	PROJECT		Standby SRU & Additional Tanks	
	CLIENT		IOCL Paradip Refinery	
SPECIFICATION FOR ACID PROOF BRICK LINING	Project No. 080557C001	Document No. 080557C-000-JSS-1700-016	Rev. No. B	Page 1 of 6

SPECIFICATION FOR ACID PROOF BRICK LINING

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1. SCOPE

This specification covers the requirement of materials and laying of Acid proof brick lining.

This JSS covers typical General specification for some standard items only and the CONTRACTOR shall comply with the requirement as given in 080557C-088-JSD-1700-001 for specific cases and for any other items not mentioned/specified in this JSS. The requirement for various type of building as specified in the document 080557C-088-JSD-1700-001 shall be the governing one. The CONTRACTOR shall submit the detailed specification for the other items not covered in this specification for Approval by OWNER'S/ENGINEER IN CHARGE during execution.

2. REFERENCES

2.1 APPLICABLE CODES

The Indian Standard codes applicable to this section shall include but not limited to the following:

- ◆ IS 4832(Part-I) : Chemical resistance mortar – silicate
- ◆ IS 4832(Part-II) : Chemical resistance mortar – resin type
- ◆ IS 4457 : Acid and/or alkali Resistant tiles.
- ◆ IS 4860 : Acid resistant bricks.
- ◆ IS 9510 : Specification for Bitumen Mastic, Acid resistant grade.
- ◆ IS 10570 : Methods of testing Refractory castables



2.2 APPLICABLE SPECIFICATIONS

- ◆ ASTM D41-94 : Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and waterproofing

3. PRIORITY OF REQUIREMENTS

In case of any variation and discrepancy in condition between the special conditions, this specification and codes, order of priority shall be as under: -

- (1) Special conditions.
- (2) This specification.
- (3) Codes.

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4. **MATERIALS**

Acid Proof Bricks / Tiles

The Bricks shall conform to IS: 4860 - Class I quality. All bricks shall be dense, homogeneous and manufactured out of special raw material which shall have low lime, flint, sand and iron contents. These shall be specially fired and vitrified at high temperature to have qualities of low absorption. The size of the bricks shall normally be 230mm x 114mm x 64 mm or as per IS: 4860. The size of Acid proof tile shall be as per IS: 4457.

Acid Proof Mortar

Silicate mortar

It shall consist of selected potassium silicate solution and inert filter powder. Both mixed well to enable to set at ambient temperature. The mortar shall conform to IS: 4832 (Part — I). The mixing proportion and other instructions for use shall be as specified standard manufacturers. Silicate mortar from standard manufacturers only shall be used. Contractor shall obtain approval from Engineer - in - charge prior to order and supply of the material. This type of Mortar is resistant to most acids except hydro-fluoric acid and concentrated ortho-phosphoric acid; they are not resistant to alkalies of any concentration or to boiling water or steam.

Resin Mortar



The furane and phenolic mortar for jointing consist of inert powder synthetic resin syrup. No water shall be used during mixing. This mortar shall conform to IS: 4832 (Part — II). The mixing proportion and other instructions shall be as specified by standard manufacturers. Resin mortar from standard manufacturers only shall be used. Contractor shall obtain approval from Engineer — in — charge prior to order and supply of the material. This type of Mortar has a good resistance to non-oxidising mineral acids, and poor resistance to oxidising mineral acids. They are fairly resistant to inorganic alkalies and water.

Bitumen Primer

A bitumen primer is an asphalt based material thinned with petroleum solvent (conforming to ASTM D-41) should be applied over the surface. Primers from standard manufacturers only shall be used.

Bitumen Mastic

The bitumen mastic shall consist of a mixture of asphalt cement mineral filler, and mineral aggregate, which are acid alkali proof. The composition, preparation and properties of the bitumen mastic shall be as per IS: 9510 for resisting acid. The bitumen mastic shall be insoluble in Benzol and the matter soluble in diluted hydrochloric acid should not be more than five percent. "Prodorphalte" by Coromandal Prodorite or equivalent may be used.

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5. LAYING

Surface preparation

The concrete surface shall be thoroughly cleaned with all loose/damaged areas chipped out, patched or replaced. Proper slope for good drainage shall be ensured by laying a fresh bedding in cement mortar, if necessary, and avoiding all low spots. The concrete shall be dry, clean and well cured before installation of the membrane is taken up.

- All damaged or questionable areas should be chipped out and replaced.
- Adequate floor slope for good drainage is important.
- Low spot should be avoided because finished floor will follow contour or sub floor.
- Concrete should be dry, clean and well cured before application of membrane is started.

Primer application

A bitumen primer should be applied over the prepared surface. It should be allowed to dry before applying the membrane material.

Membrane application

Bitumen mastic is used to build up the membrane. It is heated to 120-205° C and applied to the primed surfaces. Multiple coat application should be made to thickness requirements. The thickness of the mastic layer shall be to suit the acid concentration and expected load or as specified by the Engineer-in-charge. Each coat should be inspected for blisters and pinholes. If present, they should be broken and before Applying subsequent coats. Bitumen mastic should not be used as the membrane material where solvents are involved.



Reinforcement application

Bitumen coated glass cloth can be used for membrane reinforcements at the corners, edges, walls, etc. depending on the requirements.

Application of mortar and bricks

A thin layer of about 6mm potassium silicate type mortar is spread on the back of the acid proof brick and the bricks are pressed down on the bed. Proper joint thickness of about 20mm should be maintained and filled up with suitable resin type mortar.

In this case, joints with silicate mortar should be acid cured with 20 to 25 percent hydrochloric acid or with 30 to 40 percent sulphuric acid before applying the resin type mortar. After acid curing, the free acid in the joints shall be cleaned with water and sufficient time should be allowed should be allowed for thorough drying. After curing resin mortar is used for filling up the joints.

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6. GUARANTEE

The vendor shall give material and performance guarantee for a minimum period of one year from the date of commissioning of the plant.

7. PAYMENT (APPLICABLE FOR ITEM RATE TENDER)

Payment shall be on basis of actual area covered measured in square metres, and shall include supply and cost of all materials, tools, labour, installation as per specifications and manufacturer's recommendations all complete and as directed.