

	Strategy	Engineering
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Strategy for Hendrina Boiler
Refractory cast cement and
Factory Bricks**

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1. INTRODUCTION

Hendrina Power station require supply and delivery of Refractory cast cement and Factory Bricks for the boiler. The aim of this strategy is to evaluate a potential company which can deliver and supply refractory on a regular basis.

2. SUPPORTING CLAUSES

2.1 SCOPE

This document covers the scope of work for Hendrina Power station, supply and delivery of Refractory cast cement and Factory Bricks.

2.1.1 Purpose

The purpose of this document is to supply and delivery the Boiler refractory.

2.2 NORMATIVE/INFORMATIVE REFERENCES

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

2.2.1 Normative

- [1] 240-168966153: Tender Technical Evaluation Procedure
- [2] 32-1034: Eskom Procurement and Supply Chain Management Procedure
- [3] 32-1033: Eskom Procurement and Supply Chain Management Policy

2.2.2 Informative

- [1] ISO 14001:2004 - Environmental Management Systems
- [2] HSPPA/006 - Eskom Hendrina Power Station's Quality Procedure
- [3] NEC3 - National engineering Contract
- [4] ISO9001 - Quality management system
- [5] 240-106628253 - Standard for Welding Requirements on Eskom Plant
- [6] 240-71443868 - Standard for Evaluation of Surface Microstructures Using the Metallographic Replication Technique
- [7] 240-75109745 - Standard for Metallographic Replication Applicable to High Temperature High Pressure Components in Eskom Plant

2.3 DEFINITIONS

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

CONTROLLED DISCLOSURE

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2.3.1 Classification

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

2.4 ABBREVIATIONS

Abbreviation	Description
AIA	Authorised Inspections Authority
ASGISA	Accelerated and Share Growth Initiative of South Africa
BBBEE	Broad Based Black Economic Empowerment
EMD	Electrical Maintenance Department
EMS	Environment Management Systems
FT	Feet
HP	High Energy Piping
LP	Left Hand
MSDS	Material safety data sheet
RH	Right Hand
RTS	Return to service
SM	Service/Site manager
KPI	Key performance Indicators
QCP	Quality Control plan

2.5 ROLES AND RESPONSIBILITIES

As per 240- 168966153: Tender Technical Evaluation Procedure

2.6 PROCESS FOR MONITORING

N/A

2.7 RELATED/SUPPORTING DOCUMENTS

N/A

3. TENDER TECHNICAL EVALUATION STRATEGY

3.1 TECHNICAL EVALUATION THRESHOLD

The minimum weighted final score (threshold) required for a tender to be considered from a technical perspective is 70%.

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3.2 TET MEMBERS

Table 1: TET Members

TET number	TET Member Name	Designation
TET 1		System Engineer
TET 2		Snr Engineer
TET 3		System Engineer
TET 4		System Engineer

3.3 MANADATORY TECHNICAL EVALUATION CRITERIA

Mandatory technical evaluation criteria (gatekeepers) are a meet criteria. These criteria shall not be weighted or scored but shall be assessed on a yes/no basis as to whether the criteria are not met. an assessment of 'no' against any criteria shall technically disqualify the tender and shall not be further evaluated against qualitative criteria table 3: mandatory technical evaluation criteria.

Table 3: Mandatory Technical Evaluation Criteria

	Technical criteria description	Reference to technical specification/ tender returnable	Yes	No
1.	Compliance with provided client specification (i.e. bidder to attach test certificate)	Compliance and lab test certificate results verified by independent third party for refractory and product description for bricks.		

3.4 QUALITATIVE TECHNICAL EVALUATION CRITERIA**Table 2: Qualitative Technical Evaluation Criteria**

	Technical Evaluation Criteria			
Requirement	Determinants	Points	(%)	Weight %
1. Company's experience in supplying Refractory cast cement and Factory Bricks.	Two relevant task orders/contracts + two related contactable references.	5	100	30
	Two relevant task order/contract + one related contactable reference.	4	80	
	One relevant task order/contract + one related contactable reference.	2	40	
	No experience.	0	0	
2. Supply and delivery: Provide a detailed methodology which includes how the material will be protected from adverse weather conditions during transportation and after delivery.	Full detailed methodology of transportation and storage	5	100	70
	Partially detailed methodology of transportation and storage	4	80	
	Methodology for transportation detailed post-delivery storage not detailed.	2	40	
	No methodology provided	0	0	
		Total		100

SPECIFICATIONS FOR REFRACTORY CEMENT

Refractory cast cement should meet the following specifications or exceed the mechanical properties as tabled in the table below. Only mouldable and castable refractory material manufactured from any bakeable monolithic refractory which will fit the Eskom plant and meet the abrasion quality requirements as per ASTM C-704 and ISO 16349:2015 standard or meet the mechanical properties as tabled below. The refractory must be wear-resistant particularly with Pulverised coal (PF) and must resist thermal shock over a minimum operational period of 18 months.

Suppliers should also provide material safety data sheets for the refractory casting cement that will be acceptable to Eskom Plants, over and above the material itself to guarantee safety, health of personnel, plant and environment. Materials must not release toxic gases nor particulate emissions during usage.

Refractory or epoxy to be supplied should resist high velocity PF erosion and minimum temperature of 1200 °C for a minimum of 18 months continuous plant operation without compromising the refractory strength and durability. It should not disintegrate or separate, crack under thermal shock after the boiler has been in operation for a minimum period of 18 months.

<u>Refractory cast mechanical properties</u>	
Maximum service temperature	1350°C
Bulk density dried at 110°C	2660 Kg/M ³
C.C.S dried at 110°C	52Mpa
Fired to 1000°C	47Mpa
Fired to 1300°C	85Mpa
Shelf life (keep Cool & Dry)	6 moths
Thermal Conductivity @1000°C	3,20W/mk
<u>Chemical Analysis</u>	
SiO ₂	24,00%
Al ₂ O ₃	30,28%
Fe ₂ O ₃	12,79%

TiO2	0,93%
MgO + CaO	10,30%
Na2O + K2O	0,26%
Cr2O3	19,09%
SPECIFICATIONS FOR BRICK RFRCTRY	
BRICK, REFRACTORY: DIMENSIONS: WD 114 X LG 230 MM; GRADE INSULATING, FIRE, COLOUR: RED, ACID RESISTANT	

TET MEMBER RESPONSIBILITIES

<In Table 4 identify the TET members allocated to review/evaluate each Qualitative criterion (minimum 2 evaluators per criteria / sub-criteria)>

Table 3: TET Member Responsibilities

Mandatory Criteria Number	TET 1	TET 2	TET 3	TET 4
N/A				
Qualitative Criteria Number	TET 1	TET 2	TET 3	TET
1	X	X	X	X
2	X	X	X	X
3	X	X	X	X
4	X	X	X	X
1	X	X	X	X
2	X	X	X	X
3	X	X	X	X
4	X	X	X	X
1	X	X	X	X
2	X	X	X	X
3	X	X	X	X
4	X	X	X	X

3.5 FORESEEN ACCEPTABLE / UNACCEPTABLE QUALIFICATIONS**3.5.1 Risks****Table 4: Acceptable Technical Risks**

Risk	Description
1.	The supplier has no previous record of supplying refractory.

Table 5: Unacceptable Technical Risks

Risk	Description
1.	Supplier not meeting client specifications and no methodology

3.5.2 Exceptions / Conditions**Table 6: Acceptable Technical Exceptions / Conditions**

Risk	Description
1.	None

Table 7: Unacceptable Technical Exceptions / Conditions

Risk	Description
1.	None

4. AUTHORISATION

This document has been seen and accepted :

5. REVISIONS

Date	Rev.	Compiler	Remarks
March 2024	0		First issue/ Compilation

6. DEVELOPMENT TEAM

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

7. ACKNOWLEDGEMENTS

N/A