Matimba Power Station Unit 1 to 6 DHP Refurbishment

PART A REQUEST FOR AN EXPRESSION OF INTEREST (EOI)/ REQUEST FOR INFORMATION (RFI)			
Description of the works/goods/services	**Matimba Power Station Unit 1 to 6 DHP Refurbishment**		
Deadline for submission	**33 days after publication**	**At (South African Standard Time)**	**14:00**
Tender Office address	**THE TENDER OFFICE** **MAIN SECURITY GATE, THE TENDER BOX** **MATIMBA POWER STATION** **NELSON MANDELA DRIVE** **LEPHALALE** **0555**		

Eskom Holdings SOC Ltd ("Eskom") invites you to submit an:

- **Request for information (RFI)** to submit information for the works/goods/services as stated in the table. This RFI is a stand-alone information-gathering and market-testing exercise, intended only to inform and assist Eskom's further deliberation and development of a strategy for the refurbish and or upgrade Matimba Power Station Unit 1 to 6 DHP System. Eskom may request indicative prices if so stated in this RFI.

Eskom has delegated the responsibility for this **RFI** to the signatory of this document, whose details can be found below.

We look forward to receipt of your response.

Yours faithfully

Name	Designation	Signature	Date
Dumisani Makamu	**Snr Advisor Procurement**		**2024.06.06**
Telephone number	**014 763 8022**	**Fax and/or e-mail address**	**makamudh@eskom.co.za**

PART B RESPONSE SHEET IN TERMS OF A REQUEST FOR AN EXPRESSION OF INTEREST/ REQUEST FOR INFORMATION To be completed by the supplier			
To	Eskom Holdings SOC Ltd	**Date**	
Attention			
Tel no		**Fax no and /or e-mail address**	
From		**Address**	
Address			
Sender			
Description of the works/goods/services			

Please find below our response to Eskom's questions:

No.	Question	Please indicate your response in this column
1.	**Your contact's name and contact details.**	
2.	**Company registration number**	
3.	**Brief description of previous experience on the system and Description of the solution that you can offer**	
4.	**Indicative prices, see Table 1 and 2 together with technical specification document.**	
5.	**Returnable for this RFI See Table 1 and 2**	

INTENT OF THIS RFI

The intent of this RFI is strictly an information-gathering and market-testing exercise.

METHOD OF DELIVERY

The information can be forwarded to **Dumisani Makamu** at the email address cited above or at the reception of the above physical address for the attention of **Dumisani Makamu**.

FORMAT OF SUBMISSION

The information can be provided either as a hard copy document.

IMPORTANT NOTES

1. Due to the specific need that this RFI process must fulfil, Eskom wishes to clarify that this invitation is not intended to impede, amend, or replace any current or future procurement process that Eskom has engaged in or will engage in.
2. Eskom reserves the right, in its absolute discretion, at any stage and without notice, to terminate further participation in the process by any Party, to select or disqualify any interested participant from further engagement, to amend and/or terminate this RFI process or any future process pursuant to this process.
3. This RFI is a stand-alone information-gathering and market-testing exercise, intended only to inform and assist Eskom's plans in pursuing solutions to the current issues experienced on the DHP at Matimba.
4. Any and/or all information submitted by any and/or all respondents may be used without the necessity of acknowledging the source, and without such entity gaining any rights in respect of such a solution, including but not limited to any intellectual property rights.
5. No portion of any of the information submitted will be treated as confidential and respondents should **NOT** submit sensitive or confidential information.
6. Any information provided pursuant to this RFI process and any subsequent processes and/or engagement is not confidential. Through making a submission a respondent accept the terms and conditions which governs this process.
7. All participants responding to this RFI process need to ensure that they have received all information and remain solely responsible for satisfying themselves as to the information required in responding hereto and are fully responsible for all costs incurred in relation hereto and under no circumstances will any resultant cost be borne by Eskom.
8. Where any information or clarification is required, please do not hesitate to send an email to **Dumisani Makamu** at **MakamuDH@eskom.co.za** . Contacting the system engineer is not allowed as all communication must go through the buyer.

INTRODUCTION

Matimba Dust Handling Plant is old, it needs to be refurbished to reduce the amount of ash visible on the ground floor and top sections of the DHP due to conveyor ash leaks violating environmental standards. These ash leaks lead to secondary damages on the adjacent plants such as gearbox oil filters clogging from dust and consequently overheating, leading to premature failures of these components. Furthermore, an ash conveying system design that matches the current feeding capacity on the Electrostatic Precipitator Hoppers is required to address the challenge of backlogs and Chain conveyors breakages on overload.

Figure 1: Matimba's Hopper & Collector conveyors Layout

SUPPORTING CLAUSES

SCOPE

To test the market by requesting information on how to partner with Eskom Holdings to propose a system refurbishment approach, design solutions, construct, refurbish, supply of spares and materials, offer sales of spares and materials, refurbish spares and materials including the fabrication of equipment and plant components for Matimba's Dust Handling Plant. To avoid irregularities on patented technologies and intellectual properties associated with Chain conveying systems and ash conditioning systems, a supplier must have OEM/s

distribution rights as the designer and distributor of spares and materials for the Dust Handling plant.

PURPOSE

This document entails the technical background, technical requirements and minimum technical evaluation criteria which will be used to compare and assess the presented solutions proposals during the Request for Information Assessment. This RFI is intended to receive feedback from all interested suppliers as per Scope to determine how many possible suppliers exist that can do proper Upgrade and refurbishment to the DHP and to determine an estimated project cost.

DEFINITIONS

- OEM-Original Equipment Manufacturer of Dust Handling Plant is the organisation that designed and manufactured Dust Handling Plant System and subsystems.
- Conditioner-A conditioner consist of a steel casing with two counter rotating shafts fitted with paddles. The shafts and paddles act as screws moving fly ash from inlet to the conditioner outlet. The system is fitted with nozzles along the length of the conditioner to add moisture.
- Hopper aeration system-An air supply system that supplies air via aeration pads to the ash within the hopper. This aeration reduces bulk density of ash in the hopper which ultimately improves flowability of the ash.
- Ash Flow Control Valve-A Pneumatic actuated valve system designed to control flow of ash out of the hoppers to the Electrostatic chain conveyors by limiting capacity being discharged based on capacity in the conveyors.
- Slide Gates-The Isolate chutes while at the same time allowing control in terms of which route ash flow must follow.

ABBREVIATIONS

DHP	Dust Handling Plant
BMH	Bulk Materials Handling
ESP	Electrostatic Precipitator
CC	Collector Conveyor
AFCV	Ash Flow Control Valve
BE	Bucket Elevator
BTC	Bunker Top Conveyor
FAB	Fly Ash Bunker
UCLF	Unplanned Capability Loss Factor
RH	Right Hand
LH	Left Hand
UAGS	Unplanned Automatic Grid Separation
ID	Inner Diameter
LH	Left Hand
NDE	Non-Drive End
NDT	Non-Destructive Testing
OEM	Original Equipment Manufacturer
PM	Plant Maintenance
PQP	Process Quality Procedure
QCP	Quality Control Plan/Procedure
SAP	System Application Product
SHE	Safety Health and Environment
STESP	Station Thermal Efficiency Programme
MSOW	Master Scope Of Work
SOW	Scope Of Work
KKS	Kraftwerk-Kennzeichen-System
FLOC	Functional Location

DISCLOSURE CLASSIFICATION

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

THE WORKS

BACKGROUND

As outlined in the introduction, a solution is required that will be implemented to ensure a reliable and coping Dust Handling Plant.

EXISTING SYSTEM

Matimba Power Station DHP uses several chain conveyors (8 per unit numbered from 1 to 8 in figure 1) to collect fly ash from the ash hoppers outlet. Each chain conveyor collects from 4 ash hoppers which have a different ash collecting capacity. The conveying system consists of a steel casing that encapsulates an endless chain that scrapes bulk material from one end of the conveyor to the other over a horizontal distance. The collected ash is then transferred to the collector conveyors numbered 9 to 12.

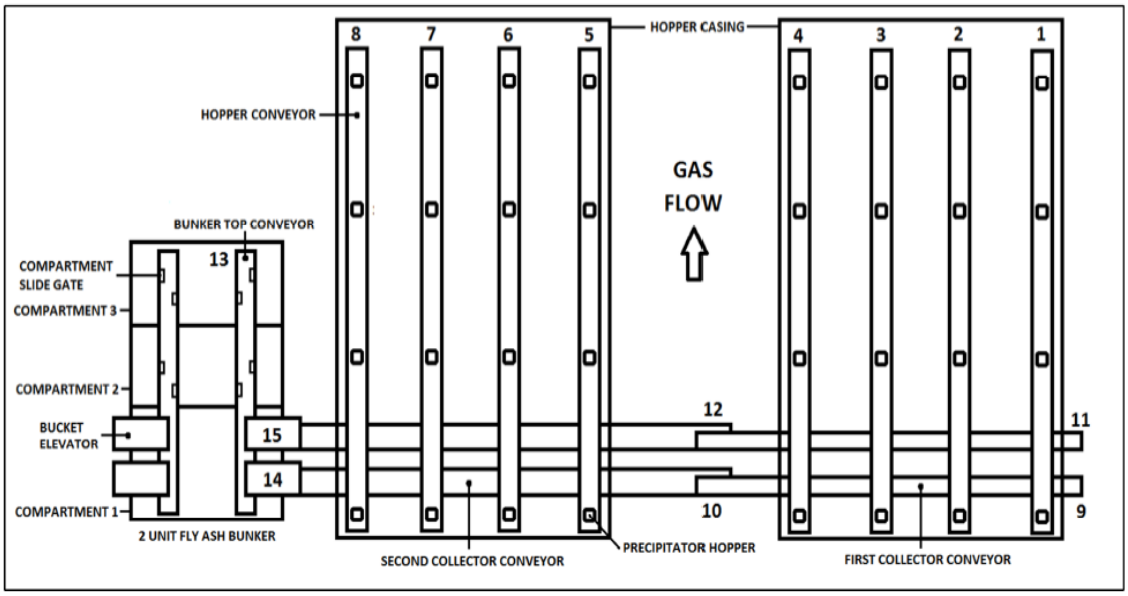


Figure 2: Current System Layout

The conveying system is equipped with buckets elevators (numbered 14 and 15) which also consist of a steel casing and an endless belt with buckets fixed to it to carry the bulk material over a vertical distance and discharges the bulk material at the top of the elevator. The discharged ash is then conveyed by a bunker top conveyor numbered 13 onto the bunker compartments before the ash gets conditioned by mixing it with water. From there, the ash is taken out of the DHP by a series of belt conveyors into the ash dump.

Existing System Overall Specifications

Ash Flow Rate: 253t/h(max)

Conveying Height(Bunker Top): 44m

Bucket Elevator Capacity: 253t/h

Ash Properties

Relative Density: 2.3

Bulk Density: 1.2

Moisture content: 0%

Temperature: 150°C

Table 1: Current Sub-systems specifications

Sub-System	Specifications
Precipitator Conveyors	• Length is 22.1m • Capacity 32t/h • Chain speed is 0.06m/s • Drive {Motor=2.2kW, Speed=1430r/min} • Reducer
Collector Conveyors	• Length is 36m • Capacity is 253t/h • Chain speed is 0.15m/s • Drive {Motor=18kW, Speed=1750r/min} • Reducer
Bucket Elevator	• Continuous Bucket model. • Height id 44.5m • Belt speed is 1.46m/s • Drive {Motor=55kW, Speed=1480r/min} • Reducer
Bunker Top Conveyor	• Length is 25m • Capacity is 253t/h • Chain Speed is 0.15m/s • Drive {Motor=18kW, Speed=1750r/min} • Reducer

Conveying Capacities

Matimba's current DHP system is such that a 10-hour backlog can be recovered at 20 hours at maximum conveyors speeds. Under normal operation, each boiler produces about +/- **107t/h** of flash corresponding to the DHP design capacity of **117.6t/h**. The Dust Handling Plant is designed to handle about **252t/h** in backlog conditions.SO3 plant modification was introduced to the system with the aim of emissions reduction.

Table 2: Conveying Capacities

Plant/System	Normal Capacity (t/h)	Backlog Capacity (t/h)	Normal Capacity conveyor speed (m/s)	Backlog Capacity Conveyor speed (m/s)	Continuous Operation
Dust Handling Plant (DHP)	117.6	252	N/A	N/A	N/A
Electrostatic Precipitator conveyors (8)	14.7	31.6	0.006	0.006	Yes
Collector Conveyors	117.6	252.8	0.1	0.15	Yes
Bucket Elevators	117.6	252.8	1.34	1.34	Yes
Bunker Top Conveyor	117.6	252.8	0.1	0.15	Yes

From 2001 to 2007 before the SO3 plant modification emissions were sitting at an average of 553tons of ash per month. From the year 2012 emissions were at an average of 260 tons per month that entails the aid of SO3 plant. This implied with the aid of SO3 plant we are collecting an average of 293tons of ash more per month. That gives 48.833 tons/unit/month more, 1.575 tons/unit/day, 0.066 tons/unit/hour.

Hopper Storage Capacity

Matimba's DHP Hoppers are designed to have the shape of Truncated Rectangular Pyramid as indicated on Figure 3. These Hoppers are of different sizes and this section will discuss their sizing or storage capacity.

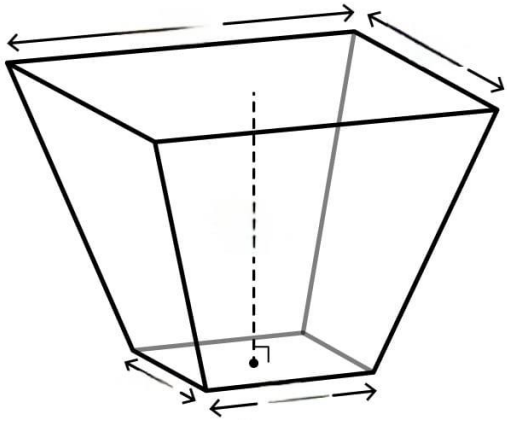


Figure 3: Truncated Rectangular Pyramid

Actual Size estimates taken from the direction of Flow:

Row 1:

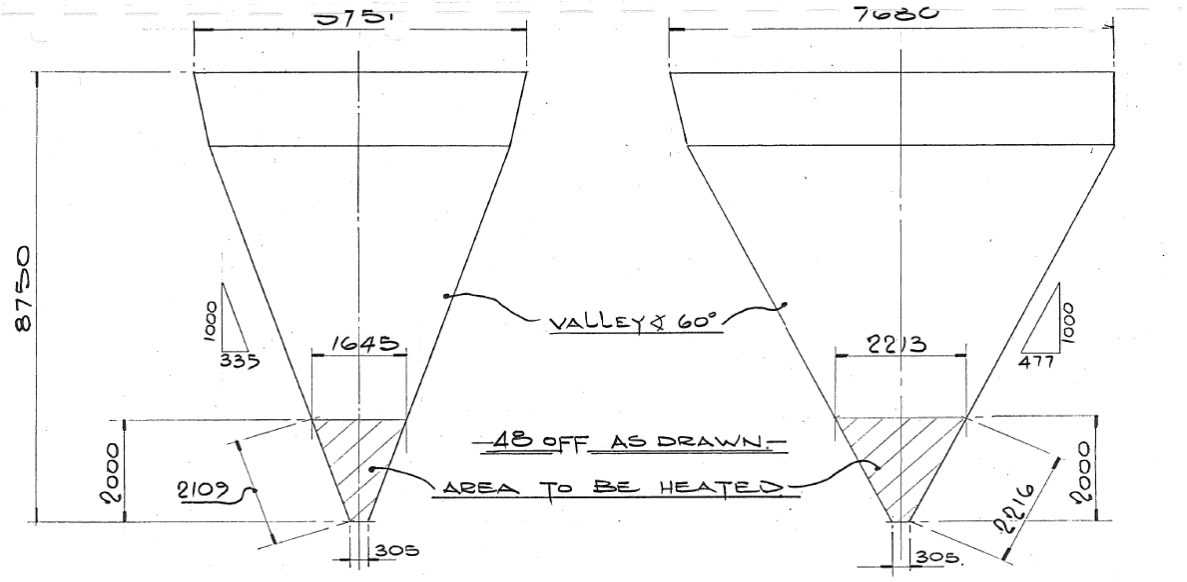


Figure 4: Row 1 view dimensions

Row 2

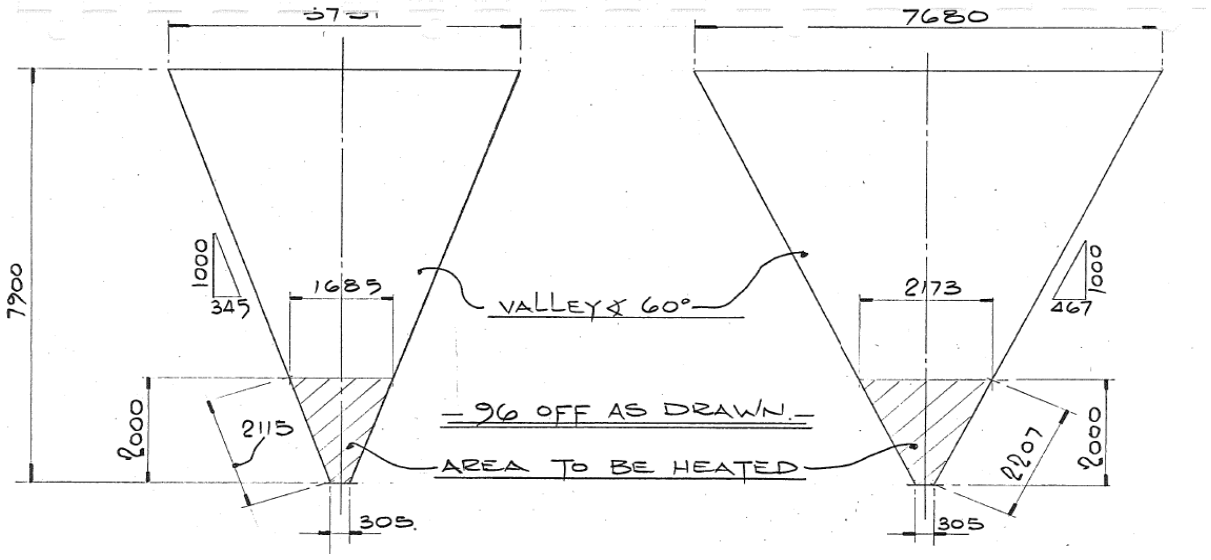


Figure 5: Row 2 view dimensions

Row 3

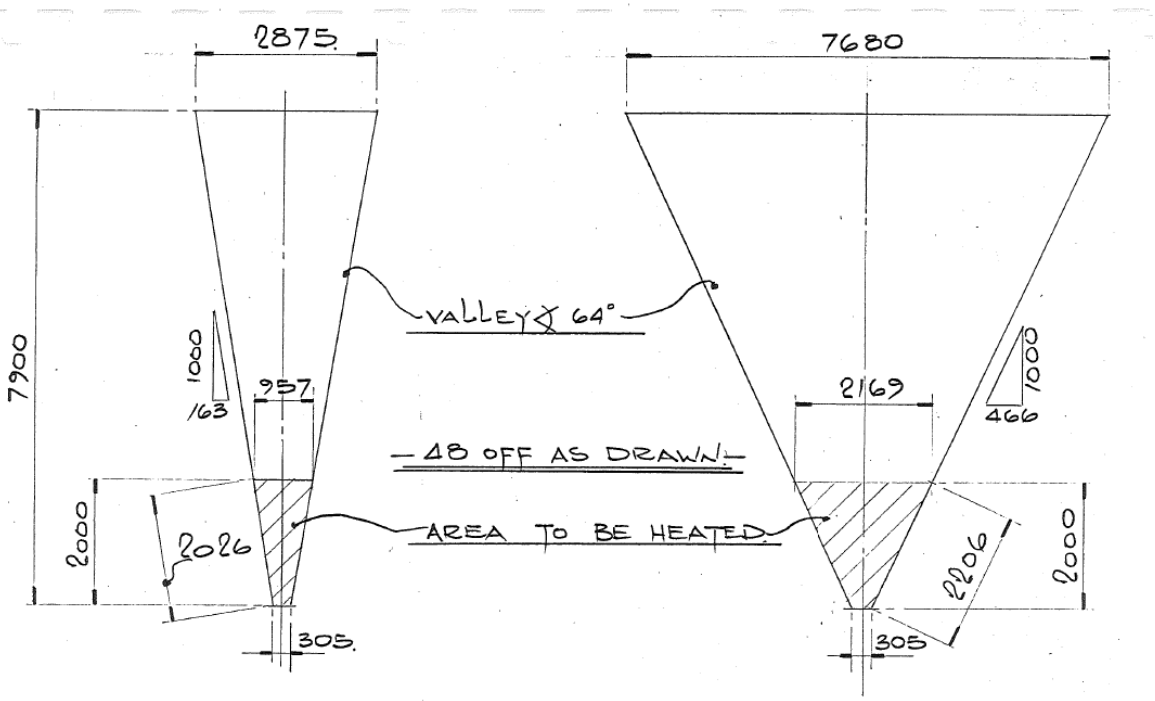


Figure 6: Row 3 View Dimensions

Figure 7 : Electrostatic Precipitator Chain Conveyor

Hopper Chain Conveyor (1 to 8 in figure 2)

There are four hopper outlets discharging ash into each of the hopper chain conveyors. There is a single fall through after Field 1 of the hopper.

The system consists of the following:

- Single speed electric motor and two reduction gearboxes
- Sprocket shaft connected via rigid coupling to the output gearbox.
- Wear rails and guide rails
- Tensioning via threaded bars at the non-drive end
- Proximity pulse sensing switch on the non-drive end (sprocket revolution detection)
- Limit switch on the drive end (low limit chain tension detection

Outside Casing Details of hopper chain conveyor:

- Trough width: 490 mm
- Length (Sprocket centre to centre): 21.44 m
- Upper trough height (Outlets of fields 1 & 2): 345 mm
- Upper trough height (Outlets of fields 3 & 4): 95 mm
- Return trough height: 355 mm
- Height of product in the conveyor=225mm

Figure 8: Collector Conveyors Arrangement

First Collecting Chain Conveyor (9 in figure2)

The first collecting chain conveyor receives fly ash from the four hopper chain conveyors. There are fall throughs situated after each inlet. The ash is conveyed to the active stream second collecting chain conveyor.

The system consists of the following:

- Dual speed electric motor and reduction gearbox

Input to the first collecting chain conveyor (in sequence):

- Manual isolation slide gate
- Compensator

Outside Casing Details:

- Trough width: 640 mm
- Length (Sprocket centre to centre): 35.48 m
- Casing height: 620 mm (10 mm thick casing plates)
- Upper trough height: 150 mm
- Return trough height: 450 mm

Second Collecting Chain Conveyor (11 in figure1)

The second collecting chain conveyor receives fly ash from the four (4) hopper chain. There are fall throughs situated after each inlet. Ash is discharged into the active stream bucket elevator.

The system consists of the following:

- Dual speed electric motor and reduction gearbox

Input to second collecting chain conveyor (in sequence):

- Manual isolation slide gate
- Compensator

Outside Casing Details:

- Trough width: 1 300 mm (10 mm thick separating plate)
- Length (Sprocket centre to centre): 31.36 m
- Casing height: 620 mm (10 mm thick casing plates)
- Upper trough height: 150 mm
- Return trough height: 150mm

Both collector routes can also receive ash from Hoppers 501 & 502 Through bypass routes.

Figure 9: Bucket Elevator Arrangement

Bucket Elevator (14 in figure 2)

The bucket elevator conveys the ash to the top of the ash bunker and discharges it into either the bunker top chain conveyor or directly into the ash bunker compartment one.

The system consists of the following:

- Single speed electric motor, fluid coupling and reduction gearbox
- Pony drive connected to the gearbox mid-stage reduction (inspection speed) with sprocket chain
- Tensioning via threaded bars on the non-drive end
- Belt tracking limit switches on drive and non-drive ends
- Proximity pulse sensing switch on the non-drive end (sprocket revolution detection)
- Bifurcated discharge chute
- Diaphragm switches in boot and discharge chute (level indicator)

Input to bucket elevator (in sequence):

- Manual isolation slide gate
- Compensator

Casing Details:

Height (Pulley centre to centre): 42.325 m

Figure 10: Bunker Top Conveyor System

Bunker Top Chain Conveyor (13 in figure2)

The bunker top chain conveyor conveys ash into ash bunker compartments two and three. There is a fall through situated after both inlets.

The system consists of the following:

- Dual speed electric motor and reduction gearbox

Input to bunker top chain conveyor (in sequence):

- Compensator
- Bucket elevator to bifurcated chute

- Manual isolation slide gate
- Compensator

Outside Casing Details:

- Trough width: 1 300 mm (10 mm thick separating plate)
- Length (Sprocket centre to centre): 24.36 m
- Upper trough height (Inlets to chain conveyor): 550 mm
- Upper trough height (Outlets to ash bunker): 150 mm
- Return trough height: 450 mm

Hopper and Routes Slide gates

Figure 11: Slide gates on Bucket Elevator routes

Matimba Power station's DHP routes are managed and controlled by means of slide gates system installed at various section in which path selection is required. The gates also aid on hopper discharge and isolation in cases on conveyor overload and bypass path usage.

DESIGN REQUIREMENTS

The Contractor is requested to do a detailed concept design to meet the design requirements as set out in Table 3 & 4 together with the attached DHP additional specification document.

Provide feedback of the Table 4 technical requirements though a report or method statement with the necessary data sheets where possible. See submission for this RFI Section.

SUBMISSION FOR THIS RFI

Before continuing with this RFI, carefully examine and understand the expectation as set out in “Matimba DHP technical specification” attached to this RFI. The following returnable are as per technical requirements of document “Matimba DHP technical Specifications”. To simplify the submission of this RFI only the following was extracted from “Matimba DHP technical specification”.

For the sake of this RFI, it is requested that each DHP supplier complete the following:

1. Complete 3 - respond with a Yes or No at each row and or bullet point where:
    a. Yes: “I accept the returnable and have no issue to supply such information during official tender”
    b. No: “I do not accept the returnable”
    c. If “No”, sufficient proof, motivation and detail must be supplied or else the dispute will be dismissed.
    d. Suppliers are welcome to supply the information if willing to do so for this RFI.
2. Complete Table 4– respond with a Yes or No where”.
    a. Yes: “Will be able to meet the specification”
    b. No: “Will not be able to meet the specification”
3. Take note of the technical data set out in “Matimba DHP technical Data & requirements.’

Table 1: Tender returnable

Item	Returnable	Yes/ No
1	Provide a proposal of the layout in depth	
2	Give detailed specifications in the proposed solution (e.g., Capacity, Drives specs) and clear indication of improvement.	
3	Provide an in-depth method statement for the proposed solution.	
4	Supply data sheets for any new upgrade on the system.	
5	Site visits to conduct an assessment or evaluation of the current system and provide cost estimates for the proposal.	
6	Indicate detailed calculations supporting the proposed solution with respect to capacity.	
7	Provide Estimated BOQ of all major equipment with its pricing.	
8	Provide In-Depth Costings.	

Table 2: Technical Requirements for the Proposed

Item	System Requirements	Yes/ No
1	The proposed solution must be capable of handling more than 252t/h of flow rate, preferably its maximum capacity should be 280t/h or more.	
2	Hopper extraction control valves should be incorporated in the system (Hydraulic, Motorised or Pneumatic actuated)	
3	All Hoppers to be fitted with Bypass chutes and pipes to control Backlog Conditions	
4	The system must incorporate Automated slide gates, also manually operable.	
5	Speed indications and or sensors to be part of the proposed solution.	
6	Overload protection to be part of each conveying route/stream	
7	Flow Measuring & Protection system on each Chain conveyor to be part of the system, preferably independent of current pneumatic system.	
8	Incorporate a new control system that compares input rate and conveyor extraction rate, then decides after either to open/close the control valve or increase the drive speed of the extraction conveyors.	
9	Proper sealing between hopper and conveyor must be in place.	
10	Increase the current drive system output speed by changing the gearbox ratios from speed reducer to a speed increaser, allowing speed variation with reasonable torque, or any similar approach allowing speed increase with reasonable output Torque.	
11	The scope with respect to the drives is not limited to electric motors & reducer gearbox, explore other better drive methods in the market e.g., hydraulic drives on the proposed solution.	

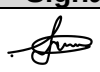
12	The conveyors and bucket elevators must have operational modes with different speeds (normal& backlog operation) The operational mode must be able to be selected from the control room and locally.	
13	Bucket elevators must have specific speed settings to be used for inspections.	
14	The new casings design must enable the DHP to run to the station's life with minimal or no ash leaks and allow for ease of replacement on maintenance	

PRICING

Considering Table 1 & 2 technical requirements and please specify the following.

1. Estimated cost of the proposed solution per Unit R_____
   a. Including all added upgrades

Yours faithfully

Name	Designation	Signature	Date
Fulufhelo Munyai	**Procurement Manager**		2024.06.06
Telephone number	**014 763 8271**	**Fax and/or e-mail address**	**MunyaiFA@eskom.co.za**