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

Grootvlei Power Station is situated close to the town of Balfour in Mpumalanga province. The Power Station consists of six units with a capacity of 200 MW each and the total installed capacity is 1200 MW. The first of six units was commissioned in 1969. Three of the units were mothballed in 1989 and the rest in 1990. Grootvlei was one of the power stations being recommissioned. The return to service of the first unit occurred during 2007 and all six units were recommissioned during 2010. The power station is currently 51 years old.

Concrete is a durable construction material and, if designed and placed properly, will give long service under normal conditions. However, many concrete structures are deteriorating, often prematurely, and require remedial measures to reinstate their safety and/or serviceability. Consequently, the need for repair and protection has grown considerably in recent years.

Following the condition assessment performed, there are no serious defects discovered on the concrete walls. However, the top rim refractory brick walls exhibit serious cracks which are a cause for concern.

Therefore, this document provides the scope of works relating to the refractory bricks repair work, which will be performed by the *Contractor*. Refer to figure 1 below illustrating a cross-section of the bricks.

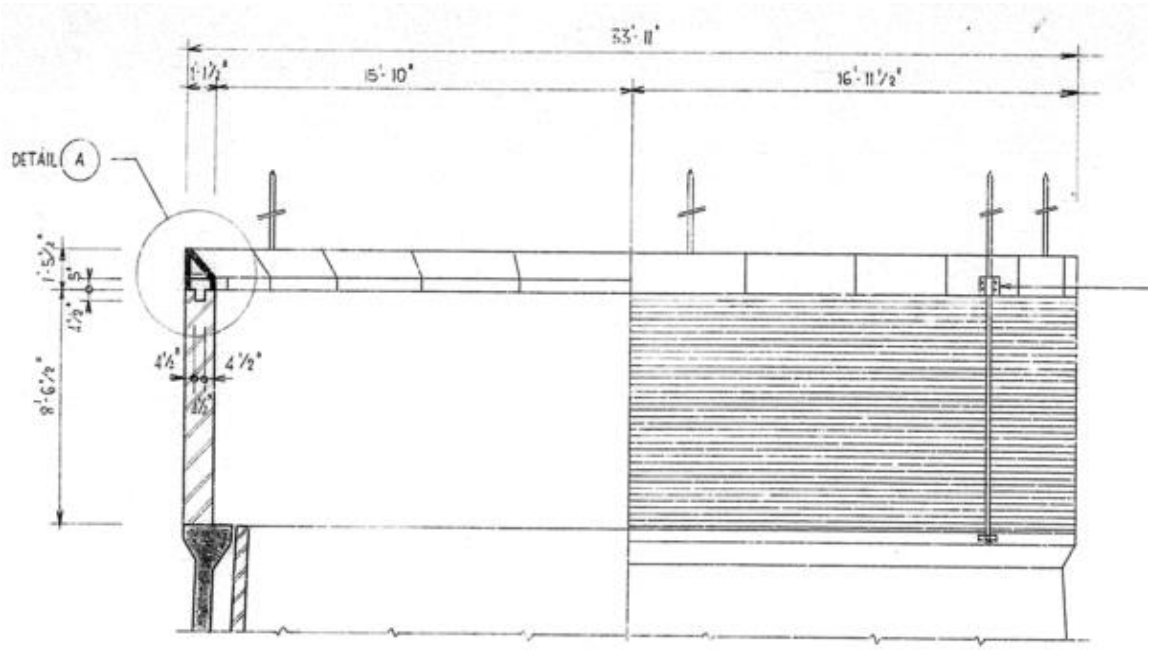

Figure 1: Top Rim Wall Refractory Bricks

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

The project objective is the Regain the overall structural integrity of the chimney stacks top rim so that operation of the plant can continue until the refurbishment project can commence/be executed. and also prevent collapse and falling of refractory bricks.

(Refer to appendix for the nature of defects)

1.3 Interpretation and terminology

The following abbreviations are used in this Works Information:

Abbreviation	**Meaning given to the abbreviation**
AFC	Approved for construction
OBL	Outside battery limits
CIDB	Construction Industry Development Board
ECSA	Engineering Council of South Africa
CE	Compensation Event
UIF	Unemployment Insurance Fund

2 Management and start up.

2.1 Management meetings

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

Title and purpose	Approximate time & interval	Location	Attendance by:
Kick off meeting	Immediately after contract award	Grootvlei Power Station or virtual	*Employer*, *Contractor*
Risk register and compensation events	Monthly or anytime when a risk arises or when CE is raised	Grootvlei Power Station or virtual	*Employer*, *Contractor*
Overall contract progress and feedback	Weekly	Grootvlei Power Station or virtual	*Employer*, *Contractor*
Contractor SHE Forum and all station SHEQ related meetings	Monthly or when the need arises	Grootvlei Power Station or virtual	*Contractor*

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

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

2.2 Documentation control

All communication between the Employer and the Contractor shall be via formal letters sent on Email.

Upon completion of the works, the Contractor shall submit to the Employer As built drawings in a format indicated by the *Employer*. The drawings shall be submitted with a transmittal numbering each drawing as per number sequence provided by the Employer. This number sequence will be provided to the Contractor once the number of drawings to be submitted has been confirmed.3 soft copies and 3 filed hard copies of the data book must be submitted.

2.3 Health and safety risk management

The Contractor shall adhere to all OHS Legal requirements, OHS corporate policies, standards and procedures to which Eskom subscribes and as indicated on the issued SHE specification.

The Contractor shall, when coming on site (Grootvlei Power Station), abide by the Life Saving Rules. These will be provided by the Employer on the start of the contract.

The Contractor shall also abide by the Grootvlei High risk Safety, Health, and Environmental Specifications 240-73418055, which will also be provided by the Employer.

The Contractor shall, when coming on site (Grootvlei Power Station), make use of approved personal protective clothing such as overalls, safety shoes, safety hat, safety goggles, dust mask and gloves when necessary.

The Employer follows an Incident management procedure (32-95) that includes the investigation of all accidents involving personnel and property. This is done with the intention of introducing control measures to prevent a recurrence of the same incidents. The Contractor is expected to fully co-operate to achieve this objective. The Contractor will report any incident and accidents to Grootvlei Power Station within 24 hours. This report does not relieve the Consultant of his legal obligation to report certain incidents to the Department of Labour, or to keep records in terms of the Occupational Health and Safety Act, and Compensation for Occupational Injuries and Diseases Act.

The Contractor implements a safety plan and maintains the safety system until the completion of the whole of the works. The plan, will as a minimum, contain PPE information, written safe work procedures, job specific risk assessments, safety meetings, etc. The plan will be to the Employer's satisfaction and will be accepted prior to the commencement of any work.

The Contractor will be subject to periodic audits by the Employer to ensure compliance with the plan. Any deviations will be corrected to the Employer's satisfaction.

The Service Manager has the right to stop the Contractor's work activities which, in the opinion of Service Manager, is un-safe. The Contractor may only continue with work activities when all safety deficiencies have been corrected to the Service Manager's satisfaction. The Contractor shall have no claim against the Employer in respect of delay due to the above.

2.4 Environmental constraints and management

The Contractor must familiarise themselves with the waste management policies and procedures (240-28981069 and 240-29828394 respectively) within 14 days from date of contract awards, and must comply with the environmental criteria and constraints stated in the policy document. The requirements include the identification, collection, storage, transportation and disposal of waste. Hazardous waste shall be disposed off in line with the applicable environmental legislation. It is important to note that all spillages must be cleaned immediately and reported to the service manager as soon as possible. It is the responsibility of the polluter to clean all spillages and for the rehabilitation of the polluted land and the cost associated with that.

2.5 Quality assurance requirements

- The Contractor implements a quality system and maintains the quality system until the completion of the whole of the Works. The system, will as a minimum, comply with the provisions of the ISO 9001 and the Supplier Contract Quality Requirements Specification 240-105658000/ QM-58. The system will be to the Employer's satisfaction and will be accepted prior to the commencement of any work on site.
- The Contractor is responsible for defining the level of Quality Control Plan (QCP) or inspections to be imposed. The level should be based on criticality of plant and material and must be submitted to the Service Manager for acceptance prior to the commencement of any work activities.
- The Contractor compiles a data package of relevant drawings, test certificates, design checks and other technical information for each section of work or Task Order which is to be reviewed and signed off by the Supervisor or Employer Representative.
- The Contractor will be subject to periodic audits by the Employer in order to ensure compliance with the system. Any deviations will be corrected to the Employer's satisfaction.
- The Service Manager has the right to stop the Contractor's work activities which, in the opinion of Service Manager, does not meet the requirements of the system and will have a detrimental effect on plant performance.
- The Contractor may only continue with work activities when all deficiencies have been corrected to the Employer's satisfaction. The Contractor shall have no claim against the Employer in respect of delay due to the above.
- The Contractor ensures that all plant and materials for the Works are to the standard and quality accepted by the Employer and ensures that they are suitable for the purpose intended by the manufacturer.
- The Contractor will work according to the Employer's standards, specifications, guidelines and procedures. Where no standards, specifications, guidelines and procedures are available, the Contractor will work according to the Generation Quality Manual. Where possible, standards will be reflected in the Task Order.
- The contractor will ensure that they facilitate effective and efficient management of incident from the moment it occurs, until it can be audited and mitigated.
- In case the contractor damages the plant whilst executing the scope, the contractor shall rectify the plant and the contract can be terminated thereafter.

2.6 Invoicing and payment

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

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

- Name and address of the *Contractor* and the *Project Manager;*
- The contract number and title;
- *Contractor*'s VAT registration number;
- The *Employer*'s VAT registration number 4740101508;
- Description of service provided for each item invoiced based on the Price List;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

Add procedures for invoice submission and payment (e. g. electronic payment instructions)

2.7 Insurance provided by the *Employer*

As stated for "Format A" available on
http://www.eskom.co.za/Tenders/InsurancePoliciesProcedures/Pages/EIMS_Policies_From_1_April_2014_To_31_March_2015.aspx

3 Introduction-*Employer's* design

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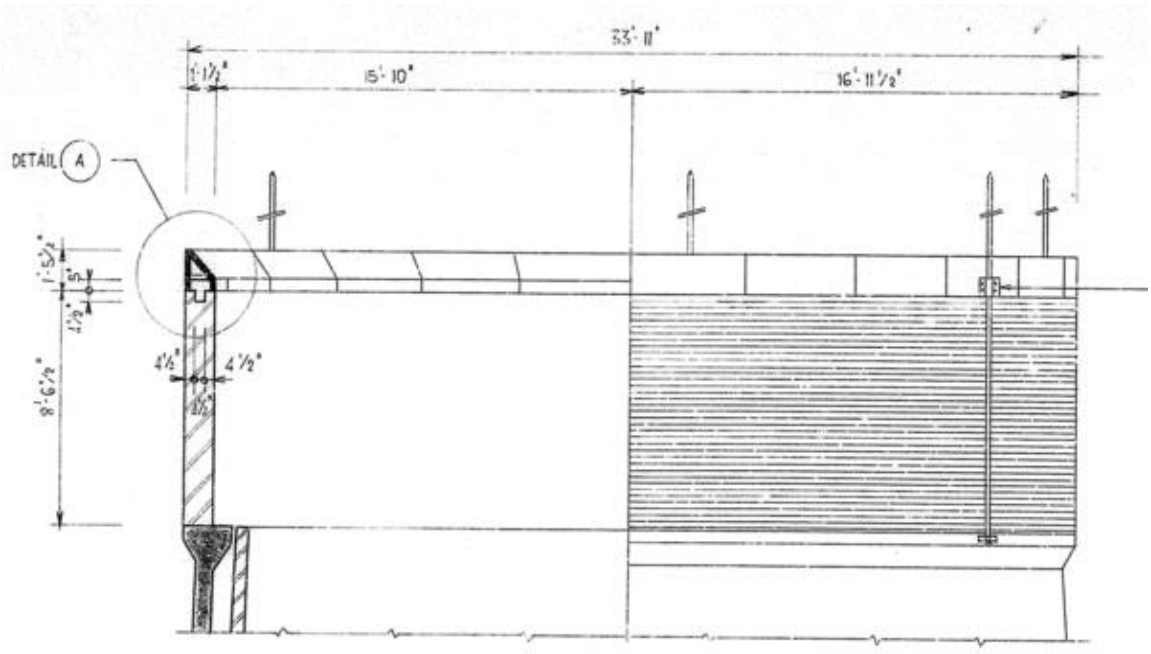

Figure 1: Top Rim Wall Refractory Bricks

4 Supporting Clauses

4.1 Scope

This document covers the scope of works relating to refractory bricks repairs on the chimney stacks, where the works are to be performed by the *Contractor*. This document outlines all the requirements required to complete the repair works.

4.1.1 Purpose

The purpose of this document is to outline the minimum requirements and the scope of activities required from the *Contractor* for the execution of the works.

4.1.2 Applicability

This document applies to Grootvlei Power Station and all other stakeholders involved in the project.

4.1.3 Normative/Informative References

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

4.1.4 Normative

[1] Eskom Health, Environment and Quality (SHEQ) Policy 32-727

[2] ISO 9001 Quality Management Systems

[3] National Environmental Management Act (NEMA) 107 of 1998

[4] Construction Regulations, 2014

[5] Occupational Health and Safety Act No. 85 of 1993

[6] 240-99527377: Inspection Manual for Civil Works at Eskom's Power Station

[7] SANS 10400: The application of the National Building Regulation

[8] 240-56364545: Structural Design and Engineering Standard

4.1.5 Informative

[9] Condition Assessment Report

4.2 Definitions

N/A

4.2.1 Disclosure Classification

Controlled disclosure: **controlled disclosure to external parties (either enforced by law, or discretionary).**

4.3 Abbreviations

Abbreviation	Description
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
MPa	Megapascal
ITP	Inspection Test Plan
SANS	South African National Standards
WTP	South Smoke Stack
BOQ	Bill of Quantity

4.4 Roles and Responsibilities

Grootvlei Power Station will be responsible for appointing an appropriate *Contractor* to perform the repairs as indicated in this document.

The *Contractor* shall be responsible to deliver work according to specification

The *Engineer* shall monitor construction quality during construction

4.5 Process for monitoring

The *Contractor* submits a quality control plan for approval by *Employer*.

4.6 Related/Supporting Documents

Condition Assessment Report

5 EMPLOYER'S OBJECTIVES AND PURPOSE OF THE WORKS

The objective and purpose of the works is to:

- Regain the overall structural integrity of the chimney stacks top rim so that operation of the plant can continue until the refurbishment project can commence/be executed.
- Prevent collapse and falling of refractory bricks.

(Refer to appendix for the nature of defects)

6 Scope of Works to be caried out in the South Smoke Stack

6.1 description of the works

The *Contractor* shall adhere to the South African Environment Protection Act, the Waste Management code of practice and the South African Occupational Health and Safety Act No. 85 (OHS Act), the regulations promulgated thereunder and Eskom Health, Environment and Quality (SHEQ) Policy 32-727 for demolition, removal, separation and disposal of scrap, waste and hazardous materials.

Each of the two Chimney Stacks is founded on pilled foundations with shells constructed using a ring formwork and the pouring was done in multiple lifts of approximately 9 meters, with internal and external reinforcement, adding to a total of approximately 150 meters of height.

The shell concrete cover to the reinforcement according to the design drawings is of 50 mm. Shell internals are cladded with Refractory Dusty Bricks which are supported by reinforced concrete corbels. The Chimney

Stack top ring wall is designed and constructed with Refractory Bricks. During the assessment walkdown, it was observed that severe cracks have occurred around the periphery of the top rim.

The work shall consist of:

- Removal and disposal of loose debris.
- Repairing of refractory brick wall.
- Repairing of access cat ladder to a usable condition.
- Procurement of all materials required to complete the works.
- Provide all necessary equipment, including safety equipment, tools and materials required for the works.
- Ensure that surrounding equipment and structures are not damaged during execution.
- Supplying material and the mixing and placing of the chosen repair product as described on the product manufacturer's application manual and this specification.
- Supplying, fabricating, constructing, maintaining and removing temporary works, including false work and formwork.
- The quality control (QC) testing of all material.

6.2 employers design

The Employer has conducted a visual assessment of the chimney stacks to assess the extent of the deteriorated of the structures. The following was observed:

I. Heat resistance refractory bricks have severely cracked.
II. Steel cat ladders are unsafe for use, with evidence of corrosion.
III. Delamination of the top ring grout.

6.3 contractor's requirements

1. The Contractor takes full accountability and liability for the works as described in the scope of works.
2. The Contractor is required to confirm and verify all information supplied by the Employer prior to being used in the works.
3. The Contractor adheres to all design requirements, codes of standards and regulations stated in this scope of works and any other requirements applicable for the successful completion of works.
4. Any discrepancy or ambiguity between the Employer's Specifications or requirements is to be immediately brought to the attention of the Project Manager for clarification.
5. Where the Contractor requires additional information to design or install certain components of the Plant, the Contractor notifies the Project Manager of the Contractor's requirements a minimum of one (1) week before continuing with the works.
6. Any damages to existing infrastructure and services resulting from the works is repaired/ made good by the Contractor at his own expense. This is subject to the Contractor supplying a method

   statement for the repair works to the Project Manager for review and acceptance prior to conducting the repair works.
7. The Contractor quantifies the limitations and risks in the form of a detailed risk assessment, which is reviewed and accepted by the Project Manager prior to commencing with construction work

6.4 CONSTRUCTION

6.4.1General

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 National Building Regulations and SANS 10400 for all works.

2. Submits a comprehensive method statement (including a comprehensive risk assessment) detailing the proposed methods for the entire works to the *Project Manager* for acceptance prior to the start of the works. Refer to Section 4.4.5 for method statement requirements.

3. Submits a project specific safety file to the *Project Manager* for comments / acceptance.

4. Submits a detailed level 3 schedule for the *works* to the *Project Manager* for acceptance after contract award.

5. Takes all necessary precautions to ensure that none of the existing structures / facilities not forming part of the *works* is damaged during construction. The *Contractor* is liable for all damages that may occur and repairs are to be done at no additional cost to the *Employer*.

6. The *Contractor* disposes of all waste material at a waste disposal site to be approved 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 *Project Manager*.

7. Continuously monitors the conditions within the working and surrounding areas for any hazardous substances or situations, and in such case, the *Contractor* is required to take necessary precautionary measures.

8. Manages access to the working areas and the Site.
9. Manages activities on Site to ensure that no interference takes place between the *works* and that of others.
10. The *Contractor* is responsible for the design and erection of all the temporary supports required for the *works*. In addition to the aforementioned, the *Contractor* adheres to the following:

- The *Contractor* is restricted to the designated working areas.
- The *Contractor* is not to enter any other areas and ensures that his employees abide by the applicable regulations.
- The *Contractor* performs all hoisting and lifting by qualified riggers.
- The *Contractor's* Equipment does not impair the operation or access to the plant/building
- The *Contractor* provides any temporary or expendable materials required for the storage of materials.
- The *Contractor* safeguards and secures all items whilst in the *Contractor's* custody and control, until completion of the works.
- Plant and equipment not forming part of the *works* are not to be modified without written permission from the *Project Manager*. Modification in this sense includes, but is not limited to the following:
  - Welding onto existing plant,
  - Drilling into structural steel or concrete,
  - Cutting or removing
  - Loading adjacent structures.

11. The Contractor ensures that a complete QCP, risk assessment, method statement and ITP's, where applicable are submitted to the *Project Manager* for review and acceptance before the works can commence. During reviews of the ITP's, the *Project Manager* provides the necessary intervention points.

12. All items that are assembled and constructed off site are listed and provided to the Pro*jec*t *Manager*. From this, an ITP is developed between the Project Manager and the *Contractor* to determine the intervention points.

6.4.2 Construction, Erection and Monitoring

1. The *Contractor* is responsible for the construction of all *works* in accordance with the accepted designs, drawings, and specifications.

2. The *Contractor* is responsible for the safety of all personnel involved in the *works* as well as the safety of all personnel at Grootvlei Power Station affected by the construction of the *works*.

3. The *Contractor* is required to confirm all site dimensions, levels and cast-in items positions on site prior to any fabrication of steel members.

4. The *Contractor* notifies the *Project Manager* of any defects that have occurred or are foreseen in order to reduce further damages that may occur.

5. The *Contractor* is responsible for the design, erection, maintenance, and removal of all temporary works required for the execution of the *works*. Refer to Section 4.4.1 for requirements for temporary works.

6. The *Contractor* takes full professional accountability and liability for all temporary items required for the execution of the works.

6.4.3 Plant and Material Supply

1. The *Contractor* provides all tools and equipment for the handling of material and the proper execution of the works.
2. The *Contractor* takes reasonable care to ensure that equipment used does not cause damage to any existing infrastructure. In the event that such damages do occur to the surrounding infrastructures, the *Contractor* is responsible for repairing such damages and is liable for all costs associated with the repairs.
3. The *Contractor* is to supply, deliver, offload and temporarily store (as may be required) all materials needed to carry out the works.

6.4.4 Storage Facilities

1. The *Contractor* is to make his own arrangements with regard to storage facilities and laydown areas that are required to complete the works. All laydown areas on Site are as per agreement with the Project Manager.
2. All storage facilities (Plant, Material and Equipment) will be within the boundaries of the Site in order not to affect the operations of Others.

6.4.5 Method Statement

1. As a tender returnable, the *Contractor* submits a general Construction Work Method Statement taking into consideration the various phases of the project.
2. This Method Statement clearly illustrates how the Contractor accounts for the risks of this project and is tailored to address the specified project objectives and requirements.
3. The Method Statement includes, as a minimum and where applicable, the following:

- Constraints identified and considered by the *Contractor*.

- Interfacing with Others; the Contractor illustrates an understanding of the work that is to be completed by Others and accommodates for the completion of such work in his methodology.
- Description and illustrations of a construction traffic plan, use of laydown areas and plot plan.
- Shifts and hand overs for the various sections of the works, this information is to enable the *Employer* to integrate the programmes of the various contractors.
- Design tools and systems that the *Contractor* plans to use.
- Construction methodology and sequence of construction taking into consideration access restrictions and safety requirements.
- Detailed risk assessment which lists risks specific to the works and is accompanied with associated proposed mitigations.
- List and description of plant and machinery required to carry out the civil and structural components of the works.
- Inspection and quality control plan.
- A clear description of the responsibilities of the Contractor's personnel involved with the works, including (where applicable) his Project Manager, Site Quality Manager, Site Engineer, Health and Safety Manager, Technical Office Manager, Production Manager, Supervisor, Environmental Officer, Fabricator, Erection Engineer, Shop detailer, Transporter and other personnel required for the civil and structural works.
- Construction sequencing considerations, which take into account any constraints.
- Health, safety and quality control for the activity.
- All plant, equipment and machinery required to complete activity.
- Manufacturer's literature/ Technical Data Sheets for all materials used including product description, composition, material and performance properties, installation and application procedures, use limitations and recommendations.
- Plan for confining, collecting and disposing of waste materials as a result of removal operations, where applicable.
- Works required to safeguard existing infrastructure and services.
- A Steelworks Method Statement which describes the following as a minimum:
  - Method of fabrication and erection;
  - The physical location of manufacturing and fabrication;
  - Erection procedures which includes considerations for modularisation and construction sequencing, including a lifting and rigging plan;
  - Transportation;

4. All Method Statements are reviewed and accepted by *Project Manager* prior to commencing any work.
5. The Contractor submits a new Construction Work Method Statement, a month prior to commencing with any construction activities and after Contract Award, which covers all the

aspects listed above, and any additional requirements or changes arising from negotiations or clarifications, for acceptance by the Project Manager. This Method Statement is to include interfaces with Others. This new method statement includes a sequential erection procedure which clearly shows detailed consideration for stability requirements of the structure (if applicable) at all stages during erection.

6.4.6 Constructability Analysis

1. The *Contractor* uses the *Employer's* standard: 240-107981296, Constructability Assessment Guideline to perform the constructability analysis.

2. The *Contractor* has a structured process in place for constructability analysis, for the optimum use of construction knowledge and experience in planning, design, procurement, and field operations to achieve the *Employer's* objectives.

3. Qualified people with adequate skills in construction knowledge and experience are involved from the beginning of the project, to maximize the benefits of the constructability analysis. This process includes examining design options, where applicable, that minimize construction costs while maintaining standards of safety, security, quality, cost and schedule, and is initiated in the front end planning process. The Contractor considers various phases of the project and demolition activities, where applicable, that includes manpower plans, organization, construction equipment usage, material storage and handling and preparation of construction facilities.
4. The *Contractor* submits a Constructability Analysis Report based on the Method Statement to the *Project Manager*, for his review and acceptance. The (first) submission of the report is submitted as part of the tender documents and clearly indicates how the Tenderer takes into account interfaces with other contractors where applicable, together with the Site and time constraints and rigging studies. This report clearly illustrates how the construction would be completed within the allowable timeframes and highlights the risks of meeting this requirement. The *Contractor* is required to plan his activities to avoid the following interface risks and any other risks relevant to the works:

- Interface issues arising from working in close proximity to Others;
- Access to Site;
- Material storage;
- Delivery;
- Other Works related risks;

5. This report clearly illustrates the construction sequencing and durations for the completion of the works within the contract period. The Contractor submits a risk assessment as part of the Work Method Statement, which is informed by the Constructability Analysis Report that advises on a proposed approach and methodology to mitigate risks described above and any other risks, which may impede successful execution of the works.
6. The second submission of the Constructability Analysis further elaborates on the first submission and is submitted one week after design completion of the works. This report is

a revision on the first submission to take into account the Contractor's final design/proposal and includes consideration for modularised construction for faster construction durations.

6.4.7 Construction Programme

1. As part of the Method Statement and as a tender returnable, the *Contractor* submits a Level 3 construction programme considering all the interfaces and time constraints.
2. This programme does not omit key activities. Timing of the activities is consistent with the Construction Work Method Statement.
3. The programme is to show that the *Contractor* has a clear understanding of the full scope of works, including the accompanying risks. The programme is to be logical and realistic.
4. The Contractor submits a Programme for all the phases of the *works* to the *Project Manager* for his acceptance.
5. This programme is accompanied with the following:

- A comprehensive narrative which describes the basis of the programme;
- A list of assumptions that the programme was based on;

6. The programme clearly indicates the following:

- Activities of all the project work to be done by the *Contractor* and the other work covered by the contract that is being done by the sub-contractors;
- Logical links/ sequence/ relationships that connect the various activities together (showing all hold points).
- Master schedule is to show Links/logic, the CPM (Critical Path Method) technique is used for programme and planning. The critical path is clearly illustrated.
- The works is completed within accepted durations that are in consistence with key dates provided in the Contract Data. Milestone dates in line with Key Date/Contract Data shown on the schedule.
- Schedule Work Package Classifications (Deliverable, Engineering, Procurement, Manufacturing, Supply, Construction and Installation Work Packages)
- The amount of shifts planned per day for each section of the works.
- The way in which the *Contractor* plans to interface with Others. Interface points with Others are identified in the programme;
- A comprehensive description of each activity, including the name and designation of the responsible person;
- Full details of all terminal point release requirements;
- Any erection or commissioning activities that may affect other maintenance and construction activities on Site;
- Identifies when services are required for commissioning purposes;

- Sufficient information with regard to the activity duration and a description to enable measurement of the progress of the activity within the required update period
- Each description in the programme explains and represents the performance of the activity, including tangible deliverables or products;
- Resources required to perform an activity for each activity that requires resource assignment;
- Single source of responsibility or ownership per activity.

6.5 DELIVERABLES

The *Contractor* provides the following document deliverables as part of the *works*.

6.5.1 Tender Phase

The tenderer submits the following as a minimum in the tender submission:

1. Method Statement (including Constructability Analysis, QCP and Risk Assessment) for the entire works clearly demonstrating understanding of and compliance with the full scope as detailed in the Scope of Works.

2. Relevant experience in installation and construction of similar projects. List of verifiable relevant references (minimum of 3 projects) must be provided for works completed within the last 5 years. References to include contact numbers and name of client, description of scope in the project and the cost of the project as a minimum.

3. CV's of the proposed key resources each having a minimum of 5 years' relevant experience (construction manager, site engineer/agent). Construction manager to be professionally registered with SACPCMP or similar professional body. Engineer/technician to be professional registered with the Engineer Council of South Africa. Copy of valid certificate to be provided. Organogram of site team to also be provided clearly indicating the roles that the resources will fulfil in the project.

4. CIDB Grading 7GB

6.5.2 Planning phase

1. A Level 3 schedule (schedule with defined activities) for the design scope clearly highlighting all activities involved, major milestones and provision.
2. Detailed Method Statement (including constructability analysis) for the execution of the works.
3. Risk Assessments.
4. Project specific safety file.
5. Project Quality Control Plan.

6.5.3 Pre-Construction/Installation

1. Detailed method statements for the construction of the works
2. Inspection and Test Plans (ITP's) indicating all intervention points
3. Quality Control Plans (QCP's)
4. Construction Programme
5. Project Specific Safety File (updated)

6. Any temporary works required as part of construction signed by a professionally registered Structural Engineer/Technician

7. Detailed Risk Assessments (updated)
8. Visual Assessment Report

6.5.3 Post Construction/Installation

1. QA returnables (monthly)
2. As-Built drawings
3. Safety File

7. materials

The *Contractor* is required to supply all materials necessary for the repair and restoration of deteriorated wall areas as follows:

- The *Contractor* is required to supply the recommended wall repair products or similar approved.
- The *Contractor* is required to supply and install all temporally and access related works required.

The *Contractor* is required to obtain approval from the *Employer* for the products and material intended to use for wall repair.

8. construction methods

8.1 Surface preparation

Prior to any repairs, the *Contractor* is required to remove all dust, dirt, water and debris from the surface of the walls to be repaired.

The *Contractor* is required to supply and erect appropriate protection barriers/shrouding or other approved means as required on the chimney stacks so as to completely contain all loose or flying debris from the surface preparations. The means of containment shall be subject to the approval of the *Employer*.

The *Contractor* is required to remove all areas of unsound mortar and grout by chipping or other approved methods. The *Contractor* shall exercise caution and take care not to damage any existing wall and capping.

The *Contractor* ensures that all equipment that may be on the way of the repair is temporarily removed and will be reinstalled after the repairs have been completed.

8.2 repair of bricks

- Ceiling of mortar between the cracks
- Grout replacement around the capping
- Application of a SikaWrap-230 C around the top rim wall periphery as per attached product data sheet (refer to figure 2 below). Three horizontal lines of 300mm width all around.

Figure 2: Sika Wrap Application

[A detailed repair method should be provided by the contractor]

9. method of measurement

Repairs will be measured on an area basis. The area to be paid for will be the total number of square metres of wall repaired in accordance with this specification as computed from measurements made by the Engineer.

10. basis of payment

Repairs will be paid for at the Contract Unit Price per square meter for repairs measured as specified herein, which price will be payment in full for performing all operations herein described and all other items incidental to the Work. Refer to appendix B for a guideline for cost breakdown per item.

11. INFORMATION ISSUED BY THE EMPLOYER

The following drawings and standards are issued to the *Contractor* for information.

Document number	Document Title	Revision
240-107981296	Constructability Assessment Guideline	1

12. Appendix A: TYPICAL Defects

Diagonal brick wall cracks: Southern Chimney

13. Procurement

13.1 People

13.1.2 Minimum requirements of people employed on the Site

a. The *Contractor* shall provide suitable and qualified resources and shall prioritize candidates around Dipaleseng Community through the local forum where they meet the requirements for the job. The *Contractor* shall not employ previously dismissed Eskom employees.

b. Verifications of skills, qualifications and a police clearance will be conducted on all Contractor Employees.

c. The Contractor provides competent personnel with the relevant post qualification experience for the implementation of all of the works. All CV's with relevant qualifications and detailed experience are submitted to the Project Manager within four weeks of the start date. All foreign qualifications to be certified by SAQA and proof of certification to be supplied. Foreign ID or passport holders also require a valid work permit to perform work.

d. The Contractor appoints either a Contract Manager or a Project Manager who possesses documented competencies to manage the duties related to the NEC contract and project management. This person serves as the direct liaison for the Employer's Project Manager and also has the authority to make decisions and instruct all other Contractor's personnel, as and when required.

e. All Contractor employees shall undergo police clearance verification before being inducted onsite.

f. The Contractor shall adhere to minimum wage renumeration as per labour regulation

g. Contractor employees shall be registered for UIF as per labour regulation

13.1.3 BBBEE and preferencing scheme

BBBEE requirements are specified in the Supplier Development Localisation and Industrialisation (SDL&I) target setting document provided. SD&L to comment

13.2 Subcontracting

13.1.1 Preferred subcontractors

Where subcontracting of certain activities is required, the *Contractor* shall notify the *Employer* and an agreement shall be obtained with the *Employer* to ensure compliance. Refer to the SDL&I Target Setting document.

13.1.2 Subcontract documentation, and assessment of subcontract tenders

a. If the Contractor subcontracts work, he is responsible for providing the Works as if he had not subcontracted. This contract applies as if a Subcontractor's employees and equipment was the Contractor's.
b. The Contractor supports local Small, Micro and Medium Enterprises (SMME) by purchasing equipment, tools and materials locally where such equipment, tools and materials are available.
c. All Subcontractors need to be approved by the Project Manager before the Subcontractor may be allocated work by the Contractor or be brought to the Site.
d. Subcontract documentation and assessment of subcontract tenders shall be done by the Contractor.
e. The Contractor must inform the Project Manager when intending to subcontract some of the works from the contract Scope of Work.
f. The Contractor may subcontract according to NEC contract or other types of contracts.

g. The Contractor submits the proposed contract data for each Subcontractor for acceptance to the Project Manager.
h. The Contractor only employs competent Subcontractors.
i. The Contractor indicates on a list as shown below, the names of any Subcontractors (when known) whose services may be used to provide the works. The Contractor provides a short description of the work it is proposed to sub-contract to each, together with an approximate value of the work to be executed by each. Where the Subcontractor is required to do physical work on Site, the Contractor provides details of the experiences of the mentioned Subcontractor as well as a list of references involving work of a similar nature.
j. Notwithstanding the inclusion of a Subcontractor name below, the Contractor obtains the written acceptance of the Project Manager prior to the employment of such Subcontractor.

Subcontractor	Description of work	Approximate value
1.		
2.		
3.		

13.1.3 Limitations on subcontracting

Where the *Contractor* encounters scenarios where specialised work is required, subcontracting of such services is to be obtained in agreement with the *Employer*. Refer to the SDL&I Target Setting document.

13.1.4 Attendance on subcontractors

a. Subcontractors shall remain the responsibility of the main *Contractor*. They shall adhere to the Employers code of ethics and comply with all the Employers requirements.
b. It is the Contractor's responsibility to ensure that the Subcontractor(s) completes and supplies a daily Site diary, which includes details such as the labour resources available, starting time, ending time, equipment and materials used, weather conditions, interruptions etc.
c. The Contractor ensures that the diary is submitted by the Subcontractor to the Project Manager daily for checking, commenting and signing-off and a copy is supplied. If the daily diary is not signed off by each worker then a separate daily attendance register is supplied.

13.2 Plant and Materials

13.2.1 Quality

a. The Contractor ensures that all equipment, tools and material that the Contractor / Subcontractor uses to execute the works, complies with the SABS and other stated standards.
b. All plant and materials sourced and supplied for the installation are new and all are free from defects. Reconditioned/refurbished plant and/or materials are NOT regarded as new under any circumstances and may NOT be utilised.
c. The Contractor does not use plant and materials, which are generally recognised as being unsuitable or otherwise unsuitable for the purpose for which they are intended.
d. Only components of high reliability are utilised, with a proven operating history, to enable the plant to achieve the required reliability and availability. Plant and material design, engineering and manufacture is in accordance with the best practice applicable to high-grade products of the type to be furnished, to ensure the efficiency and reliability of the works and the strength and suitability of the various parts for the works.
e. Plant and materials withstand ambient conditions and the variations of temperature arising under working conditions without distortion, deterioration or undue strains in any part.
f. No repair of defective plant and materials may be permitted without the Project Manager's approval and any such repair, if approved, is carried out to the satisfaction of the Employer.

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

All plant and material shall be provided by the *Contractor*. Where the scaffolding is required, the *Employer* shall provide.

13.2.3 *Contractor*'s procurement of Plant and Materials

a) Absolutely no changes to the current plant configuration will be allowed unless authorised by the Employer.
b) It is mandatory that plant, equipment and materials be procured in accordance with the specifications listed in the Works Information.
c) Should any equipment not be available on the market due to obsolescence, the Contractor recommends a suitable alternative. All alternative equipment to be approved by the Employer before procurement.
d) The Contractor only procures plant and materials as specified in the Works Information. Any change of specifications is notified in writing by the Project Manager as an instruction.
e) The procurement schedule is clearly shown and integrated into the Contractor's accepted project programme ensuring delivery of equipment to site in advance to the installation activity
f) All items procured and stored at the Contractor's premises or the Employer's premises are stored in accordance with the manufacturer's or material's specifications.
g) The Contractor ensures that plant and materials procured carry a minimum of 52 weeks warranty or guarantee period due to defect or malfunction.
h) Plant and materials used for the works are to bear no labelling other than the plant coding specified by the Employer.
i) The Contractor procures and stores all materials as per the recommendations stipulated in the materials data sheet.

13.2.4 Spares and consumables

a) The Contractor shall provide required spares and consumables that may be needed at or just after take over to ensure continuity.

b) The Contractor shall provide consumables for all Contractor employees, ie. Gloves, dust masks, earplugs.

13.3 Tests and inspections before delivery

a. The *Project Manager* reserves the right to appoint a representative or representatives to inspect all parts during manufacturing and testing and to be present at any of the tests specified in this *works*.

b. The *Employer's* representative/s and/or third-party/independent inspection authority must have unhindered access to witnessing all manufacturing and testing processes at the manufacturing facility.

c. Where holding points exist on the manufacturing QCP's, no manufacturing activity shall proceed if the preceding activity on the manufacturing QCP was not approved by both the *Contractor* and *Employer's* representatives.

d. The *Employer* carries out quality inspections at his discretion and as per the pre-approved Quality Control Plan (QCP).

e. Such tests as may be required by the *Project Manager* are carried out by the *Contractor* during or after manufacturing to prove compliance with the specification independently of any test which may have been carried out at the manufacturer's facility.

f. The *Contractor* is not relieved of his responsibilities if the *Project Manager* and other *Employer* representatives choose to waive the witnessing of any manufacturing and testing processes.

g. The *Contractor* provides a test certificate for each test required.

h. The *Contractor* provides current calibration certificates for all equipment used during manufacturing and testing when required to do so by the *Project Manager*.

i. The *Contractor* is responsible for quality assurance and control during manufacturing and testing. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the *Employer* (including the absence of disapproval) shall not relieve the *Contractor* from any responsibility under the *Contract*, including responsibility for errors, omissions, discrepancies and non-compliances.

j. The *Contractor* takes note of and responds to any comments made by the *Employer* on the *Contractor's* manufacturing documents. However, the *Employer* is not bound to check the *Contractor's* manufacturing documents for any errors, omissions, ambiguities or discrepancies or compliance with the requirements of the Works Information. The *Employer's* receipt of, or review of, or comment on, the *Contractor's* manufacturing documents does not relieve the *Contractor* from responsibility for the *Contractor's* errors or omissions or departure from the requirements of the standard.

k. The Contractor shall test, Inspect and certify that the system is reliable and safe to use before takeover.

l. The Contractor shall provide all test certificates of compliance (CoC).

13.4 Marking Plant and Materials outside the Working Areas

All equipment shall be properly marked for identification.

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

a. The *Contractor* shall use inspected and tested equipment, equipment compliance documents shall be madeavailable on request by the *Employer*

b. All temporary works shall be removed after completion

13.6 Cataloguing requirements by the *Contractor*

The Contractor shall provide all the information (specification) required by the Employer to catalogue the spares for this system.

14 Construction

14.1 Temporary works, Site services & construction constraints

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

The Contractor shall gain site entry once:

a) The Medicals have been confirmed valid for all the Contractors Employees
b) All the Contractors employees have completed the Site Inductions (Held on Mondays and Wednesdays)
c) All the Contractors Employees provide a Security Clearance

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

Access to Site

The *Contractor* makes his/her own assessment of and allows in his/her rates for those access problems that may be encountered. No extra payment or claim of any kind is allowed on account of difficulties of access to the works, or for the requirement of working adjacent to or in the same area as others.

Access to site shall be in line with the Grootvlei Power Station's access procedure. The *Contractor* shall be required to make an application to enter site for the duration of the contract, including the warranty and defect period where applicable. A permit shall only be issued once the *Contractor* and his or her employees have attended the safety induction and has undergone medical checks.

All the assets must be declared and registered with security upon entering site. This includes portable assets such as laptops. The record must be kept on the OV18 form. No asset shall be removed from site if the OV18 form is not attached.

The *Contractor* shall have no claim against the *Employer* in respect of delay at the security main gate.

All *Contractor* permits shall be returned to Protective Services on completion of the works.

Equipment

Any equipment, or appliances, used by the *Contractor* conforms to the applicable OHS Act safety standards and is maintained in a safe and proper working condition. The *Employer* has the right to stop the *Contractor* use of any equipment which, in the opinion of *Employer*, does not conform to the foregoing.

Off-loading and material handling equipment is not available on site and if required, is to be provided by the *Contractor*.

Site Regulations

Note that the speed limit on the site is 40 km/h. The vehicle permit of any persons contravening any traffic act on site shall be cancelled.

The *Contractor* complies with the Grootvlei Site Regulations, a copy of which is available for perusal at the *Employer*'s offices.

Any subject within the authority of the *Employer* may be addressed by a Site Regulation. Before work starts on site, an inaugural meeting is held with the *Contractor* to explain all requirements of the Site Regulations.

The *Contractor* is issued with a file of current Site Regulations on arrival. The file remains the property of the *Employer* and the *Contractor* is responsible for its maintenance and updating as revised regulations are issued by the *Employer*.

Permits

No work commences without the acceptance of the permit to work or LAR by the *Contractor*. The plant safety regulations course can be done at any Eskom Power Station but the practical course is Grootvlei specific.

Accommodation and Transportation

At his own cost the *Contractor* provides his/her own accommodation and transport for all his/her employees engaged in the execution of the works. This includes the needs of his/her sub-Contractor. No accommodation is available at Grootvlei Power Station.

Security

The *Contractor* provides security necessary for the protection of the works at all times until the completion of the whole of the works.

The *Contractor* is informed of the access procedures through Site Regulations and note that such procedures may change depending on the prevailing security situation.

All persons entering the Grootvlei site pass through the control points at the main access gate and are required to have temporary permits that are issued to *Contractor* staff on request. All persons submit ID documents with the application for temporary permits. If it is necessary to bring equipment onto site a list is submitted which is verified by security staff prior to equipment entering the security area.

If any *Contractor* staffs are transferred from Grootvlei or leave site, the person's permit is handed over to the Supervisor. The *Contractor* ensures that personnel leaving site are transported out of the security area and that the permit is returned.

No firearms, weapons, alcohol, illegal substances and cameras are permitted on site. Any person suspected of being under the influence of alcohol is tested and if proved positive, is refused entry to the security area.

No "private work" is carried out for or on behalf of any Eskom employee.

Safety

The *Contractor* implements a safety plan and maintains the safety system until the completion of the whole of the works. The plan, will as a minimum, contain PPE information, written safe working procedures, job specific risk assessments, safety meetings, etc. The plan will be to the *Employer*'s satisfaction and will be accepted prior to the commencement of any work.

The *Contractor* will be subject to periodic audits by the *Employer* in order to ensure compliance with the plan. Any deviations will be corrected to the *Employer*'s satisfaction.

The *Employer* has the right to stop the *Contractor* work activities which, in the opinion of *Employer*, is un-safe. The *Contractor* may only continue with work activities when all safety deficiencies have been corrected to the *Employer* satisfaction. The *Contractor* shall have no claim against the *Employer* in respect of delay due to the above.

Site	:	Grootvlei Power Station
Regional Authority	:	Dipaliseng Town Council, Mpumalanga Province
Nearest Towns	:	Balfour – 18km north east of power station
		Villiers – 30km south of power station
		Heidelberg – 40km north of power station
		There are informal settlements within a 10 km radius of the power station.
Infrastructure	:	Grootvlei Power Station is situated approximately 3km from the N3 highway and is connected to it by means of a tarred road. There is also a secondary tarred road connecting the site with the R51 and R53. Water is supplied to the adjoining township, and sewage is returned to the sewerage *Works* of the power station.
		The railway line from Balfour to Bethlehem passes the station.
		400kV and 88kV power lines cross the existing road network in the area.
Latitude & longitude	:	26° 46' S & 28° 29' E
Landowner	:	The power station is situated on the farm Grootvlei Power Station, ERF 458 IR, Title deed number CCT50784/1983. Eskom is the landowner.

River catchment	:	Mid-Vaal
Regional Climate		Grootvlei Power Station is situated on the Highveld in the western part of Mpumalanga province on the escarpment, at an average height of 1551 m above sea level. The winters are generally dry and cold with regular frost and temperatures varying between -7ºC and 23ºC. The summers are mild with most of the rainfall occurring during this season. Temperatures vary between 12º & 32º C.
Wind direction		Data from the Heidelberg weather station shows that Grootvlei Power Station is sited in such a way that for most of the year (291 days) the wind direction is from the power station in a direction that is North West.
Rainfall		Based on information recorded at the Heidelberg weather station, the average annual rainfall for the Heidelberg area is approximately 691 mm. (Weather Bureau, Pretoria).

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

The Contractor records information of all those that enter the *Employer*s site on each site. This information is to be presented to the *Employer* on the day of the site visit and as and when requested by the Employer..

Working hours at Grootvlei Power Station are as follows:

Monday – Thursday	: 07:15 to 16:30
Friday	: 07:15 to 12:15
Saturday, Sunday and Public Holidays	: Off

14.1.4 Site services and facilities

The Contractor shall make provision for onsite power (At the ash dam) in the form of a generator shall a need arise for the execution of the works. Power for the site offices shall be provided by the Employer at a location less than 50m away from the established offices. Ablution facilities shall be availed by the Employer at a distance less than 50m from the established site.

14.1.5 Facilities provided by the *Contractor*

The contractor provides all facilities and equipment as quoted for in his site establishment for the successful and efficient execution of the works. The employer shall allocate a site for the Contractor to establish. Upon completion of the works, the Contractor shall de-establish site and remove all the facilities and equipment previously brought to site.

14.1.6 Survey control and setting out of the *works*

Refer to the technical specification for all benchmarks.

14.2 Completion, testing, commissioning and correction of Defects

14.2.1 Work to be done by the Completion Date

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

	Item of work	**To be completed by**
	As built drawings of	Within days after Completion
	Performance testing of the *works* in use as specified in paragraph of this Works Information.	See performance testing requirements.