
- Payment for tower assembly and erection shall be due as per the *Supervisor's* verification.
- Payment for stringing shall be due upon regulation, clamping, installation of line hardware, accessories, jumpers, anti-climbing devices, latchways and line inspection complete and accepted by the *Supervisor*.
- Payment for minor works, access and environmental work items shall be due as per the verification.
- One half of retention money shall be paid on the satisfactory completion of groundwork rehabilitation (including bush clearing), to be completed no later than four weeks after the issue of the Take-Over Certificate.
- The balance of retention shall be paid on the *defects date* i.e., on the issue of the Completion Certificate.
- Weather Data is recorded in accordance with the Contract Data and submitted to the *Supervisor* daily.

2.13 Training workshops and technology transfer

Compliance to the SD&L requirements

3 Engineering and the *Contractor's* design

3.1 *Employer's* design

The *Contractor* shall comply with the design criteria stated in the Works Information.

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

The *Contractor* is required to appoint a geotechnical specialist to investigate soil / rock conditions and apply suitable foundations designs including earthing system, in various soil conditions, at each foundation position for all towers, in accordance with the loading conditions given in the Line Specification (in Works Information Appendices). The *Contractor* shall submit foundation designs for acceptance well in advance of construction (see TRMSCAAC1 Rev 6).

Standard conventional foundation designs for the 6 soil / rock types shall be supplied by Eskom. The *Contractor* is required to investigate soil / rock conditions and apply suitable modified foundation designs including earthing system, in various soil conditions, at each foundation position for all towers, in accordance with the loading conditions given in the Line Specification. The *Contractor* shall submit foundation designs for acceptance for all designs well in advance of construction (see TRMSCAAC1 Rev 6).

Upon acceptance of the *Contractor's* foundation designs, copyright shall pass to the *Employer*. The contractor shall provide geotechnical report or other foundation related information required by the *Employer*. This does not relieve the *Contractor* of the responsibility to investigate the soil / rock conditions, design, test and install suitable foundation systems.

The *Contractor* is responsible for the design of temporary works such as temporary access roads, formwork, excavation support, special scaffolding and any other safety requirements to ensure safe execution of works, and etc.

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

Where foundations or hardware are to be designed or supplied by the *Contractor*, a Drawing Register for all foundation designs and hardware assemblies is to be compiled and submitted for acceptance prior to installation.

A Soil Nominations Register is updated by the *Contractor* in conjunction with the *Supervisor* and submitted to the *Project Manager*. The *Supervisor* verifies the nomination of each foundation excavation.

Prior to the casting of concrete, a suitable mix design, according to procedure in the document Titled TX Tower and Line Construction (TRMSCAAC1 Rev 6), is to be submitted to the *Project Manager* for acceptance. Each concrete batch delivered to site is to be accompanied by a Concrete Batching Note containing dispatch date & time, batch volume, slump test result, total amount of cement and total amount of water in the mix. Four test cubes are to be made of each concrete batch at the batching plant and tested at 7 and 28 days

A minimum of one set of cubes should be cast per day at the work site. They are to be clearly marked as to the position in which they were placed. Where the *Contractor* uses his own testing equipment, or whether use is made of an independent facility, Cube Test Reports must be completed by the *Contractor* to ensure correct timing of tests and tracing of defective concrete. Results are made available weekly.

During stringing operations, the *Contractor* keeps a suitably detailed Stringing Record indicating the location of drums, joints, and duration of stringing. Clearances over railways, roads, power lines, telephone lines etc. are to be measured and submitted to the *Project Manager*, when sagging of that section is complete.

Where OPGW is installed, documentation indicating test results for joints is to be submitted by the *Contractor* performing OPGW jointing in accordance with NRS 061-2:2002. The records consist of

- a) Pre-Installation Drum Tests – performed upon delivery
- b) Post-Installation Joint Tests – performed during installation, and
- c) End-to-end power and light source tests – performed after installation

The *Contractor* compiles and submits a Tower Footing Resistance Schedule before commencement of stringing.

3.4 Other requirements of the *Contractor's* design

The *Contractor* is responsible for the design of temporary works such as temporary access roads, formwork, excavation support, special scaffolding, etc. These designs are to be submitted for acceptance by the *Employer*.

The *Contractor* submits a concrete mix design for acceptance before commencement of construction, in accordance with TRMSCAAC1 Rev 6.

3.5 Use of *Contractor's* design

Upon acceptance of the *Contractor's* foundation designs, copyright will pass to the *Employer*. The provision of geotechnical or other foundation related information by the *Employer* does not relieve the *Contractor* of the responsibility to investigate the soil/rock conditions, design, test and install suitable foundation systems.

3.6 Design of Equipment

The *Contractor* submits particulars of the design of an item of equipment for the *Project Manager* for acceptance if the *Project Manager* instructs him to.

A reason for not accepting is that the design of the item will not allow the *Contractor* to provide the works in accordance with: -

- The Works Information
- The *Contractor's* design which the *Project Manager* has accepted or
- The applicable Law.

3.7 Equipment required to be included in the *works*

The *Contractor* shall submit a list of all vehicles, machinery and equipment

3.8 As-built drawings, operating manuals and maintenance schedules

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 and electronic 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:

ITEM	DATA	INFORMATION SUPPLIED BY
0.	Cover and Index	Project Manager
1.	General line data	Project Manager
2.	Summary of Project	Project Manager
3.	Foundation and Tower Schedules	Contractor
4.	Stringing records	Contractor
5.	OPGW Installation	Contractor
5.1	Schematic Layout	
5.2	Cable Colouring and Fibre Coding	
5.3	Power Meter and Light Source Results	
5.4	Splice Performance <i>Summary</i> (detailed report submitted separately)	
6.	Drawings	
6.1	Foundation Drawings	Contractor
6.2	Tower Outline Drawings	Project Manager
6.3	Hardware Drawings incl. OPGW hardware	Supplier/Contractor
6.4	Insulator Drawings	Supplier/Contractor
7.	Line Profiles	Project Manager

The *Project Manager* submits relevant information as detailed above to the *Contractor* within two weeks of Take-over.

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

4 Procurement

4.1 People

4.1.1 Minimum requirements of people employed on the Site

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.

4.1.2 Supplier Development Localisation & Industrialisation SDL&I

Eskom will apply a penalty of 2.5% of the invoice amount for failure to meet SDL&I obligations.

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.

4.1.2.1 Job creation

100% of General Workers to be sourced from local community.

Semi-Skilled -70%, the remaining 30% can be sourced from any other area.

Skilled-30% sourced from local community the remaining 70% may be sourced from any other area.

Tenderer to priorities employing semiskilled and general labour from communities surrounding: -

- Tshabo 2, Tshabo 3, Dongwe
- Ilitha, Ndevana, Inkandla,

- KwaMpundu, Gwiqu, St. Marry, Sinquma
- Nkqonkqweni, Ekuphumleni(Ntsonkotha village), Zikhwaba, Khwetyana, Mathanda, Mzonkeshe, Zikwaba, Msobomvu.

4.1.2.2 Skills development

Note: The skills development candidates shall be sourced from previously disadvantaged Communities with preference given to communities from:

- Tshabo 2, Tshabo 3, Dongwe
- Ilitha, Ndevana, Inkandla,
- KwaMpundu, Gwiqu, St. Marry, Sinquma
- Nkqonkqweni, Ekuphumleni(Ntsonkotha village), Zikhwaba, Khwetyana, Mathanda, Mzonkeshe, Zikwaba, Msobomvu

4.1.2.3 Subcontracting

A tenderer to subcontract a minimum of 30% to one or more of the following designated groups:

- I. an EME or QSE which is at least 51% owned by black people;
- II. an EME or QSE which is at least 51% owned by black people who are youth;
- III. an EME or QSE which is at least 51% owned by black people who are women;
- IV. an EME or QSE which is at least 51% owned by black people with disabilities;
- V. an EME or QSE which is 51% owned by black people living in rural or underdeveloped area or townships;
- VI. a cooperative which is at least 51% owned by black people;
- VII. an EME or QSE which is at least 51% owned by black people who are military veterans.

NOTE 3: Tenderers to submit the following returnables for subcontracting (Contract Condition):

- Sub-contracting agreement/s between Main Contractor and subcontractor/s
- Valid B-BBEE certificates/ valid affidavits of the sub-contractor/s.
- Consolidated B-BBEE certificate for Joint Ventures.

Scope that may be subcontracted and/or outsourced:

- Surveying & pegging
- Bush clearing
- Transport
- Security
- Foundations
- Hiring of Helicopter
- Hiring of portable toilets
- Construction of access roads and installation of gates.
- Supply of Concrete
- Tower assembly
- Rehabilitation
- Accommodation.
- Site establishment.

4.2 Designated Sectors

When applicable the following stipulated minimum threshold for Local Production and Content must be achieved in full by the tenderer.

Commodity	Local Content Threshold
Steel	100%
Cables	90%
Cement	100%

4.8 Subcontracting

4.8.1 Preferred subcontractors

The *Contractor* shall complete and attach a list of preferred *subcontractors*.
The list does not authorize the *Contractor* to go ahead and appoint the subcontractor without *Project Manager's* approval.

4.8.2 Subcontract documentation, and assessment of subcontract tenders

The *Contractor* shall complete and attached a list of *subcontractors*.

4.8.3 Limitations on subcontracting

The *Contractor* shall not subcontract more than 30% of the whole of the contract.

4.8.4 Attendance on subcontractors

N/A

4.9 Plant and Materials

4.9.1 Quality

Refer to attached quality documents.

4.9.2 Plant & Materials provided “free issue” by the *Employer*

The *Employer* shall supply and deliver to the *Contractor's* camp, the following. The *Contractor* is to take delivery thereof, check for completeness, provide suitable off-loading and secure storage facilities and implement an efficient material management system.

- Phase Conductor
- Earthwire
- OPGW and hardware
- Insulators
- Line hardware and fittings
- All other Plant and Material are to be provided by the *Contractor*

The *Project Manager* supplies the *Contractor* with a Materials Schedule indicating the total material requirement for the project. The *Contractor* verifies and updates the inventory for submission at monthly meetings.

The *Contractor* keeps record of all material delivered and kept on site

Upon delivery of material, the *Contractor* verifies each material consignment in terms of quantity and quality. If such verification cannot be performed upon delivery, the *Contractor* indicates on the delivery note the date by which the inspection will be made. This date is not more than seven days after receipt of the material.

The *Contractor* records the results of the inspection on the delivery note, makes two copies of each delivery note, and submits the original plus one copy to the *Supervisor*. The *Contractor* submits detailed material schedule to the *Project Manager* on a monthly basis.

At the end of the project, material to be returned to stores is quantified in conjunction with the *Supervisor* and a detailed schedule submitted to the *Project Manager*.

4.9.3 Contractor's procurement of Plant and Materials

The *Contractor* shall comply to document "Quality Assurance for Procurement of Assets, Goods and Services" in works information during fabrication, supply and delivery of foundation steelwork, reinforcing, earthing devices and all other foundation related material.

Fabrication, galvanising and delivery to site of 529A, 520B, 518H, 518C, 518D, 517E and 517F series towers complete with leg and body extensions, guy and tower ropes and fittings, anti-climbing devices and av-locks (anti vandal bolts) and tower shackles etc. in accordance with TRMSCAAC1 Rev 6.

Supply and delivery of the following line labels in accordance with TRMSCAAC1 Rev 6:

- Tower labels
- Line identification labels
- Crossing labels.

Supply, delivery and installation of additional earthing material to towers exceeding maximum earth resistance requirements.

Supply and delivery of servitude gates (including electrification, earthing and access ramps where applicable).

Supply and delivery of bird guards, bird diverters, aerial warning spheres and guy markers.

4.9.4 Spares and consumables

Not Applicable

4.10 Tests and inspections before delivery

The *Contractor* is to provide prototype towers in accordance with TRMSCAAC1 Rev 5.2 upon request by the *Project Manager*. All guy, spacer and cross ropes are to be tested before erection.

4.11 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.

4.12 Contractor's Equipment (including temporary works).

Not Applicable

5 Construction

The *Contractor* shall comply with all the requirements of the SHE specification, RoD (EA) and EMP. Temporary works, Site services & construction constraints.

5.1 Temporary works, Site services & construction constraints

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

The *Employer* and *Contractor* representatives shall negotiate access with respective landowners. Written records shall be kept. The *Contractor* is reminded that access shall not necessarily be continuous along the line, both from a physical and negotiated point of view. In addition, vehicular access may be restricted, prohibited or impossible in certain areas.

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

The *Contractor* undertakes demarcation, construction and rehabilitation of all access roads, construction areas, tower sites etc., in accordance with TRMSCAAC1 Rev 5.2 and the Environmental Management Plan. Wherever possible the *Contractor* is to make use of existing access roads tracks to and in existing adjacent servitudes.

The *Contractor* allows for the implementation of procedures contained in the Environmental Management Plan. Deviation from these procedures resulting in damage to the environment or property shall be regarded as a defect.

Access shall not necessarily be continuous along the servitude. All access routes are to be marked and constructed as agreed by the *Contractor* and the client *Supervisor*.

Vehicular access to some tower sites and parts of the servitude may be restricted, prohibited or impossible and might not necessarily be linear. The *Contractor* is to make provision for alternative methods of construction at these positions.

Installation of servitude and game gates shall be in accordance with TRMSCAAC1 Rev 5.2 as required by the *Supervisor*. Where gates are required within the servitude, these are to be installed on the centre line to facilitate stringing, or as directed by the *Supervisor*. Wherever possible, existing servitude gates on adjacent servitudes are to be used. If requested by the *Employer*, the *Contractor* shall supply and erect "concertina gates". Concertina gates are to be made with five steel poles and five strands of barbed wire.

The *Contractor* performs bush clearing along the servitude and at tower sites as required for access and construction purposes and/or as instructed by the *Supervisor*. Bush clearing is to be in accordance with ESKASABG3 - "Standard for Bush Clearance and Maintenance within Overhead Power line Servitudes", TRMSCAAC1 Rev 6 "Transmission Line Towers and Line Construction" and the Environmental Management Plan.

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

Contractor to refer to SHE specification and the EMP

5.1.4 Health and safety facilities on Site

Contractor to refer to SHE specification and the EMP

The *Contractor* shall appoint the security for the site camp and plant and material

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

Refer to the EMP, the *Contractor* allows for the implementation of procedures contained in the Environmental Management Plan. Deviation from these procedures resulting in damage to the environment or property will be regarded as a legal contravention and penalised with an amount of **R 15 000.00 per each contravention**.

5.1.6 Title to materials from demolition and excavation

Contractor to refer to SHE specification and the EMP

5.1.7 Cooperating with and obtaining acceptance of Others

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*.

5.1.8 Publicity and progress photographs

As agreed with the Eskom *Project Manager*, *Contractor* to inform the *Project Manager* accordingly

5.1.9 *Contractor's* Equipment

Records are to be kept of Equipment on Site including whether it is owned or hired.

5.1.10 Equipment provided by the *Employer*

N/A

5.1.11 Site services and facilities

Contractor shall provide everything else necessary for Providing the Works.

5.1.12 Facilities provided by the *Contractor*

Contractor is to provide in the way of Site accommodation, laboratories, storage, vehicles, Construction camp site and office equipment etc. for the *Project Manager* and the *Supervisor*, and any restrictions or minimum requirements concerning the *Contractor's* own facilities

The *Contractor* is to provide the following items to facilitate the *Employer's* site *Supervisors* project administration team:

- a) Minimum one lockable site office (To accommodate 12 working stations, 3mX2m for 2 working stations), supplied with power, air conditioning, refrigeration, kitchen facilities and office furniture. Upon Completion, the office will remain the property of the *Contractor*.
- b) Minimum of 12 x working stations including office chairs, printing (A3 and A4 colour), copying & computer facilities, IT infrastructure, document-binding, storing & laminating facilities, disposables, etc.
- c) Uncapped Wi-Fi functional for exclusive Eskom site personnel and to be managed by Eskom Site Manager.
- d) One fully functional (refer to point b) office (capacity x2) for sole use of Project Manager and Engineer.
- e) Security, maintenance (including supplies and disposables) and cleaning services for the duration of the contract.
- f) Portable water kitchen facilities and toilet facilities for sole use of Clients Representatives.

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 daily.
- Detailed list of equipment by category on site daily with an indication of its working condition i.e., working order, under repair, working but standing idle etc.
- Weather conditions as agreed with the *Supervisor* daily.

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 always kept up to date for inspection by the Supervisor and/or Project Manager.

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

N/A

5.1.14 Survey control and setting out of the works

The employer will peg all bend points on the line; however, Contractor is responsible for detail pegging and surveying for all tower positions in accordance with the co-ordinates and line profiles, determining foundation positions, leg extensions and guy rope lengths

Foundations

- The Contractor shall comply with attached document titled "The standard for the construction of overhead powerlines" (TRMSCAAC1 Rev 6)
- The *Contractor* undertakes to appoint a geotechnical specialist and to conduct geotechnical investigation on all tower foundations, nominate foundation types, design foundations, carry out concrete test and install concrete foundations and earthing system, including setting out, excavation, foundation steelwork, reinforcement, concrete and reinstatement in various soil conditions, in accordance with TRMSCAAC1 rev 6 and TRMASAAJ7.
- The *Contractor* informs the *Project Manager* of the nominated soil/rock condition at each foundation position and the design solution for the foundation at least two weeks before installation of the foundation.
- Concrete batching and mixing plant(s) established by the *Contractor* shall be solely dedicated to the works. The *Supervisor* shall approve the design, operation and location of the plant(s).
- The *Contractor* provides his own equipment for the testing of concrete cubes on site, or should he make use of an independent testing facility, ensures that test results after 7 days, 14days and 28 days are made available to the *Supervisor* within 5 days of each test.
- Where the excavated material of foundations is unsuitable for backfill, the *Supervisor* may instruct the *Contractor* to import suitable material.
- All excavated foundation shall be fenced off to prevent animals from falling in.

Towers

- The *Contractor* undertakes pegging, assembly and erection of towers, leg and body extensions and installation of anti-climb devices, bird-guards and line labels.
- The *Contractor* manufactures and tests all guy, spacer and cross ropes and supplies all fittings, U-bolts, dead-ends, shackles, etc. necessary for the installation thereof and erection of the masts.
- Measurement of earth footing resistances is to be undertaken before the commencement of stringing, in accordance with TRMASAAJ7 and additional earthing installed as required by the *Project Manager*.
- Earthwire insulators are to be installed on selected towers as per the staking table and the line design.

Stringing

- The *Contractor* undertakes stringing and regulating of phase and earth conductors together with the installation of line fittings and hardware in accordance with TRMSCAAC1 Rev 6.
- Upon delivery, the *Contractor* assembles one test sample for each hardware assembly to ensure compatibility with the tower.
- Adequate provisions are to be made for the protection and safe transport of composite insulators and all other material to the work site and during erection. Strict adherence to the “guide to the storing, transporting and installation of composite insulators” is mandatory. Climbing down or over composite insulators is strictly forbidden – ladders and cradles must be used.
- The *Contractor* provides for the making up of samples and testing of compression joints in accordance with TRMSCAAC1 Rev 6 before stringing commences.
- The *Contractor* determines the location and type of crossings, and compiles a detailed stringing programme, which is to be submitted to the *Supervisor* at least four weeks before stringing commences. The *Supervisor* shall liaise with local representatives of various bodies with regard to outages.
- When stringing over existing powerlines, telecommunication lines, railway lines and roads the *Contractor* is to provide and erect suitable crossing solutions and nets as required by the safety regulations (Scaffolding will not be allowed as a possible crossing solution).
- Aircraft warning devices, bird-guards and bird-diverters are to be installed where instructed as per EMP and the line design

5.1.15 Excavations and associated water control

Refer to SHE specification, EMP. Contractor to barricade and use suitable system for all foundation to prevent animals and human beings from falling in open excavations. Foundations should be marked with material that can be visible at night. The contractor must select material that cannot be consumed by animals. Refer to the SHE specifications for more information.

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

Contractor to identify if any and inform project manager accordingly

5.1.17 Control of noise, dust, water and waste

Refer to the SHE specification and EMP.

5.1.18 Sequences of construction or installation

Contractor to inform the Project Manager according on the sequences of construction. Progress Schedule and Method Statements. The contractor shall compile an access plan for all tower position for approval prior to start construction.

5.1.19 Giving notice of work to be covered up

Contractor to inform the Project Manager accordingly

The *Contractor* must take cognisance of the Environmental Management Plan and TRMSCAAC1 Rev 6 in the rehabilitation of damage caused during construction.

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

Existing farm roads and tracks to be maintained throughout the contract and left in at least as good condition as was found before construction commenced. The *Contractor* and *Supervisor* are to agree, using photographic evidence, if necessary, as to the state of such roads and tracks before construction commences. Existing berms are to be repaired during and after construction in accordance with TRMSCAAC1 Rev 6.

New access roads are to be closed on completion unless otherwise instructed. The *Supervisor* may instruct the *Contractor* to install water erosion control berms and other methods upon closure.

Tower sites are to be rehabilitated to the satisfaction of the landowner and *Supervisor*. In certain circumstances re-vegetation, mulching and erosion control measures etc. may be called for.

5.1.20 Hook ups to existing works

Contractor to confirm, prior to starting of construction

5.2 Completion, testing, commissioning and correction of Defects

5.2.1 Work to be done by the Completion Date

All the Work is 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 of Neptune Pembroke 400kV line	Within 30 days after Completion
Performance testing of the <i>works</i> in use as specified in this Works Information.	Within 30 days after Completion

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

N/A

5.2.3 Materials facilities and samples for tests and inspections

Contractor to inform the Project Manager 30days prior to inspections and shall comply with the standard for the construction of overhead powerlines (TRMSCAAC1 Rev 6).

5.2.4 Commissioning

All the Work is to be done by the Completion Date prior commissioning

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

N/A

5.2.6 Take over procedures

Take-over is after all works as stipulated in the *Works* info is completed or at the same time as Completion Take-over of The Works shall be in accordance NEC ECC3 hand over Certification and Projects Execution Hand over Document

The *Contractor* advises the *Supervisor* when the line is available for final inspection and assists if required.

By the completion date in the contract data, the *Contractor* shall complete all work required above the anti-climbing devices. All other work (rehabilitation, installation of retaining walls, ground-works, removal of temporary works, removal of construction camps, batching plants etc.) shall be completed within four (4) weeks of Take-Over. The *Supervisor* and / or landowner prior to the release of any retention moneys held against this contract shall approve such work.

The *Contractor* maintains the works until the defects date with regard to making good erosion caused by his operations, shrinkages, imperfections, settlements, etc.

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

Clause 43.4 of the NEC requires that the *Project Manager* arranges for the *Employer* to allow the *Contractor* access to and use of a part of the *works* which has been taken over if needed to correct a Defect. After the *works* have been put into operation, the *Employer* may require the *Contractor* to undertake certain procedures before such access can be granted

5.2.8 Performance tests after Completion

N/A

5.2.9 Training and technology transfer

Compliance to the SD&L requirements

5.2.10 Operational maintenance after Completion

N/A

6 Plant and Materials standards and workmanship

6.1 Investigation, survey and Site clearance

Refer to the **EMP** and attached document titled "The standard for the construction of overhead powerlines" (TRMSCAAC1 Rev 6)

6.2 Building works

N/A

6.3 Civil engineering and structural works

N/A

6.4 Electrical & mechanical engineering works

N/A

6.5 Process control and IT works

N/A

6.6 Transfer of Real Ownership

- Each item of plant and Material shall become the property of the Employer, free from any liens and other encumbrances, upon the earlier occurring of
- The item becoming part of the permanent work: or
- Payment for the item being made in full to the Contractor, in which event ownership shall be transferred to the Employer by Constitutum possessorium (i.e the contractor retains physical control of the item on behalf of its new owner, the Employer)

7 List of drawings

7.1 Drawings issued by the *Employer*

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

The following is a list of drawings issued with the enquiry:

- Outline tower drawings.
- Conceptual hardware drawings.

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

Drawing number	Revision	Title
		Bend point co-ordinates, stacking tables and profiles
		Outline tower drawings
		Conceptual Hardware drawings
		Eskom Standard Conventional Foundation drawings
		Conceptual Hardware Drawings
		Bend point co-ordinates, stacking tables and profiles
		Outline tower drawings

7 Specifications

The following is a list of specifications and standards applicable to Neptune Pembroke line:

- Insulators
- Hardware
- Phase conductor
- Earthwire
- OPGW

- Jumper Specification
- Tower, Foundation and Earthing Specification
- Environmental Management Plan.

The specifications, standards and guides listed below are applicable to this contract and are **available on request. Latest revision** available at time of tender **will apply**.

- | | | |
|---|------------|--|
| • | NWS 1074 | Guy Strand Grips for Transmission Lines |
| • | ESKCAAB4 | Zinc Coated Earth Conductor, Guy and Stay Wire for Transmission Lines |
| • | TRMASACQ9 | Quality Requirements for the Procurement of Assets, Goods and Services |
| • | ESKASABG3 | Bush Clearance and Maintenance within Overhead Power Line Servitudes |
| • | TRMSCAAC 6 | Transmission Line Towers and Line Construction |
| • | TRMSCABC9 | Design and Manufacture of High Voltage Equipment Labels |
| • | TRMASAAJ7 | Earthing of Transmission Lines |
| • | DTSSCAAU5 | Compression Accessories for Phase and Earth Conductors for Transmission Lines |
| • | TRMSCABS9 | Specification for Composite Insulators |
| • | TRMSCAAI3 | Spacer or Spacer Damper Assemblies for Conductor Bundles for Transmission Lines |
| • | TRMSCAAA3 | Ceramic and Glass Cap and Pin Insulators |
| • | TRMSCAAH2 | Specification for Suspension and Strain Assemblies and for Hardware for Transmission Lines |
| • | TRMSCAAD4 | Phase Conductor for Transmission Lines |
| • | TRMASAAJ7 | Earthing of Transmission Lines |
| • | 32-136 | Contractor Health & Safety Requirements |

Guide to the Storing, Transporting and Installation of Composite Insulators.

8 Stability and Security Management

8.1 The following items are to be provided under Security Management; (Refer to Annexure 1)

TDP Security Scope of Work

- Two-way radios
- Panic buttons
- Surveillance cameras (to oversee entire site establishment)
- Registers for access control & inventory management
- Firearm safes
- Signage
- Alcohol testers
- Mag-touch system
- 4x4 patrol vehicle
- Guard house
- Bullet resistant vests (as per security officer)
- Raincoats & umbrellas (as per security officer)
- Pepper spray (as per security officer)
- Batons (as per security officer)
- Handcuffs (as per security officer)
- Torches (as per security officer)
- Steering wheel locks (per vehicle parked at site)
- Tyre and wheel / axle locks (per vehicle parked at site)
- Fuel cap locks (per vehicle parked at site)
- Operating lever locks (per levers on doors on site)
- Alarm system

- Spotlights (Sufficient to light for the entire campsite. They must be out facing, i.e., to spot perpetrators and the security guards)
- Satellite phones

8.2 Stability Undertaking

Tenderers who complete and submit the undertaking as required, but who do not meet Eskom's targets, will not be disqualified. Project Stability undertakings do not form part of scoring, but commitments will form part of contractual obligations

1. The tenderer to participate in the stakeholder Management platforms that introduces the project tendered for and strategizes on project development and mitigate project risks or emergencies interrupting project operations
2. The tenderer to display commitment to social upliftment of communities where the project is executed through job creation, skills transfer, local SMME inclusion, local to site procurement, enterprise development in the core scope of the works and Corporate Social investment initiatives.
3. Refer to Annexure 2 (Transmission Stability Requirements)

Project Stability Penalty and Performance Security

Eskom will apply a penalty of 2.5% of the invoice amount for failure to meet Project Stability obligations.

As security for the fulfilment of all Project Stability obligations, Eskom will apply a penalty of 2.5% of every invoice amount (excluding VAT) for failure to submit Project Stability performance reports every quarter against the stability plan submitted at contracting stage; **or** failure to meet the Project Stability obligations in a contract.

Reporting and Monitoring

- The suppliers shall on a monthly basis submit a report to Eskom in accordance with monthly report Template on their compliance with the Project Stability Obligations described above.
- Eskom shall review the Project Stability reports submitted by the suppliers within 60 (sixty) days of receipt of the reports and notify the suppliers in writing if their Project Stability obligations have not been met.
- Upon notification by Eskom that the suppliers have not met their Project Stability obligations, the suppliers shall be required to implement corrective measures to meet those obligations before the commencement of the following report, failing which Retention clauses shall be invoked.
- Every contract shall be accompanied by the Project Implementation Schedule which must be completed by the suppliers and returned to Project Stability Representative for acceptance 28 days after contract award.

C3.2 CONTRACTOR'S WORKS INFORMATION

Not Applicable
