PART 3: SCOPE OF WORK

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C3.1: EMPLOYER'S WORKS INFORMATION

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1 Description of the *works*

1.1 Executive overview

The Watershed Strengthening project was established due to the fact that the network was struggling with the growth in the area. The substation is located closed to Lichtenburg approximately 5km on the R505. Grid Planning had proposed the installation of a new transformer as well as extending the existing 132kV yard and upgrading the busbar to tubular. Initially the project was split into phase 1 and phase 2 in order to be able to commission the HV yards at least get the transformer operational when phase 1 scope of work (SOW) was completed. However, phase 1 scope of work was not completed due to the contract expiring which prompted the Project Manager to back on open tender market to complete the remaining SOW as well phase 2. The remaining SOW will include the following items to be completed and commissioned:

- Main column and medium equipment foundations
- Drainage system
- Medium support structures.
- Earthing, including earth mat.
- Decommissioning of existing bays.
- Trenches and trench covers
- Concrete Gutter
- Yardstone
- HV Safety Fence
- Busbar support foundations and structures.
- Manholes and Manholes covers
- Oil dam outlet
- Buildings
- Floodlighting
- Access Road
- Security lighting

The detailed scope of works for the Watershed Substation Strengthening project can be outlined as follows:

Note that this document must be used in conjunction with the design drawings (see item 2.1) as well as all specifications, procedures, guidelines and standards mentioned therein. Work will be performed in a live substation, and therefore all necessary safety procedures and precautions must be adhered to.

The civil engineering scope of work for this project includes the following:

1.1.1. R
Remaining Scope of Work

The following list includes the consolidated scope of work for building in all substations mentioned above see table below:

Items	Remaining Scope of Work
➢ **Main column and medium equipment foundations**	Construction of the following columns: • C96 to C101. • C84 to C89. • Please refer to the Foundation, Trench and Earthmat (FTE) drawing 0.18-14129-13
➢ **Drainage system**	• The drainage system was incompleted. The terrace was constructed on a depression therefore the drainage system consist of interlinked perforated concrete lined gutter. • For details see updated drawing 0.18-32131
➢ **Medium support structures.**	• Lattice steel support structures must be assembled and erected • See bay layouts for drawing number
➢ **Earthing, including earth mat.**	• Installation of earth from the main earth mat to the fences (HV fence and perimeter fence). • Installation of earth from earth mat to buildings
➢ **Access Road**	• The existing access road is required to be upgrade. • Please refer to drawing 0.18-32141 sht 1-3
➢ **Decommissioning of existing bays**	**132kV feeder 12, 13, Cap bank 31. Transformer 2, Transformer 4 Bays:** • ALL these bays needs to be constructed. (Phase 2) • Existing Bays needs to be decommissioned. • Please refer to the Foundation, Trench and Earthmat drawing 0.18-14129-13
• **Trenches and trench covers**	• Supply and installation of cable trench covers. • Please refer to the Foundation, Trench and Earthmat drawing 0.18-14129-13 • Please also refer to precast detail 0.54/390 sht 17a

➢ **Concrete Gutter**	• The concrete lined gutters form part of the drainage system. • For details see updated drawing 0.18-32131
➢ **Yardstone**	• Yardstone is required to have 100mm thickness • Stone size is specified to be 19-23mm.
➢ **HV Safety Fence**	• The HV yard safety fence is required to be supplied and installed including gates and removal panels. • Please see detail 0.54-4963 sht 1-4
➢ **Busbar support foundations and structures.**	• Please refer to the updated FTE drawing 0.18-14129-13
➢ **Manholes and Manholes covers**	• Please refer to DTL. 0.54-390 sht 1-4
➢ **Oil dam outlet**	• The oil dam was completed but when it's operational it won't be able to disperse stormwater or it will run back into the the dam because the outlet wasn't constructed. • Refer to the fire protection drawing for details.
➢ **Buildings**	• The consumable store, cladded store and access control buildings are all incomplete. • This includes roofing, windows, doors, ceilings, plumbing and general electric. • Refer to the building folder uploaded by the procurement.
➢ **Floodlighting**	• It has been complete for phase 1 and is required in phase 2.

BUILDINGS

CONTROL BUILDING

Exterior

- Paving – seal the gap between the paving and the building and or kerb
    - If the gap is larger than 10mm – mortar fill.
    - If the gap is smaller than 10mm – Exterior expandable acrylic joint filler.
- The exposed concrete raft foundation must be cleaned and made good with Sika cementitious mortar repair. The finished look must be a smooth square aesthetical clean concrete grey.
    - Height H.V yard side = 150mm
    - Height Road side = 400mm
- Clean all brickwork
- Seal and make good all openings in wall of aircon or pipe entries.
- Clean gutters and downpipes
- Paint Fascia – one coat and similar colour
- Install a 100mm pvc drainage pipe to the stormwater manhole from the cable trench entrance.
- Door D5
    - Steps – Make good with Sika cementitious mortar repair. The finished look must be a smooth square aesthetical clean concrete grey.
    - Painted as per the finishes schedule
    - Add dust seals as per the door schedule
- The cable entrance duct on the road side to be completed. Only the walls is done with no cover slab.
- Ramp at main entrance door –
    - close the sump
    - Seal the expansion joints with Exterior expandable acrylic joint filler
- All wall expansion joints – rake out fibre board and fill with Exterior expandable acrylic joint filler brown Sika Sikaflex 11FC
- Install glass to the porch windows
- Roof:
    - Check ridges and waterproofing by specialist
    - Check and repair the water leak to the battery room. (road side)

Battery room

- Drainage channel grid does not fit – 2m length at basin side.
- Emergency eyewask – place eyewash on opposite side to have more space to the battery bank.
- Maintenance sink pvc outlet – extend the pipe to drain into channel.
- Door frame –
    - clean paint and varnish
    - Repair the wall against the frame at the bottom of the frame.
- Walls – repair and make good the flaking paint and paint with acid resistant paint as specified.
- Close roof area above walls marked as firewalls with 4mm nutec board and drywall lightweight steel tracks as the frame. All gaps must be sealed with foam filler.
- Drainage channel to the outside according to detail – make good on outside.
- Repair and make good between the wall, cornice and ceiling.
- Make good the ceiling above the door area.

Porch

- Fit glass to the windows
- Fit expansion joint filler

Control room

- Door D3 to porch – make good the fixing of the ironmongery to the door.
- Replace the skirting with 19 x 76 meranti hardwood skirting. Sand and paint with clear polyurethane varnish.
- Door D1 –
    - main entrance door. Paint as specified.
    - Apply door seals as specified to make door airtight.
    - The top lock chain according as specified in the door ironmongery.
- The expansion joint in the wall must be opened up to fit acrylic joint filler. Repair cracks and Paint 500mm on either side.

Storage yard

- Paving is not completed. Paving – seal the gap between the paving and the building and or kerb
    - If the gap is larger than 10mm – mortar fill.
    - If the gap is smaller than 10mm – Exterior expandable acrylic joint filler.

Cladded store

- Complete the concrete apron.
- Complete the floor slab
- Complete the steel structure and cladding. Only the brickwork is done.

Consumable store

- The exposed concrete raft foundation must be cleaned and made good with Sika cementitious mortar repair. The finished look must be a smooth square aesthetical clean concrete grey.
- Complete the brick walls and make good.
- Apply the final screed and floor finish to the raft foundation floor.
- Fit roof with waterproofing as specified.
- Fit door complete as specified.

Workshop

- The exposed concrete raft foundation must be cleaned and made good with Sika cementitious mortar repair. The finished look must be a smooth square aesthetical clean concrete grey.
- Entrance door:
    - Door is clashing with the floor.
    - Fit ironmongery.
    - Complete ceiling and paint
    - Install windows
    - Install crawl beam.
    - Repair floor cracks and apply screed and epoxy as specified.
    - Complete store area
    - Complete all finishes as detailed and specified.

ACCESS CONTROL BUILDING

Exterior

- Complete parts of the foundation ring beam and slabs.
- The exposed concrete raft foundation must be cleaned and made good with Sika cementitious mortar repair. The finished look must be a smooth square aesthetical clean concrete grey.
- Cut joints and fill with Exterior expandable acrylic joint filler brown Sika Sikaflex 11FC

- Install the roof fascia's and paint as specified
- Window plaster bands to be painted as specified.
- Window frames to be cleaned.
- Porch concrete roof
    - edge steel I-beam to be painted as specified.
    - Concrete repair to soffit of slab. No sand cement mixture.
    - Waterproofing by specialist.
    - Complete downpipe.
- Complete plumbing on the outside.
- Install burglar bars to the toilet windows as specified.
- Make good facebrick wall and plumbing pipes.

Interior

- Tile skirting:
    - Make good top of tile skirting – paint black
    - Clean and make good.
- Clean floor tiles – was wiped with oil.
- Remove elec. Conduit & isolator at basin.
- Replace worktop
- Clean overpainted paint marks on various components .
- Clean door frame of panel room and toilet
- Kitchen floor unit to be cleaned and sealed at wall.
- Ablution:
    - Complete sanitaryware as specified
    - Clean tiles
    - Add burglar bars
    - Add lockers and safe as specified

FLOODLIGHTING

- Supply and install one 24m mast OLM09 including steelwork, foundation, cables, electrical equipment, and luminaires as specified on the drawings.
- Supply and install one 24m mast foundation, relocate one 24m mast OLM10 to new position shown on drawings. Connect existing supply cable.

SECURITY LIGHTING

- Supply and install 2 poles and luminaires for the entrance gate area.
- Supply and install new armoured cable inside security lighting pole from MCB to luminaire.

CONTROL BUILDING ELECTRICAL INSTALLATION

- Investigate and repair emergency lighting
- Investigate and repair air conditioning installation
- Supply and install isolator for the extraction fan in the battery room
- Supply and install 8 diffusers in the battery room ceiling.
- Supply and install isolator and speed control for the pressurization fan in the control room.
- Powder coat extractor fan support.

- Supply and install Oil dam pump supply cable, Distribution Board and isolator
- Complete legend card according to drawing
- Repair holes where piping goes through holes of air conditioners
- Replace the drain pump pipe saddles with Masterbat saddles
- Supply and install air conditioner trunking between outdoor and indoor units and on the outside wall.
- Remove conduit and wiring from battery room roof void, replace with armoured cabling.
- Investigate and repair emergency cutoff switch of battery room.
- Repair battery room luminaire.
- Supply and install beige powder coated trunking from DB1 to roof void.
- Clean all light switches, power points and isolators.

ACCESS CONTROL BUILDING ELECTRICAL INSTALLATION

- Supply and install the luminaires according to the drawing.
- Supply and install 2 air conditioning units.
- Supply and install 2 isolators for the air conditioners
- Install the supplied DB8 including equipment.
- Connect the installed supply cable to DB8.
- Supply and install supply cable to DB8B.
- Supply and install Blower motor supply cable and power point.

WORKSHOP ELECTRICAL INSTALLATION

- Supply and install DB5
- Supply and install luminaires according to the drawing, ensuring the luminaires are on the correct phases and specified.

CLADDED STORE ELECTRICAL INSTALLATION

- Supply and install DB4 including Supply cable from workshop DB5 and equipment in DB4.
- Supply and install electrical equipment within the store, power points, light switch, and luminaires.

CONSUMABLE STORE ELECTRICAL INSTALLATION

- Supply and install isolator including Supply cable from workshop DB5.
- Supply and install electrical equipment within the store light switch, and luminaires.

1.2. *Employer*'s objectives and purpose of the *works*

Watershed 275/88/132kV Substation forms part of the Carletonville Customer load network. The substation is supplied from Hera and Pluto MTS's at 275kV level. Transformation is effected via 2 x 275/88kV 315MVA transformers. Subsequently, the 132kV single busbar is fed via a split (to reduce/manage fault levels) 88kV busbar by 2 x 88/132kV 180MVA transformers. The majority of load is evacuated at the 88kV voltage level (75%), with the remaining load at 132kV voltage level (25%). The 132kV load is however supplied via the 88kV busbar; hence the 2 x 275/88kV transformers carry the total load of the substation. There is only 1 x 132kV busbar at Watershed Substation. On the loss of the busbar, the entire 132kV load at Watershed MTS will be lost.

1.3. Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	**Meaning given to the abbreviation**
AFC	Approved for construction
OBL	Outside battery limits
PM	Project Manager
QS	Quantity Surveyor
EA	Engineering Assistant
HV	High voltage
kV	Kilo volt
ORHVS	Operating Regulations for High Voltage Systems
SHEQ	Safety, Health, Environmental and Quality

2. Management and start up.

2.1. 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 register and compensation events	Weekly on Wednesday when necessary at Watershed substation or MS Team	Watershed substation or MS Team	To be determined
Overall contract progress and feedback	Monthly on Wednesday at Watershed substation or MS Team	Watershed substation or MS Team	*Employer*, *Contractor*, *Supervisor*, and core project team

Site Inaugural meeting will be held on site two (2) weeks prior to commencement of site activities and the contractor shall avail safety file for auditing purposes.

Project progress meetings will be held once every fortnight on site in order to track work progress, safety, environmental and other issues. A contractor must avail himself to these meetings.

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

The documentation supplied by the Contractor shall include be in both hard copy and electronic form. A minimum of three hard copies will be provided. Each document shall include, at a minimum, the following information:

- Title
- Status
- Revision
- References
- Purpose
- Description

2.3. Health and safety risk management

The Contractor shall at all times comply with the health and safety requirements prescribed by law as they may apply to the works. The Contractor shall comply with the health and safety requirements contained in in the following documents as a minimum:

- The OHS Act 85/1993, its Regulations and incorporated SANS Codes
- Eskom SHEQ Policy:32-727
- Eskom’s Covid 19 Health and Safety Policy Statement: 240-155373927
- Health and Safety Specification: TPD PDPMAN-SP 84
- Working at Heights Standard: 32-418
- Life Saving Rules: 240-62196227
- Eskom Vehicle Safety Specification:32-345
- Eskom Substance Abuse, 32-37
- Eskom Occupational Health & Safety Incident Management Procedure, 32-95
- Eskom Employees Right of refusal to Work in an Unsafe Situation Procedure 240-43848327.
- Operating Regulations for High Voltage Systems Procedure: 32-846

The authorization procedure for a permit to work shall be followed by the Contractor before commencing work on site. It is the Contractor’s responsibility to ensure that a permit to work is obtained before access to the work can be given. It is the Contractor’s responsibility to also ensure that the safety file has been audited by the Health and Safety Representatives before establishing site.

The Contractor must be in possession of current First Level 2 certificate. The Contractor's trucks must have a valid and current crane test certificate with the truck driver and crane operator's certificate. All tools must have valid and current test certificates, which must be produced two weeks before site establishment.

The Contractor will only leave site once a written site instruction has been issued by an Eskom site representative. Working hours will be from 08h00 to 16h00 during week days (as per outages) ,weekend work to be carried out only on request by Eskom.

The Contractor is to have an Eskom certified and authorized person available in each area where work is being performed at all times in accordance within accordance with the Eskom ORHVS Procedure 32-846.

A detailed risk assessment with sufficient control measures must be done PRIOR commencement of any task on site by a competent risk assessor. The Contractor Supervisor shall ensure strict adherence to the Safe Work Procedures and the identified control measures. If needed the Contractor is to visit construction site at own cost before work commences to familiarise him/herself with the scope of work and develop a baseline risk assessment.

Before any excavation is commenced, it will be the responsibility of the Contractor to ascertain from Responsible Eskom site Representative Site Supervisor the position of any existing services on site. Once these are indicated to the contractor they shall be deemed "known". Any costs incurred for repairs to any "known" services shall be for the contractor's account.

The Contractor's attention is drawn to the fact that other contractors will be on site hence access and interfacing with them will be required. The Contractor shall allow safe access for other contractors and Eskom personnel when required. Where multiple contractors are working close by, contractors will be required conduct a joint risk assessment and communicate shared risks to their respective contractors.

The Contractor shall establish a refuse control system. All waste is to be collected and disposed of as required by Eskom and the local authority.

The Contractor shall make his own arrangements for the provision of accommodation for his employees.

2.4. Environmental constraints and management

The *Contractor* shall comply with the environmental criteria and constraints stated in 240-146467524: TPD Environmental Tender Evaluation Report

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,
- EPC32-727: Eskom SHEQ Policy,
- ST32-726: SHE Requirements for the Eskom Commercial Process.
- Environmental Authorisation issued by Department of Forestry, Fisheries and Environmental Affairs for the proposed re-routing of 4X 132 kV power lines and associated infrastructures at the Watershed substation near Lichtenburg in the North West Province. DEA ref # : 14/12/16/3/3/1/1094
- Environmental Management Plan developed by Environmental Impact Management Services (Pty) Ltd for proposed re-routing of 4X 132 kV power lines and associated infrastructures at the Watershed substation near Lichtenburg in the North West Province.
- 240-133087117: Environmental Incident Management Procedure
- Eskom Waste Management Standard 32-245
- Transmission Power Delivery (TPD) Waste Management Plan TDPMAN-PN-53
- TDPMAN-ST-37: Environmental Requirements for Contractors and /or Suppliers

The Eskom Transmission Environmental Management Programme provides the aspects and impacts that will require management and must be followed strictly. For tendering purposes, contractor shall prepare the **following method statements** for all environmental concerns raised through the Eskom Transmission Environmental Management Plan and in any other relevant forum such clarification meetings

- Water supply
- Waste management
- Storage of hazardous material
- Noise management
- Dust management
- Soil erosion
- Stormwater management
- Mixing of concrete
- Vehicle maintenance and refuelling (in case of an emergency)
- Vegetation clearance
- Accessibility of the site (access road)
- Equipment and construction material storage
- Top soil management
- Rehabilitation

Any changes to the approved method statements / mitigation plan shall be reported and approved by Eskom Transmission Environmental representative and Project Manager prior to the commencement of work and during construction. The main supplier must ensure that all sub-contractors' environmental mitigation plan comply with legal and other requirements and also includes all the environmental risks associated with the scope of work. The main (principal) contract shall define the specific system elements (risk) applicable to the subcontractor's scope of work or supply.

No environmental records shall be destroyed or discarded by the supplier. Eskom and the supplier shall agree that the supplier retains certain environmental records.

The Contractor is to send a flash report for any environmental incidents that have occurred on site as soon as possible or within 24 hours to the Environmental Advisor Contact person and PM, clearly stating any impact to the environment.

Waste generated during watershed strengthening project must be disposed at a registered landfill site and contractor shall retain records of disposal. This include waste generated during demolish of the existing type oil holding dam and existing septic tank

Deviations from these requirements will be regarded as a non-conformance. Should there be a concerns regarding environmental performance and non-conformance to environmental requirements, management engagements and interventions will be introduced to determine a means to addressing the shortfalls.
Once these interventions have been explored and exhausted, then the Eskom supplier disciplinary process must be followed.

NB: The Contractor is to compile a complete environmental file. The file needs to be audited and approved by the Transmission Environmental Department, prior to commencement of work.

2.5. Quality assurance requirements

The following standards contain provisions that, through reference in this text, constitute provisions of this specification. At the time of publication the revisions indicated were valid. All standards are subject to review, and parties entering into service agreements based on this specification are encouraged to investigate the possibility of applying the most recent revisions of the standards listed below. Information on currently valid national and international standards may be obtained from the Information Centre at Megawatt Park and Technology Standardisation Department.

In the event of conflict between documents invoked here and the contents of this specification, the contents of this specification shall be considered to have preference. Such conflict shall be pointed out to the Employer for confirmation.

- Eskom NWS 1674 - "Standard Specification for approval of drawings submitted by Contractors and Contractors."
- Project Quality plan

The Employer requires that the Contractor operate a quality management system as stated in the Scope.
The Employer requires that the Contractor provide a quality policy statement and quality plan which complies with requirements stated in the Scope.

2.6. Programming constraints

The Contractor shall include all stages including deliverables per stage in the programme. The programme shall be submitted to the Employer for acceptance in MS Projects format.

2.7. *Contractor*'s management, supervision and key people

Defined costs are actual costs incurred by the Contractor. These costs should not include profit or company overheads. All compensation events will only be paid on defined costs.

In an event of labour costs, the Contractor is required to provide pay slips of the employees used. The labour mark-up indicated in this contract will be added to these actual costs to form the final value of the compensation event.

In the event that the Contractor is required to supply anything other than people, the Contractor is required to provide a copy of his Contractors invoice. The profit and overhead mark-up indicated in this contract will be added to these actual costs to form the final value of the compensation event.

Copies of payslips and Contractors invoices are to accompany the requests for compensation events.

The Contractor shall under no circumstances refuse additional work on the basis of costs as defined above

2.8. Invoicing and payment

Within one week of receiving a payment certificate from the *Project 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 *Project Manager's* payment certificate.

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- Name and address of the *Contractor* and the *Project Manager;*
- 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;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

The Contractor attaches the detailed assessment of the amount due to each tax invoice showing the Price for Work Done to Date for each item in the Price List for work which he has completed.

A tax invoice shall be submitted on completion of the works in the format required. A breakdown of all work completed during the previous period shall be attached. Invoicing and relevant details will be discussed at site hand-over meeting. Payments will be processed once all completion certificates and invoices are submitted

2.9. Insurance provided by the *Employer*

Defined costs are actual costs incurred by the Contractor. These costs should not include profit or company overheads. All compensation events will only be paid on defined costs. In an event of labour costs, the Contractor is required to provide pay slips of the employees used. The labour mark-up indicated in this contract will be added to these actual costs to form the final value of the compensation event.

In the event that the Contractor is required to supply anything other than people, the Contractor is required to provide a copy of his Contractors invoice. The profit and overhead mark-up indicated in this contract will be added to these actual costs to form the final value of the compensation event. Copies of payslips and Contractors invoices are to accompany the requests for compensation events.

The Contractor shall under no circumstances refuse additional work on the basis of costs as defined above

2.10. Contract change management

Not applicable

2.11. Provision of bonds and guarantees

Not applicable for this contact

2.12. Training workshops and technology transfer

Training shall be conducted for the maintenance and operational of newly constructed or erected infrastructure such as security fence, ventilation system, sewer plant, water network system, etc.

3. Engineering and the *Contractor*'s design

3.1. *Employer*'s design

Eskom has designed the new foundations, buildings, structures, earthworks, road, water and sewer network, drainage, terracing, fencing, etc as detailed on the relevant drawings listed in Section 7 of this document and the quantities are given in the bill of quantities.

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

The Contractor is to design any temporary works required to construct the works if not provided in the designs.

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

Not applicable

3.4. Other requirements of the *Contractor*'s design

Not applicable

3.5. Use of *Contractor*'s design

Not applicable

3.6. Design of Equipment

Not applicable

3.7. Equipment required to be included in the *works*

Not applicable

3.8. As-built drawings, operating manuals and maintenance schedules

The Contractor is to provide Eskom with detailed "as built" records where deviations have been made from construction drawings within 14 days after Any deviation from the actual design is to be accompanied by the risk assessment.

4. Procurement

4.1. People

4.1.1. Minimum requirements of people employed on the Site

The Contractor shall comply with the Employer's site requirements in the use of labour for the works.

Skills development will not be a weighted criterion but tenderers will be encouraged to propose training initiatives in terms of the skills required for this project. Eskom will apply a penalty of 2.5% of the contract value for failure to meet SDL&I obligations after agreement is reached. For the duration of the contract, Eskom will retain 2.5% of every invoice (excluding VAT) as security for the fulfilment of all SDL&I Obligations. The retained amounts shall only be released to the contractor upon fulfilment of all SDL&I obligations at the end of the contract. Alternatively the contractor shall submit a bond equivalent to 2.5% of the contract value and shall only be released to the contractor upon fulfilment of all SDL&I obligations.

Local production and content

As per DTi guidelines {PPPFA act section 9, paragraph 9(1)} Steel forms part of the designated commodities with a threshold of 100%. As a result tenderers are required to fill in, sign and submit local content declaration forms to confirm their local spend on steel. Failure to do as stated above and to meet the threshold as set by DTi will disqualify a tenderer.

Material	Threshold %
Steel	100%
Cement	100%
Fence/Wire Products	100%

4.1.2. BBBEE and preferencing scheme

The Contractor shall comply with the Employers's Broad Based Black Economic Empowerment (B-BBEE) or preferencing scheme measures

Pre-qualification criteria for preferential procurement will apply as follows:

(a) a tenderer subcontracting a minimum of 30% to: EME/QSE that are B-BBEE level 1 to 2.

4.1.3. Supplier Development and Localisation (SD&L)

The *Contractor* complies with and fulfils the *Contractor's* obligations in respect of the SD&L in accordance with and as provided for in the *Contractor*'s SD&L Compliance Schedule stated below:

Skill Type (occupation)	Target number of person to be trained local to site	Proposed number of person to be trained local to site
Foreman	1	
SHEQ Trainee officer	2	
Shutter hand	5	

The *Contractor* shall keep accurate records and provide the *Project Manager* with reports on the *Contractor*'s actual delivery against the above stated SD&L criteria. The Contractor shall keep accurate records and provide the Project Manager with reports on the Contractor's actual delivery against the above stated SD&L criteria.

The *Contractor*'s failure to comply with his SD&L obligations constitutes substantial failure on the part of the *Contractor* to comply with his obligations under this contract.

4.2. Subcontracting

4.2.1. Preferred subcontractors

The Employer reserves the right to approve all subcontractors that the Contractor intends to enter into subcontracts with in order to make sure that the subcontractor complies with operational standards.
The Contractor shall not subcontract more than twenty five percent (25%) of the whole of the contract.

4.2.2. Subcontract documentation, and assessment of subcontract tenders

The NEC system is compulsory for all subcontract documentation.

4.2.3. Limitations on subcontracting

The Employer reserves the right to approve all subcontractors that the Contractor intends to enter into subcontracts with in order to make sure that the subcontractor complies with operational standards.
The Contractor shall not subcontract more than twenty five percent (25%) of the whole of the contract.

4.2.4. Attendance on subcontractors

Not applicable

4.3. Plant and Materials

4.3.1. Quality

The *Contractor* shall control his activities and processes in accordance with Eskom's Quality Requirements for Procurement of Assets, Goods & Services QM 58, as amended. Quality requirements are described in the Project Quality Plan document number TB-PQA&QC-TX

4.3.2. Plant & Materials provided "free issue" by the *Employer*

Not applicable

4.3.3. *Contractor*'s procurement of Plant and Materials

Not applicable

4.3.4. Spares and consumables

Not applicable

4.4. Tests and inspections before delivery

All structural steelwork as well as fencing and lighting poles is to be inspected by the *Contractor* before being delivered to site and should have a certificate from the Galvanizer stating the coating thickness. The requirements are also indicated on the Project Quality Plan document number TB-PQA&QC-TX-PQP-2009 and QM 58.

4.5. Marking Plant and Materials outside the Working Areas

Not applicable

4.6. *Contractor*'s Equipment (including temporary works).

Not applicable

4.7. Cataloguing requirements by the *Contractor*

Not applicable

5. Construction

5.1. Temporary works, Site services & construction constraints

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

Entry to the site is governed by the Grid's Engineering Assistant and the Contractor shall adhere to all regulations given. All employees are to sign the Workers declaration on entering and leaving the working area. The Contractor is to have an Eskom certified and authorized ORHVS person available on site at all times in accordance with ORHVS Procedure 32-846.

The authorized ORHVS person is to have a valid first aid level 2 certificate. The authorization procedure for a permit to work shall be done before the Contractor commences work on site. It is the Contractor's responsibility to ensure that the authorization procedure for a permit to work is obtained before access to the work can be given. To arrange for an interview for authorization. The Contractor will be required to have an Eskom certified and authorized ORHVS person available in each area where work is being performed.

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

Access on site is restricted to the area in which the Contractor is working and which has been barricaded. Strictly no movement outside the barricaded working area unless escorted by authorized HV Plant personnel. The majority of the work is to be performed in the live HV Yard and the contractor will take all necessary precautions and work in conjunction with Eskom personnel.

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

The Contractor is to supply Eskom with Police clearance for all the employees on site before Work commences. The normal working hours shall be from 07:30 am to 04:30 pm. Any work done outside this duration must be arranged through the senior HV Plant supervisor.
The maximum speed limit on site is 40 km/h.

5.1.4. Health and safety facilities on Site

There are no Toilet facilities available on site. Contractor to provide his own toilet and dining facilities in accordance with the TPD Health and Safety Specification. Refer to Clause 24 -***Contractor's Site Facilities*** in the Health and Safety Specification. No work on site will be allowed to commence before the toilet facilities are available on site.

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

The Contractor shall control his activities and processes in accordance with TDPMAN-ST-37: Environmental Requirements for Contractors and /or Suppliers. The Contractor shall establish a refuse control system. All waste is to be collected and disposed of as required by Eskom and the Local Authority.

5.1.6. Title to materials from demolition and excavation

All the materials from excavation and demolition must be disposed of by the Contractor except where expressly stated by the PM or the relevant staff from the Grid. All rubble and other materials must be classified, weighed and transported to a registered dumping site.

5.1.7. Cooperating with and obtaining acceptance of Others

The Contractor's attention is drawn to the fact that other contractors will be on site and access and interfacing with them will be required. The Contractor shall allow safe access for other contractors and Eskom personnel when required.

5.1.8. Publicity and progress photographs

Warning signs and notices must be clearly displayed at all sites where work is taking place. It is the responsibility of the Contractor to ensure that all its workers and visitors adhere to all signs.
No photographs are to be taken without the permission of the E.A.

5.1.9. *Contractor*'s Equipment

All equipment must be registered in the equipment register and as per 32-136. The Contractor is responsible for his own insurance of his equipment. The Contractor is to take stock of his material and equipment on a regular basis and any shortage to be reported to the Project Manager immediately, stating if it is hired or owned.

5.1.10. Equipment provided by the *Employer*

Not applicable

5.1.11. Site services and facilities

All the water necessary for construction purposes must be provided for by the Contractor. It is the Contractor's responsibility to test any water before using it for construction purposes. The Contractor to submit a test Certificate for the water used on site. Electricity is available on site. The Contractor shall provide all connections, extensions and additional supply points necessary for 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. The Contractor shall provide everything else necessary for providing the Works.

5.1.12. Facilities provided by the *Contractor*

The Contractor supplies all plant and materials required for providing the Works.There are no Office or Telephone facilities available on site. The Contractor is to provide his own facilities on site and ensure that these facilities are kept in a clean condition to Eskom's satisfaction. There are no Toilet facilities available on site. The Contractor is to provide own toilet and dining facilities in accordance with the Health and Safety Specification **Clause 24- Contractor's site facilities**. No work on site will be allowed to commence before the toilet facilities are available on site.

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

The Work is to be carried out next to an existing HV yard and the *Contractor* is to take note of the surrounding foundations, equipment and buildings. The other work will be carried out on the access road to the Substation.

5.1.14. Survey control and setting out of the *works*

The Contractor is responsible for setting out the works.

5.1.15. Excavations and associated water control

All necessary precautions shall be taken to ensure that deep excavations are safe and that the sides are stable, if not they shall be battered. All excavations are to be properly barricaded at all times.

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

Before any excavation is commenced, it will be the responsibility of the Contractor to ascertain from the "Engineering Assistant" the position of any existing services on site. Once these are indicated to the Contractor they shall be deemed "known". Any costs incurred for repairs to any "known" services shall be for the Contractor's account.

5.1.17. Control of noise, dust, water and waste

The *Contractor* shall control his processes and procedures so as to minimise noise and dust. All waste is to be collected and disposed of as required by Eskom and the Local Authority.

5.1.18. Sequences of construction or installation

Only prescribe sequences of work where absolutely necessary such as when *Contractor* has to give access to Others (without take over) and for technical reasons such as under tidal conditions and in rivers.

- Construct equipment bay foundations in the 132 KV yard for the phase-1, and including new columns, beams, earthing, trench/trench cover and yard stone.
- While the above is in progress:
    - Complete remaining work on Modify the existing security fence (inner and outer) and the non- lethal barrier fence
    - Demolish the existing buildings
    - Complete remaining work on erect diamond mesh fence inside 88 KV yard and remove the existing safety fence
    - Provide water tank and booster pump and reconnect associated pipe route as per drawing and demolish and dispose the existing one.
    - Complete remaining work on Construct new calcamites sewer plant as per drawing,
    - Remove the exiting steel work columns, beams and foundations in the 132 KV yard in order to build the new terrace for phase-2
    - Complete remaining work on Constructed a new concrete section of road inside the substation on the new terrace.
    - Complete remaining work on new oil dam as soon as possible to be used in case of build up of water and oil in the blocked off bund areas and connect the piping from the existing and new transformers to it
    - Complete remaining work on a new control room in the new 132 KV yard
    - Complete remaining work on construct new foundations for the new 132 KV bus bar and feeder bay and erect the associated steelworks, column and beams.
    - Complete remaining work on Installation of earth mat and earth tails. Sacrificial anodes maybe required depending on the soil tests.
    - Complete remaining work on a new cladded store building with bund area for oil drums and cap bank cans
    - Complete remaining work on a new workshop and consumable store

- Complete remaining work on a new access control building with water, electrical and sewer connections.
- Build the second portion of the 132 KV terrace.
- Complete remaining work on Construct new foundations for the cap bank.
- Complete remaining work on Erect safety fencing around the 132 KV yard
- Complete remaining work on Installation of new light masts
- Complete remaining work on Supply and lay new yard stone
- Complete remaining work on Installation of new security lighting around the whole station barrier fence
- Complete remaining work on Upgrade the existing road and build a new section to the new access entrance.
- Complete remaining work on Close the inner, outer and non-lethal barrier fences where the existing gates area.
- Complete all the works as mentioned under description of works above (section 1.1)

5.1.19. Giving notice of work to be covered up

The Contractor is to give the Site Supervisor at least 3 days' notice before covering up the work

5.1.20. Hook ups to existing works

The earthing of the new foundations is to be connected to the existing yards earthing. The new oil dam drainage should be connected to the existing oil drainage for the transformers. The sewer piping to be connected to the new sewer connections. The modified security fence to be connected to the existing fence.

5.2. Completion, testing, commissioning and correction of Defects

5.2.1. 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 14 days after Completion

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

To allow for the erection of electrical equipment some parts of the feeder bays may need to be made available to the equipment suppliers before the works are completed. This will be managed by the Site Supervisor to ensure harmony and coordination of all on-going works.

5.2.3. Materials facilities and samples for tests and inspections

From time to time random test cubes of the ready mix concrete used will be requested, however, for any hand machine mixes test cubes will be mandatory.

5.2.4. Commissioning

Detailed commissioning procedure and compliance certificate shall be issued by the Contractor. Final certificate of compliance shall be issued by the contractor to the Employer after Completion.

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

Not applicable

5.2.6. Take over procedures

Takeover is after Completion. The Employer shall require the Contractor to provide training to Employer personnel.

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

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, Entry to the site is governed by the Grid's Engineering Assistant and the Contractor shall adhere to all regulations given. Contact Mr Marebuti Maleka at 084 656 8925

5.2.8. Performance tests after Completion

The procedure for performance test is specified under the project quality plan document.

5.2.9. Training and technology transfer

Employer requires the Contractor to provide training in the use and maintenance of the works or any associated transfer of technology from him to the Employer.

Training shall be provided for at least 10 of the Employer's staff. The Employer's preference is to have training courses conducted in South Africa wherever feasible and practical. The Employer can elect to receive the training at the Supplier's site. Training shall be provided in the broad categories of system operations, hardware maintenance, Contractor's software and operating system software, system implementation, maintenance and development.

Specialised hardware training courses shall include system maintenance concepts, system expansion and HMI equipment maintenance. All hardware training shall be supplemented with periods of practical hands-on training and on-job-training. All software training shall be supplemented with periods of hands-on training and on-job-training.

The Contractor's suggested approach to fulfilling the Employer's training requirements, the course descriptions, course schedules and venues, and course costs per person shall be detailed. All training material or at least the material used during the initial training shall be provided to allow the Employer to provide further training in-house. The training to be provided shall be structured to ensure compliance to the following:

- The title of each training activity shall indicate the focus which is being covered for the training;
- The purpose of each training activity shall be clearly stated.

• The specific outcomes that each training module is expected to deliver upon completion of the training module shall be clearly stated.
The methods of assessment and assessment criteria to be used for assessing the trainees on their ability to deliver on the specific outcomes shall be provided.
• The training documentation shall comply with the following layout from an information perspective:
• Clearly titled document
• Date of issue of the document (CCYY/MM/DD)
• Document review date (CCYY/MM/DD)
• Purpose of the training
• Specific outcomes, assessment methods and assessment criteria related to the training.

5.2.10. Operational maintenance after Completion

Not applicable

6. 6. Plant and Materials standards and workmanship

6.1. Investigation, survey and Site clearance

Not applicable

6.2. Building works

not applicable

6.3. Civil engineering and structural works

Title	Date or revision	Tick if publicly available
Eskom Specification, Standards, Policies and Procedures		
The OHS Act 85/1993, its Regulations and incorporated SANS Codes	Latest Rev.	✓
Eskom SHEQ Policy:32-727	Latest Rev.	✓
Eskom's Covid 19 Health and Safety Policy Statement: 240-155373927	Latest Rev.	✓
Health and Safety Specification: TPD PDPMAN-SP 84	Latest Rev.	✓
Working at Heights Standard: 32-418	Latest Rev.	✓
Life Saving Rules: 240-62196227	Latest Rev.	✓
Eskom Vehicle Safety Specification:32-345	Latest Rev.	✓
TST41-120 Environmental Requirements for the Procurement of Assets, Goods and Services.	Latest Rev.	✓
TST0015 Training, assessment and authorization of persons for the operation & maintenance of the Power System Contractor Safety in a High Voltage Environment	Latest Rev.	✓
TPC41-283 Non Conformance Procedure	Latest Rev.	✓
Occupational Health and Safety Act No. 85 of 1993	Latest Rev.	✓
TST41-168 Quality Requirements for Procurement of Assets,	Latest Rev.	✓

Goods & Services.		
Eskom Particular Specifications		
EPS 1 Specification for Earthmat	Attached	
EPS 2 Specification for Stone Surfacing of Yard	Attached	
EPS 3 Variations and Additions to Standardised Specifications	Attached	
Standardised Specifications		
SABS 1200 Standardised Specification for Civil Engineering Construction		✓
SANS 2001 CC1:2007 Construction Works Part CC1: Concrete Works (structural)		✓
SANS 2001 CS1:2007 Construction Works Part CS1: Structural steelwork		✓
SANS 121 Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles -–Specifications and Test Methods		✓

1 ESKOM PARTICULAR SPECIFICATIONS

EPS.1 SPECIFICATION FOR EARTHMAT

1. SCOPE

This specification covers the requirements for the construction of the earth mat installation.

2. INTERPRETATIONS

The Earth mat shall be constructed in accordance with:

2.1 Supporting Specifications

a) The relevant drawings.

b) This specification.

3. MATERIALS

3.1 Copper Rod and Flat Strap

Annealed black copper rod and flat strap, as detailed in the Bills of Quantities and drawings shall be used. The Contractor shall purchase the required materials, transport it to the site and store it in clean, dry conditions.

4. CONTRACTOR'S EQUIPMENT

The Contractor shall ensure the provision of suitable construction equipment for the installation of the earth mat in compliance with the requirements of the specification.

5. CONSTRUCTION

5.1 Trenches

Trenches for earth mats shall be excavated as narrow as possible, but wide enough to permit laying of the earth mat and compaction of the full depth of backfill in compliance with the specification. Backfilling shall consist of suitable material free from roots, rubble or stones larger than 30mm.

5.2 Installation

Installation of the earth mat, jointing beneath the surface of the yard, earthing of steel structures, steel supports, buildings, security fencing and gates shall be done in a workmanlike manner by competent personnel, all according to the earthing standards as detailed on drawing no 0.54/393 (applicable sheets) and the project drawings.

5.3 As Built Drawings

On completion of the works the Contractor shall submit all information as may be required for the completion by the Project Manager of "as built" drawings of the earth mat installation, including the positions of all joints below ground level and details of all deviations from the routes shown on the drawings.

6. TOLERANCES

The exact position of the earth mat is not critical, but it shall be laid as close as possible to the routes shown in the drawings. The positions of the trenches shall be approved by the Supervisor before excavation commences.

7. TESTING

The Contractor will arrange for the earth mat to be tested electrically and to submit a report to Eskom for approval, and any part of the mat and connections found to be defective shall be repaired by the Contractor.

The tests shall consist of resistivity and continuity tests.

8. MEASUREMENT AND PAYMENT

The rates as scheduled in the Bill of Quantities shall cover the cost of all activities, transport, labour, materials and testing required for the provision of the relative item in accordance with the drawings and specification.

EPS.2 SPECIFICATION FOR STONE SURFACING OF YARD

1. SCOPE

This specification covers the requirements for the stone surfacing of the yard.

2. INTERPRETATIONS

2.1 Supporting Specifications

The stone surfacing shall be constructed in accordance with:

a) SABS 1083-1976. Table 7 single sized crushed stone for Roads.
See table on page 19

b) This specification

3. MATERIALS

3.1 Stone

Stone shall be clean, hard, durable and sound crushed stone of 26,5mm or 37,5 nominal size, approved by the Project Manager and details of the stone being offered shall be submitted timeously. Samples of the stone shall be submitted in good time to the Supervisor for approval and no stone, other than the samples, shall be delivered to the site before the Project Manager's written approval has been obtained.

3.2 Weedkiller

Weed killer shall be in accordance with the terms of clause 5.3.

4. CONTRACTOR'S EQUIPMENT

The Contractor shall ensure the provision of suitable construction equipment for the construction of the stone surfacing in compliance with the requirements of the specification.

5. CONSTRUCTION

5.1 Surface Preparation

After the completion of the earthworks and just before the application of the stone surfacing the Contractor shall clear the area of all vegetable growth and ensure that the underlying wearing course layer is compacted to 93% Mod AASHTO density.

5.2 Laying of Stone

The stone shall be spread over the compacted surface of the yard, levelled and lightly rolled to a finished thickness of 100 mm or as otherwise specified on the drawings.

5.3 Weed Killer

A granular or liquid weed killer suitable for the soil to be treated, the climate and the general site conditions shall be applied before or after the spreading of the stone surface. Choice and application of the weed killer to be used shall be carried out only by a pest control operator with a current registration certificate covering the field of weed control, issued in terms of Government Notice R1 449 dated 1 July 1983.

The application of weed killer shall be guaranteed by the Contractor to provide a 95% effective control of growth of all types of vegetation for a period of 2 years from the date of application. Any growth, in excess of 5% of the area treated, which occurs within the guarantee period shall be removed and re-treated at the Contractor's expense.

The Contractor shall exercise due care while applying the weed killer to ensure that vegetation, animals or persons on areas adjoining the site are not affected by movement of the weed killer through wind, rain or transport by water. He shall be responsible for any claim which may be made by adjoining property owners for damages resulting from his activities.

6. TOLERANCES

The average finished thickness of the stone layer shall be at least 100 mm or as otherwise specified on the drawings and nowhere shall the finished thickness be less than 15 mm less than the specified average finished thickness.

7. TESTING

Not applicable.

8. MEASUREMENT AND PAYMENT

The rates as scheduled in the Bill of Quantities shall cover the cost of all activities, labour, materials and testing required for the provision of the relative item in accordance with the drawings and specification.

SABS 1083-1976

TABLE 7- SINGLE-SIZED CRUSHED STONE FOR ROADS

1	2	3	4	5	6	7	8	9	
Property		Requirements							
		Nominal size of stone, mm							
Grading, %(m/m) of material passing Sieves of nominal aperture size, mm		53,0	**37,5**	**26,5**	19,0	13,2	9,5	6,7	4,75
75,0	100								
53.0	85-100 **100**								
37,5	0-30 **85-100**	**100**							
26,5	0-5 **0-30**	**85-100**	100						
19,0	- **0-5**	**0-30**	85-100	100					
16,0	-	-	-	100					
13,2		**0-5**	0-30	85-100	100				
9,5			0-5	0-30	85-100	100			
6,7			-	0-5	0-30	85-100	100		
4,75				-	0-5	0-30	85-100		
3,35					-	0-5	0-30		
2,36						-	0-5		

EPS.3 Variations and Additions to Standard Specifications

SABS 1200 A (1986) GENERAL

VA-A 2 INTERPRETATIONS

VA-A 2.8 ITEMS IN SCHEDULE OF QUANTITIES

VA-A 2.8.1 Principle

Add "plus overheads" after "Contractors profit" in the second line.

VA-A 2.8.2 Preliminary and General Section

Delete "general" between "all" and "risks" in the fourth line, and "on which the tender is based" in the fifth line and replace with "which form the contract".

VA-A 3 MATERIALS

VA-A 3.1 QUALITY

Add:

The Contractor shall at his own expense supply and provide all the Constructional Plant, Temporary Works, materials for both temporary and permanent works, labour and supervision, transport to or from the site and in and about the Works and everything required for the construction, completion and maintenance of the Works. The Contractor shall ensure that all the aforegoing constituent parts of the Works are to the standard and quality elsewhere specified in these documents or where not specified to the highest quality available and shall also ensure they are suitable for purpose intended by the Employer.

The Contractor shall be responsible for the strength and quality of all materials used and workmanship employed and for the stability of the permanent works and the temporary works and 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.

VA-A 5 CONSTRUCTION

VA-A 5.1 SURVEY

Setting out of the Works

Add:

Survey reference marks and bench marks supplied by Eskom shall be to a datum defined in writing and or on the drawings.

VA-A 5.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS

The requirements for watching, barricading, lighting, etc. shall be as follows:

Every excavation, which is accessible to the public, including other contractor's or Eskom personnel, or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered shall be:

(a) protected by a barrier or fence consisting of not less than two ropes or wires stretched at heights of 600 mm and 1 200 mm between poles or standards, of strength adequate to safely contain pedestrians and as close to the excavation as is practicable; and

(b) provided with red warning lights or any other clearly visible boundary indicators at night or when visibility conditions are poor.

VA-A 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

Add:

Adequate prior notice in writing by Eskom of the existence of any services shall be deemed sufficient to make such services "known" to the Contractor.

VA-A 5.6 POLLUTION

Add:

A refuse control and removal system shall be implemented by the Contractor. All construction waste shall be collected and removed from site. Refuse may only be disposed of in recognised registered disposal sites.

VA-A 5.7 SAFETY

Delete this clause.

VA-A 5.8 GROUND AND ACCESS TO WORKS

Delete this clause.

Add new clauses:

VA-A 5.9 SITE TO BE LEFT CLEAR

At all times prior to the completion of the Works and including the period of maintenance the Contractor shall be solely responsible for maintaining the site in a clean, tidy and safe condition to the satisfaction of the Supervisor and is deemed to have made due allowance in the contract prices therefore. Eskom shall be

entitled to instruct the Contractor at any time to remove any excess materials, debris, rubbish and the like from the site and the Contractor shall forthwith comply with such instructions and at no extra cost to the Employer.

On completion of the Permanent Works the Contractor shall, at his own expense, remove all surplus excavated materials, debris, unused materials, temporary erections and plant save that required for maintenance work which shall be removed, as aforesaid, on completion of the whole of the Works. However no means, appliances, guards or other things provided in presence of the Machinery and Occupational Safety Act or for securing the safety of persons may be removed if such removal constitutes a change to the safety of persons.

VA-A 5.10 DIMENSIONS

Dimensions on the Drawings are to be considered correct even if not drawn to scale. No dimensions shall be obtained by scaling.

VA-A 7 TESTING

Add new clause:

VA-A 7.5 CONTROL TESTS

The Contractor shall carry out, at his own cost, such tests as he considers necessary to satisfy himself that his work is sound. He shall also carry out such tests as have been specified and are included in the rates, and submit the results to Eskom.

Eskom may order such additional tests as it considers necessary to prove compliance with the Specification. The cost of such additional tests shall be borne:

(a) by the Employer if the result of the additional test indicate that the Works or the part of it that was subjected to the tests comply with the applicable requirements, and

(b) by the Contractor if the results indicate that the Works or the said part of it do not so comply.

VA-A 8 MEASUREMENT AND PAYMENT

VA-A 8.2 PAYMENT

VA-A 8.2.1 FIXED AND VALUE RELATED ITEMS

Delete …in a single payment in terms of the first….. and replace with …pro-rata payment in terms of each progress certificate ….

VA-A 8.2.2 Time-related Items

Delete and replace with:

Payment for time-related items will be effected as follows only after payment for the relevant fixed charge item if any has been made.

Subject to the provisions of SABS 1200 A clauses 8.2.3 and 8.2.4, payment of incremental amounts (calculated by the division of the remainder of the tendered sum by the number of months required to complete the site activities for which the relevant sum was tendered) will be authorised in each of the subsequent progress certificates until the sum tendered has been paid, provided that the Employer shall be entitled to amend the amount to be paid in respect of time-related items in the event of:

(a) extension of time being granted in accordance with the contract.

(b) adjustment to the time-related items in accordance with the terms of contract.

(c) delays caused by the Contractor for which no extension of time will be granted under the contract.

ADD NEW CLAUSES:

VA-A 8.9 RATES INCLUSIVE OF CONTRACTOR'S OBLIGATIONS, LIABILITIES AND RESPONSIBILITIES

The rates and prices contained in the Preliminary and General Section of the Bills of Quantities shall, together with the remainder of the Bills of Quantities, be deemed inclusive of all the Contractor's obligations, liabilities and responsibilities whether or not they are expressly described therein.

VA-A -8.10 ADJUSTMENT TO PRELIMINARY AND GENERAL ITEMS

Adjustment to fixed and value related amounts will be made on the following basis only: -

a) The first 15% variance to the contract value will not be subject to P & G adjustment.

b) If the final contract value varies by more than 15% in relation to the original contract value, the preliminaries shall be adjusted in proportion to the amount by which the difference exceeds 15% of the original contract value.

c) No other adjustments shall be made.

EPS 4 Specification for Fencing

1. SCOPE

This specification covers the requirements for the construction of 2,4 m security, 1,8 m safety and 1,2 m high boundary fencing.

2. INTERPRETATIONS

2.1 SUPPORTING SPECIFICATIONS.

The fencing shall be constructed in accordance with:

a) SABS 1200 DA Earthworks (Small Works)

b) SABS 1200 G Concrete (Structural) and the relevant variations and additions to these.

c) This specification

3. MATERIALS

3.1 FENCES FOR INLAND AND COASTAL AREAS

For fences installed in inland areas with average or mild corrosion conditions, the materials shall be:

a) posts, stays and extension arms shall be of the dimensions shown on the drawings and as follows:

(i) Galvanised hot rolled mild steel sections for security and safety fences.

(ii) Galvanised mild steel tubular sections for boundary fences.

b) Standards and Droppers

2,5 kg/m Y section steel standards and 0,56 kg/m ridgeback T section steel droppers protective coated with tar or bitumen for boundary fences.

c) Wire
Wire for fencing shall comply with SABS 675, 1373 and CKS 592 as relevant and shall be:

Straining Wire 4,0 mm dia galvanised MS

Barbed Wire - 2,24 mm dia galvanised HT campeon class A barbed wire for boundary fence and security fence overhangs

Rectangular Mesh -3,15 mm dia galvanised HT mesh 50 x 50 openings for security fences with stainless steel jointing clips.

Diamond mesh 2,50 mm x 64 galvanised MS

Barbed tape coils 760 mm dia coils of 2,5 mm galvanised wire with long blade profile galvanised barbs at 37,5 mm spacing.

d) Gates

Galvanised steel tube frame

e) Metal Fittings

Bolts, nuts, washers, turnbuckles, hinges and similar metal fittings shall be of galvanised MS complying where relevant with SABS 135 and 1149.

3.2 GALVANISING

Galvanising of steel members and metal fittings shall comply with SABS ISO 1461 for general applications.

Galvanising of mild steel and high tensile wire shall comply with SABS 675

Galvanising of barbs on barbed tape shall comply with SABS 675.

3.3 HOLES

Holes in the steel members for fences shall not be punched or flame cut but shall be drilled (and burs removed) before the member is galvanised.

3.4 CONCRETE

Concrete for post foundations shall be grade 15 MPa/26 mm and for kerbs, grade 20 MPa/19 mm.

4. CONTRACTORS EQUIPMENT

The Contractor shall ensure the provision of suitable construction equipment for the erection of the fencing, gates and concrete kerb in compliance with the requirements of this specification.

5. CONSTRUCTION

5.1 General

Construction of the fence, gates and concrete kerb shall comply with the requirements given on the drawings and with the requirements of this specification.

5.2 Clearing Fence Line

Where the fence line has not already been cleared, it shall be cleared over a width of at least 1 m on each side of the centre line of the fence and surfacing irregularities shall be graded so that the fence will follow the general contour of the ground. The bottom of the fence shall be located a uniform distance above the ground line in accordance with the requirements shown on the drawings. All material removed shall be disposed of as specified in clause VA-D 5.2.2.3.

5.3 Installing Posts and Standards

The lengths of all posts above ground shall be such that the correct clearance between the lowest wire and the ground can be maintained.

Straining posts shall be erected at all ends and corners or bends in the line of the fence and at all junctions with other fences, provided that straining posts shall not be spaced further apart than the minimum distances shown on the drawings.

Spacing of intermediate posts, standards and droppers shall not be more than is indicated on the drawings, provided that the spacing of standards and intermediate posts between any two straining posts shall be uniform.
All posts and stays shall be set in dug holes of the dimensions shown on the drawings and provided with concrete bases. Holes shall be dug to the full specified depth, even in rock where blasting may be necessary to obtain the required depth.

Corner, tee-off, gate and straining posts shall be braced by stays bolted to the posts.

All posts shall be accurately aligned and set plumb. After posts have been set in concrete the concrete shall be cured for at least 7 days before the fence wire is attached to the posts at the spacing shown on the drawings.

5.4 Installing Fencing and Straining Wire

All fencing wire shall be attached to the posts as detailed on the drawings. The wire shall be carefully stretched and hung without sag, and with true alignment, care being exercised not to stretch the wire so tightly that it will break or that posts will be pulled up or destroyed.

The maximum force in fencing wire after it has been stretched between straining posts shall be 0,9 kN.

Splices in the straining wire will be permitted if made using a splice tool. The wire ends shall be carried past the splice tool for at least 75 mm and wrapped snugly around the other wire for at least 6 complete turns, the two separate wire ends being turned in opposite directions. The unused wire ends shall be cut close to leave a neat splice.

5.5 Installing Welded Mesh Sheets

Welded mesh sheets shall be stretched against the fence posts and properly tied to the straining wire by means of 2,5 mm nominal diameter binding wire or stainless steel clips at 250 mm centres , or closer to remove excessive bulges in the mesh. The mesh shall be taken continuously past the face of all immediate posts, intermediate straining posts and corner posts. At the straining posts and corner posts the mesh is to be clamped on either side of the post using 20 mm wide galvanised flat bars, bolted together with galvanised bolts and nuts and fastened to the post by means of a hook bolt, as detailed on the drawings. Small bulges formed in the mesh between these clamps are acceptable. Mesh with has been distorted prior to erection e.g. egg shaped instead of circular coils will not be accepted.

The bottom 400 m of the welded mesh shall be dipped in a bitumen solution, and when erected the bottom 300 mm (min. 250 mm) shall be buried in an excavated trench and backfilled with a granular material and neatly levelled off to the Supervisor's satisfaction. The joining of the welded mesh sheets shall be as shown on standard drawing number 0.54/5499 sht 5. The screw threads on the stand-outs of all bolts, hook bolts and eye bolts to be turned over after erection to prevent the possible removal of the nuts.

5.6 Installing Diamond mesh or Wire Netting

Diamond mesh shall be stretched against the fence and properly tied to the fencing wire as detailed on the drawings. The diamond mesh shall be secured by tying wire at every third aperture along the straining wires and at every aperture at end and gate posts.

5.7 Installing Barbed Wire (Only if specified)

Single strand barbed wire to be fitted to the top of the posts shall be installed along the upper face of the single overhang of fence. The barbed wire shall be stretched as described in clause 5,4 and fixed to the immediate posts using 2,5 mm diameter binding wire.

5.8 Concrete Kerb (Only if specified)

Where scheduled a concrete kerb of nominal dimensions 75 mm wide x 300 mm deep of Grade 20 MPa concrete (or precast concrete kerb fig 5 to SABS 927-1969) shall be constructed along the security fence line, as detailed on the drawings.

5.9 Installing Gates

Gates shall be installed at the places indicated on the drawings or as instructed by the supervisor. The gates shall be hung on gate fittings in accordance with the details shown on the drawings. Gates shall be so erected as to swing in a horizontal plane at right angles to the gate posts, clear of the ground in all positions. Gates shall not be further than 40 mm from the gate post when closed, or as otherwise shown on the drawings.

5.10 Transport and Storage

The transporting, off-loading and storage on site of all materials shall be carried out with care so that no damage to steel, mesh, paint or galvanising will occur. Any damage shall be made good in a manner approved the Supervisor.

5.11 Earthing

The fence shall be earthed across gate openings and removable panels by means of a 40 mm wide x 3 mm thick copper earthing strap, as shown on Drawing No. 0.54/398 or as otherwise detailed on the drawings.

6. TOLERANCES

The completed fence shall be plumb, taut, true to line and ground contour, with all posts and stays firmly set.

Permissible Deviations shall be as follows:

a) The height of the lower fencing wire above the ground at posts and standards shall not vary from that shown on the drawings by more than 25 mm. Other fencing wires shall not vary by more than 10 mm from their prescribed relative vertical positions.

b) The maximum acceptable out of alignment of fence posts in any direction shall be 25 mm. The maximum acceptable out of plumb of fence posts in any direction shall be 20 mm.

c) The maximum acceptable distortion of mesh already erected shall not exceed $\pm$ 25 mm on each 4 m length.

d) Gates shall swing in a horizontal plane at right angles to the gate posts clear of the ground in all positions with a maximum ground clearance of 80 mm. Double leaf gates shall not have a gap of more than 40 mm between the two leaves when closed and all gates shall be not further from the gate posts when closed than the dimensions shown of the drawings.

7. TESTING

Testing shall be as specified in SABS 1200 G clause 7 and variations and additions or as called for by the Supervisor.

8. MEASUREMENT AND PAYMENT

8.1 GENERAL

Fences will be measured by length over the lengths laid, excluding gates which are scheduled separately. Corner and strain posts (including stays) and intermediate posts will be measured separately by number including excavation in earth.
Soft or hard rock encountered in the excavations will be separately measured and paid for.

Payment will be made in accordance with clause 8.2.

8.2 SCHEDULED ITEMS

8.2.1 Fencing Unit: m or km

Fences will be classified by type or detailed description. The rate shall cover all the costs associated with the erection of the fence in compliance with the specification, including supply and erection of the fencing complete as described, provision of the mesh footing trench and filling, and complying with precautions and tolerances.

8.2.2 Gates Unit: m or km

Gates will be classified by type and size or detailed description.

The rate shall cover all costs associated with the supply and erection of the gate in compliance with the specification including posts, excavation of post holes in earth, disposal, filling with concrete, excavation in earth for the earth strap, backfilling and provision and installation of the earth strap, complying with precautions and tolerances.

8.2.3 Extra-over for excavation in:

a) Soft rock Unit: m3
b) Hard rock Unit: m3

The rate shall cover all the costs additional to the cost of excavating in earth disposing of surplus material and backfilling, where required.

8.2.4 Testing Concrete

Concrete compressive strength Unit: No

The rate shall cover the cost of making and testing groups of three test cubes in accordance with SABS Test Methods 861 and 862.

6.4. Electrical & mechanical engineering works

Not applicable

6.5. Process control and IT works

Not applicable

6.6. Other [as required]

Not applicable

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.

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

DESCRIPTION	DRAWING NO
MAIN LAYOUTS	
STATION ELECTRIC	0.18/14097
KEY PLAN	0.18/14128
FOUNDATION, TRENCH AND EARTHMAT	0.18/14129 SHEET 0
FOUNDATION, TRENCH AND EARTHMAT	0.18/14129 SHEET 2
STEELWORK MARKING PLAN	0.18/14130 SHEET 0
STEELWORK MARKING PLAN	0.18/14130 SHEET 2
BAY LAYOUTS	0.18/14126
DRAINAGE LAYOUT	0.18/32131
132kV TUBULAR LAYOUT	0.18/32216
DEMOLISHING DETAIL	0.18/32147
FENCES LAYOUT	0.18/32144
SECURITY FENCE LAYOUT	
TRANSFORMERS, REACTOR AND OIL DAM	
TRANSFORMER 3 & 4 PLINTH AND BUNDWALL AREA	0.18/32240
OIL DAM DETAILS	0.54/3754
OIL DAM JOINTS DETAILS	0.54/5664
OIL DAM COMPARTMENT WALL	0.54/6084 SHT 1
FENCES AND GATES	
SAFETY FENCE DETAILS	0.54/4963 SHT 1 – 4
SECURITY FENCE WITH OVERHANG DETAILS	0.54/5633 SHT. 1 - 7
SAFETY FENCE EARTHING CLAMP FOR SUBSTATION GATES	0.54/6743
7m SECURITY SLIDING GATE GENERAL ARRANGEMENT	0.54/7470 SHT 1
7m SECURITY SLIDING GATE OUTSIDE	0.54/7470 SHT 2
7m SECURITY SLIDING GATE OUTSIDE	0.54/7470 SHT 3
7m SECURITY SLIDING GATE OUTSIDE	0.54/7470 SHT 4
7m SECURITY SLIDING GATE NON-LETHAL MIDDLE	0.54/7470 SHT 5
7m SECURITY SLIDING GATE NON-LETHAL MIDDLE	0.54/7470 SHT 6
7m SECURITY SLIDING GATE NON-LETHAL MIDDLE	0.54/7470 SHT 7
7m SECURITY SLIDING GATE OUTSIDE	0.54/7470 SHT 8
DESCRIPTION	DRAWING NO
7m SECURITY SLIDING GATE OUTSIDE	0.54/7470 SHT 9
7m SECURITY SLIDING GATE OUTSIDE	0.54/7470 SHT 10
CONCRETE WALL	0.54/5846 SHT 1
CONCRETE WALL DRAINAGE DETAILS	0.54/5846 SHT 4

BUILDINGS	
CONTROL BUILDING PLAN	**0.18/32130 SHT 1**
CONTROL BUILDING ELEVATIONS	**0.18/32130 SHT 2**
CONTROL BUILDING FLOOR LAYOUT	**0.18/32130 SHT 3**
CONTROL BUILDING SECTIONS AND DETAILS	**0.18/32130 SHT 4**
CONTROL BUILDING FINISHES SCHEDULE GENERAL	**0.18/323130 SHT 5**
CONTROL BUILDING FINISHES - SCHEDULE	**0.18/32130 SHT 6**
CONTROL BUILDING FINISHES – DOORS AND WINDOWS	**0.18/32130SHT 7**
CONTROL BUILDING ACCESS FLOOR	**0.18/32130 SHT 8**
CONTROL BUILDING DOORS	**0.18/32130 SHT 9**
CONTROL BUILDING DRIP FLASHING	**0.18/32130 SHT. 10**
CONTROL BUILDING GENERAL ARRANGEMENT AND SETTING OUT	**0.18/32130 SHT 11**
CONTROL BUILDING RAFT FOUNDATION CONCRETE	**0.18/32130 SHT. 12**
CONTROL BUILDING RAFT FOUNDATION REINFORCEMENT DETAILS AND SCHEDULE	**0.18/32130 SHT. 13**
ACCESS CONTROL BUILDING PLAN	**0.18/32133 SHT 1**
ACCESS CONTROL BUILDING GENERAL ARRGT. & SETTING OUT	**0.18/32133 SHT 2**
ACCESS CONTROL BUILDING RAFT FOUND. CONCRETE	**0.18/32145 SHT.1**
ACCESS CONTROL BUILDING RAFT FOUND. REBAR	**0.18/32145 SHT.2**
ACCESS CONTROL BUILDING FINISHES SCHEDULE	**0.54/7515 SHT 2**
ACCESS CONTROL BUILDING WINDOW AND DOOR SCHEDULE	**0.54/7515 SHT 3**
DESCRIPTION	**DRAWING NO**
ACCESS CONTROL BUILDING SANITARY WARE SCHEDULE	**0.54/7515 SHT 4**
ACCESS CONTROL BUILDING PANEL ROOM ACCESS FLOOR	**0.54/7515 SHT 5**
ACCESS CONTROL BUILDING CONCRETE ROOF SLAB	**0.54/7515 SHT 6**
ACCESS CONTROL BUILDING WINDOW STEEL AWNING	**0.54/7515 SHT 7**
ACCESS CONTROL BUILDING ABLUTION WINDOW BURGLAR BARS	**0.54/7515 SHT 8**
ACCESS CONTROL BUILDING OPERATING ROOM WORKTOP COUNTER	**0.54/7515 SHT 9**
ACCESS CONTROL BUILDING ELECTRICAL INSTALLATION	**0.18/32135 SHT 3**
WORKSHOP BUILDING PLAN	**0.18/32136 SHT1**
WORKSHOP BUILDING ELECTRICAL	**0.18/32136 SHT2**
WORKSHOP BUILDING RAFT FOUNDATION	**0.18/32136 SHT3**
CONSUMABLE STORE BUILDING PLAN	**0.18/32137 SHT 1**

CONSUMABLE STORE ELECTRICAL INSTALLATION	**0.18/32137 SHT 2**
CONSUMABLE STORE BUILDING RAFT FOUNDATION	**1.18/32137 SHT 3**
STORAGE YARD GA	**0.18/32146**
CLADDED STORE STEEL	**0.54/5588 SHT 1-3**
CLADDED STORE PLAN	**0.18/32148 SHT 4**
CLADDED STORE RAFT FOUNDATION	**0.18/32148 SHT 5**
CLADDED STORE ELECTRICAL	**0.18/32138**
TERRACE AND ROADS	
ACCESS AND TERRACE ROADS LAYOUT AND DETAILS	**0.18/32141 SHT 1**
ACCESS AND TERRACE ROADS LONGITUDINAL SECTIONS	**0.18/32141 SHT 2**
T-JUNCTION ENTRANCE	
TERRACE LAYOUT	**0.18/32140**
MAIN COL. FOUNDATIONS TOP OF PLINTH LEVELS	**0.18/32132**
DESCRIPTION	**DRAWING NO**
GENERAL CIVIL STANDARDS	**0.54/390 SERIES**
EARTHING STANDARDS	**0.54/393**
BATTERY RM EMERGENCY SINK, SHOWER & PLUMBING	**0.54/1150 SHT 25**
CONTROL ROOM KEY CABINET	**0.54/1150 SHT 31**
CARPORT	**0.54/6123**
WATER STORAGE TANK & SLAB	**0.54/6622 SHT 2**
WATER STORAGE TANK SUPPORT	**0.54/6140**
GENERAL ELECTRICAL	
CONTROL BUILDING ELEC. INSTALLATION LAYOUT 400KV	**0.18/32134 SHT 1**
CONTROL BUILDING VENTILATION LAYOUT 132KV	**0.18/32134 SHT 2**
CONTROL BUILDING SCHEMATIC DIAGRAM 132KV	**0.18/32134 SHT 3**
BOOSTER PUMP ELEC. INSTALLATION LAYOUT 132KV	**0.18/32134 SHT 4**
BOREHOLE PUMP ELEC	**0.18/32134 SHT 5**
OILDAM SUMP PUMP ELEC	**0.18/32134 SHT 6**
FLOODLIGHT CABLE ROUTE AND MAST LOCATION	**0.18/19158 SHT 1**
FLOODLIGHT LUM. ORIENTATION LAYOUT	**0.18/19158 SHT 2**
FLOODLIGHT SCHEMATIC 132KV YARD	**0.18/19158 SHT 3**
SECURITY LIGHTING CABLE ROUTE & POLE LOCATION	**0.18/32135 SHT 1**
SECURITY LIGHTING SCHEMATIC SLDB1 & 2	**0.18/32135 SHT 2**
NEW FOUNDATIONS	
LABEL SUPPORT FOUNDATION	**0.54/401**
132KV ISOLATOR	**0.54/7512**

88KV ISOLATOR	**0.54/7512**
275KV ISOLATOR	**0.54/7514**
275KV PANTO GRAPH ISOLATOR	**0.54/5829**
PLUG BOX	**0.54/710**
132KV CIRCUIT BREAKER FOUNDATIONS	**0.54/7511**
88KV CIRCUIT BREAKER FOUNDATIONS	**0.54/7511**
275KV CIRCUIT BREAKER FOUNDATIONS	**0.54/8280**
88KV MAIN COLUMN FOUNDATIONS	**0.54/5612**
132KV MAIN COLUMN FOUNDATIONS	**0.54/4316**
275KV MAIN COLUMN FOUNDATIONS	**0.54/4473**
400KV MAIN COLUMN FOUNDATIONS	**0.54/3996**
MEDUIM EQUIPMENT SUPPORT FOUNDATION	**0.54/4358**
275kV EARTH SWITCH	**0.54/6432**
88kV EARTH SWITCH	**0.54/8293**
132kV EARTH SWITCH	**0.54/8293**
24m LIGHT MAST	**0.54/4659**
JUNCTION BOX	**0.54/4713 SHT. 1**
132KV BUSBAR SUPPORT	**0.54/4319**
132KV BUSBAR SUPPORT	**0.54/7852**
<u>NEW STEELWORK</u>	
MEDUIM EQUIPMENT SUPPORT	**0.54/3512 SHT 1**
MEDUIM EQUIPMENT SUPPORT	**0.54/302**
SMALL/MED EQUIPMENT SUPPORT CAP	**0.54/306**
MEDUIM EQUIPMENT SUPPORT CAP 'M2'	**0.54/307**
132KV STEELWORK BEAM AND COLUMN	**0.54/336**
132KV STEELWORK BEAM AND COLUMN	**0.54/336**
275KV STEELWORK COLUMN	**0.54/342**
275KV STEELWORK BEAM	**0.54/348**
275KV STEELWORK BEAM	**0.54/345**
LABEL SUPPORT	**0.54/400 SHT 1**
LABEL SUPPORT DOUBLE	**0.54/400 SHT 2**
ELEC. EQUIPMENT LABEL SUPPORT	**0.54/403**
LINE MATCHING UNIT BRACKET – MEDUIM EQUIPMENT SUPPORT	**0.54/673**
BUSBAR LABEL 1 FRAME DETAIL	**0.54/1790**
ELEC. EQUIPMENT LABELS 'L' MOUNTING BRACKET	**0.54/1794**
132KV TUBULAR BUSBAR SUPPORT	**0.54/4320**
400KV 24m LIGHT MAST	**0.54/4658**
TUBULAR BUSBAR LABEL SUPPORT	**0.54/5601**
132KV ISOLATOR SUPPORT DETAIL	**0.54/7702**
132KV ISOLATOR SUPPORT DETAIL	**0.54/7703**
132KV IN-LINEISOLATOR SUPPORT DETAIL	**0.54/7699**
132KV ISOLATOR SUPPORT DETAIL	**0.54/7706**
132KV EARTH SWITCH SUPPORT DETAIL	**0.54/8400**

132KV CIRCIUT BREAKER SUPPORT DETAIL	**0.54/6934**
400KV YARD STEELWORK FLOODLIGHT CATLADDER AND PLATFORM FOR TYPE NC9 COLUMN	**0.54/6106 SHT 1**
400KV YARD STEELWORK FLOODLIGHT CATLADDER AND PLATFORM FOR TYPE NC9 COLUMN	**0.54/6106 SHT 2**
400KV YARD STEELWORK FLOODLIGHT CATLADDER AND PLATFORM FOR TYPE NC9 COLUMN	**0.54/6106 SHT 3**
275KV SUPPORT	**0.54/6226**
SURGE ARRESTERS TOP CAP	**0.54/6326**
400KV BUSBAR SUPPORT	**0.54/6434**
MED EQUIPMENT SUPPORT SURGE ARRESTER EARTHSTRAP MOUNTING BRACKET	**0.54/6603**
CIRCUIT BREAKER SUPPORT	**0.54/6934 SHT 1-5**
DEMOLISHED STEEL	
MEDUIM EQUIPMENT SUPPORT	**0.54/302**
SMALL/MED EQUIPMENT SUPPORT CAP	**0.54/306**
MEDUIM EQUIPMENT SUPPORT CAP 'M2'	**0.54/307**
LARGE EQUIPMENT SUPPORT	**0.54/309**
LARGE EQUIPMENT SUPPORT CAP 'L2'	**0.54/311**
132KV STEELWORK BEAM AND COLUMN	**0.54/336**
132KV STEELWORK BEAM AND COLUMN	**0.54/337**
LABEL SUPPORT	**0.54/400 SHT 1**
LABEL SUPPORT DOUBLE	**0.54/400 SHT 2**
ELEC. EQUIPMENT LABEL SUPPORT	**0.54/403**
LINE MATCHING UNIT BRACKET – MEDUIM EQUIPMENT SUPPORT	**0.54/673**
BUSBAR LABEL 1 FRAME DETAIL	**0.54/1790**
ELEC. EQUIPMENT LABELS 'L' MOUNTING BRACKET	**0.54/1794**
MEDUIM EQUIPMENT SUPPORT CAP FOR HAEFELY LINE TRAP	**0.54/2214**
400KV YARD STEELWOR COLUMNS NC1 & 2	**0.54/3531**
400KV YARD STEELWORK BEAM WITH OFFSET TYPE NB8	**0.54/3533**
400KV YARD STEELWORK COLUMN TYPE NC9	**0.54/3538**
400KV YARD STEELWORK EARTWIRE PEAK FOR SUSPENSION COLUMNS	**0.54/3541**
6000 HIGH SUPPORT FOR FIRE BARRIER	**0.54/4160**
132KV TUBULAR BUSBAR SUPPORT	**0.54/4320**
LARGE EQUIPMENT SUPPORT CAP LINE TRAP	**0.54/4337**
400KV 24m LIGHT MAST	**0.54/4658**
MED. EQUIPMENT SUPPORT CAP	**0.54/4722**
132KV ISOLATOR SUPPORT	**0.54/5015**
DESCRIPTION	**DRAWING NO**
TUBULAR BUSBAR LABEL SUPPORT	**0.54/5601**

132KV ALSTOM ISOLATOR SUPPORT DETAIL	**0.54/5857**
400KV TRANSFORMERS STAINLESS STEEL FIRE BARRIER	**0.54/5856**
132KV ALSTOM EARTH SWITCH SUPPORT 3000 CRS.	**0.54/5951**
132KV ALSTOM EARTH SWITCH SUPPORT 3600 CRS	**0.54/5952**
400KV YARD STEELWORK FLOODLIGHT CATLADDER AND PLATFORM FOR TYPE NC9 COLUMN	**0.54/6106 SHT 1**
400KV YARD STEELWORK FLOODLIGHT CATLADDER AND PLATFORM FOR TYPE NC9 COLUMN	**0.54/6106 SHT 2**
275KV SUPPORT	**0.54/6226**
SURGE ARRESTERS TOP CAP	**0.54/6326**
400KV BUSBAR SUPPORT	**0.54/6434**
MED EQUIPMENT SUPPORT SURGE ARRESTER EARTHSTRAP MOUNTING BRACKET	**0.54/6603**
BREAKER SUPPORT	**0.54/6934 SHT 1-5**
<u>DEMOLISHED FOUNDATIONS</u>	
LABEL SUPPORT FOUNDATION	**0.54/401**
132KV ISOLATOR	**7.18/17135**
132KV ISOLATOR	**7.18/4570**
132KV ISOLATOR	**0.54/465**
132KV ISOLATOR	**0.54/483**
132kV CIRCUIT BREAKER	**0.54/6493**
132kV CIRCUIT BREAKER	**0.54/2314**
132kV CIRCUIT BREAKER	**0.54/3898**
132kV CIRCUIT BREAKER	**7.18/14897**
132kV CIRCUIT BREAKER	**0.54/3371**
132kV CIRCUIT BREAKER	**0.54/521**
CT FOUNDATION	**7.18/12604**
MEDUIM EQUIPMENT SUPP FOUND	**0.54/308**
MEDUIM EQUIPMENT PAD TYPE	**0.54/4358**
JUNCTION BOX	**0.54/4713 SHT. 1**
JUNCTION BOX	**0.54/406**
VT JUNCTION BOX	**0.54/407**
132kV COLUMN	**0.54/4316**
PLUG BOX	**0.54/710**
132KV MAIN COLUMN FOUNDATIONS	**7.18/3998**
132KV MAIN COLUMN FOUNDATIONS	**7.18/4050**
132KV MAIN COLUMN FOUNDATIONS	**0.54/4316**
CONTROL BUILDING	**0.54/1256**
CONTROL BUILDING	**0.54/1150**
CONTROL BUILDING	**0.54/1288**
CONTROL BUILDING	**0.54/1259**

C3.2 *CONTRACTOR*'S WORKS INFORMATION