Eskom	**COAL HANDLING PLANT TERRACE BIN 1 REPAIR WORK**	

Unique Identifier:	N/A
Alternative Reference Number:	N/A
Area of Applicability:	Kendal Power Station
Documentation Type:	TE
Revision:	6.0
Total Pages:	25
Date:	December 2021
Disclosure Classification:	CONTROLLED DISCLOSURE

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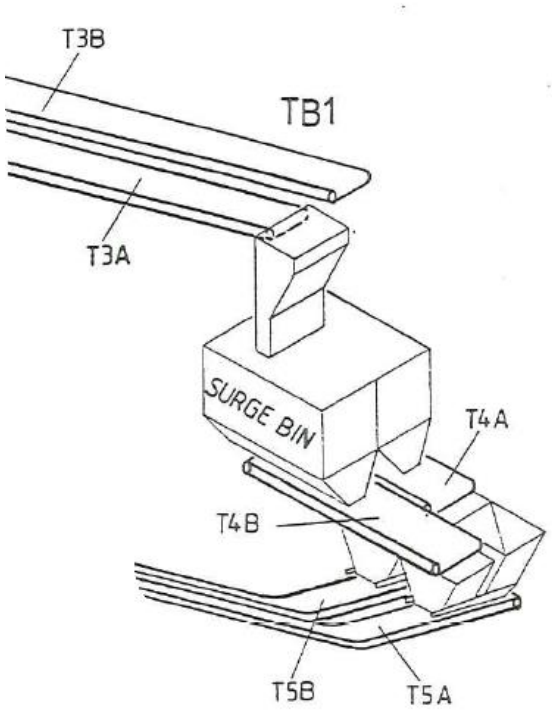
REPAIR OF THE TERRACE BIN 1

PART 3 WORKS INFORMATION

SECTION 2 WORK TO BE PERFORMED BY THE *CONTRACTOR* FOR THE *WORKS*

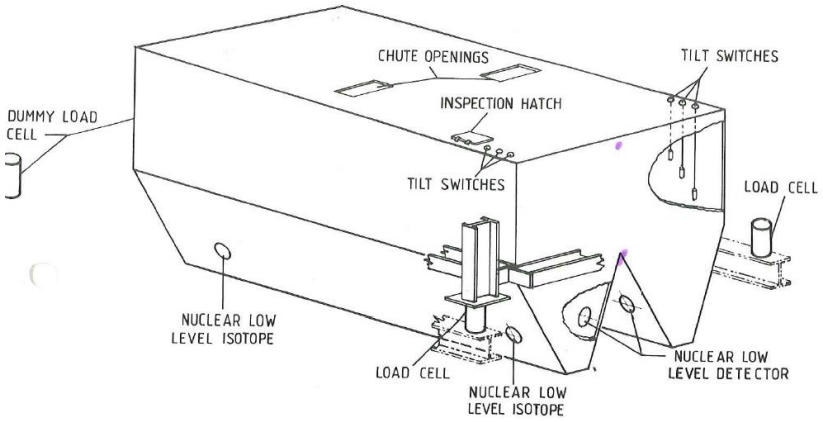
1. BACKGROUND

The repair of the failed Terrace bin 1 hopper section which is located within the CHP at Kendal power station, Mpumalanga is fundamental to ensure safe, reliable and efficient operation of the coal plant and the consistent supply of coal to units 1 and 2. Unit 1 was commissioned in 1994 and unit 2 a year after. Terrace bin 1 is a rectangular steel structure used to store bulk solids. The coal stored is used for the generation 1 372 MW of electricity by units 1 and 2 therefore **the plan provided shall be so detail to such an extent of an hourly activity schedule.**

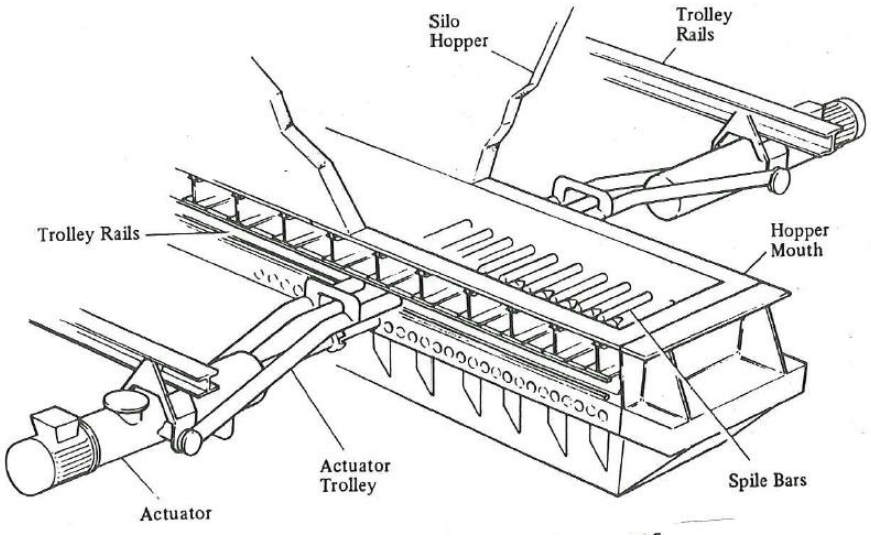


Kendal has three terrace bins 1, 2 & 3 which each have two outlet hoppers normally dedicated to supply one boiler unit. The terrace bins are elevated and supported by steel columns. The coal is fed into the terrace bin 1 by two overbin feed conveyors, T3A&B while extracted by two underbin feeder belts, T4A&B supplying coal through incline conveyor, T5A&B before distributed by mill bunker filling conveyors, ECB into the five (5) mill bunkers. By using the movable head or shuttle conveyor it is possible for any terrace bin hopper outlet A or B to supply coal to the boiler unit of its paired hopper. The two overbin infeed conveyors are designed to operate as duty and standby but can run simultaneously under emergency conditions. The design capacities for T3A&B are 3600 TPH while for the rest the conveyors up to mill bunkers is 1050 TPH with the exception of T4A&B which is accommodated with the varying capacity capability.

Terrace bins hopper section is constructed of the 16 mm mild steel plates lined with the 12 mm 3CR12 stainless liners and stiffened with ± 68^0 vertical slanting beams of 405 x 178 x 53,8 kg/m and 300 x 100 x 46,2 kg/m I sections capable to handle a minimum live loads of 8 tonnes and dead load of 500 tones. The access into the terrace bin is from the top using the manhole size of 800 x 800 mm cut-out and 1800 x 1200 mm dust extraction opening while at the bottom using the hopper mouth access. The front or back hopper mouth is of trapezium shape with bases of 1210 mm and 610 mm, and height of 915 mm vertical to the T4 conveyor belt line.



The throat of the bottom hopper section has two low level nuclear detectors installed. The spile bars support frames are installed on each side of the hopper mouth where spile bars are inserted to prevent coal from being loaded onto the T4s during maintenance and emergencies.



The spile bars support frames have the overall dimensions of 11860 x 610 x 324 mm. it is made up of 16 mm plates, 25 mm plates, 300 x 100 x 46 outside channels, 300 x 120 x 16 fabricated inside channels and 80NB pipes.

Between the spile bars support frames and T4 conveyor belt line there is another hopper section angled at 2.2^0 to the belt line from back to front with enough clearance to allow the lifting and lowering of the T4 conveyor. This bins hopper section is constructed of the 16 mm mild steel plates lined with the 12 mm 3CR12 stainless liners and stiffened with

16 mm plates. This bottom hopper section is made up of 4 sections with joints at 2700 mm apart, bolted together to the spile bar support frame.

There are three (3) transverse stiffener plates or hopper mouth ties installed transverse to the hopper mouth spaced and bolted to 405 x 178 x 53,8 kg/m I beam at 2700 mm apart which are located above the spile bar support frame. The transverse stiffeners are made of the 25 mm mild steel thick plate and protected by a 25 thick Roqlast cap saddle liner.

There are proximity switches and strikers are attached to the spile bars apertures to provide interlocks with the drive system.

In 2017, T4B feeder belt frequently experienced problems where upon investigation it was discovered that the bin has bulged on B-side spile bar frame area. On further investigation it was determined that the root cause was the missing transverse stiffener which was removed in April 2015 when T3A conveyor belt fell inside the bin. As per Eurocode part 4 critical and high pressure values are experienced at the vertical walls and hopper transition area due to coal material loading which lead to the spile bar frame located there to quickly reach its plastic state thereby exerting excessive pressure load onto T4B feeder bed structure.

Between 2017 and 2019 various options were proposed where 60 days terrace bin 1 outage option was rejected though identified damaged steel hopper panels were sourced and delivered on site. To mitigate the production loss when executing the repair work on the damaged terrace bin 1, 6 Concepts were considered, with Option 6 being chosen.

Concept 6 involves installing a mobile feeder at the back of T5A tail end conveyor, with a mini coal stockyard and a haulage route to ensure continuous coaling.

The contractor/tenderer shall be aware that the materials to be used for the repairs of the terrace bin 1 have been fabricated, painted and available for installation. The material used for fabrication has the material certificates available on request and are stored at Kendal Power Station. The material available are:

- Hopper mouth ties (Transverse stiffeners)
- Crotch Angles
- Hopper mouth angles
- Spile bar support structure (Module)
- Fastening and stud liner bolts
- Hopper section liners
- Hopper section plates
- Front profile plate

2. SUPPORTING CLAUSES

2.1 Scope

This document details the scope of work to be executed by the contractor which entails all related activities required to repair the Terrace bin 1 located within the coal handling plant at Eskom – Kendal Power Station. The scope of work shall cover all the disciplines as applicable to the repairs of the terrace bin with the intention to return to its original structural integrity or even improved state.

Over and above this available material, it is required that the tenderer/contractor shall conduct a structural design check in a form of calculations, analysis, simulation etc. and produce the installation details which will be used for the installation. This shall be a hold

point that shall be required for the contractor to confirm the suitability of the material for use. It is therefore compulsory that the contractor makes use of the competent person to perform this mile stone. The contractor shall be required to provide the client with design report, calculations, installation drawings, bill of materials list, specification etc.

The tenderer shall submit the construction completion report and associated as built drawing which will be used as future statutory reference report for the assessment (Safe to use) of the terrace bin as stipulated in the OHSAct under construction regulations.

Non-submission of this report will render the project incomplete.

2.2 Purpose

The purpose of this document is to clearly define what the contract shall cover and what his or her boundaries are. The document serves as guideline from the client on what is expected from the contractor while also taking into consideration that the contractor has expertise of this field of engineering.

2.3 Applicability

This document shall apply only to this SOW activity for the repairs of Terrace Bin 1 structure and its associated services specified within Kendal power station.

2.4 Informative References

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

2.4.1 Normative

[1] ISO 9001 Quality Management Systems,

[2] 32-727, Safety Health Environment and Quality (SHEQ) policy,

[3] Occupational Health and Safety Act no. 85 of 1993

[4] Eskom Cardinal rules

[5] 36-681, Generation Plant Safety Regulations

[6] Previous assessment of TB1

2.4.2 Informative

[1] 32-1034, Eskom Procurement and Supply Management Procedure

[2] SANS 294, Construction Procurement Procedures

2.5 Definitions

2.5.1 General

Definition	Description
Eskom Cardinal rules	Are safety rules designed to keep all employees and visitors safe at all times, so that they must be acted upon at all times.
Method Statement	A written document detailing the key activities in sequence to be performed in order to successfully complete the work tasks while ensuring as practical reasonable that all risks and hazards identified are reduced.
Minimum Weighted Final Score	The final highest technically ranked score after consolidating all individual scoring by TET members recommended from a technical perspective provided this score exceeds the 75% threshold.
Safe Working Procedure	Is the procedure that describes how work is to be carried in a safe and standardised process.
Material deviations	Is the non-conforming deviation to the technical requirements e.g. has the detrimental effects on the scope or quality or performance of works as identified in the Scope of Works.

2.5.2 Classification

Controlled Disclosure: Controlled Disclosure to external parties (either enforced by law, or discretionary).

2.6 Abbreviations

Abbreviation	Description
CSY	Coal stockyard
C&I	Controls and Instrumentation
CV	Curriculum vitae
EDWL	Engineering Design Work Lead
CHP	Coal Handling Plant
TB1	Terrace Bin 1

2.7 Roles and Responsibilities

Not Applicable

2.8 Process for monitoring

Not Applicable

2.9 Related/Supporting Documents

As per scope of work

3. SCOPE OF WORK

The Scope of works is for the complete repair of the failed Terrace Bin 1 and construction, installation and modification of infrastructure to enable continuous coaling to units. This is based on Concept 6 that was approved.

Concept 6 involves installing a mobile feeder at the back of T5A tail end conveyor, with a mini coal stockyard and a haulage route to ensure continuous coaling.

3.1 Technical scope

a) Geotechnical assessment, design and construction of ground slab and modification of Terrace bin 1 for temporary coaling supply

b) Further engineering assessment, analysis and design for repairs of the failed Terrace Bin 1, performed by a competent person and

c) The permanent repair of the Terrace Bin 1,

d) Replace all bolts on the crotch area section

e) Replace all internal damaged and missing liners complete with their stud bolts using drawing 0.64/34093 Rev 2 and 34099 Rev 0 for fabrication where contractor will be required to confirm dimensions on site.

f) Fix both platform and handrail around the nuclear detector area. Refer to drawings:

- 0.64/34130 Rev 1
- 0.64/34131 Rev 2
- 0.64/34135 Rev 1

g) Clean the top roof structure of the Terrace Bin and the external beams of the bin from the top to the bottom.

h) Repair the chute work for T3 A&B complete with the associate skirting using the following drawings:

- 0.64/ 13262 R4
- 0.64/ 13422 R2
- 0.64/14237 R7
- 0.64/14238 R

i) Dismantling of terrace bin 1 IBR structure behind tail end of T5A conveyor belt in order to allow fitting of mobile feeder

j) Dismantling of T5A infeed chute in order to allow positioning of mobile feeder. Note that the contractor shall re-instate the chute to original condition after terrace bin 1 repairs

k) Transportation and installation of mobile feeder from coal stockyard to tail end of T5A conveyor belt

l) Design and fabricated new mobile feeder chute specific to T5A conveyor belt

m) Installation of electrical cable for mobile feeder

n) Installation of C&I protections

o) Commissioning of the mobile feeder

p) Note that after completion of terrace bin 1 the contractor shall be expected to return mobile feeder to original position at coal stockyard and install original chute

3.1.1 Geotechnical assessment, design, construction of ground slab and modification of Terrace bin 1 for temporary coaling supply

The Contractor is responsible for the following:

a) Conducting a survey and GPR scan to determine existing services for the proposed Ground slab area, and designing and constructing accordingly to avoid or protect the existing services

b) Assessment of the existing concrete ground slab, design extension and construction of the slab inclusive of a suitable liner system (if required) to accommodate the temporary operations of the mobile feeder, at the TB1 area, for use as a mini coal stockyard

c) The requirements for the ground slab is an area of 30m x 25m x 0.3m, and the configuration (shape and allowed size) of the mini stockpile, 35MPa concrete

d) Designing and Constructing of stormwater and drainage management system for the mini coal stockyard area

e) All stormwater and drainage designs must be in line with Regulation GN704

f) The dirty network drains system drawings is supplied in the Appendix

g) Removal of sheeting on southern side of Terrace Bin 1 for installation of Mobile feeder

h) Manufacture and installation of a chute to allow feeding of coal from mobile feeder onto T5a

i) Removal of any trees and terracing of the area to allow for a mini coal stockyard and operations

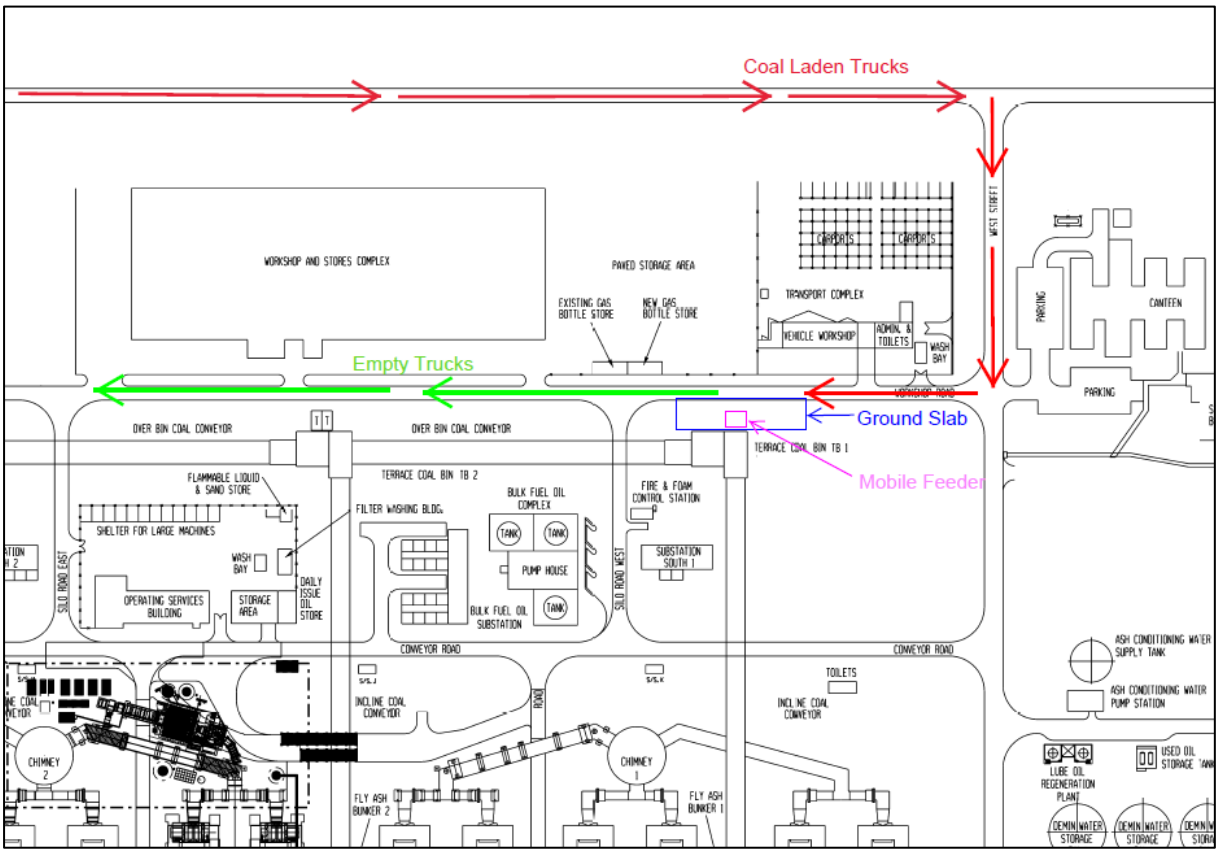


Figure 1: Layout of Ground slab, Mobile feeder and Station Roads for Coal Route

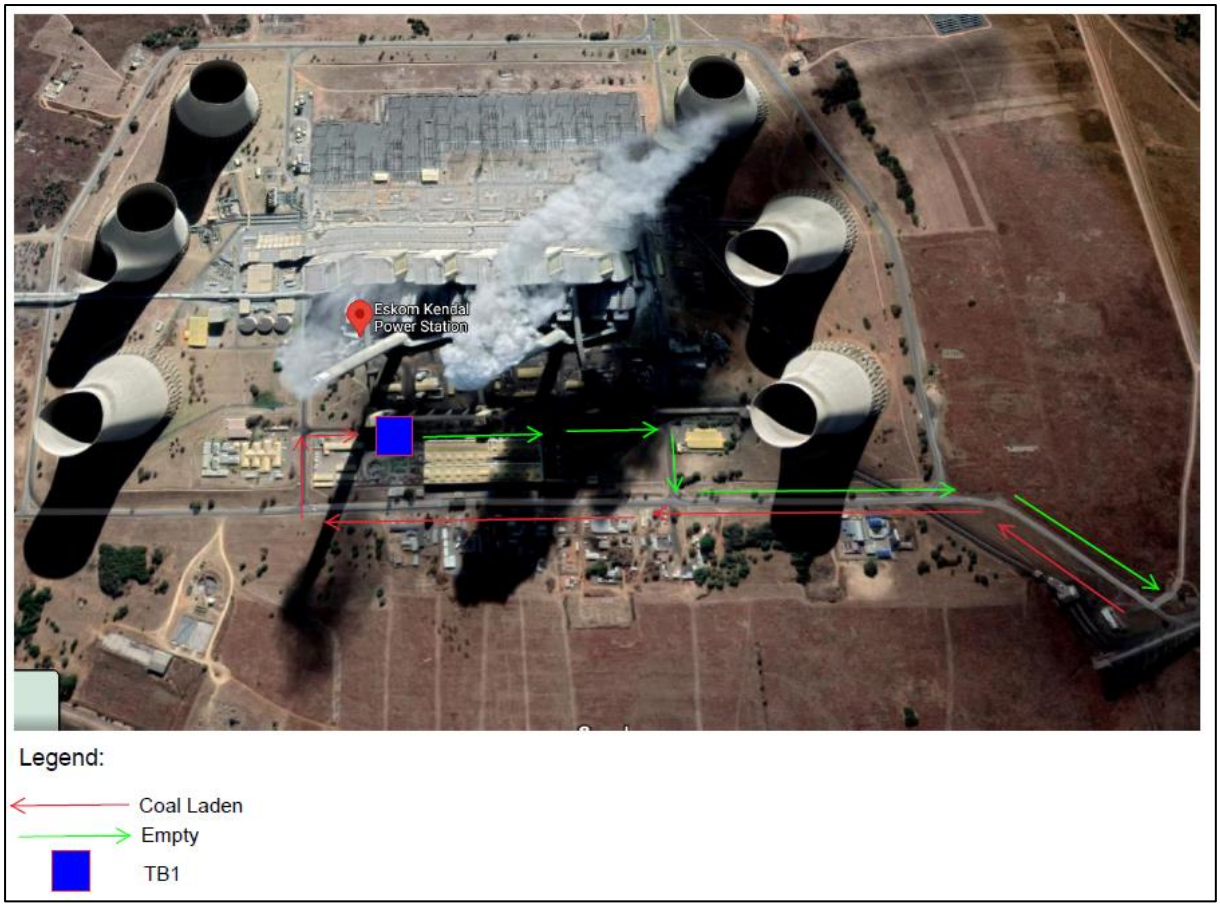


Figure 2: Existing station Roads and Coal Route to TB1

Figure 3: Modification of TB1 Housing for Coaling operations

3.1.2 Further Structural Assessment by the Contractor

The detailed structural assessment and analysis by the contractor in order to determine the suitability of the materials available on site and further advice shall cover the minimum following aspects:

a) Information gathering, which include bin design assessment calculations (if available) using what, construction drawings of the existing TB1 and performing site inspections of Terrace bin 1.

b) Review of the complete existing TB1 structure, and make any recommendations based on existing site conditions and re-design assessments. This includes taking into consideration the condition and suitability already procured material that is stored on site.

c) Determine all the loads exerted on the bin more importantly in their worst case, what affects they have and on which areas of the bin they occur.

d) Take into consideration that the bin was designed and installed in the early 1980s therefore the design codes used for its design are unknown therefore simple design calculations will be required to determine the loads or forces the bin is exposed to during operation process.

e) Take into consideration that the structural assessment of the bin is primary governed by special structures principles worse when the type and properties flow and friction property of the stored material, its density, the loads applied on the bin structure and the associated load carrying system vary widely.

f) The walls of the bin are subjected to both normal pressures and vertical frictional shear or traction produced by the material stored.

g) Other potential loads including external vibrations, stresses created between the bin wall and stored material, support columns should be considered during the evaluation process.

h) The function of the transverse or tie beams and connections besides the restraining effect along the bin shall be considered and determined.

i) To determine connection details covering various loads it is exposed to.

j) Structural assessment and modification(s) of the structure to accommodate the effective discharge of coal from the feeder to the T5A&B conveyor streams in order to address severe spillages during the coal extraction operation.

k) Condition assessment of the joint or connection pins and the hydraulic cylinder capacity and capability for the lifting and lowering structure

l) Assessment of damaged support structure on the tail end of T5A, incline conveyor which affect the alignment and spillages in that area caused by the illegal belt removal structure incorporated. The contractor shall recommend the better method to remove damaged conveyor belts of T5A-F incline conveyors.

3.1.3 Permanent repair of the failed Terrace bin 1

The manufactured material installation scope of works includes the following:

a) The management of the complete scope of work to be executed.

b) The material used for fabrication should be thoroughly checked and then provide proofs required for such tests. E.g. material test certificates.

c) The damages indicated on the preliminary investigation by the client shall be taken into consideration.

d) To ensure good quality weld the contractor shall explicitly explain what weld practice and post weld stress relieving methods will be adopted in order to enhance the coal bunker integrity or life

e) Housekeeping, cleaning, removal and disposal of unnecessary coal around the work area.

f) The findings of the tenderers investigations or assessments.

g) The painting of the affected area

h) Updating of affected drawings to Eskom standards

3.1.4 Production requirements

The operating conditions listed below are required to ensure the consistent generation of electricity to the South African nation therefore the tenderer will be expected to consider the production requirements on his or her methodology. But for any reason/s if that cannot be achieved it will be expected of the tenderer to identify that activity, its duration, risks identified and predicted consequences.

a) The Terrace Bin 1 is used to supply coal consumed by units 1 & 2 for the electricity generating.

b) The allowable timeframe/period for repairs of the Terrace Bin 1 is 60 days, starting in January 2022. The Contractor must ensure all pre-planning and executing of work that can be done before the simultaneous outage is executed and ready.

c) The normal operating hours for the power station with full staff is from Mondays at 07:15 to Thursdays at 16:30 and on Fridays from 07:15 to 12:15 while the rest of the times it is operating with the skeleton staff. The Contractor makes the necessary

arrangements and gets the necessary permissions to work on shift basis, to ensure that the repairs are completed within allowed timeframe.

d) The four hours (from 08:00 to 12:00) weekly maintenance schedule on unit 1 and 3 is on Fridays while units are generating on full load (686 MW).

e) The station when running on full capacity (6 units generating electricity) on average about 2400 TPH of coal is required while the average coal supplied is 3000 TPH required to also build up mill bunker levels and live piles.

f) The always running A and B conveyors streams from T3 to ECB are not used as duty and standby.

g) Only seven (7) hours including permit to work arrangements will be allowed with no coal is supplied to the units while generating at half loads (368 MW) meaning terrace bin 1 isolated.

h) The tenderer shall familiarise with the Eskom Cardinal Rules and Plant Safety Regulations.

3.2 Scope of work requirements

The SOW requirements which the tenderer must adhere to:

a) All materials recommended by the tenderer but not to Original Equipment Manufacturer (OEM) specification and can partly provide the requirements of the SOW that might negatively influences system functionality shall be accepted by the Project Manager prior implementation. Therefore, it is recommended that the replacement shall be done to OEM specifications.

b) Supply, transportation, dismantling, replacement, restoration as well as testing, safety, quality management, all technical documentation, function testing, commissioning, management of old materials or scraps which are necessary for completeness are deemed part of the works.

c) Dumping or storing of the scrap material on site shall be agreed with the Project Manager. This excludes domestic waste and oil sludge, which is dumped in accordance to the Kendal's Environmental Procedures.

d) The tenderer or the contractor shall conduct the site surveillance around the Terrace Bin 1 area where this work will be conducted in order to determine the existing services (electric cables, piping etc.) taking into consideration that there are no existing drawing to reflect the current state of the plant.

e) Interfacing to achieve necessary connections with the existing structure installations will be contractor's responsibility where existing drawings listed under section 12.1, enquiry drawings will be utilised on project manager's approval.

f) Interfacing with other stakeholders e.g. Eskom personnel shall be conducted via the Project Manager on any work required for smooth and efficient completion of the works e.g. starting and stopping of the conveyors, emptying of bin, disconnection etc.

g) The tenderer or the contractor shall provide his or her own RP who has proof that he or she has passed and met all Eskom requirements.

h) The tenderer or the contractor shall supply and operate his or her own hoisting and rigging equipment where safe rigging and lifting procedures will be provide prior utilising that equipment within Kendal site.

i) If any modification during installation by contractor shall be submitted to the client for acceptance prior to execution.

j) The tenderer or the contractor temporally labels the plant according to the KKS coding standard.

k) On completing of the work the contractor commissions the plant and performance test according to Kendal accepted quality control plan (QCP's).

l) The tenderer or his contractor shall supply Operating and Maintenance manuals and technical documentation for any new equipment.

m) The tenderer or the contractor provides and ensures safe working environment on all activities performed.

n) All drawings utilised and specified or stipulated on this sow shall be updated using ONLY MicroStation V8 version which natively drawn (no converted drawings will be accepted under any circumstances) to as-built status and failure to do so shall render the project incomplete.

o) The tenderer or the contractor is responsible for the removal and installation of all service lines and its associated equipment i.e. any Fire, Air, C&I and Electrical systems found within and around the Terrace Bin 1 structure. This should be done with the advice from the Eskom Responsible Person, but the departments may not be involved in the actual execution.

p) All housekeeping in and around the working area i.e. cleaning, before and after execution is the responsibility of the tenderer or contractor

4. EXCLUSIONS FROM THE SCOPE OF WORK

There is no exclusions, all work to be executed by contractor.

5. SPECIFICATIONS AND PROCEDURES

The following specifications are read in conjunction with this document. Unless otherwise stated, the latest revision of the specification at the time of issuing this enquires is applicable. The following specifications form part of the works.

Table 1 Specification and Standard

Number	Description
ISO 14001	Environmental management system
ISO 9001	Quality management system requirements
OHS Act 85	Occupational Health and Safety Act
QM58	Supplier Contract Quality Requirement's Specification
SANS 10160	Basis of structural design and actions for buildings and industrial structures
SANS 10162:1	Limit state design of hot rolled steelwork
SANS 10400	Building Regulation of South Africa
SANS 2001 CS1	Construction Works Part CS1: Structural Steelwork

6. CIVIL – STRUCTURAL / MECHANICAL WORK

As per scope of work

7. INSTRUMENTATION

The instrumentation work to be carried out, involves safe removal of instruments, isolation of signals where removal is not necessary, storing of removed equipment, reconnecting after the repair work is performed, commissioning and testing of the instruments.

7.1 Disconnecting Instruments and Isolation of signals

All instruments that form part of the scope shall be isolated and safely removed by the contractor to allow for the repair work to be carried out on the terrace bin. The following instruments shall be safely removed and/or isolated by the contractor:

- Isolate Terrace Bin 1 Level PLC
- Remove/Isolate T3A and T3B blocked chute detectors
- Remove/Isolate T3A and T3B belt protection signals
- Remove/isolate T4A and T4B belt protection signals
- Safely remove and isolate terrace bin nuclear level measuring device, the nuclear device shall be stored in a safe storage facility taking into consideration nuclear safety protocols. (IEC 62327 and IEC 62957-1)
- Isolate terrace bin level measuring loadcells

7.2 Reconnecting of Instruments Functional Testing

The contractor shall safely reconnect the disconnected signals and remount all the instruments that were removed from the plant. The instruments are functionally tested for correct operability and functionality. The following instruments and signals are restored to their original location on the plant in preparation for hot and cold commissioning:

- Reconnect Terrace Bin Level PLC
- Remount and reconnect T3A and T3B blocked chute detectors
- Reconnect T3A and T3B belt protection signals
- Reconnect T4A and T4B blocked chute detectors
- Reconnect T4A and T4B belt protection signals
- Reconnect terrace bin level measuring load cells
- Safely reinstate the terrace bin nuclear level device (IEC 62327 and IEC 62957-1)

Commissioning of the reinstated instruments forms part of the overall plant commissioning and testing and is detailed in section 12 of this document.

8. ELECTRICAL

All electrical work required to be executed under this SOW but limited to disconnecting, connection, function testing and commissioning as will be specified by the contractor on the methodology provided will be executed by Eskom.

9. ENVIRONMENTAL

The Contractor ensures that all action from the EMPr compiled by the Eskom Environmentalist is adhered to.

10. PAINTING AND COATING

10.1 General information

This guideline covers the requirements for the protective coating of steel structures against corrosion and must be read in conjunction with the latest editions of the standards specified in this document below:

SANS 684 for structural steel paints

SANS 12944 for corrosion protection of steel structures by protective paint systems

SABS 064 for the Preparation of steel surfaces for coating

ISO 8501-1 for surface preparation standard for painted steel surfaces

SANS 1091 for national colours standards for paints

SANS 1319 for Zinc phosphate primer for steel

SANS 2808 for paint & varnishes – determination of film thickness

SANS 2409 for paint & varnishes – cross cut tests

Whenever the reference is made to the standard or code, other authoritative standards and codes that ensure equal or higher quality than the relevant standard and codes will be accepted subject to the Project Engineer's prior review.

Contractors must have a quality management system which must be submitted to the Engineer for approval before commencement of the work.

Surface preparation, priming and site painting shall be measured in m3 of the surface treated. The Project engineer reserves the right to inspect the work at any stage of the execution superseding the QCP requirements.

A cross cut test must be done according to SABS SM159 to determine that the original coating adheres correctly to the substrate. A test shall be done to ensure that the finish coat will not react and that undue dissolving and lifting of the coat does not happen. This can be done by applying a small quantity of the finishing coat thinners.

10.2 Non-destructive examination

It is the contractor's responsibility to ensure that the integrity of the surface to be painted is structurally sound and is suitable for coating.

As per surface condition requirement non-destructive procedures, techniques and acceptance criteria for the examination shall be in accordance with written and approved procedures.

All costs incurred during all non-destructive examinations, inspections and tests and examinations due to non-conformance of the specified requirements shall be borne by the contractor.

10.3 Surface preparation for coating

The method of cleaning and preparing the surface of steel structure prior to the application of the coating system shall be in accordance with the applicable provisions of SANS standards and shall take place at the location specified in the project specification.

The original coating shall be rubber down to remove any smooth finish to form a suitable key for finish coat and any damaged areas prepared and patch primed with suitable primer.

Surface contaminants e.g. residues of oil, grease, dust, corrosion, chemical contaminants etc. will seriously affect the adhesion of applied coatings and must be removed ,therefore, failure to remove these contaminants surface cleaning will result in them being distributed over the steel surface and contaminating the abrasive.

The following methods of surface treatment are recommended for this but that does not supersede the manufacturer's recommended method for the coating while also taking into consideration safety and working environment requirements:

1. Soluble iron corrosion products
2. Manual scrapping
3. Hand and power tool cleaning
4. Blast cleaning

Welded seams shall be thoroughly steel brushed before painting.

All the significant defects that appear after surface preparation of the steelwork shall be repaired in accordance with an approved procedure which is taking into account the structural integrity of the affected area.

10.4 Protection coating system

Should the tenderer wish to offer coating system other than those specified as an alternative, he or she shall submit the full technical details and a list comparing all appropriate details of the alternatives proposed with original specified.

The paint manufacturer's recommendations for the application of different coating systems, curing time before handling or application of subsequent coats, health and safety recommendations etc. must be carefully adhered to.

All paints shall be delivered on site in the original containers that shall display the manufacturer's name and SABS mark.

The coating shall be from one manufacturer only and the paint manufacturer's instructions shall be strictly adhered to but should the different coats be offered the tenderer shall ensure that they compactable with each other.

No painting on the site shall be done in extreme weather or when humidity or frost is liable to cause wet or damp condition on the surface to be painted.

The protection coating system for the structural steel shall consist of primer, undercoat and finish coat where the condition of the paint application shall depend on air temperature, steel temperature and humidity while taking into consideration the environment it will be used on (dusty, wet and in confined upper turret of the slew bearing).

The approved manufacturers of the coating system are Dulux, Plascon and any supplier verified to conform to the respective grades of SANS standards e.g. for under coats to grade I of SANS 681, for coatings to SANS 53811

Protective painting system shall consist of the following:

a) Corrosion resistant primer

b) Undercoat (intermediate coat)

c) Finish coat

11. PLANT CODIFICATION AND LABELLING

11.1 Coding

The KKS plant coding system has been adopted by Eskom and will be coded with KKS (Corporate directive EVD 1085) where the relevant KKS code also appears on the labels.

There is no clear definition of which plant to code and to what level should the plant be coded, however the structure should include all equipment that other disciplines might require in their daily operating, maintenance and engineering duties.

11.2 Labelling

All notices, labels and designations shall be in English. A list of wording, terms, designations etc., shall be submitted in a form of a schedule for approval before manufacturing of labels and notices commences and is subject to Employer's acceptance. Labels for instruments and removable items are mounted alongside the item and not fixed to the item itself.

Equipment shall be marked clearly in accordance with the Drawings where it is visible from the nearest floor level. Contractor supplies and installs temporarily labelling.

The label material to be used for coal equipment is the Anodised Aluminium.

12. TESTING AND COMMISSIONING

The Contractor issues a detailed commissioning program for acceptance. The commissioning includes, but is not limited to the following:

12.1 Pre-Start Check

All abnormalities and defects encountered during this plant check are to be brought to the attention of the Supervisor as soon as possible.

12.2 Cold Commissioning

The purpose of cold commissioning is that, following completion of no load checks; the plant is run without load to certify that it is complete in all respects. The checks include:

- Final inspection of plant by commissioning engineers.
- Replace all protections and other sections for easy access which were removed to carry out this work.

12.3 Hot Commissioning

The purpose of hot commissioning is to prove the performance of the plant to the Client. The Contractor's commissioning manager and his engineers, assisted by Employer's engineers are responsible for hot commissioning.

- Check system integrity.
- Complete all remedial work for acceptance by Employer.

Manuals must be in English.

13. DRAWINGS

13.1 Enquiry Drawings

DRG NO	DESCRIPTION	REV
0.64/13650 & 34132	General arrangement of Terrace bins 1, 2 & 3	R2 & R0
0.64/14111 & 134133	Details for Terrace bins 1, 2 & 3 general arrangement	R3 & R0
0.64/34134	Terrace bins 1, 2 & 3 miscellaneous steel items	R1
0.64/3759	Hopper transition, spile bar and belt interface details	R0
0.64/12527	Terrace bins 1, 2 & 3 spile bar loading chute and frame	R8
0.64/15865 &6	TB 1, 2 & 3 spile bar support frame at hopper mouth	R1
0.64/14221	TB1, 2 &3 transfer tower elevation on lines A & C	R5
0.64/14222	TB1, 2 &3 transfer houses elevation on lines I & H	R4
0.64/34092	TB1, 2 &3 steel sections in hopper	R2
0.64/3490	TB1, 2 &3 hopper bin portion – centre section	R2
0.64/34089	TB1, 2 &3 hopper bin portion – outer walls	R2
0.64/34093	TB1, 2 &3 hopper bin portion – 3CR12 liners	R2

It is the responsibility of Kendal's project department to contact Eskom legal department in order to be certain that the above mentioned drawings can be provided to the tenderer without the legal obligations of violating the propriety information.

It is the responsibility of Kendal's design and specification department to ensure that the latest revisions are utilised for this tender.

13.2 New Drawings

Drawings shall be submitted in hard copy and electronically in their native format. The acceptance of drawings shall not relieve the Contractor of the responsibility to supply the equipment according to the requirements on this Specification. The final drawing shall be as build meaning to represent what is in the plant. All the preliminary drawings and documentation shall be submitted by the Contractor prior to installation work.

The following procedure for the approval of drawings shall be strictly followed:

a) Contractor prepares and submits to Eskom drawings for approval.
b) Drawings submitted by the contractor to Eskom shall be drawn natively in MicroStation V8, where drawings created in ANY software other than MicroStation and converted to MicroStation will not be acceptable.
c) Contractor checks drawings for compliance with all requirements of the specification and submits three (3) copies, signed off as checked to the Engineer for approval.
d) Engineer returns two (2) copies, stamped as approved or returned for resubmission, to the Contractor.
e) Manufacture or purchase of the equipment commences after approval of the drawings by the Engineer.

f) Contractor checks and inspects equipment during all stages using the approved QCP documents.
g) Contractor presents the Engineer with written confirmation that all equipment is in full compliance with the Specification and has been checked, inspected and fully tested. This confirmation, signed and dated by the Contractor, shall accompany a written request for the Engineer to witness re-inspection and re-testing of the equipment.
h) During the Engineer's inspections a fault list will be drawn up, if necessary, and handed to the Contractor.
i) Only after satisfactory rectification of the fault list and subsequent re-inspection, may the equipment be dispatched to site.
j) The Contractor shall ensure that full copies of the specification, as well as an approved, signed copy of the drawings, are at hand during all inspections.
k) A complete set of Record ("As Built") Drawings certified as accurate shall be submitted to the Engineer immediately after completion of the Installation.
l) The contractor shall take note that ALL existing Eskom drawings referred to or supplied are not available in their native format but only in PDF format therefore it is the contractor's responsibility to redraw them before utilizing (reference to) them.

13.3 Documentation Submission and Recording

The Contractor establishes a document tracking system to record the dates for the supply and the receipt of all design drawings, calculations, requests for information and design documentation.
The Contractor submits to the Project Manager a schedule within two weeks from the starting date all documents for acceptance. The schedule provides individual titles of drawings and calculations, and their proposed submittal dates, for submittals as requested in the Works Information and as necessary for the review by the Project Manager as the proposed means of compliance by the Contractor with all aspects of the requirements of the Contract. The scheduled date of first submittal, time allowed for acceptance and expected date of issue after acceptance will be shown for each drawing or document.

The Contractor is required to deliver the following:

a) Detailed assessment Report, Works Information, Specifications, removal and replacement procedure, Bill of Quantities (considering what was previously procured) and Approved for Construction Drawings for the designs and implementation, inclusive of detailing the repairs and elements to be replaced, if required
b) Quality control plan
c) Revised Operating & Maintenance Manual, if required
d) Envisaged program/schedules for the scope of work
e) The Consultant shall continuously present the findings to Eskom for review, challenge, recommendations and approval. It is further important to note that there will be 2-weekly technical meetings between Eskom and the Consultant. The Eskom Design Review procedure must be followed throughout the design

14. WARRANT

Without prejudice to any other rights of the Tenderer under these conditions, the Client warrants that:

- All Goods delivered will be free from defective materials or workmanship;
- The goods will remain free from defects for a period of one year (unless otherwise stated in the Contract Data) from the time of Goods acceptance by the Client.
- It is the supplier's responsibility to properly package the supplied goods for long-term storage which are suitable to protect the content against damage through rough handling while transported and stored.
- This warranty shall survive any inspection, delivery and acceptance process.

15. MINIMUM TECHNICAL TENDER RETURNABLES

The *Contractor* shall submit the following minimums with his or her tender submission:

- The tenderer shall with not less than two pager provide not less than **two similar projects previously executed or managed** by his or her company which involves industrial structural assessment and construction work as a joint venture or has subcontracted part or all the services to the consulting company or any other contractor which provide similar services.
- The tenderer's **company registration with CIDB** having a contractor grading designation of 5CE or 5ME or higher where the joint ventures shall be according to CIDB requirements
- The **project organogram** showing all project team members based on the roles and responsibilities they will play on this project.
- The **project execution plan or programme** showing detailed activity schedule and the total duration from the start to finish. The execution plan provided shall be so elaborated in the Gantt chart to provide a common understanding on how this project will be approached rather than what will be done using tenderer's past experience gained on similar project/s previously executed by integrating the methodology and resources provided.
- The **detailed bill of material** to be provided by the contractor shall ensure that the above scope of work is properly executed without complications and delays. This takes into account the already available material on site.
- The **detailed project execution methodology** complete with the safe working procedure showing ALL tasks or activities required to effectively complete the works to be undertaken under this project while achieving the required quality and safety standards. Tenderer shall describe in a detailed and sequential manner his or her intended methodology to execute the complete works. Methodology provided shall take into consideration that the outage allowable time is only **30 days**, when execution of the works will occur, with both units 1 & 2 being offline. If the tenderer feel that the requested requirements cannot be achieved her or she shall list the risks identified and their mitigations then provide a detailed hourly activity schedule and hours requested.
- The tenderer shall provide the list **all the equipment** and / or **tools** required to execute the complete scope of work.
- Tenderer shall submit a **commissioning procedure** inclusive of the schedule providing details of how the terrace bin work will be commissioned, what acceptance tests will be performed, what data will be collected as proof of tests, how the evaluation of the complete installation's performance will be conducted and the list of all technical documentation that he or she will submit to Eskom – Kendal as part of the handover process
- Tenderer shall submit a safe handling and removal procedure for the nuclear device and the national and international standards that governs such a process.

16. REVISION TRACKING

Revision	Date	Compiler	Reason
1.0		S. Malgas	Required for repair of TB1
2.0	May 2021	S. Malgas/ R. Pillay	Civil and Structural scope added
3.0	August 2021	S. Malgas/ R. Pillay	Updated for inclusion of Scope for TB1 only
4.0	September 2021	S. Malgas/ R. Pillay	Updated requested by Project Manager only to include the scope for Terrace Bin1 excluding (Electrical, C&I, T3,T5, conveyors)
5.0	October 2021	S. Malgas/ R. Pillay/ Eugene Motsoatsoe	Updated for repair of TB1 including C&I scope
6.0	December 2021	R. Pillay/S. Malgas	Only critical work for TB1 to be Scoped, inclusive of C&I. Concept 6 will now be implemented.

17. APPENDIXES

Missing liner connection bolts – TB1

Spile bar support structure (Modul)

Loose hopper crotch connection bolt at TB1