



OGDCL PAKISTAN:
OIL & GAS DEVELOPMENT
COMPANY LIMITED

KPD-TAY Compression Project (Phase-II)

ISSUED FOR TENDER

REV	DATE	DESCRIPTION	ORIG	CHKD	LE	QA	PM	LOCAL REPR.	PROJ. MAN
0	6-1-2022	ISSUED FOR TENDER	HB	MD	KM	MPM	MAS		
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ENAR Petrotech Services (Pvt.) Limited ,
7-B , Sector 7-A , Korangi Industrial Area ,
Karachi Pakistan

TITLE:

SPECIFICATION FOR BRICK MASONRY

PROJECT NO.
14-0258

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1.0 GENERAL

1.1 Scaffolding

Scaffolding of adequate strength for use of workmen at all levels and heights shall be provided.

1.2 Damage to masonry from scaffolding or from any other cause shall be repaired.

2.0 MATERIAL

2.1 All Portland or Masonry cement for mortar shall conform to the applicable Standards.

2.2 All sand for mortar shall conform to the applicable Standards for aggregate for Masonry mortar.

2.3 All water used in the manufacture of bricks and in the preparation of mortar or grout shall be free from objectionable quantity of silt, organic matter, alkali, salts and other impurities, and shall be tested.

3.0 MORTAR

3.1 Mortar for all brick masonry, except where otherwise directed, shall consist of one part Portland cement to six parts of damp loose mortar sand by volume and sufficient water to produce proper consistency for the intended use. The ultimate crushing strength of mortar shall not be less than 17 MPa at 28 days.

3.2 Methods and equipment used for mixing mortar shall be such as will accurately determine and control the amount of each ingredient entering the mortar. Mortar shall be mixed only in sufficient quantity for immediate use and all mortar not used within 30 minutes after addition of water to the mix shall be wasted. Tempering of mortar shall not be allowed.

4.0 BRICK

4.1 The moulds used in the manufacture of bricks shall be thoroughly sanded before each use and shall be sufficiently larger than the size of the bricks being manufactured to allow for shrinkage in drying and burning. Over-size, irregular and worn moulds shall



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be destroyed. Each finished brick for brick masonry shall be $230 \times 115 \times 75$ mm in size and shall weigh between 3.2 to 4.2 kgs. All bricks shall have a "frog" 6mm deep on one face.

- 4.2 All bricks shall be manufactured by the Trench Kiln Method or other standard methods. The earth used in manufacturing bricks shall be carefully selected and shall be free from objectionable quantities of lime, gravel, coarse sand, roots, or other organic matter. Salts shall not exceed 0.3% and calcium carbonate shall not exceed 0.2%. The Brick shall be obtained from approved source.
- 4.3 All bricks shall be of first class quality made from good brick earth, free from saline deposit and shall be hand moulded. They shall be thoroughly burnt without being vitrified, shall be regular, uniform in shape and size with sharp and square edges, parallel faces and of deep red or copper colour. First class bricks shall be homogeneous in texture and shall emit a clear ringing sound when struck, and shall be free from flaws, cracks, chips, stones and modules of lime.

4.4 **Physical Requirements of Bricks shall be:**

	<u>Average of Five Bricks</u>	<u>Individual Brick</u>
– Minimum compressive strength, brick flat-wise (using average gross area).	2,465 psi	2,175 psi
– Minimum Modulus of Rupture, brick flatwise (using average gross area).	435 psi	290 psi
– Maximum water absorption (by 5 hr. boiling)	22%	25%
– Maximum saturation co-efficient (*)	0.88	0.90

(*) Saturation Coefficient is the ratio of absorption by 24 hours submersion in cold water to that after 5 hours submersion of brick in boiling water.

5.0 G.I. EXPANDED METAL STRIPS

Galvanized Iron metal strips weighting 1.6 kg/m^2 shall be of approved origin and applicable Standards and of sizes as shown on the Drawings.



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6.0 PLACEMENT AND WORKMANSHIP

6.1 Placing

Brick shall not be placed during rains sufficiently heavy or prolonged to wash the mortar from the brick. Mortar which becomes diluted by rain shall be removed and replaced before continuing with the work. All brick to be used in brick masonry shall be moistened with water for twenty four hours before they are used by a method which will ensure that each brick is thoroughly and uniformly wetted. All bricks shall be free from water adhering to their surface when they are placed in the brick masonry.

6.2 All horizontal and vertical joints shall be completely and solidly filled with mortar when and as the bricks are laid. The thickness of joints shall not exceed $\frac{3}{8}$ inch and the joints shall be raked $\frac{1}{2}$ inch deep when the mortar is still fresh so as to give proper bond to the plaster. Care shall be taken that the striking tool do not develop a cutting edge as the subject of striking the joint is to compress the mortar into the joint.

6.3 Bricks shall be laid "frog" upward with mortar joints and in English and Flemish bond as shown on the Drawings. Both bed and vertical joints shall be 6 mm in thickness completely filled with cement mortar as specified herein, and each brick shall be bedded by firmly tapping with the handle of the trowel. All horizontal joints shall be parallel and all vertical joints in alternate courses shall be directly over one another. Excess mortar at the outer edges shall be removed and joints drawn straight with the edge of a trowel and a straight edge. All anchors and similar work required to be embedded in the brick masonry shall be installed as the work progresses. At the completion of the work all holes or defective mortar joints shall be cut out and repainted.

7.0 DAMP PROOF COURSE

All damp proof course unless otherwise specified shall consist of class 'C' cement concrete, 50 mm thick, mixed with 2.5 kg of padlo per bag of cement or other approved quality water-proofing compound as per manufacturer's specifications and shall be laid at required levels as per Drawings. The D.P.C. shall be tamped, consolidated, leveled and edges and corners made to the requirements of the relevant Drawings, including finishing and curing complete.



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The Contractor shall similarly provide and build in a vertical damp proof course at jambs of openings in cavity walls and a horizontal damp proof course above such openings and to parapet walls.

8.0 ANCHORING

All brick masonry walls shall have a continuous reinforcement of G.I expanded metal strip 0.5mm thick. The width of the strip shall be 25mm less than the thickness of the wall. It shall be embedded in mortar after every 12 courses of brick work and anchored at ends to concrete or brick masonry by using concrete nails.

9.0 POINTING

9.1 The Joints of Brick masonry walls shall be given fine groove pointing by striking the joints to external surfaces of the wall. Tooling shall be done when the mortar is partially set but still sufficiently plastic to bond. All tooling shall be done with a tool, which compacts the mortar, pressing the mortar into the joint rather than dragging it out. Raked joints shall be 12 mm deep fine grooved in order to give pressed and compacted surface. All joints shall be given finish with 1:3 cement sand mortar with a pointing tool.

9.2 At the completion of the work, all holes, and defective mortar joints shall be cut and repainted. Exposed masonry shall be protected against staining or other damages and excess mortar shall be cleared off the surfaces as the work progresses. All exposed masonry shall be clean, smooth, fine and shall be of acceptable finish. In the event ordinary cleaning is not adequate special methods such as sand blasting shall be used to clean the surfaces.

9.3 Finishing

The exterior faces of the walls shall be finished by striking the joints as the work proceeds. The joints shall be struck by raking the green mortar after the brick work has been laid and finishing the joint with a pointing tool. Horizontal joints shall be struck to form a weathered joint and vertical joints shall be struck with a V-notch. Care shall be taken that the striking tools do not develop a cutting edge, as the object of striking the joint is to compress the mortar into the joints.



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10.0 CURING AND REPAIR

All brick masonry shall be water cured and shall be kept wet for at least seven days by an approved method which will keep all surfaces to be cured continuously wet. Water used for curing shall meet the requirements of the specifications for water used in the manufacture of bricks.

11.0 TOLERANCES

11.1 Brick

No overall dimension of brick (width, height and length) shall differ from the specified standard dimension by more than 3mm. Standard dimensions of brick are the manufacturer's designated dimensions.

11.2 Brick Work

All brickwork shall be erected plumb and true to line and level with maximum variation in any storey height or any length of wall being 1 mm in 1 metre.

The maximum tolerance in the length, height or width or any single masonry unit shall be $\pm 3\text{mm}$.

11.3 Testing

Atleast 10 bricks shall be selected from each lot of 50,000 bricks or parts thereof delivered to the site of work, and tested at an approved laboratory in accordance with the provisions of ASTM C67-78, for:

- Weight
- Size
- Water absorption
- Modulus of Rupture
- Compressive Strength.



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12.0 SUBMITTALS

Specimen samples of bricks, aggregates for mortar or grout, Portland cement, masonry cement, reinforcement, G.I Expanded metal strips, and water intended to be used in the works. Specimens of bricks shall be representative of a complete range of colours, textures and sizes.

Results of all the tests performed upon the materials and masonry units obtained from the site of work.

13.0 EXPANSION JOINTS IN BRICK MASONRY WALL (WHEREVER REQUIRED)

Expansion joints shall be provided at locations as shown on the drawings. Expansion Joints (25mm wide) in brick masonry wall shall be filled with Styrofoam to full depth of wall or the joint shall be sealed with approved bituminous joint sealer as shown on drawing.