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|---|---|---|
| Eskom | **Scope of Work** | **Generation** |

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## Content

# 1. Introduction

This document outlines the technical requirements and scope of work needed to place a routine preventative and corrective contract which will also render the multidisciplinary civil maintenance services.

Multidisciplinary civil engineering, preventative and corrective maintenance services include but not limited to visual and detail inspections, technical investigations and adhoc maintenance repairs, and maintenance reports including scope of work, bill of quantities, tender technical evaluation and NEC contract document. The condition ofthe structures, geotechnical, stormwater drainage, roads, dams, and buildings in general must be evaluated based on Eskom's civil inspection manual and the frequency of the detailed inspections planned accordingly.

The *Contractor* will be responsible for the preventative and corrective maintenance of Tutuka Civil, Structures and Building works. The *Contractor* shall maintain civil & building works to ensure that: -

- There is a decreased need for constant capital investment.
- Existing facilities are used their full life expectancy.
- The infrastructure performs better, effective, and reliable and has a longer life due to a greater emphasis on preventive maintenance.
- The productivity of personnel is enhanced because of a lack of frustration due to constant equipment failure.
- Compliance to Construction Regulations of 2014 and Eskom's procedures and standard.

# 2. Supporting Clauses

## 2.1 Scope

### 2.1.1 Purpose

The purpose of this document is to determine scope of work for routine preventative and corrective civil and structural maintenance, inspections and adhoc maintenance repairs, and maintenance reports for multi skilled civil and structural maintenance services.

### 2.1.2 Applicability

This document shall apply to Tutuka Power Station only.

### 2.1.3 Effective date

The effective date will be from final signature.

## 2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

### 2.2.1 Normative

1] ISO 9001: Quality Management Systems

[2] 240-99527377: Inspection Manual for Civil Works at Eskom's Power Stations

[3] 2014 Construction Regulation

[4] Occupational Health and Safety Act (No. 85 of 1993)

[5] ISO 9001: 2015 Quality Systems Standard

[6] 15ENG GEN-970: Tender Technical Evaluation Strategy- 5 Year Civil Maintenance Service Contract (Rev 2.0)

[7] NEC3 Contract- Maintenance Service Contract

### 2.2.2 Informative

[1] 474-10814: Civil and Structural Infrastructure Generation Fleet Inspection Strategy Report

[2] 240-50317699: Manage Technical Queries Procedure

[3] 240-53113685: Design Review Procedure

[4] 240-53114186: Document and Records Management

[5] 240-53665024: Engineering Quality Manual.

[6] QM-58: Supplier Contract Quality Requirements Specification

[7] SANS 5865 Concrete tests – The drilling, preparation, and testing for compressive strength of cores taken from hardened concrete.

[8] SANS 5863 Concrete tests – Compressive strength of hardened concrete.

[9] 240-144332407 Standard for Eskom Power Stations Concrete Remedial Work

[10] 240-57127951: Standard for the Execution of Site Investigations

[11] SANS 1200: Standardized specification for civil engineering construction

[12] 240-56364545: Structural design and engineering standard

[13] 39-60: Contract quality requirements

[14] COLTO Green Book Standard specifications for road and bridge works

[15] Tutuka Water Use License (License No: 08/C11K/ABCFGI/1016)

[16] 15ENG GEN-280 Tutuka Storm Water Management Plan

[17] Dam Safety Inspection Report for Raw Water Reservoirs 1 & 2 Tutuka Power Station (2010)

[18] Dirty Water Dam Survey (2020)

[19] Stein Muller Dam Bathymetric Survey 2019

[20] Bathymetric surveys in Tutuka Eskom Power Station for internal dams namely the South Dam (DB Thermal Dam), North Clean Dam and the Raw Water dam (2019).

[21] The Survey of the following Dams, General Waste Landfill Site Ponds, Coal Stockyard Dam, North Clean Water Dam and South Clean Water Dam to determine the Volumes and Inflows (2020).

### 2.2.3 Drawings

For the list existing drawings associated with the Civil/Structural plants refer to **Appendix A** under section 11.

## 2.3 Definitions

N/A

### 2.4 Abbreviations

| Abbreviation | Explanation |
|---|---|
| CSY | Coal Stockyard |
| ECM | Engineering Change Management |
| ECSA | Engineering Council of South Africa |
| ISO | International Standards Organization |
| LDV | Light Duty Vehicle |
| NEC | New Engineering Contract |
| PIR | Performance Improvement Report |
| PM | Planned Maintenance |
| QIM | Quality Issue Management |
| QM | Quality Management |
| REV | Revision |
| SANS | South African National Standards |
| SHT | Sheet |

### 2.5 Roles and Responsibilities

#### 2.5.1 Contractor Civil Engineering

- Compiles scope of work, BOQ and technical evaluation strategy
- And Eskom Civil Engineering Conducts technical evaluation, as per the issued technical evaluation strategy.

#### 2.5.2 Contractor Civil Maintenance Team

- Compiles scope of work, BOQ and technical evaluation strategy

- Eskom Civil Maintenance Supervisors Conducts technical evaluation, as per the issued technical evaluation strategy.

#### 2.5.3 Environmental

- Ensures that environmental legislation and standards are adhered to, and environmental practices are always implemented during provision of the Civil Maintenance Services by Contractor

#### 2.5.4 Quality

- Ensures that quality legislation and standards are adhered to, and quality practices are always implemented during execution of the works.

#### 2.5.5 Safety

- Always ensures safe practice when work is executed in line with Eskom Safety Procedures.

#### 2.5.6 Contractor

- As per OHS Act (85/1993), and 2014 Construction Regulations
- Executes the works.
- Appoints a supervisor with related work experience to supervise the work, form part of Tutuka's team to conduct investigations, give technical assurance at all times and manage the contract on behalf of the Contractor.

### 2.6 Process for Monitoring

The tender committee will evaluate the contract.

### 2.7 Related/Supporting Documents

As per section 2.2

## 3. General Constraints

a) A site tender briefing session/scope clarification meeting to be conducted and attended by the Tenderer/Contractor or a technical representative. A representative from Civil Engineering, Civil Maintenance and others will meet prospective tenderers/contractors for a scope clarification and site briefing meeting.

b) The Contractor shall appoint an experienced Project Manager to manage the contract,

supervise the work, and give technical assurance at all timeson behalf of the Contractor. If not available, the delegate/stand-in must be appointed in writing by the Contractor to ensure continuity of the works.

c) All technical queries to be directed to the appointed Professional Civil Engineer/Technologist registered with ECSA.

d) The Contractor to submit a project schedule specifying activities and duration for preventative and corrective maintenance.

e) Submit a construction method statement for maintenance works, inclusive of risk assessments per area of work, to the Employer for review and approval within 28 days prior to commencement of respective activities for review and approval by the Employer.

f) Contractor's tools, machinery, equipment, and execution of work shall not impair the operation at the specified Station Dams or access to the station and/or neighboring site areas.

g) During execution of the scope of work, Contractor to share the site with other contractor/s conducting operation and maintenance tasks.

h) Contractor is responsible to provide their own measures to secure machinery, equipment, materials, and resources on site.

## 4. Scope of work

### 4.1 Civil Maintenance Contractor

The Service provider is to render a multidisciplinary (E.g., Civil & Structural Maintenance) Civil Maintenance Services in the form visual and detailed inspections, adhoc maintenance repairs, and compiling maintenance reports including scope of work, bill of quantities, tender technical evaluation and NEC contract document as and when required by Tutuka Power Station. The condition of the structures, geotechnical, stormwater drainage, roads, dams, and buildings in general must be evaluated based on Eskom's civil inspection manual and the frequency of the detailed inspections planned accordingly.

The CVs of the people relative to their area of disciplines must be submitted with the tender document. Contractor to provide a key resource of:

a) Civil Professional Engineer or Professional Civil Engineering Technologist with minimum 8 years related work experience will supervise the work, always give technical assurance on behalf of the Contractor, and form part of Tutuka's team to conduct investigations.

b) General building maintenance resources as stipulated under section 4.9.

The scope will include the areas surrounding Tutuka Power Station such as coal stockyard, railway terminal, ash disposal, raw water dam, terrace dams, sewage treatment plants, and domestic waste site.

The service provider is to render a service to Tutuka Power Station as a Civil Maintenance Contractor for deliverables as specified in the task list.

The service provider must have at least a minimum of five years Civil Maintenance experience, in particular on Civil and Structures covering the following:

i. Executing the monitoring, inspection, and maintenance strategy for all civil & structural infrastructure at Tutuka Power Station. The inspection and maintenance reports will be reviewed and accepted by the Employer.

ii. Perform civil & structural visual and detailed inspections as per the Eskom Generic Civil works manual [2], Construction Regulations 2014 and monitoring, inspection, and maintenance strategy. Detailed inspections will be deemed as and when required.

iii. A program must be developed for each structure specifying the level of inspection required dependent on the condition/status of the structure relative to **Error! Reference s ource not found.**, and aligning with the Eskom Generic Civil works manual ([2] and [3]), Construction Regulations 2014

iv. Compile repair scopes for the approval by the employer and for the execution by the maintenance contractor (major structural repairs will be deemed as and when required),

v. Executing adhoc maintenance repairs on civil infrastructure as per inspection report and repair recommendations approved by the Employer.

vi. Actively involved with structural, road and dam investigations and the sharing of practical experience with Engineers.

vii. Perform adhoc maintenance reports of when an as required.

viii. Knowledgeable in all Eskom processes i.e., SAP system, etc.

ix. Allow skills transfer to Eskom employees when executing inspections, adhoc maintenance repairs, and adhoc maintenance reports. This may be in the way of the Employers resource executing inspections under the guidance of the Civil Maintenance Contractor or executing maintenance works.

## 4.2 Civil Plant Inspections (Routine Planned & Corrective Maintenance)

The Contractor will be required to develop the monitoring, maintenance, and inspection strategy in line with Eskom Standards and Procedure and Construction Regulations 2014. The Contractor will perform planned maintenance and statuary plant inspections during normal operation of civil infrastructure, planned or unplanned outages, with the objective to identify preventative and corrective actions, both short and long term, utilizing appropriate systems such as work orders, scopes of work etc. and revise the approved maintenance and inspection strategies to minimize the impact on plant performance and costs. This includes compiling and submitting costing proposal and specification writing which shall conform to the required (NEC) format.

After each visual or detailed inspection, Contractor to issue inspection report detailing the condition of the structure, required repair and/or replacement works, and bill of quantities for Employer to approve. Contractor to execute approved maintenance repair and/or replacement works issued by the Employer.

### 4.2.1 Preventative and Corrective Maintenance

The *Contractor* will be responsible for the preventative and corrective maintenance of Tutuka Civil,Structural and Building works. The *Contractor* shall maintain civil & building works to ensure that: -

- There is a decreased need for constant capital investment.
- Existing facilities are used their full life expectancy.
- The infrastructure performs better, effective, and reliable and has a longer life due to a greater emphasis on preventive maintenance.
- The productivity of personnel is enhanced because of a lack of frustration due to constant equipment failure.
- Compliance to Construction Regulations of 2014 and Eskom's procedures and standard.

Inspections include, but are not limited to the following Civil/Structural Plants:

i. 6x Cooling towers.
ii. 2x Smokestacks/chimneys
iii. Flu ducts
iv. 6x Coal silo's
v. 8x Clarifiers
vi. 11x Licensed Dams
vii. Conveyor structures
viii. Boiler structures
ix. Turbine Structure
x. Railway
xi. Roofing
xii. Ash dumps

xiii. Station Roads
xiv. Water storage tanks
xv. Station drains.
xvi. Concrete channels
xvii. Station Fencing
xviii. Ash dump
xix. Sewage plants
xx. Tutuka Buildings
- General
- Main Building
- Offices
- Workshop and stores
- Fire Station
- Ablution blocks
- Visitor Centre
- Houses

xxi. Pipe work
xxii. Bridges and culverts
xxiii. Void Detection
xxiv. All Station channels i.e., concrete, earth, brickwork
xxv. Concrete structures
xxvi. Steel Structures

The major repairs/maintenance and rehabilitation will be handled as a separate project and will follow the Project Engineering Change Management Procedure (240-53114026) and Procurement and Supply Chain Management Procedure (32-1034). The Contractor is to submit scopes for the employer's assessment. Based on this assessment the employer will decided whether the repairs will be handled as a separate project or not.

The *Contractor* must be able to supply all tools, equipment, material, platforms, and access equipment to execute the preventative and corrective scope of work for all civil, structures, geotechnical, hydraulics, roads drainage and sewerage works.

### 4.3 Adhoc Civil Maintenance Repairs and/or Replacement

The *Contractor* will be responsible for, but not limited to, the execution of the following activities:

| **Infrastructure** | **Activity** |
|---|---|
| Buildings, Workshops, and Units | Ceiling Repairs and/or Replacements |
| | Window and Door Repairs and/or Replacement, including fire doors and main tiller roller doors |
| | Tiling Repairs and/or Replacement |
| | Ablution Repairs and/or Replacement |
| | Plumbing Repairs and/or Replacement |
| | Roof Repairs and/or Replacement |
| | Gutter Repair and/or Replacement |
| | Painting |
| MV Switchgear Rooms and Equipment Rooms | Ceiling Repairs and/or Replacement |
| | Waterproof sealing application |
| | Repair and/or Replacement of Fire doors |
| Roads (Asphalt) | Road Marking (painting)<br>• White Lines (Broken or unbroken)<br>• Yellow Lines (Broken or unbroken) |
| | Road Marking (signage) |
| | Pothole Repairs- Patching using 40mm thick medium continuously graded asphalt- Rate to include application of tack coat (ss60 or similar) and surfacing with continuously grade asphalt. |
| | Resurfacing Repairs- Resurfacing using 40mm thick medium continuously graded asphalt- Rate to include application of tack coat (ss60 or similar) and surfacing with continuously grade asphalt. |

| **Infrastructure** | **Activity** |
|---|---|
| Roads (gravel) | Resurfacing |
| | Grading |
| | Compaction |
| Roads (Rigid) | Road Marking (painting)<br>• White Lines (Broken or unbroken)<br>• Yellow Lines (Broken or unbroken) |
| | Road Marking (signage) |
| | Cracking sealing |
| | Crack filling |
| | Spalling repairs |
| | Treating buckled pavements. |
| | Pothole Repairs |
| | Resurfacing Repairs |
| | Road Repairs (surface and base) |
| | Milling of existing pavement layers and stockpile within 1km free haul |
| | Texturing and curing the concrete pavement |
| | Resealing of joints in existing concrete pavements |
| Concrete Structures | Concrete removal |
| | Hand packing |
| | Gunniting/Shotcrete |
| | Chemical anchoring |
| | Casting of concrete (15MPa/30MPa) as directed by the Engineer |
| Drainage (Open and closed) | As and when required repairs and/or replacements |

| **Infrastructure** | **Activity** |
|---|---|
| Tutuka & Thuthukani Sewage Treatment Plants | As and when required concrete repairs |
| Fencing | As and when required repairs and/or replacements |

### 4.4 Projected Maintenance Frequency

Table below details the baseline minimum maintenance frequency identified for the Civil infrastructure, at which the Contractor to execute adhoc civil/structural maintenance works inclusive of repairs and/or replacement works.

| **Civil/Structural Plant** | **Maintenance Frequency** |
|---|---|
| Buildings, Workshops, and Unit | 3 monthly inspections |
| | 3 monthly unblock gutters |
| Road & drainage system (Asphalt) | 3 monthly inspections |
| | Monthly inspections to be conducted during rainy season |
| Road & drainage system (Gravel) | 3 monthly inspections |
| | Monthly inspections to be conducted during rainy season |
| | Blading/Grading and levelling of the road to be. carried out once every two months or as and when needed |
| Rigid Roads & Drainage | 3 monthly inspections |
| | Monthly inspections to be conducted during rainy season |
| MV and LV Switchgear Rooms, and Equipment Rooms | 3 monthly inspections |
| Tutuka & Thuthukani Sewage Treatment Plant | 3 monthly inspections |
| Cooling towers | 3 monthly inspections |
| Water Treatment Plant Structures | 3 monthly inspections |
| 2x Smokestacks/chimneys | 6 monthly inspections |
| 6 x Flue ducts | 3 monthly inspections |
| 6x Coal silo’s | 3 monthly inspections |
| 8x Clarifiers | 3 monthly inspections |
| 11x Licensed Dams | 3 monthly inspections |

| | |
|---|---|
| Coal & Ash Conveyor structures | 6 monthly inspections |
| Boiler structures | 3 monthly inspections |
| Turbine Structure | 3 monthly inspections |
| Roofing | 3 monthly inspections |
| Ash dumps Channels | 3 monthly inspections |
| Drainage System (Surface and Subsurface) | 3 monthly inspections |
| | As and when required service detection |
| Sewage System | 3 monthly inspections |
| | As and when required service detection |
| Station channels i.e., concrete, earth, brickwork, etc. | 3 monthly inspections |
| Station Fence | Monthly inspections |
| Ablution facilities | 3 monthly inspections |
| | Monthly inspections to be conducted during rainy season |
| Bridges and culverts | As and when required inspections and repairs |
| | Monthly inspections to be conducted during rainy season |
| Void Detection | As and when required inspections and repairs |
| Steel structures (i.e., conveyor structures, dust handling plant, boiler building and turbine building) | 3 monthly inspections |
| Concrete structures (i.e., CW pump houses, sumps and buildings) | 3 monthly inspections |

### 4.5 Inspection report writing

All reports described in this section must be retained in both electronic and hardcopy format. Listedbelow are the minimum requirements for all inspection reporting:

i. The date of the inspection, name, and affiliation of the Engineer/Technologist.
ii. The names of plant personnel present during the inspection.
iii. What assets were inspected, and what portions of those assets were inspected. It must not be assumed that where a report records nothing there were no problems.
iv. The condition category for the elements of the plant assets inspected, using the categorization described in 240-99527377 (Inspection Manual for Civil Works at Eskom's Power Stations).
v. This must highlight any elements where the condition category according to Table 8-2 in the Inspection Manual for Civil Works at Eskom's Power Stations due to any deterioration mechanism was assessed by the Structural Engineer as 4 or 5.
vi. Recommended actions to be taken by the maintenance personnel at the plant. Where any structural member or portion of any structure is identified as 4 or 5, recommendations

regarding repairs and/or replacement must be provided. As the intention of the visual structural inspection does not include design remedial measures, the recommendation may simply be that an Engineer must be contracted to provide a design.

vii. Clearly labelled photographs identifying typical members and showing their condition.

viii. A written report must contain a summary of all remedial actions recommended, and these must be prioritized according to the priorities defined in Table 9-1 in the Inspection Manual for Civil Works at Eskom's Power Stations

ix. A written report must be submitted to the Plant Engineer within four weeks after the date of the inspection.

x. All safety critical findings must be communicated to the Plant Engineer immediately on completion of the engineering visual inspection.

xi. A brief written report of all safety critical findings must be submitted within one week after the date of inspection. Safety critical items include only those items that are considered by the Engineer to constitute an immediate hazard to the safety of personnel in the plant.

### 4.6 Training of staff

To continuously assist with the training of individuals and to share knowledge and experience through mentoring and coaching where Employer's resources will form part of the Contractor's inspection and adhoc Civil Maintenance team.

### 4.7 Meetings, Task Teams, and Committees

The Contractor's Professional Engineer or Technologist as when and as required must avail himself to representTutuka Civil Maintenance in the following:

- Plant Focus
- Production Meeting, if required by Auxiliary Plant Manager
- Technical Plant Meetings
- Project Meetings
- Meetings internal or external to Tutuka regarding Civil Maintenance related issues
- Modification Meeting
- Contractor Safety Meetings
- When and as required by the Employer

### 4.8 Other Duties

Other Duties include:

- Adhoc maintenance repairs and/or replacement, and adhoc maintenance reports by when and as required by the Employer. The costs with regard to other civil maintenance services will be reimbursable at the rates approved by the Service Manager and within prior consent of Eskom.

- Monitor plant indicators, to ensure that all structures are maintained in line with Tutuka and Eskom Generation standards and guidelines, thus ensuring long term plant health.
- Quality control of inspection documentation on behalf of Eskom

## 4.9 Other Works

### 4.9.1 Description of Works

The *Contractor* is responsible to supply skills to do the following work:

**a) Plumbing maintenance**

- Laying and joining of Steel, PVC, and HDPE pipes
- Opening, cleaning, and unblocking of sewage drains and manholes.
- Opening, cleaning, and unblocking of open channels and culvert drains
- Cleaning and installing of gutters, roof sheeting.
- All Plumbing maintenance

**b) Carpentry maintenance**

- Repairs to fire doors and furniture
- Hanging of doors, fitting of ceilings and new installations
- Repairs / replacement of installations such as ceilings, skirtings, doors, door locks etc.
- Roof repairs and replacements.
- Repairs of existing and installation of new dry walls as and when required.
- Repairs of existing office furnishings and installation of new workstations, cupboards and related notice boards/ white boards as required.
- All carpentry maintenance

**c) Bricklayer**

- Laying of floor ceramic tile, wall tiles and Marley tiles
- Building of brick walls including building with face brick
- Laying and breaking of concrete
- Doing structural repairs to concrete structure
- All Bricklaying maintenance

**d) Painting**

- Painting with normal paints and epoxy products
- All non-plant related painting of Offices and Utility Buildings

- All Road Marking and Signage.
- All Painting works.

### e) Fitter

- Packing of glands
- Fault findings on gearboxes, aerators, and minor repair on pumps
- Greasing, checking, changing and top up oil on sewage plant equipment.
- Repair, remove, replace, and renew pipes and valves.
- Any other task as instructed.
- All fitting maintenance (E.g., Laser alignment, etc.)

### f) Masonry duties

- Repairs and building modifications as required to buildings, paving, wall, and floor tiles etc.
- Repairs and building of sewerage and storm water manholes, catch pits and bund walls.
- Repairs and additions to concrete floors, paving, storm water channels etc. as and when required.

### g) Welding Duties (As and When required)

- Repairs and replacement of burglar bars, security gates etc.
- Repairs to all metal roller shutter and sliding doors at stores, logistics etc.
- Repairs / replacement of existing road signs, notice boards and the installation of new signs etc.
- Repairs and replacement of metal handrails, balustrades etc.
- Repairs to security gates, booms, and palisade fencing.
- Repairs to zippel filing system structures.
- Repairs to metal sub-station doors and locking mechanisms.
- Repairs to all parking garages, carports at Columbus Site and residential properties.
- Repairs to all heavy-duty metal shelving as required for metal samples at the laboratory.

### h) Glazier

- Measure, cut and install all types of glass, including wire glass, tempered glass and plexiglass.
- Remove and replace broken glass in wood, aluminium or mental framed openings.
- Fitting and cutting all Glass and glazing
- Repair and replace window hardware and door closures.
- Clean, maintain, adjust, calibrates window frames.

### i) Roof Maintenance

- Clearing of debris on the sheeting, gutters and downpipes.
- Wash all the roofing sheets and perform flood tests in preparation for the application of first coat and second coat.
- Repair or replace all damaged steel sheeting, gutters and downpipes as necessary.
- Apply waterproofing geotextile membrane to cover the whole roof and seal all roof sheeting overlap, nails, and roof sheeting repaired areas, as necessary.
- Apply modified epoxy primer and Supacrylic as required to seal roof.
- Repair, paint and replace all damaged false ceiling.

### j) Civil Engineering to do following inspections.

- Inspections to be done as per the *Employer's* inspection manual for Civil Works. Inspection report and estimated repair cost to be submitted for Employer to approve before commencing with the repairs.
- After inspections have been done repairs must be done on the faults found
- The resources must have the correct experience and qualification to do the required inspections.

### k) Land Surveyor

The Surveyor will be required to perform and report on the following:

- Topographical surveys
- Verification surveys on Contractor's survey work
- Design verification surveys for Engineering
- Volumetric verification surveys
- The extension and maintaining of the survey control network
- Survey data processing for establishing as-built conditions
- Maintaining standardized survey processes and systems
- Routine monitoring on the following:
  a. Dam Water Levels, Volume and Sedimentation (3 monthly surveys)
  b. Tutuka Power Station Ash Disposal Facility (3 monthly surveys)
  c. Tutuka Power Station Waste Landfill Site (3 monthly surveys)

Typical as and when required requests from the various departments will be as follows, but not limited to:

a. Eskom Engineering – Wide variety of requests including as-built verifications, verifications on new designs and drawings as well as clashes where engineering integration is required.

b. Projects Execution Team – Wide variety of requests including environmental spillage reports, surveys to support construction progress reports and surveys to support Tutuka construction activities.

c. Tutuka Quality Team – Construction progress and survey reports.

d. Tutuka Quantity Surveyors – Volumetric surveys reports

e. Monitoring and reporting on settlement of at-risk works

Survey work will be executed once a Survey Request form comprising of a list of Tasks to be performed is completed by the requester and approved by the Service Manager or the Engineering Manager. The Employer will issue a consultant as and when required with an agreed Task Order consisting but not limited to the following:

- Task Schedule with detailed description of the work in the Task
- Price list of items in the Task Schedule
- Starting and completion dates for the Tasks
- Total of the Prices for the Tasks

### 4.10 Required Machinery, Equipment, and Materials

The Contractor must have all the necessary equipment for the visual and detailed inspections.

The *Contractor* is responsible to supply the following tools, equipment and machinery to enable the *Contractor t*o carry out the work as per contract. The required machinery is not limited to the following list (Bidder to refer to the BOQ).

#### 4.10.1 Tools and Equipment

i. High powered and high-resolution camera for structural inspections

ii. 1.5m spirit level

iii. Diesel Powered Generator 5kv and lighting system.

iv. Laser measuring device.

v. High pressure cleaner

vi. Laser measuring device.

vii. Push wheel measuring device.

viii. Tape measures

ix. Digital callipers
x. Safety harness
xi. Wheelbarrow
xii. Trowel
xiii. Groove cutter
xiv. Polishers
xv. Grinders
xvi. Schmidt hammer
xvii. Drones for tall structure inspection (As and when required)
xviii. Geological hammer
xix. Dumping level
xx. Measuring staff
xxi. Compressors
xxii. Rammer compactor
xxiii. All hand tools including socket set and set of rings flat spanners
xxiv. Heavy duty hand Grease pump
xxv. Walk-behind vibrating Roller.
xxvi. Concrete/cement mobile drum mixer
xxvii. Vibratory plate compactor
xxviii. Concrete vibrator/poker
xxix. Concrete Cutter
xxx. Plumbing, carpentry, and bricklaying tools
xxxi. Welding machine
xxxii. Fuel driven Water pump including suction and discharge pipes.
xxxiii. Spades, rakes, picks and shovels.
xxxiv. All Electric grinders
xxxv. Electric jack hammer including bits and drills.
xxxvi. Electrical planer, electrical hand saw and belt sander.
xxxvii. Galvanised Pipe thread cutter and pipe vice

xxxviii. Step ladders

xxxix. Portable safety barricading

xl. All Drilling machines.

xli. Electrical extensions 220VAC

xlii. Drain rods.

xliii. Chemical anchor equipment

xliv. Painting rollers, brushes and trays

The costs with regard to special services such as access to higher areas, laboratory testing, and land surveying work will be reimbursable at the rates approved by the Employer's Representative and with the prior consent of the Employer.

### 4.11 General Requirements for Contractor to adhere to

a. Contractor to be provide all machinery, equipment, and materials required to execute the scope of work.
b. Call-out response time is 1 hour and team roster to be handed in one week upfront.
c. Team to consist of *Contractor* working supervisor and required skilled persons needed to execute work.
*d.* The *Contractor* is responsible to supply transport for his staff on site as per the *Employer's.* requirement. Staff will not be allowed to walk from one job to another.
e. Minimum of 2 LDVs and Maximum of 5 LDVs will be required to transport staff, equipment, and spares / materials on site.
f. The *Contractor* is responsible for submission of health and safety file prior to commencing of work.
g. The *Contractor* is responsible for maintaining of the *Contractor's* health and safety file and will be audited on a frequent basis.
h. The *Contractor* is responsible for the induction of their employees.
i. All work undertaken must be done in accordance with workflow service.
j. Permit to work/LAR and workers register to be completed.
*k.* Application for Isolation Permit to be arranged by the Contractor's plant safety authorised Supervisor.
l. The *Contractor* must provide proof of experience and certified qualifications and medical certifications of all personnel.

## 5. Testing Requirements and Procedures

The Contractor shall conduct all concrete works, geotechnical works and structural works testing in accordance with the latest standard methods and procedures as outlined by the appropriate authorities (B.S/ Euro Code equivalent, A.S.T.M, A.A.S.H.T.O, I.S.R.M, S.A.B.S / S.A.N.S).

The *Contractor* is responsible for the transportation of all samples to the laboratory as well as the testing thereof.

Any other field testing that may be required in support of the objectives of the design must be carried out with notification to the *Employer's* geotechnical/civil engineer.

## 6. Quality Control Assurance

The Contractor's Civil Engineer or Technologist will when and as required be able to perform quality control and support Employer during execution of Civil Maintenance works. Contractor's Civil Engineers or Technicians mustbe competent with NEC suite of contracts.

The Contractor shall develop and implement a system for quality verification records, including site investigation Plans, Record Books (Data Books) as specified in the Tutuka Quality Specifications.

Routine checks and inspections to be conducted as per Contractor's Quality Control Plan (QCP), illustrating defined intervention assessment points. The Contractor submits QCP for the Employer to review and approve before commencement of any works. The QCP include witness, hold, test, and inspection points.

Before commencement of the works, the Contractor compiles and present detailed technical proposal outlining execution strategy, plan/programme and control measures associated with the required works. Contractor to present this during the kick-off meeting for Employer to approve before commencement of any works.

## 7. Configuration Management

### 7.1 Documentation

All documents supplied by the *Contractor* shall be subject to Eskom's approval. The language of all documentation shall be in English. The *Contractor* shall include the *Employer's* drawing number in the drawing title block. This requirement only applies to drawings developed by the *Contractor* and his Subcontractors. Drawing numbers will be assigned by the *Employer* as drawings are developed.

All Documentation and Data books shall be completed, delivered, and approved when the Contractor applies for final inspection at repair completion and handed over to the Employer at takeover application.

All project documents must be submitted to the delegated Employer's Representative with transmittal note according to Project / Plant Specific Technical Documents and Records Management Work Instruction [23]. In order to portray a consistent image, it is important that all documents used within the project follow the same standards of layout, style and formatting as described in the Work Instruction. The *Contractor* is required to submit documents as electronic and hard copies and both copies must be delivered to the *Eskom Representative* with a transmittal note.

The detailed technical report in conjunction with the drawings shall contain sufficient information to enable a complete re-analysis of the operation and maintenance conditions, and modification/repair/replacement/refurbishment of Civil infrastructures.

## 7.2 Drawing Submission

The Contractor to produce and submit drawings as and when required once work has been completed. Drawing submission includes but not limited to layout and detail drawings. Drawings to be submitted to the Employer for approval.

The creation, issuing and control of all Engineering Drawings will be in accordance with the latest revision of Engineering Drawing Standard [24]. Drawings issued to Eskom will be a minimum of one hardcopy and an electronic copy. All Contractors are required to submit electronic drawings in Micro Station (DGN) format, and scanned drawings in pdf format. No drawings in TIFF, AUTOCAD or any other electronic format will be accepted. Drawings issued to Eskom may not be “Right Protected” or encrypted,

## 7.3 DOCUMENT RETURNABLES

The Contractor shall produce and submit a project plan, project quality plan, organogram, detailed method statement and testing procedure, QCP, safety file for approval prior to the commencement of work. The Contractor to conduct induction and medicals prior to commencement of work.

These documents should contain the following information, which is not limited to: -

a) **Programme**: The programme to specify the different activities and associated timelines applicable for the execution of the required works aligning with each task order issued by the Employer

b) **Quality Plan**: Highlight the activity or standard which shall be used to ensure quality materials and workmanship for every task order issued by the Employer.

c) **Organogram**: Indication of the core staff who will be involved in the execution of the required works for every task order issued by the Employer. Names and qualifications, together with ID and CV’s to be included.

d) **Method Statement**: Detailed method statement specifying skills, labor, materials, tools, machinery, equipment and testing procedures applicable for the execution of the required works, aligning with every task order issued by the Employer.

e) **QCP**: Must indicate relevant hold, surveillance and witness points for the Contractor and Employer which align with every task order issued by the Employer.

Contractor to provide the above documents for Employer to approve before commencement of any works, aligning with task order issued by the Employer.

## 8. Acceptance

This document has been seen and accepted by:

| Name | Designation |
|---|---|
| | |
| | |
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| | |

## 9. Revisions

| Date | Rev. | Compiler | Remarks |
|---|---|---|---|
| 11 May 2022 | 1 | | Draft issued for Review |
| 06 June 2022 | 1.0 | | Final Document |
| 02 December 2022 | 2.0 | | Final Document with changes |
| 10 August 2023 | 3.0 | | Final Document with changes |
| 10 April 2024 | 4.0 | | Final Document with changes |
| 08 August 2024 | 4.0 | | Final Document with changes |

## 10. Development Team

The following people were involved in the development of this document:

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## 11. Acknowledgements

- N/A

## 12. APENDIX A-DRAWINGS

### 12.1 Sewage Plant

[1]. 0.61_02042_REV_2 - Tutuka sewage plant clarifier
[2]. 0.61_02776_REV_2 - Sewage maturation pond
[3]. 0.61_02776_REV_2 - Tutuka sewage plant maturation pond
[4]. 0.61_09143_REV_0 Tutuka sewage inlet
[5]. 0.61_12435_REV_1 Thuthukani sewage inlet
[6]. 0.61_12437_REV_1 - Tutuka sewage surge tank
[7]. 0.61_23013_REV_0 - Thuthukani sewage plant clarifier
[8]. 21.61/55323_Sewage drains system P&ID
[9]. 21.61/55322_ Tutuka Sewage treatment & water recovery system P&ID

### 12.2 Stormwater/Drainage System

[1]. 0.61/00077 Rev 8. Storm Water Drainage Layout
[2]. 0.61/00076 Rev 31 Dirty Water Drainage
[3]. 0.61/00133 Rev 3 Drainage GA. Road. Dirty. Storm Water. Sewer
[4]. 0.61/00134 Rev 1 Dirty Water Drainage. North of Terrace.
[5]. 0.61_13921_REV_2-Ash dump clean water dam south
[6]. 0.61_55339 Common Plant CCW Drainage System P&ID
[7]. 21.61_55329 Common Plant West Water Treatment Plant Dirty Drains System P&ID
[8]. 0 61/55330 Common Plant Station Drain System PID0.61/00077 Rev 8. Storm Water Drainage Layout
[9]. 0.61/02821/REV 16 WTP Drains and Manholes
[10]. 0.61/02822/REV 7 WTP Drainage and Manhole Detail
[11]. 0.61/04099/REV 1 West Pipe Trench Layout
[12]. 0.61/55328 Demin Regen Effluent Drains P&ID

### 12.3 Roads Drawings

[1]. 0.61_00310_REV_2 - Tutuka Power Station Road Key Plan
[2]. 0.61_00311_REV_2 - Main Access Road Longitudinal Section
[3]. 0.61_00323_REV_1 - Typical Cross-Section and Pavement Make-Up
[4]. 0.61_00680_REV_8 - Tutuka Power Station Roads - Layout Plan Within Main Station Area
[5]. 0.61_00683_REV_2 - Tutuka Power Station Roads - Longitudinal Section Main Access Road
[6]. 0.61_00717_REV_3_SHT_1 - Tutuka Power Station Roads Typical Cross-section
[7]. 0.61_00718_REV_1_SHT_3 - Tutuka Power Station Roads Typical Cross-section
[8]. 0.61_00721_REV_0 - Tutuka Power Station Roads Typical Kerb Inlet Details Type 2A & 2B
[9]. 0.61_00722_REV_0 - Tutuka Power Station Roads Typical Kerb Inlet Details Type 3A & 3B
[10]. 0.61_00729_REV_0 - Tutuka Power Station Roads Typical Kerb Details
[11]. 0.61_00731_REV_1 - Tutuka Power Station Roads Layout Plan for Road Signs and Markings within Main Station Area
[12]. 0.61_00734_REV_8 - Tutuka Power Station Roads Layout Plan for Service Ducts
[13]. 0.61_00738_REV_6 - Tutuka Power Station Roads Layout Plan for TelecommunicationServices
[14]. 0.61_00744_REV_16 - Tutuka Power Station Roads Layout Plan for Main Terrace RoadDrainage
[15]. 0.61_08838_REV_0 - Coal Stockyard layout Proposed Arrangement of Roads and SecurityFence

### 12.4 Coal Plant Drawings

[1]. 0.61_08888_REV_2 - Silo 1 Slide Walls Concrete Layout
[2]. 0.61_09661_REV_1_SHT_1 - Silo 2 Slide Walls Reinforcement Details
[3]. 0.61_09662_REV_0_SHT_2 - Silo 2 Slide Walls Reinforcement Details
[4]. 0.61_09665_REV_1 - Silo 1 Operation Floor Concrete and Reinforcement Details
[5]. 0.61_10011_REV_1 - Silo 4 & 6 Slide Walls Concrete Details and Sections
[6]. 0.61_10017_REV_0 - Silo 6 Slide Walls Reinforcement Details
[7]. 0.61_10299_REV_2 - Silo 2 & 4 Operation Floor Concrete and Reinforcement Details
[8]. 0.61_10456_REV_0 -Silo 3 & 5 Slide Walls Concrete Details and Sections
[9]. 0.61_10917_REV_1 - Silo 6 Operation Floor Concrete and Reinforcement Details
[10]. 0.61_10918_REV_0 - Silo 3 & 5 Operation Floor Concrete and Reinforcement Details
[11]. 0.61_04113_REV_2 - Silo Feed Conveyor General Arrangement
[12]. 0.61_04525_REV_1 - Silos Stainless steel liners Details
[13]. 0.61_04866_REV_0 - Silo Walls Typical Reinforcement Details
[14]. 0.61_10156_REV_3_SHT_8 - Conv N101 & N103 Make-up Section
[15]. 0.61_10157_REV_5_SHT_1 - Gravity Take-up Frames Conv N101 & N103
[16]. 0.61_10157_REV_5_SHT_2 - Pier 7 Take-up Guides and access Conv N101 & N103
[17]. 0.61_10157_REV_6_SHT_2 - Pier 7 and Conv 101 & 103 Take-Up Guides
[18]. 0.61_10585_REV_0 - Silo 6 General Arrangement

[19]. 0.61_10917_REV_1 - Silo 6 Operation Floor Concrete and Reinforcement Details
[20]. 0.61_11253_REV_2 - Silo 6 Internal Ground Slab Details
[21]. 0.61_11621_REV_SHT_1 - General Arrangement of Steelwork on top of Silo 6
[22]. 0.61_04524_REV_0 - Silos 1-6 Concrete Hopper Details
[23]. 0.61_07143_REV_0 - Silo 1-6 Concrete Foundation Details
[24]. 0.61_07144_REV_0 - Silo 1-6 Foundation Reinforcement Details
[25]. 0.61_07145_REV_0 - Silo 1-6 Foundation Bending Schedule [26].
0.61_07960_REV_1 - Silo 1-6 Concrete Foundation Details
[27]. 0.61_10910_REV_3_SHT_1 - Silos 1-6 Concrete Hopper Reinforcement Details
[28]. 0.61_10911_REV_0_SHT_2 - Silos 1-6 Concrete Hopper Reinforcement Details
[29]. 0.61_10912_REV_2_SHT_3 - Silos 1-6 Concrete Hopper Reinforcement Details
[30]. 0.61_10913_REV_2_SHT_1 - Silo 1-6 Concrete Hopper Bending Schedule
[31]. 0.61_10914_REV_1_SHT_2 - Silo 1-6 Concrete Hopper Bending Schedule
[32]. 0.61_04128_REV_1 - Silo 1-6 Concrete Foundation Details
[33]. 0.61_04522_REV_0 - Silo 1-6 Foundation Reinforcement Details
[34]. 0.61_04527_REV_0 - Silo 1-6 Structural Steel Roof

### 12.5 MV Switchgear Rooms & Equipment Rooms

[1]. 0.61/3967 Rev 3 Unit 1 Equipment Room elevation section
[2]. 0.61/3966 Rev 5 Unit 1 Equipment Room plane section
[3]. 0.61/5031 Rev 9 Unit 2 Equipment Room elevation section
0.61/5032 Rev 5 Unit 2 Equipment Room plane section
[5]. 0.61/1230 Rev 3 Unit 3 Equipment Room elevation section
[6]. 0.61/5375 Rev 5 Unit 3 Equipment Room plane section
[7]. 0.61/5374 Rev 5 Unit 4 Equipment Room elevation section
[8]. 0.61/12528 Rev 5 Unit 4 Equipment Room plane section
[9]. 0.61/13068 Rev 4 Unit 5 Equipment Room elevation section
[10]. 0.61/13067 Rev 4 Unit 5 Equipment Room plane section
[11]. 0.61/15085 Rev 4 Unit 6 Equipment Room elevation section
[12]. 0.61/15085 Rev 6 Unit 5 Equipment Room plane section
[13]. 0.61_01182_REV_6 MV Switchgear Room 1 & 2
[14]. 0.61_01438_REV_10 MV Switchgear Room Sectional Layout
[15]. 0.61_05039_REV_3 LV Switchgear Room

### 12.6 Buildings & Workshops

[1]. 0.61_06174_Admin first floor
[2]. 0.61_06175_Admin second floor
[3]. 0.61_06176_Admins 3 and 4 floor
[4]. 0.61_06177_Admin 5 floor
[5]. 0.61_06179_Admin roof plan
[6]. 0.61/15014 Workshop Gutters
[7]. 0.61_12142_REV_1 WORKSHOPS AND STORES COLUMNS 15-23 UPPER ROOF PLAN
[8]. 0.61_12141_REV_1 WORKSHOPS AND STORES COLUMNS 8-15 UPPER ROOF PLAN
[9]. 0.61_12140_REV_1 WORKSHOPS AND STORES COLUMNS 1-8 UPPER ROOF PLAN
[10]. 0.61_12139_REV_2 WORKSHOPS AND STORES COLUMNS 15-23 UPPER FLOOR LOWER ROOF PLAN
[11]. 0.61_12138_REV_4 WORKSHOPS AND STORES COLUMNS 8-15 UPPER FLOOR LOWER ROOF PLAN
[12]. 0.61_12137_REV_3 WORKSHOPS AND STORES COLUMNS 1-8 UPPER FLOOR LOWER ROOFPLAN