PART 3: SCOPE OF WORK

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C3.1: EMPLOYER'S WORKS INFORMATION

Contents

1 Description of the *works*

1.1 Executive overview

The *works* is the design of the system, supply/manufacture (procurement, delivery and offloading) of all material as per accepted design, install/assembly, commissioning, and training of Eskom personnel for the electric fences (non-lethal) at Nooitgedacht and Bosloop Pump Station sites. This includes decommissioning and removal of the existing middle tier fence (energized fence) inclusive of the existing civil works (above and below ground), to a designated area within each pump station. The pump stations' layouts and approximate perimeter lengths are provided in the layout drawings (0.80/6133, sheets 2, 3 and 4) and figures 1, 2 ,3 below in item 3.1. (**Note** the lengths/dimensions provided are approximate length for the outer fence, the *Contractor* confirms all dimension on site.)

The *Contractor's* design is performed by, or under the direction, control, and supervision of an ECSA registered professional engineer. The electrical design shall be as per Eskom's standard *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*

Power supply points to the electric fence energizers will be provided by the *Employer* on each pump station site using the existing distribution boards. Cabling from the energizers to the electric fence will be re-used as far as possible. Where the re-use of cables is not possible, the replacement of such is agreed with the *Project Manager.* The *Contractor* replaces damaged/unsuitable cables with new cables using existing cable route.

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

The objective and purpose of the *works* is to comply with the Eskom standard for energized fences *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries*.

The works is detailed in the technical specifications *365-KOM-AABZ28-SP0004-20 KWS Pump Stations Energized Fence Upgrade Technical Specification Rev. 1.*

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	Description
AC	Alternating Current
AIA	Authorised Inspection Authority
AWS	American Welding Society
C&I	Control and Instrumentation
CAD	Computer-aided design
CoC	Certificate of Compliance
CV	Curriculum Vitae
DB	Distribution Box

Abbreviation	Description
DC	Direct Current
ECSA	Engineering Council of South Africa
EMS	Environmental Management System
EPC	Engineering Procurement and Construction
HMI	Human Machine Interface
HT	High Tension
I/O	Input Output
IP	Ingress Protection
ISO	International Standards Organisation
ITP	Inspection Test Plan
JB	Junction Box
K25	Specific Conductivity at a reference temperature of 25°C
kV	Kilo Volts
KVA	Kilo Volts Amperes
KWS	Komati Water Scheme
LCS	Local Control System
LV	Low Voltage
MCB	Miniature Circuit Breaker
NKP	National Key Point
OHSA	Occupational Health and Safety Act No. 85 of 1993
PED	Primary Energy Department
PLC	Programmable Logic Controller
PPE	Personal Protective Equipment
Pr. Eng.	Professional Engineer
Pr. Tech	Professional Engineering Technologist
QCP	Quality Control Plan
QMS	Quality Management System
RAM	Reliability, Availability and Maintainability
SANS	South African National Standard
SAQCC	South African Qualification and Certification Committee
SHE	Safety, Health and Environment
SHEQ	Safety, Health, Environmental and Quality
SOC	State Owned Company
SS	Stainless Steel
TOC	Total Organic Carbon
UPS	Uninterruptible Power Supply
V	Volts

1.4 General Requirements

(1) The *Contractor* designs the fence system, supply/manufacturer, assemble, construct, installs and commissions the electric fence at Nooitgedacht and Bosloop Pump Station sites.

1.5 Project Execution Methodology

(1) The *Contractor* is responsible for carrying out all activities and supplying all resources, machinery, equipment people, skills etc., required to provide the *works*. This includes clarification and co-ordination with the *Project Manager.*

(2) The *Contractor* is responsible throughout the execution of the *works* to ensure the execution and completion of all activities shown in Appendix A: Project Methodology and submission.

(3) All documentation submitted by the *Contracto*r conform to all the requirements of the documentation synopsis and is in an adequate state of completeness.

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
Technical meeting (Risk register; compensation events; Issues)	Weekly on Fridays at Nooitgedacht/Bosloop Pump Station, Mpumalanga or as per *Project Managers* request.	Megawatt Park, Nooitgedacht/Bosloop Pump Station site in Mpumalanga
Overall contract progress and feedback	Monthly on the 25th of each month at Nooitgedacht/Bosloop Pump Station site in Mpumalanga or the 1st working day after the 25th if the 25th is over a weekend of public holiday	Nooitgedacht/Bosloop Pump Station site in Mpumalanga

Meetings of a specialist nature may be convened as required. Records of these meetings are submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

All meetings are 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.

Meetings are arranged as per the specific contract requirements. During the design phase the progress feedback meetings are held at Megawatt Park (MWP) or via video conference on a bi-weekly basis. This meeting is attended by *Employer's* representatives and *Contractor* representatives.

2.2 Documentation control

- All verbal communication is followed up with written confirmation.
- All written communication should be on formal letters with corporate letter heads.
- An email system is used for general communication.
- Minutes of Meetings are held for all meetings relating to the project.

- Communication is extremely important and is managed to ensure maximum benefits to the project.
- A document management system will be implemented.
- All communication to be directed to the *Project Manager*

2.3 Health and safety risk management

The *Contractor* shall comply with the health and safety requirements contained in Annexure C of this Works Information.

2.4 Environmental constraints and management

- The *Contractor* conforms to the Eskom SHEQ policy, KWS environmental emergency and response work instruction, spill handling work instruction, environmental incident management and waste management work instruction. An environmental induction will be provided before the *Contracto*r commence work on site.
- The *contractor* manages environmental impacts as identified in the environmental risk assessment.
- The *contractor* is responsible for safe disposal of the existing fence and associated components by ensuring that the fence and components are taken to the authorised recycling site. The waste manifesto from the receiving site must be submitted to Eskom/KWS Environmental Officer within 7 days.
- The following environmental requirements will be included in the Tender/Request for Proposal (RFP):
  - Environmental Risks Assessment as per scope of the project
  - Environmental costing as per the scope of the project.

A template for compiling risks assessment and example of the environmental costing is included on SHEQ Documents (see Appendix B).

2.5 Quality assurance requirements

Quality requirements will be negotiated and linked to contract award. Quality objectives are as follows:

- Contract Quality Plan Requirement as per Scope of works.
- Quality Control Plan (Inspection and Test Plan) Requirements as per scope of works.
- The supplier shall complete and sign Form A (Enquiry/Contract/Quality Requirements for QM58 and ISO 9001).

The supplier shall submit objective evidence of a developed and implemented QMS that complies with ISO 9001:2015 or any applicable standard of quality management system (the latest applicable revision). The following documents (approved copies) shall be submitted:

(1) Quality management system manual or a document that is defined and describes the QMS and its scope

(2) Quality Policy
(3) Quality Objectives
(4) Control of documented information
(5) Records required by ISO 9001 standard (List of Records)
(6) Internal audit procedure
(7) Control of nonconformity outputs
(8) Nonconformity and Corrective action procedure
(9) Documented information for defined roles, responsibilities, and authorities
(10) Documented information for Control of Externally Provided Processes, Products and Services
(11) Latest copy of an internal management system audit report (with Nonconformity, Correction and/ or Corrective Action Reports)
(12) Latest copy of an external management system audit report (with Nonconformity, Correction and/ or Corrective Action Reports
(13) Detailed objective criteria are attached in the Quality evaluation criteria form.

2.6 Programming constraints

The *contractor* is limited to the removal of the existing fence (non-lethal energised fence) on one site at a time, and only once commissioning is completed and the site of handover thereof, can the following site fences be removed and *works* commence.

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

The *Contractor* submits an organogram with updated CVs of each employee on the project.

Reporting structures and responsibilities are to be included on the organogram or in an addendum to the organogram.

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* addresses the tax invoice to ERI (Eskom Rotek Industries) invoicing email address:

invoiceserilocal85@eskom.co.za or to the following address: The *Project Manager*, Eskom Rotek Industries SOC Ltd, Lower Germiston Road, Rosherville Johannesburg, P.O. Box 40698, Cleveland 2022 and include on each invoice the following information:

- Name and address of the Contractor
- The Contractor's Company name
- The Contractor's vendor number
- The Contractor Invoice number

- The Contractor's Order number
- The contract number and title.
- The *Employer's* registration number: 1990/006897/30
- Contractor's VAT registration number.
- The *Employer*'s VAT registration number 4330196330
- 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.

Every 25th of each month, the *Employer* and *Contractor* will perform an assessment on the work completed for the month.

The assessment will be signed off by both parties.

The *Contractor* will submit an invoice to the *Project Manager* either hand delivery or a PDF document per email.

The *Project Manager* will submit the assessment with the invoice to Eskom Rotek Industries's Accounts Payable Section for payment.

2.9 Insurance provided by the *Employer*

Refer to Policy Number ESK 2015/6 ACAR.

2.10 Contract change management

All scope changes must be approved by the *Project Manager*.

2.11 Provision of bonds and guarantees

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*

All project related documents to be kept in either electronic format or hard copies in files at the *Contractor's* premises.

2.13 Training workshops and technology transfer

On *completion* of the *works*, Plant specific operating and maintenance philosophy training to be done with the *Employer's* staff. Three operators and one maintenance employee to be trained.

The *Contractor* is to supply all OEM manuals in A4 files which are clearly marked with the contract name and contract number.

3 Description of the *Works*

The *works* is the removal of the existing electric (non-lethal), design, construction and commission of electric fence that comply to the Eskom Standard: *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries* at Nooitgedacht and Bosloop Pump Station sites.

The *works* also includes:

- The decommissioning and removal and disposal of the existing middle tier fence (energized fence). The *Contractor* removes the insulators on all sites prior to the dismantling of the poles and hands over the same to the *Employer* for re-use (the contractor ensures that all isolators are removed in a manner that protects the insulator from any damage.) All the steel *works*/materials (poles, barbed wire etc, is removed and stored at a designated area at each station for the *Employer* to later sell off. Where the poles are cast in concrete and cannot be unbolted the *Contractor* cuts off the pole from the concrete and stores the steel poles as above.
- The *Contractor* removes all civil/concrete/foundations *works* (above and below ground), and stores at a designated area at each pump station for disposal later. All other material (concrete, cement, stones, bricks etc from the excavations and *works* of the contractor) is disposed at a registered/approved site.
- The *Contracto*r removes the existing barbed wire, contactors and electric fence on the main access gates and replaces with new contactors and electrical fence as per the Eskom Specifications on the same gate frame/structure. The *Contractor* does not re-install barbed wire.
- The design of the electric fences system, including the anti-tunnelling beam and vegetation slab (selecting of poles/pots, wires, bobbins, etc) to meet the above standard with layout and detail section drawings for acceptance by the *Employer* prior to any purchase of materials or construction.
- The procurement and or manufacture, purchasing transporting, off-loading, and storing of materials as per accepted design, The *Employe*r provides free issue steel mesh to the contractor as detailed below in 4.3.2. The *Contractor* includes in his tender for the cleaning, handling, loading and transport of the free issue material to where required.
- Supply, fabrication, installation, testing, commissioning, and handover of the electric fence system (fence, foundations, anti-tunnelling beams etc) and the system is tested in zones and in its entirety to meet the specification requirement with the accompanying certificate of compliance for electrical fences, with a spares list for the system and all drawings as well.
- The training of *Employers* personnel, which includes amongst others, the interpreting faults and reporting of the same, basic understanding of the system, and basic repairs of the structures (such as wire breaks)
- Connecting of HV cables is performed in accordance with SANS 10222-3 2016.

The *works* excludes:

- Power supply: The *Contractor* excludes the supply of electric fence energizers as this will be provided by the *Employer* on each pump station site using the existing distribution boards. Cabling from the energizers to the electric fence will be re-used as far as possible. Where the re-use of cables is not possible, the replacement of such is agreed with the *Project Manager* and will be done by others.
- The gate structure is excluded from the scope of work, but the replacement of electric fence and removal of barbed wire is included.

Figure 1: Layout of Fence for Nooitgedacht Pump Station (Approx. 1500m) the *Contractor* to verify electric fence dimensions on site

Figure 2: Layout of Fence for Bosloop Pump Station (Approx. 1315m) the *Contractor* to verify electric fence dimensions on site

3.1 Removal

- The *Contractor* removes the insulators on all sites prior to the dismantling of the poles and hands over the same to the *Employer* for re-use (the contractor ensures that all insulators are removed in a manner that protects the insulator from any damage.) All the steel *works*/materials (poles, barbed wire etc, is removed and stored at a designated area at each station for the *Employer* to later sell off. Where the poles are cast in concrete and cannot be unbolted the *Contractor* cuts off the pole from the concrete and stores the steel poles as above.
- The *Contractor* removes all civil/concrete/foundations *works* (above and below ground), and stores at a designated area at each pump station for disposal later. All other material (concrete, cement, stones, bricks etc from the excavations and *works* of the contractor) is disposed at a registered/approved site.
- The *Contracto*r removes the existing barbed wire, contactors and electric fence on the main access gates and replaces with new contactors and electrical fence as per the Eskom Specifications on the same gate frame/structure. The *Contractor* does not re-install barbed wire.

3.2 Design

3.2.1 Contractor's Design

1. The *Contractor* takes full professional accountability and liability for the *works* designed by the *Contractor* and provides the following to the *Employer,* for review and acceptance:
    - A Level 4 schedule (schedule with defined activities) for the *works* highlighting all activities involved, major milestones and provision.
    - Detailed Electrical/Civil Design report signed by a Professional Engineer/Technologist. The *Contractor* uses (where possible) existing civil foundation on bridges and other structures that cross over channels, pipes and culverts.
    - Detailed commissioning procedure indicating the tests to be conducted on the electric fence and associated power supply.
    - Detailed Electrical drawings. Drawings are also submitted in CAD formats (.DGN) e.g., drawings showing the energiser connection to the electric fence conductors, conductor spacing etc. and excel format e.g., load schedules.
    - Operating and maintenance manual for the electrical installation. The Operating & Maintenance Manuals describe how the facility is to be operated/maintained and by whom. The operating and maintenance manuals as a minimum, consist of the following:
        - List of Contents (Index)
        - Introduction
        - General description of the functions of each of the systems including detailed description of each element of the electric fence, how it functions, how it operates and how to maintain it.

- Full alarm descriptions with procedures on the fault finding or clearing of alarms.
- Full as-built drawings, brochures and catalogues for the system and each component.
- The format of the O & M documentation shall be A4 and shall be a specially bound document with hard cover and with metal ring binding. (All drawings and details shall be reduced to A3 format and folded into A4 format.)
- The names address and telephone numbers/email addresses of all responsible persons and manufacturers/suppliers shall be listed in the O& M document.

- Documentation as per the Employer's 240-78980848 standard.

2. Any discrepancy or ambiguity between the *Employer's* Specifications or requirements is immediately brought to the attention of the *Project Manager* for clarification.

3. The electrical design shall be as per Eskom's standard *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*

3.2.2 *Employer's* Civil Design

The *Employer* has conducted the detailed design only for the civil *works* of the fence structure which is constructed by the *Contractor* in accordance with the drawings and specifications included within and referenced in this specification. The *Contractor* may choose to propose an alternative design, however, should the *Contractor* accept the *Employer's* design he/she also accepts the accountability of the design. The *Contractor* uses (where possible) existing civil foundations, beams and bridges and other structures that cross over channels, pipes, and culverts. Any changes are submitted to the *Project Manager* for approval.

3.3 Temporary *Works*

The *Contractor* is mandated in terms of Construction Regulations 2014: Duties of Designer, 6(1) a - j and 6(2) a – d, to fulfil the duties described therein for the detailed and temporary *works* designs done by the *Contractor*. Any risk associated with the *Contractor's* design is highlighted to the *Employer* together with mitigation measures. The *Contractor* is responsible for construction monitoring at the level required to certify that the *works* have been constructed in accordance with the *Contractor's* design.

3.4 Electrical

The electrical scope is detailed in the *Eskom's standard 240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*

3.4.1 Energized Fence

The energized fence scope is detailed in the *Employer's* specification: *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*

1. The *Contractor* is responsible for the construction of the *works*, including all temporary *works* and design thereof, and all associated services in accordance with the detailed drawings and specifications.
2. The civil *works* includes the fence posts, struts, foundations, anti-tunnelling beam, anti-vegetation slab and associated *works* and is constructed in accordance with the *Employer's* detailed drawings 0.80/6133 Sheets 2, 3 and 4.
3. The electrical *works* are in accordance with the *Contractor's* detailed design which is in accordance with the specifications indicated herein.
4. The *Contractor* disposes of all demolition waste at a licenced waste disposal site to be accepted by the *Project Manager*. The waste disposal site is selected to suit the classification of the materials to be disposed of. Certificates of disposal are required to be submitted to the *Employer*.
5. The *Contractor* is required to remove existing middle tier fence, and all associated infrastructure (e.g., posts, foundations, and concrete *works*). The infrastructure is to be assessed by the *Contractor* together with the *Employer* to determine how much of the existing infrastructure can be reused.
6. The *Contractor* removes the structure with no damage to the steel components that could be reused.
7. The *Contractor* submits an assessment report to the *Project Manager* for review indicating which of the existing infrastructure can be reused to upgrade the fence in accordance with the required specifications in this Works Information.

3.4.2 Power Supply and Cabling *works*

1. The existing power supply points, inclusive of MCB's and associated cabling for the existing electric fence shall be used for the new electric fence. The existing distribution boards (DB) located in the security guard house on each pump station shall be used as an interface/ power supply point to the energized electric fence.
2. The *Contractor* shall isolate the existing power supply to the existing electric fence on decommissioning of the existing electric fence.
3. There are currently 2 energizers on each pump station, with a single-phase supply from the DB (located in the security guard house) with 2 output HT cables per energizer and one common earth cable from these energizers. On installation of the electric fence system, insulation resistance and continuity tests on the cables shall be conducted as part of the commissioning tests. A Certificate of Compliance shall be provided by the *Contractor* and shall be as per the requirements of *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*
4. Existing cable routing shall be used as far as practically possible.

3.4.3 Earthing and Lightning Protection

1. Earthing and lightning protection is detailed in the *Employer*'s specification: *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*

2. The *Contractor* provides earthing drawings, reflective of As-built status of the newly installed electric fence. Drawings shall indicate, as a minimum, the connection points on the electric fence and on the earth mat.

3.5 Construction and Commission

3.5.1 General

The *Contractor*:

1. Adheres to the South African Environment Protection Act, the waste management code of practice and the South African Occupational Health and Safety Act No. 85 of 1993, the regulations promulgated thereunder and Eskom Safety, Health, Environment and Quality (SHEQ) Policy 32-727 and Waste Management Procedure, as well as the plan from KWS for all *works*.

   2. Submits to the *Project Manager* a construction method for acceptance 2 weeks prior to any construction activities commencing on site. The method statement must cover, not limited to, the following areas of construction:

   - Construction of anti- tunnelling beam in areas with a grade greater than 1:20m
   - Crossing of culverts and underground *works*, preference is given to the use of existing structures such as bridges and beams over culverts

3. Submit a project specific safety file to the *Employer* for acceptance, prior to the start of the *works.*

4. Submit a detailed level 4 schedule for the *works* to the *Project Manager* for acceptance after contract award.

5. Manage access to the working areas and the site to ensure none of the existing plant that is not in the scope is damaged during removal of the middle tier fence.

6. Manage his activities on *Site* to ensure that no interference takes place between his work and that of others.

7. Continuously monitor the condition in demolition areas and surrounding areas for any hazardous substances and in such case, the *Contractor* is required to take necessary precautionary measures.

8. Complete "Contract Activities Daily Reports".

9. Liaise with the *Supervisor* regarding utilities and telephone facilities required for his Site establishment.

10. Identifies a registered waste disposal site, outside the pump station for dumping of waste, which must be approved by the *Supervisor.*

11. Maintain and promote labour harmony on the Site and in the working environment.

12. Immediately report any potential labour disharmony to the *Supervisor*.
13. Not recruit or employ any personnel from the *Employer* and Others, without prior acceptance of the *Project Manager*.

3.6 Temporary *works*, Site services & construction constraints

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

1. The *contractor* abides by security protocols and access control procedures.
2. Alcohol testing will be conducted at any time on all employees entering the Eskom premises. All staff that tested positive for alcohol abuse will not be allowed on site.
3. The contractor will undergo plant Induction.
4. When entering the site, the contractor or visitors will be requested to come out from their vehicle in front of the gate and identify them self by means of ID card/document.
5. The contractor/visitor will be always subjected to be search before entering the site.
6. The contractor shall have their tools list when entering the site.
7. The contractor will be requested to fill in the register when entering site.
8. The contractor will strictly follow safety rules.

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

1. All vehicles must comply with the National Road Traffic Act, 1996 (Act No. 93 Of 1996)
2. Vehicle inspections will be conducted daily and check sheets must be kept at the *Contractor's* offices.
3. The contractor is restricted from entering the plant (Pump Station, Switchgear Room, Distribution Yard etc.) without authorisation by the *Project Manager* or *Employer's* representative. The following is prohibited:
    - Firearm not allowed on site.
    - No alcohol on site.
    - Not making fire on site.

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

1. Restrictions and hours of work may apply on Sites.
2. It is very important that the *Contractor* keeps records of his people and plant on Site, including those of his Subcontractors which the *Project Manager* or *Supervisor* have access to at any time. These records may be needed when assessing compensation events.

3. No weekend *work* is permitted without the acceptance of the *Project Manager*/*Employer* and *Contractor's* working hours will be aligned from 07:00 to 12:00 and 12:30 – 16:30 from Monday to Friday. Health and safety facilities on Site

4. The Contractor to supply the following for his employees:

    - Job Specific Safety training
    - Personal Protective Equipment
    - Toolbox talks
    - Safety Representatives to be trained for all areas of the *works*.
    - Qualified First aiders to be appointed for all areas of the *works*.

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

Not applicable.

3.6.5 Title to materials from demolition and excavation

The *Contractor* submits an assessment report to the *Project Manager* for review indicating which of the existing infrastructure can be reused to upgrade the fence in accordance with the required specifications in this Works Information

All steel, metal, isolators, and concrete lintels removed from the existing *works* is handed over to the *Employer*.

All discard concrete, stone, cement from the existing *works* and any discard created because of the *Contractors* activities are disposed by the *Contractor* to a registered/approved disposal facility.

3.6.6 Cooperating with and obtaining acceptance of *Others*

The *Contractor* will interact with the following stakeholders:

- Primary Energy representatives – end users
- Eskom Rotek Industries Bulk Material Services representatives – Site management
- Department of Water Affairs and Sanitation (DWS)
- PED appointed consultants and contractor (CCTV contractor)
- Internal and external auditors

3.6.7 Publicity and progress photographs

1. SHE requirements must be clearly identified on notice boards.

2. A complaints register must be maintained. The *Contractor* shall seek *Employer's* approval prior to engaging with the authorities.

3. No pictures will be taken without the written authorisation of the *Project manager*.

3.6.8 *Contractor*'s Equipment

1. The *Contractor* submits a list of all tools and equipment entering site. Equipment and tools not declared will become the *Employer's* property.
2. On completion of the project, all tools and equipment will be removed only with permission from the Project Manager on the applicable approved *Employer* documents.

3.6.9 Equipment provided by the *Employer*

Not Applicable.

3.6.10 Site services and facilities

None.

3.6.11 Facilities provided by the *Contractor*

1. The *Contractor* provides accommodation for his/her team. No accommodation will be allowed on site.
2. An open storage area will be available on site.
3. All drivers' fitness to operate specified vehicles and licenses to be always available for inspections by the *Employer.*
4. The *Contractor* provides temporary office space for the duration of the contract for *Contractor* employees at the site where the *works* is executed (Nooitgedacht and Bosloop Pump Station sites).
5. All equipment must comply with the OHSAct.

3.6.12 Existing premises, inspection of adjoining properties and checking work of *Others*

Not applicable.

3.6.13 Survey control and setting out of the *works*

1. The *Contractor* is responsible for the complete surveying and setting out of the *works* including establishment and protection of any benchmarks required to complete the *works.*
2. The *Contractor* is required to consult the Surveyor-General's office to obtain information on available registered beacons near the Site to use for the establishment of any required benchmarks close to the *works.*
3. The *Contractor* is required to submit as-built data for the civil *works* in the form of redlined marked up drawings to the *Project Manager* upon handover.
4. Signed as-built drawings are submitted for the designs done by the *Contractor* and complies with the requirements indicated in Section 3.5.1.2.
5. The *Contractor* is responsible for the verification of all survey data relating to setting out and to immediately inform the *Project Manager* of any discrepancies as soon as these are discovered.

6. The new middle tier fence is to be erected adjacent to the existing middle fence except where it is not feasible to erect. The *Contractor* shall design such area to ensure compliance with *240-56364545 Structural Design and Engineering.*

3.6.14 Excavations and associated water control

All excavations to be verified by the *Project Manager.*

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

1. Geophysical scanning is done by the *Contractor* to locate sub-surface utilities both metallic and non-metallic prior to any excavations.
2. Scans are required to be conducted for the footprint of the support structure.
3. The type of Geophysical scanning employed is at the discretion of the *Contracto*r, taking note of the required output. The *Contractor* therefore considers the working environment prior to selection of test methodology and equipment.
4. The *Contractor* considers possible signal interferences which may be experienced by the geophysical scanning equipment caused by equipment, and services stray current in and around the areas.
5. Scanning is required to be conducted to a minimum depth of 3 m.
6. The *Contractor* submits the results of the scanning to the *Project Manager* and indicates and possible services which may interfere with the *works*.

3.6.16 Control of noise, dust, water and waste

1. To be included in Risk Assessment.
2. As per authorisations and the *Employer's* policies, procedures, and work instructions.

3.6.17 Sequences of construction or installation

Contractor to develop a sequence of construction that will minimize delays to the project.

3.6.18 Giving notice of work to be covered up

All intended activities must be captured in the scope of work and on the project schedule. The project schedule will be reviewed and updated weekly by the Project Manager.

3.6.19 Hook ups to existing *works*

Not applicable.

3.7 Completion, testing, commissioning, and correction of *Defects*

3.7.1 *Work* to be done by the completion date

All work to be completed by completion date. Commissioning is to be done after completion of each main activity which includes:

	Item of work	**To be completed by**
1	As built drawings of All plant	Within 30 days after Completion of each site.
2	Performance testing of the *works* at each site	Various completion days as per particular test specified in the specification.

3.7.2 Use of the *works* before completion has been certified

The use of the *works* before completion is not allowed. Plant only to be used after clearance and commission certificate is issued.

3.7.3 Materials facilities and samples for tests and inspections

1. All concrete work is required to be in accordance with SANS 2001-CC1 and SANS 10100-2 unless otherwise stated.
2. All concrete surfaces and cast-in items are required to be inspected and accepted by the Project Manager in writing before casting of concrete may commence.
3. The *Contractor* is required to obtain written acceptance from the Project Manager for the use of any admixture or the use of ready mixed concrete, to pump concrete, or to use cement or cement blends other than ordinary Portland cement (OPC)
4. Compaction of concrete is required to be done by means of mechanical vibrators only.
5. The *Contractor* is required to submit the concrete mix design to the Project Manager for acceptance.
6. The *Contractor* is required to demonstrate, by means of a report from an approved laboratory, that the aggregates do not exhibit excessive shrinking properties in accordance with SANS 1083 and is also required to demonstrate that the aggregates do not have a potential alkali silica reaction.
7. The *Contractor* is required to perform a slump test on the same batch of concrete every time a sample is taken, and the result recorded.

The table below indicates specifications pertaining to SANS 2001-CC1 and must be read in conjunction with the code.

Clause	**Specification**
3.5	**Concrete – Strength characteristics**
3.4.3	Concrete Grade is required to be: • Class 15 MPa/ 19 mm for Blinding Concrete (28 days), • Class 35 MPa/ 19 mm for Structural Concrete (28 days).
4.2	**Materials**
4.2.7	In general, one of the following types of non-shrink grout are required to be used: • Cement-based non-shrink grout, not less than 50 MPa.

Clause	Specification
	• Special proprietary non-shrink or expansive grout, not less than 50 MPa.
4.4	**Reinforcement**
4.4	Add the following: All reinforcement is stamped with a SANS quality assurance mark
4.4.3.1	Cast in-situ concrete cover is required to be a minimum of: • 60 mm for exposed to earth or water. • 40 mm for above ground or not in contact with soil.
4.7	**Quality of Concrete**
4.7.1.1	• *Contractor* submits to the *Supervisor* full details and samples of all materials which he proposes to use for making concrete at least 28 days before the concreting of the *works* is due to commence.
4.7.10	Add the following: • The *Supervisor* approves the size, shape and depth of any excavation before concrete is placed. • Unless otherwise approved by the *Supervisor*, no concrete is placed until the fixed reinforcement has been accepted in writing by the *Supervisor*
4.7.12.2.3	• All angled corners are chamfered 20 mm x 20 mm, unless such other larger size is detailed on the Drawings.
4.7.19.3	• *Contractor* submits a detailed procedure for acceptance by the *Supervisor* on how he intends to carry out the repairs of structural concrete defects
4.7.22	• For concrete pour records, the *Contractor* submits a detailed Quality Control Plan to the *Supervisor* for acceptance. • In addition, the *Contractor* supplies the *Supervisor* with two copies of these records each day covering *works* carried out the preceding day.
5.1	**Testing**
5.1.1.4	• Six 150 mm cube samples taken from each batch or place of concrete deposition, four cubes are tested at 7 days and four at 28 days. • Strength at 7 days is required to be at least two thirds of 28-day strength.
5.1.2.1	• Any of the cube samples tested indicating a result more than 3 MPa below the specified strength is disregarded.
5.2	**Tolerances**
5.2.1	• Tolerances on all concrete work is required to be a level II degree of accuracy as specified in SANS 2001-CC1 with and is to be carefully maintained throughout the construction.

3.7.4 Steelwork

1. All work is required to be in accordance with the latest edition of SANS 2001-CS1
2. The *Contractor* is responsible for the stability of the entire structure and all structural elements during all the erection stages.
3. All dimensions are required to be verified on site by the Contractor before any fabrication of steelwork commences.

4. All welding is required to be conducted by coded welders in the workshop only. Supporting documentation is also required to be submitted to the Project Manager for acceptance. All welding is required to comply with AWS D1.1.
5. All welds are required to be inspected using visual aids
6. The *Contractor* is required to supply all bolts, washers, nuts etc. for the structural steelwork.
7. All steelwork is required to be hot dipped galvanised.
8. All galvanising is required be done in accordance with SANS 121. Preparation of steel prior to galvanising and coating thickness is also required to be in accordance with SANS 121.

The table below indicates specifications pertaining to SANS 2001-CS1 and must be read in

Clause	Specification
4.1	**Materials**
4.1.1	Add the following: • All structural steelwork is required to be grade S355JR
4.1.4.1	• Electrodes for electric welding are required to be E7018.
4.6	**Workmanship - Erection**
4.6.5	• On site welding is not permitted
5.3	**Non-destructive testing of welds**
5.3.3	• Fillet welds are required to undergo magnetic particle inspection (20 % of welds)
5.3.4	• All butt welds and full penetration welds are required to undergo ultrasonic non-destructive testing (100 % of welds)

3.7.5 Commissioning

The *Contractor* is required to test, verify, and commission the fence according to the manufacturer's specification and approved drawings in the presence of the *Employer* and ensures that zoning is working. The *Contractor* submits all drawings and relevant paperwork for the electric fence system to the *Project Manager*.

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

The *Contractor* submits start-up procedures that may be applicable to the system should a system shutdown occur.

3.7.7 Take over procedures

1. The *Contractor* compiles data packs progressively for all manufacturing and construction/erection inspection, operating manuals and test records and documents for every piece of plant worked on. The *Contractor* submits data packs to the *Supervisor* and *Project Manager* for their review for all equipment and *works* undertaken with the applicable requirements and specifications.

2. Apart from any statutory data packages required, the *Contractor* also compiles and signs off a data package of the relevant drawings, test certificates etc. to the *Project Manager* for acceptance. These include, but are not limited to:

- Surveys.
- Approved ITP's, QCP's.
- Method statements and specifications adhered to.
- Risk assessments.
- Approved Drawings.
- Design Calculation Reports
- Fabrication Drawings.
- Material Certificates.
- Weld Map.
- Weld Matrix Sheet.
- Weld Sequence.
- Welding Consumables Certificates.
- Welding Procedure Specifications.
- Welders' Qualifications.
- Eskom approved NDT Contractor.
- Approved NDT procedure.
- NDT Technician Qualifications.
- NDT Reports/ Results.
- Weld test certificates
- Certificate of Manufacture.
- Inspection Reports.
- Spares list
- Cable test certificates,
- Load schedule, using 240-77301384 LV Load Schedule Template.

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

Access shall be granted by the *Project Manager* to the *Contractor* for correction of Defects.

3.7.9 Performance tests after Completion

Performance tests are done by the *Contractor* before sectional completion of the *works* as per the described execution methodology.

3.7.10 Training and technology transfer

1. Product specific training is required to enable the installation, testing, commissioning, fault finding, maintenance and configuration of the equipment by Eskom personnel or appointed contractors.

2. The training shall be a supplier-accredited course to ensure correct installation and use of the equipment within Eskom. The content of the training manual is based on the content of the technical, operating and maintenance manuals for the electric fence.

3.7.11 Operational maintenance after Completion

Not applicable.

3.8 Commissioning

The *Contractor* is required to test, verify and commission the fence according to the manufacturer's specification and approved drawings in the presence of the *Employer* and ensures that zoning is working. The *Contractor* submits all drawings and relevant paperwork for the electric fence system to the *Project Manager*.

3.9 Handover

The *Contractor* compiles data packs progressively for all manufacturing and construction/erection inspection, operating manuals and test records and documents for every piece of plant worked on. The *Contractor* submits data packs to the *Supervisor* and *Project Manager* for their review for all equipment and *works* undertaken with the applicable requirements and specifications.

Apart from any statutory data packages required, the *Contractor* also compiles and signs off a data package of the relevant drawings, test certificates etc. to the *Project Manager* for acceptance. These include, but are not limited to:

- Surveys.
- Approved ITP's, QCP's.
- Method statements and specifications adhered to.
- Risk assessments.
- Approved Drawings.
- Design Calculation Reports
- Fabrication Drawings.
- Material Certificates.
- Weld Map.
- Weld Matrix Sheet.
- Weld Sequence.
- Welding Consumables Certificates.
- Welding Procedure Specifications.
- Welders' Qualifications.
- Eskom approved NDT Contractor.
- Approved NDT procedure.
- NDT Technician Qualifications.
- NDT Reports/ Results.
- Weld test certificates

- Certificate of Manufacture.
- Inspection Reports.
- Corrosion Protection Consumables Certificates.
- Calibration Certificates.
- Notifications.
- Modifications.
- Concessions.
- Technical Queries, Engineering Responses and communications with Project Manager/ *Employer*
- Non-conformance reports.
- Internal Release Notes.
- Transport notifications.
- Calculations for any temporary *works* that may be required for the safe execution of the *works*.
- Concrete 7 day and 28-day cube test results.
- Slump test results.
- Concrete mix designs including all required test results e.g. aggregate test results.
- Pre-concrete and post concrete surveys.
- Batch Plant certificates.
- Slump tests certificates.
- Compaction tests.
- Material certificates.
- Certificate of Compliance (CoC) for the electrical installation including energised fence.
- Load schedules

  Wiring drawings inclusive of conductor spacing, energiser connection to the conductors, zoning of the electric fence etc.

3.10 Procedure for Submission and Acceptance of *Contractor's* Design

1. The *Contractor* submits all designs to the *Project Manager*.
2. The *Employer* reserves the right to review any design in the detail that is deemed necessary. The *Employer* accepts no accountability and liability due to the review of any designs or if any acceptance is given.

3.11 Other requirements for the *works*

3.11.1 Documentation and Configuration Management

(1) Document identification

All documents supplied by the *Contractor* are subject to the *Employer's* acceptance. The language of all documentation is required to be in English. The *Contractor* includes the *Employer*'s drawing number in the drawing title block. This requirement only applies to design drawings developed by the *Contractor* and his *Subcontractors*. Drawing numbers are assigned by the *Employer* as drawings are developed.

(2) Document Submission

The *Contractor* is required to submit documents as electronic (native and digitally signed PDF's), and ink signed hard copies and both copies must be delivered to the Eskom Representative with a transmittal note. The *Contractor* adheres to the following standard: Technical Documents and Records Management Work Instruction (240-76992014). For bulk document submission, the following link can be used https://zendto.eskom.co.za/.

(3) Drawings Format and Layout

1. The creation, issuing and control of all Engineering Drawings will be in accordance with the latest revision of *240-86973501 - Engineering drawing Standard.*
2. Drawings issued will be a minimum of one hardcopy and an electronic copy.
3. Drawings issued by the *Contractor* to the *Project Manager* may not be "Right Protected" or encrypted.

3.11.2 Quality Management

1. The *Contractor* submits a fully detailed Quality Control Plan (QCP) for acceptance within 2 weeks of the Contract Date.
2. The *Contractor* submits a schedule of unpriced orders to be placed and this is updated regularly.
3. The *Contractor* is responsible for defining the level of QA/QC (intervention Points) or inspection to be imposed on his Subcontractors and suppliers of material in the Quality Control Plans (QCPs). This level is based on the criticality of equipment and be submitted to the *Project Manager* for acceptance.
4. The *Contractor* submits monthly, the following QA returns:
    - A register of Defects with those older than 30 days being flagged, and an explanation attached
    - Register of accepted Defects
    - A register of Non-Conformance Report
    - Monthly Project Quality Report
    - Monthly updated Site and pre-site programmes
    - Inspection dates
    - Site Acceptance Tests
    - Inspections completed / outstanding
5. All quality control documentation is submitted to the *Project Manager* within 2 weeks of Contract date.

3.11.3 Training Requirements

1. Product specific training is required to enable the installation, testing, commissioning, fault finding, maintenance and configuration of the equipment by Eskom personnel or appointed contractors.

2. The training shall be a supplier-accredited course to ensure correct installation and use of the equipment within Eskom. The content of the training manual is based on the content of the technical, operating and maintenance manuals for the electric fence.

4 Procurement

4.1 People

4.1.1 Minimum requirements of people employed on the Site

Local employees to be employed as far as reasonably practicable.

4.1.2 BBBEE and preferencing scheme

The standard Z3 Clause included in this contract is applicable.

4.1.3 Supplier Development & Localisation

1. 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.
2. 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

Contractor to inform the *Employer* if any subcontractors are appointed.

4.2.2 Subcontract documentation, and assessment of subcontract tenders

Not applicable.

4.2.3 Limitations on subcontracting

Contractor informs the *Employer* if any subcontractors are appointed. Subcontractors will be required to comply with all Eskom specifications.

4.2.4 Attendance on subcontractors

Contractor to inform the *Employer* if any subcontractors are appointed.

4.3 Plant and Materials

4.3.1 Quality

As per quality requirements document QM – 58 Supplier contract quality requirements specification.

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

The *Employer* provides:

1. Water and electrical supply are available on site.
2. 563 sheets of Mesh Ref. 395 located at Vygeboom and Nooitgedacht pump stations. The *Contractor* includes in his/her tender any additional mesh required for the *works.*

4.3.3 *Contractor*'s procurement of Plant and Materials

3. All Plant & and Materials supplied by the Contractor must comply with the Employer's quality requirements
4. All test certificates and quality inspection documents to be included in the O&M manuals
5. Materials to be sourced locally as far as possible.

4.3.4 Spares and consumables.

Contractor to supply a list of all spares and consumables. The life-cycle of the product must be further supported in terms of spares availability for a minimum period of seven (7) years after discontinuation of the product.

4.4 Tests and inspections before delivery

The Contractor is responsible for all necessary tests and inspections before delivery to ensure successful testing and construction of the *works*.

4.4.1 Tender Demonstration Test

1. The Contractor submits evidence, during the tender phase, that plant and equipment meet the specifications defined in the Works Information and is compliant with *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*

2. The demonstration tests are locally based at a suitable venue arranged by the *Contractor*.
3. The *Contractor* arranges a time, date and venue with the *Project Manager*.
4. The *Employer* requires representation during the demonstration tests to confirm and accept the plant and equipment has met the requirements of the *Employer*.

The demonstration test allows for one retest/retune/reconfiguration of plant and equipment for each test point.

4.4.2 Factory Acceptance Test

1. The *Contractor* submits factory acceptance test procedures in accordance with the *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*

2. The factory acceptance tests are locally based at a suitable venue arranged by the *Contractor*.
3. The *Contractor* arranges a time, date and venue with the *Project Manager*.

4. The *Employer* requires representation at the acceptance tests to confirm and accept the plant and equipment has met the requirement of the *Employer.*

4.5 Marking Plant and Materials outside the Working Areas

1. Plant and Materials must be clearly marked with the project name.
2. Project designated area will be barricaded and access control will be implemented.
3. All equipment to be safely stored as per the OHSAct and environmental requirements.
4. All plant and equipment Materials to be removed from the designated area can only be removed with the permission of the *Contractor* and Project Manager.
5. Markings on the energizer to comply with *240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries.*

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

The *Contractor* is liable for all plant & equipment in the designated area under his control. The *Employe*r will not take any responsibility for any loss or damage to the equipment.

5 Plant and Materials standards and workmanship

5.1 Investigation, survey, and Site clearance

1. The *Contractor* is responsible for the complete surveying and setting out of the *works* including establishment and protection of any benchmarks required to complete the *works*.
2. The *Contractor* is required to consult the Surveyor-General's office to obtain information on available registered beacons near the Site to use for the establishment of any required benchmarks close to the *works*.
3. The *Contractor* is required to submit as-built data for the civil *works* in the form of redlined marked up drawings to the *Project Manager* upon handover.
4. Signed as-built drawings are submitted for the designs done by the *Contractor* and complies with the requirements indicated in Section 3.5.1.2 of *365-KOM-AABZ28-SP0004-20 KWS Pump Stations Energized Fence Upgrade Technical Specification Rev. 1.*
5. The *Contractor* is responsible for the verification of all survey data relating to setting out and to immediately inform the *Project Manager* of any discrepancies as soon as these are discovered.
6. The new middle tier fence is to be erected in the same position of the existing middle fence.

5.2 Civil engineering and structural *works*

The *Employer* has conducted the detailed design only for the civil *works* of the fence structure which is constructed by the *Contractor* in accordance with the drawings and specifications included within and

referenced in this specification. The contractor may choose to propose an alternative design –however should the contractor accept the *Employer's* design he/she also accepts the accountability of the design.

5.3 Electrical engineering *works*

The requirements of the electrical *works* to be complied with *240-78980848 Standard for Non-Lethal Energized Perimeter Detection System (NLEPDS) Electrical Components* and *365-KOM-AABZ28-SP0004-20 KWS Pump Stations Energized Fence Upgrade Technical Specification Rev. 1*

5.4 Process control and IT *works*

5.4.1 Control unit

1. All settings of the system including energizer configurations and alarm settings shall be configurable from the control unit.
2. Alarm conditions shall be resettable and acknowledgeable from the configuration PC and the user interface (locally and remotely).
3. The monitoring system for the alarm must be compatible with the current energiser.

5.4.2 User interface/Display unit

1. The display unit shall be able to display the configured zones or sectors of the fence including all fence alarms.
2. Alarmed zone(s) or sector(s) of the fence shall be clearly depicted (shape and size) on the display unit.
3. The User interface shall be used to view and acknowledge alarms.
4. The Control unit and the user interface/display unit can be separate units or configured as a combined system. Strict configuration rights management shall be applied such that only authorised users can make configuration changes to the system.
5. HMI/Mimic with the following details:

PC:
INTEL NUC- INTEL CEL J4005,2*DDR4 SLOTS, SOLID STATE DRIVE 120GB 2.5", 4GBDDR4 3200, Windows 11

PC Enclosure:
Mildsteel, p/c black custom for 24" LED monitor, built-in mouse, keyboard with external mounted Machine Ack and reset buttons

Software:
Stinger Fence Management software for windows 10,11

5.4.3 Concrete

1. All concrete *work* is required to be in accordance with SANS 2001-CC1 and SANS 10100-2 unless otherwise stated.

2. All concrete surfaces and cast-in items are required to be inspected and accepted by the *Project Manager* in writing before casting of concrete may commence.

3. The *Contractor* is required to obtain written acceptance from the *Project Manager* for the use of any admixture or the use of ready mixed concrete, to pump concrete, or to use cement or cement blends other than ordinary Portland cement (OPC)

4. Compaction of concrete is required to be done by means of mechanical vibrators only.

5. The *Contractor* is required to submit the concrete mix design to the *Project Manager* for acceptance.

6. The *Contractor* is required to demonstrate, by means of a report from an approved laboratory, that the aggregates do not exhibit excessive shrinking properties in accordance with SANS 1083 and is also required to demonstrate that the aggregates do not have a potential alkali silica reaction.

7. The *Contractor* is required to perform a slump test on the same batch of concrete every time a sample is taken, and the result recorded.

The table below indicates specifications pertaining to SANS 2001-CC1 and must be read in conjunction with the code.

Clause	**Specification**
3.5	**Concrete – Strength characteristics**
3.4.3	Concrete Grade is required to be: • Class 15 MPa/ 19 mm for Blinding Concrete (28 days), • Class 35 MPa/ 19 mm for Structural Concrete (28 days).
4.2	**Materials**
4.2.7	In general, one of the following types of non-shrink grout are required to be used: • Cement-based non-shrink grout, not less than 50 MPa. • Special proprietary non-shrink or expansive grout, not less than 50 MPa.
4.4	**Reinforcement**
4.4	Add the following: All reinforcement is stamped with a SANS quality assurance mark
4.4.3.1	Cast in-situ concrete cover is required to be a minimum of: • 60 mm for exposed to earth or water. • 40 mm for above ground or not in contact with soil.
4.7	**Quality of Concrete**
4.7.1.1	• *Contractor* submits to the *Supervisor* full details and samples of all materials which he proposes to use for making concrete at least 28 days before the concreting of the *works* is due to commence.
4.7.10	Add the following: • The *Supervisor* approves the size, shape and depth of any excavation before concrete is placed. • Unless otherwise approved by the *Supervisor*, no concrete is placed until the fixed reinforcement has been accepted in writing by the *Supervisor*

Clause	Specification
4.7.12.2.3	• All angled corners are chamfered 20 mm x 20 mm, unless such other larger size is detailed on the Drawings.
4.7.19.3	• *Contractor* submits a detailed procedure for acceptance by the *Supervisor* on how he intends to carry out the repairs of structural concrete defects
4.7.22	• For concrete pour records, the *Contractor* submits a detailed Quality Control Plan to the *Supervisor* for acceptance. • In addition, the *Contractor* supplies the *Supervisor* with two copies of these records each day covering *works* carried out the preceding day.
5.1	**Testing**
5.1.1.4	• Six 150 mm cube samples taken from each batch or place of concrete deposition, four cubes are tested at 7 days and four at 28 days. • Strength at 7 days is required to be at least two thirds of 28-day strength.
5.1.2.1	• Any of the cube samples tested indicating a result more than 3 MPa below the specified strength is disregarded.
5.2	**Tolerances**
5.2.1	• Tolerances on all concrete work is required to be a level II degree of accuracy as specified in SANS 2001-CC1 with and is to be carefully maintained throughout the construction.

5.4.4 Steelwork

1. All *work* is required to be in accordance with the latest edition of SANS 2001-CS1.
2. The *Contractor* is responsible for the stability of the entire structure and all structural elements during all the erection stages.
3. All dimensions are required to be verified on site by the *Contractor* before any fabrication of steelwork commences.
4. All welding is required to be conducted by coded welders in the workshop only. Supporting documentation is also required to be submitted to the *Project Manager* for acceptance. All welding is required to comply with AWS D1.1.
5. All welds are required to be inspected using visual aids.
6. The *Contractor* is required to supply all bolts, washers, nuts etc. for the structural steelwork.
7. All steelwork is required to be hot dipped galvanised.
8. All galvanising is required be done in accordance with SANS 121. Preparation of steel prior to galvanising and coating thickness is also required to be in accordance with SANS 121.

The table below indicates specifications pertaining to SANS 2001-CS1 and must be read in conjunction with the code.

Clause	Specification
4.1	**Materials**
4.1.1	Add the following: • All structural steelwork is required to be grade S355JR
4.1.4.1	• Electrodes for electric welding are required to be E7018.

Clause	Specification
4.6	**Workmanship - Erection**
4.6.5	• On site welding is not permitted
5.3	**Non-destructive testing of welds**
5.3.3	• Fillet welds are required to undergo magnetic particle inspection (20 % of welds)
5.3.4	• All butt welds and full penetration welds are required to undergo ultrasonic non-destructive testing (100 % of welds)

5.4.5 Excavations

1. All areas in which excavation is to take place or that are to be covered by terraces, banks, or structures, shall be cleared in terms of SANS 2001-BS1 and stripped of all remaining vegetation to a depth of 150 mm.
2. Topsoil shall be conserved for later use. Topsoil together with grass and other suitable vegetation are removed and placed in stockpiles not higher than 1.5m within the site.

6 List of drawings

6.1 Standards issued by the *Employer* (excluding local and international standards)

1. 240-56364545 Structural Design and Engineering Standard
2. 240-86973501 Engineering drawing Standard
3. 240-66920003 Documentation Management Review and Handover Procedure for Gx Coal Projects
4. 240-76992014 Project / Plant Specific Technical Documents and Records Management Work Instruction
5. 240-78980848 Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries
6. AWS D1.1 American Welding Society - Structural Welding Code - Steel
7. SANS 10044-1 Welding Part 1: Glossary of terms
8. SANS 2553 Welded, brazed, and soldered joints - Symbolic representation on drawings
9. SANS 9606-1 Approval testing of welders - Fusion welding Part 1: Steels
10. SANS 10064 The preparation of steel surfaces for coating
11. SABS 471/ SANS 50413 & SANS 50196 Portland cement (ordinary, rapid hardening and sulphate resisting)
12. SANS 50196 Series Methods of testing cement
13. SANS 50197-1 Cement Part 1: Composition, specifications, and conformity criteria for common cements
14. SANS 50197-2 Cement Part 2: Conformity evaluation
15. SANS 1083 Aggregates from natural sources - Aggregates for concrete

16. SANS 2001-BE1 Construction works Part BE1: Earthworks (general)
17. SANS 2001-BS1 Construction works Part BS1: Site clearance
18. SANS 2001-CC1 Construction works Part CC1: Concrete works (structural)
19. SANS 2001-CS1 Construction works Part CS1: Structural steelwork
20. SANS 50025 Series Hot rolled products of structural steels Parts 1-6
21. SANS 5831 Presence of chlorides in aggregates
22. SANS 5861-2 Concrete tests - Sampling of freshly mixed concrete
23. SANS 5862-1 Concrete tests - Consistence of freshly mixed concrete - Slump test
24. SANS 5863 Concrete tests - Compressive strength of hardened concrete
25. SANS 5864 Concrete tests - Compressive strength of hardened concrete
26. SANS 10400 The Application of the National Building Regulations
27. SANS 10142-1 The wiring of premises Part 1: Low-voltage installations

6.2 Drawings issued by the *Employer*

The following drawings are issued to the *Contractor* to be used for tender. The *Employer* provides the *Contractor* with drawings issued for construction after contract award. Drawings for Tender are not used for procurement, fabrication, or construction.

Document Number / ID	Document Title	Revision	Status
0.80/6133 - Sheet 2	Bosloop Pump Station - Security Fence Upgrade – Layout and Details	0	0.80-6133 Sheet 2 Bosloop.pdf
0.80/6133 - Sheet 3	Wintershoek Pump Station - Security Fence Upgrade – Layout and Details	0	0.80-6133 Sheet 3 Wintershoek.pdf
0.80/6133 - Sheet 4	Komati Water Scheme – Security Fence Upgrade – Details of Posts and Struts	0	0.80-6133 - Sheet 4 - Energised Fence.pdf
Documents issued for additional information only			

0.52/30115 – Sheet 6	Non-Lethal Electrified Fence - Conductors Looping Arrangement	0	0.52-30115 - Sheet 6.pdf
240-77301384	Low Voltage Load Schedule	N/A	240-77301384 Electrical LV Load Sch
365-KOM-AABZ28-SP0004-20	Komati Water Scheme Pump Stations – Energized Fence Upgrade – Technical Specification	Rev 1	365-KOM-AABZ28-SP0004-20 KWS Pump
240-78980848	STANDARD FOR NON-LETHAL ENERGIZED PERIMETER DETECTION SYSTEM (NLEPDS) ELECTRICAL COMPONENTS	Rev 4	Standard for Non-Lethal Energized

APPENDIX A: TECHNICAL SPECIFICATIONS INDEX

The Contractor is required to adhere to the latest editions of and the normative references within the following SANS standards and other codes of practice, regulations & standards:

Item	Folder	Number	Title
1	Standards		
		240-56364545	Structural Design and Engineering Standard
		240-86973501	Engineering drawing Standard
		240-66920003	Documentation Management Review and Handover Procedure for Gx Coal Projects
		240-76992014	Project / Plant Specific Technical Documents and Records Management Work Instruction
		240-78980848	Specification for Non-Lethal Energized Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries
		240-165332855	Komati Water Scheme - Vegetation Management Work Instruction
		AWS D1.1	American Welding Society - Structural Welding Code - Steel
		SANS 10044-1	Welding Part 1: Glossary of terms
		SANS 2553	Welded, brazed, and soldered joints - Symbolic representation on drawings
		SANS 9606-1	Approval testing of welders - Fusion welding Part 1: Steels
		SANS 10064	The preparation of steel surfaces for coating
		SABS 471/ SANS 50413 & SANS 50196	Portland cement (ordinary, rapid hardening and sulphate resisting)
		SANS 50196 Series	Methods of testing cement
		SANS 50197-1	Cement Part 1: Composition, specifications and conformity criteria for common cements
		SANS 50197-2	Cement Part 2: Conformity evaluation
		SANS 1083	Aggregates from natural sources - Aggregates for concrete
		SANS 2001-BE1	Construction works Part BE1: Earthworks (general)
		SANS 2001-BS1	Construction works Part BS1: Site clearance
		SANS 2001-CC1	Construction works Part CC1: Concrete works (structural)
		SANS 2001-CS1	Construction works Part CS1: Structural steelwork
		SANS 50025 series	Hot rolled products of structural steels Parts 1-6
		SANS 5831	Presence of chlorides in aggregates
		SANS 5861-2	Concrete tests - Sampling of freshly mixed concrete
		SANS 5862-1	Concrete tests - Consistence of freshly mixed concrete - Slump test

Item	Folder	Number	Title
		SANS 5863	Concrete tests - Compressive strength of hardened concrete
		SANS 5864	Concrete tests - Compressive strength of hardened concrete
		SANS 10400	The Application of the National Building Regulations
		SANS 10142-1	The wiring of premises Part 1: Low-voltage installations
		200-11768	Station Cabling and Racking Standard
2	Drawings		
		0.80/6133 - Sheet 2	Bosloop Pump Station - Security Fence Upgrade – Layout and Details
		0.80/6133 - Sheet 3	Wintershoek Pump Station - Security Fence Upgrade – Layout and Details
		0.80/6133 - Sheet 4	Komati Water Scheme – Security Fence Upgrade – Energized Fence
		0.52/30115 – Sheet 6	Non-Lethal Electrified Fence - Conductors Looping Arrangement
		0.54/393	Earthing Standards
		240-77301384	Low Voltage Load Schedule
	Tender Evaluation Criteria		
	SHEQ Documents		KWS Electric Fence SHE Specification

Annexure B: KWS Electric Fence SHE Specification

#	Folder	Document Number	Document Title	Rev	Document
01	SHE Documents	240-73416879	*KWS Electric Fence Project SHE specification*	01	KWS Electric Fence SHEQ SPEC.doc
		240-128739857	*Environmental Evaluation Criteria for KWS*	2	Environmental Criteria - Nooitgeda

Annexure C: Quality Requirements

#	**Folder**	**Document Number**	***Document Title***	**Rev.**	
01	Quality Documents	240-105658000	*Supplier Quality Management Specification*	2	Supplier Qual Management Sp
		240-126469599	*Method Statement Template*	6	240-126469599 hod Statement te
		240-109253302	*ITP Template*		20170524_240-53302 ITP Temp
		240-109253698	*Typical Contract Quality Plan Template*	3	240-109253698 Template 2016 R

C3.2 *CONTRACTOR*'S WORKS INFORMATION

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

Typical subheadings could be

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

PART 4: SITE INFORMATION

4.1. General description

The *works* is situated at Bosloop and Nooitgedacht Pump Stations in the Mpumalanga province of South Africa. Drawings of the general layout of the sites have been provided in Technical Specifications Supporting Documents in C3.1: EMPLOYER'S WORKS INFORMATION Appendix A.

The Pump Stations are access controlled. The *Project Manager* arranges site access on request from the *Contractor* prior to site establishment. The sites are accessible from public roads and dirt roads.

The Contractor confines his activities to designated sites unless he has made prior formal arrangements with the owners. The Contractor is liable for all claims resulting from damages caused by him.

The Employer expects the Contractor, his staff or agents to maintain good public relations with Land owners and members of the public at all times.

The Contractor maintains access to site in good order at his own expense during period of use.
All workers will be subjected to do the induction before they can be given access.

All safety and covid19 rules will be strictly adhered to. Access control rules and Eskom procedure will be followed accordingly.

4.2. Existing buildings, structures, and plant & machinery on the Site

Existing infrastructure at the sites are shown on the layout and facilities drawings provided in C3.1: EMPLOYER'S WORKS INFORMATION.

4.3. Subsoil information

The subsoil is estimated to have 85% soft soil, 10% medium soil and 5% hard soil including rocks.

4.4. Hidden services

The contractor must scan for any underground infrastructure prior to any digging is done. Any damage to infrastructure, caused by the Contractor, from access site or performing the *works* remains the responsibility of the Contractor to make good.

Name	Signature	Date
Lindiwe Nkonde		11/06/2025
Kefentse Letsoko		19/06/2025