

12	Field Mounted Junction Box	<p>No. of ways 12/24/36/48/64/72/96/128 with 20% spares terminals. Material and Thickness: 4mm thick Fiberglass Reinforced Polyester (FRP). Type of terminal blocks: Rail mounted cage-clamp type suitable for conductor sizes up to 2.5 mm<sup>2</sup>. A M6 earthing stud shall be provided. Protection Class IP: 55 min. for indoor &amp; IP-65 min for outdoor applications. Grounding to be provided in each JB.</p>
12	Hazardous area protection	<p>All the transmitters/instruments using in the hazards area shall be approved by ATEX/PESO and same shall be provided during the detail engineering of the project. Intrinsically safe type shall be used in general. All Intrinsically safe transmitters (loop powered) - Power supply requirement: 24 V DC. Canopy shall be provided by Contractor for all Analyzers panels/ racks, PRDS.  <ul style="list-style-type: none"> <li>•Barriers (Wherever Applicable): Intrinsically safe barriers: 3-port galvanically isolating type, as applicable.</li> <li>•Remote Indicator / indicator in local panel wherever required shall be provided by the bidder. (Microprocessor based, intrinsically safe, Loop powered type).</li> <li>•FRP canopies for field mounted electronic/ electrical instruments e.g., transmitters, positioners, temperature element heads and junction boxes.</li> </ul> </p>
13	Large Video Screen / Video Wall Cube	<p>The Bidder shall provide 80" Full HD Single Chip DLP Laser Light Source based Video Wall Cube having software license (if any required) for 'C Brick Plant'. Min Brightness up to 1800 Lumens, Aspect Ratio: 16:9, Rear Access Aspect Ratio: 16:9, Rear Access Inputs: DVI/ HDMI/ Analog D-Sub 15 pin/ Display Port, 10 Meter HDMI-HDMI cable to connect OWS to Video Wall Cube.</p>

#### **Impulse Piping, Tubing, Fittings, Valves, Manifolds**

All impulse pipes shall be of seamless type conforming to ANSI B36.10 for schedule numbers, sizes and dimensions etc. The material of the impulse pipe shall be same as that of main process pipe.

The details of impulse pipe material and associated fittings and valves are to be submitted in table PCP at the time of detailed engineering.

Stainless steel tube shall be provided inside enclosures & racks from tee connection to valve manifold and then to the instrument.

All fittings shall be forged steel and shall conform to ANSI B16.11. The material of forged tube fittings for shaped application (e.g. Tee, elbow etc.) shall be ASTM A182 Gr. 316L.

The material for bar stock tube fitting (for straight application) shall be 316SS. Metal thickness in the fittings shall be adequate to provide actual bursting strength equal to or greater than those of the impulse pipe or SS tube, with which they are used.

The valve manifolds shall be of 316 stainless steel with pressure rating suitable for intended application. 2-valve manifold and 3-valve manifold shall be used for pressure measurements using pressure transmitters/ pressure switches and differential pressure transmitter/ switches respectively. 5-valve manifold shall be used for remaining applications like flow and level measurements.

All instrument piping, tubing and its accessories shall be supported in a safe manner to prevent excessive vibrations and anchored sufficiently to prevent undue strain on connected equipment. Instrument piping & tubing shall not be routed across equipment removal areas, above or below monorails, cranes, removable gratings, cable trays.

All impulse piping shall be installed to permit free movement due to thermal expansion. Wherever required expansion loops shall be provided.

Special accessories such as condensing pots/ reservoirs shall be provided and installed wherever required.

Colour coding of all impulse pipes shall be done by the Contractor in line with the colour coding being followed for the parent pipes.

Hangers and other fixtures required for support of piping and trays shall be provided, either by welding or by bolting on walls, ceilings and structures. Hanger clamps and other fastening hardware shall be of corrosion resistant metals and hot-dip galvanized.

NOTE: (i) Rating of piping/fittings/valves etc. are subject to final process design pressure & temperature and shall be decided during detail engineering, (ii) Material shall be compatible with that of the impulse pipe material and design parameter.

Instrument & Control Cable		
S. No	Property	Requirement
1.	Voltage grade	225 V (peak value), armored, FRLS
2.	Codes and standard	VDE0815, VDE 0207, Part 4, Part 5, Part 6, VDE 0816, VDE 0472
3.	Others	Cables shall be suitable for laying in conduits, trenches, racks and underground buried installation. Repaired cable are not acceptable
4.	Cross section	0.5 sq. mm
5.	Conductor	High conductivity Annealed bare copper
6.	Shielding	Al-Mylar tape