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## Technical Specification for Refractory Installation Rig (Bricking Machine)

### Scope of work:

**General** – The installation rig will be used for installation of Refractories in a cement rotary kiln with the following specifications:

- Shell Diameter - \_\_\_\_\_
- Length of Run - \_\_\_\_\_
- Brick sizes - \_\_\_\_\_
- Special Considerations – \_\_\_\_\_  
(i.e. tapers, bell, retaining rings etc.)

The tenders shall include the supply of one pneumatically operated installation rig for a \_\_\_\_\_ (single or multiple diameter) kiln.

The bricking rig support platform system shall be designed for the following general requirements:

- Easy movement into and in the kiln
- Access to overhead kiln shell working area
- Maximum clearance under the frame for easy flow of materials and supplies.
- Easy advancement of the arches to the next course of brick.
- Easy adjustment of arch spacing to accommodate various brick lengths.

### Overall Requirements:

- The entire rig consists of a frame, a platform and a dual brick placement arch and accessories all fabricated from high strength aluminum.
- The entire assembly of the rig shall be demonstrated (references, videos, etc.) to take less than 2 hours.
- No loose bench, carriage, ladder or misc. items shall be located on the platform.
- Access with ladder, proper lighting, proper marking and instruction insures safe installation and operation.
- A minimum of 10 recent references of similar size rigs shall be provided with the proposal.
- 1 year warranty is to be offered, except for wear items

### Design criteria

Based on International (Japanese, American or European) Aluminum Fabrication Standards: Proof that the Specifications for Aluminum Structures Allowable Stress Design and Material Properties have been taken into consideration by a certified Design Engineer shall be provided.

### Fabrications

(should be based on International (Japanese, American or European) Aluminum Standards): The following shall be taken into consideration - Structural Aluminum (Sheet & Plate, Extrusions, Weld Filler Materials)

Welding Procedures should be followed: Design of Weld Connections, Welding Techniques and Qualification of Procedures and Personnel. Copy of Welder certifications should be part of the tender documents.

**Technical Specification** – The Brick Installation Rig shall consist of and include:

- Two aluminum arches fitted with pneumatic valve in base cylinders, safety check valve, emergency shut off valve, bleeder valves, pneumatic pressure gauges and filter, lubricated system.
  - o The arches shall have adjustable screw spacers to accommodate different brick lengths.

- The top of the up kiln arch shall have a cut away section to allow easy access to the keying area of the down kiln arch.
- All cylinders on both the up kiln and down kiln arches shall be able to be operated individually.
- The cylinder “bumpers” shall be made of rubber and on adjustable arches will articulate to insure flush contact with the brick.
- Cylinders are flush with the top of the arch to prevent damage to the cylinder while allowing a shelf to set the brick on.
- Cylinders are connected with quick disconnects to allow for quick change out during use and or easy maintenance after use.
- Both the up kiln and down kiln arch shall have “master valves” to allow the simultaneous raising of lowering of all the cylinders on a given arch to facilitate the positioning of the arches for the next row to be installed.
- On machines designed to adjust for various size kilns or special kiln configuration the arch panels will be separated with adjustable hinges.
- The arches will be mounted on a movable work platform mounted on wheels that travel on rails the length of the frame deck.
  - The work platform will be equipped with ergonomic stair steps to allow easy access to the area of brick installation and keying area.
  - The platform will cantilever off of the back of the frame deck to allow the arches to reach the close out row of bricks when up against a retaining ring or the end of the kiln.
  - The work platform will have perforated light-weight aluminum decking.
  - The movable platform will include a braking system to prevent the platform from rolling down kiln.
- The frame shall have a minimum of 4,500 kilograms weight capacity with a 3:1 safety factor and a standard length of a minimum of 4 meters.
  - Frames for adjustable rigs will have adjustable outriggers and legs.
  - Casters shall be covered with bricking protection polyester and be able to rotate to allow the rotation of the kiln while the machine is inside.
  - The casters will be furnished with a “lock out system” to prevent the wheels from being turned while the rig is bricking.
  - The frame deck floor will consist of light-weight perforated aluminum planking.
  - The frame will be equipped with down kiln, fall protection rails and lighting.
  - The frame ladder can be mounted either up kiln or down kiln
- The keying system shall consist of:
  - A 10 ton air pump driven hydraulic keying jack with articulating brick protecting rubber head plus fingertip control for ease of handling and operation.
  - The keying system will be supported with an arch mounted gauge to allow for consistent keying pressure monitoring.
  - The keying system will include a pneumatic shim driver with slotted shim driver heads and shim storage trays.
- Accessories:
  - Assembly and parts manuals
  - Tool box and hardware to complete assembly.
  - Seaworthy shipping packaging
- Optional equipment shall include, but not be limited to;
  - Commissioning and training
  - Minimum 5 meter long deck.
  - Brick pallet cart on wheels to mount on frame rails.
  - Second kiln ladder
  - Storage and shipping container
  - 2 years spare parts
  - Laser brick alignment device