BHARAT HEAVY ELECTRICAL LIMITED
Fabrication Plant
Bharat Heavy Electricals Limited
Industrial Area jagdishpur, District: Sultanpur
Uttar Pradesh-227817 (India)
Ph: -+91-5361-271378
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Enquiry No. :
Due Date :
Vendor Qtn. No.:

CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM PURCHASE DEPTT.)

Date :

Specification No: BHEL/FP/TS_CADS_R0

SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR COMPREHENSIVE SOLUTION FOR COMPRESSED AIR DISTRIBUTION PIPING SYSTEM AT BHEL FABRICATION PLANT JAGDISHPUR

NOTE:-

1. Vendor must submit complete information against Qualification Criteria mentioned against clause no. 15.0 of this technical specification. The offer meeting this clause would only be processed.
2. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or
3. The offer and all documents enclosed with offer should be in English language only.

NAME & ADDRESS OF THE Vendor :	NAME & ADDRESS OF THE INDIAN AGENTS(if any) :
TELEPHONE NOS.:	TELEPHONE NOS.:
FAX NOS.:	FAX NOS.:
E-MAIL ADDRESS :	E-MAIL ADDRESS :
DUNS NO. (Of Duns & Bradstreet of USA)	
SCOPE: DESIGN, ENGINEERING, SUPPLY, ERECTION & COMMISSIONING AND PROVING AT BHEL SITE OF COMPLETE COMPRESSED AIR DISTRIBUTION SYSTEM COMPLYING WITH SPECIFICATION AS BELOW	

TECHNICAL SPECIFICATIONS OF COMPRESSED AIR DISTRIBUTION SYSTEM FOR BHEL FP JAGDISHPUR

Sr. No.	Description for BHEL requirement	Specified/ to be confirmed by	Offered	Deviation	Remarks
1.0	PURPOSE-				
1.1	Design, Engineering, Supply, Erection,Testing and Commissioning and proving of complete solution of Compressed Air Distribution System for FP Jagdishpur.	vendor to confirm			
2.0	LOCATION-				
2.1	A comprehansive solution with complete equipements, accessories, efficient, energy saving compressed air distribution system through pipes shall be provided for BHEL, Fabrication Plant at Jagdishpur.	vendor to confirm			
2.2	The location of Compressor Room and Plant , approximate distances and tentative layout of distribiution system is attached herewith as per drawing No. BHEL_FP_CADS_R0	vendor to confirm			
2.3	The quantities, locations of droppings and accessories are tentative only. BHEL can change locations of above as per need and requirements. Vendor to submit their own design and drawings alongwith complete Bill of Quantities with offer.	vendor to confirm			
3.0	Technical Input				

Sr. No.	Description for BHEL requirement	Specified/ to be confirmed by	Offered	Deviation	Remarks
3.1	Screw type air compressors are installed at BHELCompressor Room with acessores as follows:-				
3.1.1	Screw Type air compressors	Vendor to Note			
3.1.2	Make & Model: ELGI Make E250 -10	Vendor to Note			
3.1.3	Free Air Delivery Capacity: 1465CFM	Vendor to Note			
3.1.4	No. and type of Air compressor- 3 no., Screw type	Vendor to Note			
3.1.5	Maximum Pressure-10 Bar g	Vendor to Note			
3.1.6	Working Pressure (minimum)-9 Bar g	Vendor to Note			
3.1.7	No. of stages -One	Vendor to Note			
3.1.8	Motor Power-315 KW	Vendor to Note			
3.1.9	Operating Voltage-3 Phase, 415 V	Vendor to Note			
3.2	Air Dryer	Vendor to Note			
3.2.1	Make & Model: Elgi Make ELRD 1750-A	Vendor to Note			
3.2.2	Qty:03 Nos.	Vendor to Note			
3.2.3	capacity: 1750CFM each	Vendor to Note			
3.2.4	Max Working Pressure: 16 Kg/Sq. cm	Vendor to Note			
3.2.5	Refridgerent Used: R134 A	Vendor to Note			
3.3	AIR RECEIVER-	Vendor to Note			
3.3.1	Make and Model: Elgi make VA 002D0	Vendor to Note			
3.3.2	Qty:03 Nos.	Vendor to Note			
3.3.3	Capacity (minimum)- 5000 Litres each	Vendor to Note			
3.3.4	Max. Working Pressure- 12.5 Kg / Sq. Cm.	Vendor to Note			
3.3.5	Out let Flange: 1 No. 4 " NB	Vendor to Note			
4.0	Description of Material Requirement				
4.1	Compressed air pipe lines shall be of Aluminium based alloy . Vendor to provide complete material composition and test certificate along with the description of tearing pressure, shearing strength and bursting pressure. Vendor shall meantion thickness of pipes of various sizes used. all the design parameters shall be well above to the Plant Maximum desired capacity with additional factor of safety	vendor to confirm			
4.2	External threading shaould not be allowed to the pipes corners	vendor to confirm			
4.3	Pipes should be coated with qualicoat coating for long life shining and longevity.	vendor to confirm			
4.4	Nitrile seals should be used to avoid leakages and pressure drops.	vendor to confirm			
4.5	Stainless steel ring (Grade 304L) should be used for gripping.	vendor to confirm			
4.6	All Joints should be made up of Polyamide materials for ease & perfect gripping and ease of removal	vendor to confirm			
4.7	Support for joints should be made of Plated Brass with black color paints.	vendor to confirm			
4.8	Working temperature should be between -20 degree to +60 degree	vendor to confirm			
4.9	Pipes should be resistant to corrosion, mechanical shocks, thermal variation, compressor oil carry over and materials should be 100% recyclable.	vendor to confirm			
4.10	All pipes and component materials should be non flammable with no propagation of flame along with confirm to UL94HB standards.	vendor to confirm			
4.11	Pipes should be certified ISO 9001 version 2000 and operates a quality management system.	vendor to confirm			
4.12	Product should be certified by TUV or equivalent Indian or International standard.	vendor to confirm			
4.13	All components should be guaranteed for 10 years with immediate replacements.	vendor to confirm			

Sr. No.	Description for BHEL requirement	Specified/ to be confirmed by	Offered	Deviation	Remarks
4.14	76mm ,100mm and above size joints, Elbow and Tee should be made up of 304L stainless steel only.	vendor to confirm			
4.15	Vendor to specify the Indian or Equivalent International standard for Compressed Air distribution System	vendor to confirm			
5.0	Plant Air Distribution system:				
5.1	Threre are three nos. screw type air compressors with dryers and recievers. Two compressors at a time shall supply compressed air to the Plant, except Shot Blasting Machine. For Shot Blasting Machine third compressor shall be used. There shall be arrangement of to make operation of any two compressors of three to supply to the plant leaving one compressor to directly shot blasing machine.	vendor to confirm			
5.2	There shall be two different Pipelines for Compressed Air Distribution System. One pipe line connecting to two compressors shall distribute air to Main plant. A separate pipeline shall start from third compressor and shall distribute air to shot Blasting Machine	vendor to confirm			
5.3	Main Plant Compressed Air Distribution System	vendor to confirm			
5.3.1	A pipeline designed for the capacity to carry maximum compressed air delivery from two compressors shall distribute the air to repective droppings.	vendor to confirm			
5.3.2	The pipeline's design and selection calculation shall be send along with offer	vendor to confirm			
5.3.3	there shall be a main header forming a closed loop covering all the four bays of fabrication shop	vendor to confirm			
5.3.3.1	Diameter of main header (Shall be sufficient to carry the Free air delivery of two compressors)	vendor to specify			
5.3.3.2	tearing pressure	vendor to specify			
5.3.3.3	bursting pressure	vendor to specify			
5.3.4	Sub-headers shall emerge from main headers and shall for an interconnecting loop to distribute the air in the all four bays passing though the intermediate columns seperating bays.	vendor to confirm			
5.3.4.1	Diameter of sub header (Shall be sufficient to carry the Free air delivery of two compressors)	vendor to specify			
5.3.4.2	tearing pressure	vendor to specify			
5.3.4.3	bursting pressure	vendor to specify			
5.4	Air Distribution to each loop of main headers and sub- headers shall be independently contolled through suitable ball valves in order to stop supply of air in any of the bay for any maintenance/rectification/repair /modification works etc.	vendor to confirm			
5.5	Each main headrs and sub-headers shall have one no. mosture sperator dropping line	vendor to confirm			
5.6	There shall be dropping pipeline emerging form main headers and sub-headers for supply of air to use at suitable approachable height on each alternate columns (tentatively specified in the drawing No. BHEL_FP_CADS_R0). BHEL can change the location of dropping pipeline as per requirement and need.	vendor to confirm			
5.6.1	The dropping pipes at intermediate columns seperating the bays shall distribute the air to two adjecent bays. Suitable provision and installations shall be made to fullfill above requirement.	vendor to confirm			
5.6.1.1	Diameter of droppings emerging form main headers:	vendor to specify			
5.6.1.2	tearing pressure	vendor to specify			
5.6.1.3	bursting pressure	vendor to specify			
5.6.2.1	Diameter of droppings emerging form sub- headers:	vendor to specify			
5.6.2.2	tearing pressure	vendor to specify			

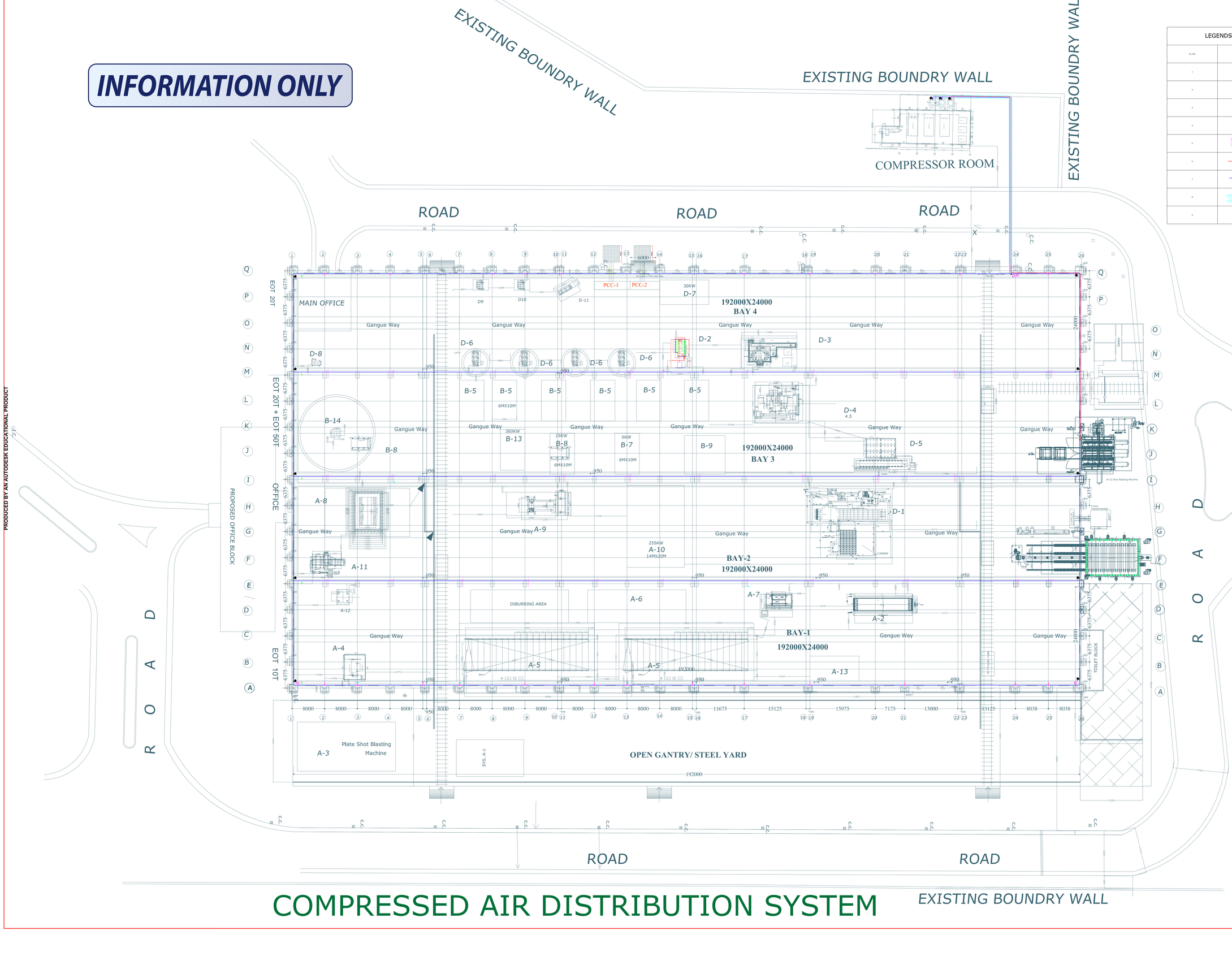
Sr. No.	Description for BHEL requirement	Specified/ to be confirmed by	Offered	Deviation	Remarks
5.6.2.3	bursting pressure	vendor to specify			
5.7	Each dropping shall be emergered form main headers and sub-headers from suitable joints (Polyamide/stainless steel as applicable) properly nitrile sealed for to avoid any leak or pressure drop.	vendor to confirm			
5.8	each droppings shall have provision of Ball Valve, on/off valve , By-Pass line with a ready to use tap for connection with leakproof sealing. All the Ball valves, On/Off Valves shall be of Legris/Festo/BDK/KSB or equivalent reputed and internationally certified make.	vendor to confirm			
5.9	each dropping shall be placed at a suitable height of 01 meter above the finished floor level.	vendor to confirm			
5.10	FRL and FR Unit Shall be provided at at the droppings near the machines as indicated in the drawing No. BHEL_FP_CADS_R0. Pressure guages shall be provided with FRL Unit to measure droppings pressure if not inbuilt in FRL Unit. FRL Unit shall be Legris/Festo or equivalent reputed and internationally certified make.	vendor to confirm			
5.11	following minimum quantities shall be offered as per drawing no.BHEL_FP_CADS_R0	vendor to confirm			
5.11.1	Nos. of droppings including droppings for moisture seperator with all accessoris like ball valve, on/off valves,by pass line, ready to use tappings as described above etc.	56 Nos. for Plant + 01 No. for Shot Blasting Machine			
5.11.2	Moisture seperator	05 Nos. for plant+ 01 No for Shot Blasting Machine			
5.11.3	FRL Unit (Filter, Regulator and Lubricator Unit)	07 Nos. for Plant			
5.11.4	FR Unit (Filter, Regulator Unit)	03 Nos. for Plant+ 01 No. for Shot Blasting Machine			
5.11.5	Pressure Guage (Dial Type with distance visibility) for measuring headers pressure.	03 Nos. for Plant+ 01 No. for Shot Blasting Machine			
6.0	Shot Blasting Machine Air Distribution System				
6.1	A separate pipeline emerging from Air reciver and ending to the point for connecting hose of shot blasting machine.	vendor to confirm			
6.2	FR (i.e. Filter, regulator) Unit shall be provided at Shot Blasting Machine.Pressure guages shall be provided with FR Unit to measure droppings pressure if not inbuilt in FR Unit. FR Unit shall be Legris/Festo or equivalent reputed and internationally certified make.	vendor to confirm			
6.3	Ball Valve, on/off valve ,By-Pass line with a ready to use tap for connection shall be provided with leakproof sealing.All the Ball valves, On/Off Valves shall be of Legris/Festo/BDK/KSB or equivalent reputed and internationally certified make.	vendor to confirm			
6.4	Interconnection of Pipelines of Plant and Shot Blasting Machine shall be provided with all the connecting accessories, controls, valves at a suitable hieght to be easily operated by a man on floor.	vendor to confirm			
6.5	Vendor to provide complete system so that the Any of Two compressors could be used for Plant Air supply and balance One compresor for Shot Blasting Machine. Further their shall be provision with all accessories to connect the Shot Blasting Air supply to the Plant Compressed Air Supply so that in case of low air requirement, the supply could be met by Shot Blasting Compressed Air Supply system or vice-versa.	vendor to confirm			

Sr. No.	Description for BHEL requirement	Specified/ to be confirmed by	Offered	Deviation	Remarks
7.0	Accessories				
7.1	All accessories required for complete Compressed air distribution system like Ball Valve, moisture seperature, Pressure Guage, interconnections, sealing material, FRL Unit etc. shall be provided by vendor in sufficient quantity in order to provide an energy saving and efficient system.	vendor to confirm			
8.0	Maintenance and Inspection by Vendor				
8.1	Vendor shall carry out periodic maintenance and inspection at a periodic interval for complete system as per the schedule mutually agreed between vendor and BHEL . Vendor shall carry out all the maintenace,repair, rectification, replacements etc. free of cost under the Garantee period.	vendor to confirm			
9.0	Structures, Supports and Foundations				
9.1	Vendor to supply/ fabricate the complete Strutural Steel Bridge (preferabely with a box type channel) Structural of sufficient strength and width for the crossing the compressed air pipelines from reciver to plant side. There shall be sufficient space for maintenace of joints,pipeline etc. The supprting columns of Fabricated Structural Steel shall be provided at sufficient distances to supprt the weight of bridge system along with pipelines.Ladder shall be provided to climb on the bridge to inspect the pipelines and joints etc. The Structural Steel shall be of SAIL, Jindal, Tata or equivalent Indian make. The minimum height of the Bridge shall be more than 09 meters form the Road level.	vendor to confirm			
9.2	The foundations of bridge supports shall be made vendor. Vendor to design and make foundation of sufficient strength. BHEL shall provide Soil Load Data if required by the Vendor.	vendor to confirm			
9.3	Vendor to provide all type of supports, structures, fasterners, anchors,foundation bolts, base plates, cover plates etc along with complete system.	vendor to confirm			
9.4	Vendor to submit the all GA drawings, layout drawings, foundation layout drawings, Quality assurance planand technical data sheet within one month after placement of LOI/PO for BHEL approval.	vendor to confirm			
10.0	Intallation & Commissioning and training				
10.1	Complete Installation and commissioning is in Vendor's scope.vendor to arrange all types of lifting aperatus, cranes, helping personels etc. on their behalf. After I&C vendor has to prove out the performance of the system to the satisfaction of BHEL	vendor to confirm			
10.2	Vendor to provide training during I&C of complte system for operation and maintenance to BHEL personel.	vendor to confirm			
11.0	Pre dispatch inspection:				
11.1	Vendor to offer Pre dispatch Inspection of materials to the BHEL inspector at vendor's works before dispatching it to BHEL site. all test cerificates, material test cerificates, quality documents shall be submitted to BHEL inspector during PDI.	vendor to confirm			
12.0	Proving and Acceptance of BHEL				

Sr. No.	Description for BHEL requirement	Specified/ to be confirmed by	Offered	Deviation	Remarks
12.1	Vendor to run the complete system and shall measure the Air pressure at a point as specified by BHEL. The pressure drop shall be under the permissble limits as per Indian or Equivalent International standard for this type of system.	vendor to confirm			
12.2	Joints shall be checked for leakage.	vendor to confirm			
12.3	Working of accessories, systems and items supplied shall be cheked by BHEL	vendor to confirm			
12.4	Checking of the system as per approved QAP.	vendor to confirm			
12.5	Proving of complete system to the satisfaction of BHEL	vendor to confirm			
13.0	Documents to be submitted along with offer				
13.1	Vendor to submit following documents alongwith their offer and other documents:	vendor to confirm			
13.1.1	Complete Specification filled in BHEL format	vendor to confirm			
13.1.2	layout drawing of system, assemblies and sub assemblies in standard formats	vendor to confirm			
13.1.3	Piping diagram.	vendor to confirm			
13.1.4	General technical litrature of systems and its parts.	vendor to confirm			
13.1.5	List of bought out items with their Indian source.	vendor to confirm			
13.1.6	AutoCAD copy of compete drawings.	vendor to confirm			
13.1.7	Structural drawings	vendor to confirm			
13.1.8	Bill of quantities with the breakup of each item	vendor to confirm			
13.2	Documents to be submitted after placement of LOI/PO for BHEL approval				
13.2.1	Layout drawing of system, assemblies and sub assemblies in standard formats	vendor to confirm			
13.2.2	Piping diagram.	vendor to confirm			
13.2.3	Structural drawings	vendor to confirm			
13.2.4	Quality Assurance Plan.	vendor to confirm			
13.2.5	Foundation drawings	vendor to confirm			
13.2.6	Foundation layout drawings	vendor to confirm			
13.2.7	Technical Data sheet	vendor to confirm			
13.2.8	Vendor submit AutoCAD copy of compete drawings. Vendor shall provide as built drawings of complete system aftger the E&C of complete system	vendor to confirm			
13.2.9	Bill of quantities with the breakup of each item	vendor to confirm			
14.0	Guarantee				
14.1	Vendor to provide guarantee of 10 years for complete Compressed Air Distribution System after acceptance of BHEL	vendor to confirm			

Sr. No.	Description for BHEL requirement	Specified/ to be confirmed by	Offered	Deviation	Remarks
15.0	Qualification Requirement				
15.1	Only those vendors who have supplied and installed simillar type of systems in past 10 years and such system is working satisfactorily till date (as on date of opening of Tender) after one years of its commissioning shall quote.Vendor to submit a performance certificate from the customer where they have supplied simillar type of compressed air distribution system for its satisfactory performance since its commissioning.	vendor to provide			
15.2	Vendor to provide name , address, email, phone no., fax No. of the above customer	vendor to provide			
16.0	General				
16.1	Vendor to provide complete system and shall supply all necessary systems, accessories etc. which are not specified in this specification but are required for smooth and trouble free operation of system.	vendor to confirm			

INFORMATION ONLY



LEGENDS (for Main Items)

SL. NO.	ITEM	DESCRIPTION
1		BALL VALVE
2		MOISTURE SEPARATOR
3		Pressure Gauge
4		DROPPINGS AT WALL SIDE OF FABRICATION PLANT COLUMNS
5		DROPPINGS AT INTERMEDIATE COLUMNS OF FABRICATION PLANT DISTRIBUTING TO BOTH ADJACENT BAYS
6		SEPERATE PIPE LINE FOR SHOT BLASTING PLANT
7		PIPELINE FOR PLANT
8		OVER HEAD BRIDGE FOR ROAD CROSSING
9		FRL(FR UNIT (FILTER REGULATOR AND LUBRICATOR UNIT)/FILTER REGULATOR UNIT)

PROJECT	FABRICATION PLANT BHEL, JAGDISHPUR
DRAWING NO.	BHEL/FP/CADS
TITLE	FABRICATION PLANT COMPRESSED AIR DISTRIBUTION SYSTEM
DRG NO.	SCALE : AS PER DRG.
DESIGNED BY	AJAY DWIVEDI
DRAWN BY	AJAY DWIVEDI
APPROVED BY	RADHA RAMAN
NORTH	SIGN. & DATE
	REV: R 00 DATE: 15.12.2011

COMPRESSED AIR DISTRIBUTION SYSTEM