BHARAT HEAVY ELECTRICALS LIMITED
CENTRALISED STAMPING UNIT & FABRICATION PLANT
Jagdishpur

TENDER FOR SUPPLY AND ERECTION OF FIRE FIGHTING SYSTEM AT JAGDISHPUR

Tender Enquiry No: BHE/FP/CVL/009

SECTION V

TECHNICAL SPECIFICATION

SPECIFIC TECHNICAL REQUIREMENTS

BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
CSU & FP
Industrial Area
Jagdishpur (UP) 227817

SECTION V

SPECIFIC TECHNICAL REQUIREMENTS

1.0 GENERAL

This section covers specific technical requirements of contract and should be read in conjunction with BOQ, other sections of the contract. In case of any conflict between the contents of BOQ and technical specifications, BOQ will prevail over technical specifications.

2.0 FREE ISSUE MATERIALS

Nothing shall be supplied as free issue material by BHEL.

3.0 DISMANTLING OF EXISTING STRUCTURES

The contractor will have to carryout dismantling of buried/ semi buried structures, if any, encountered within the battery limit and disposal of it within plant boundary as directed by BHEL at no extra cost to BHEL.

4.0 STATUTORY REQUIREMENTS

Bidder shall comply with all the applicable statutory rules pertaining to Factories Act, Fire Safety Rules of Tariff Advisory Committee, Water Act for pollution control, Explosives Act, etc.

Provisions of safety, health and welfare according to Factories Act shall be complied with. These shall include provision of continuous walkway minimum 500 wide along the crane-girder level on both sides of building, comfortable approach to EOT crane cabin, railing, fire escape, locker room for workmen, pantry, toilets, rest room, etc.

Provisions for fire proof doors number of staircases, fire separation wall, lath plastering/encasing the structural members (in the fire prone areas), type of glazing etc. shall be made according to the recommendations of Tariff Advisory Committee.

Statutory clearances and norms of State Pollution Control Board shall be followed.

Bidder shall obtain approval of Civil/Architectural/mechanical drawings from concerned authorities before taking up the construction work.

5.0 LAYOUT

Before starting the work, the Contractor shall carry out the setting out of foundation and structures and provide levels, with reference to general existing grid and bench mark. If the contractor uses the grid, , bench mark and reference pillar made by other Contractors, he shall coordinate with the Contractor and shall satisfy himself of the accuracy of the reference marks. If he is required to set out the foundation afresh, he shall do so independently with reference to the one existing grid and

bench mark which has been followed by other agency at the instruction of the Engineer. In case any discrepancy be found, it shall be immediately brought to the notice of the engineer for any rectification/modification necessary. No complaint shall be entertained at a later stage. The Contractor shall accurately set out the position for holding down bolts and inserts.

If required, in the opinion of the Engineer, he shall construct and maintain pillars for Grid, references and bench marks and maintain them till the completion of the construction. He shall also help the Engineer with instruments, materials and labours for checking the detailed lay outs and levels. The Contractor shall be solely responsible for the correctness of the layout and levels, and Engineer's approval shall not be deemed to imply any warranty in carrying out the work correctly.

6.0 WORKMANSHIP

Workmanship shall be of the best possible quality and all work shall be carried out by skilled workmen except for those which normally require unskilled persons. Welding shall be done by experienced and certified welders in proper sequence using necessary jigs and fixtures. Fabrications shall be done in shops having proper equipment for accurate edge planning and milling of column shall ends, base late surfaces etc. and shaping and dimensioning of anchor bolt assembly, inserts and other misc. items. In addition to the requirement specified above, if the bye-laws of the local Govt., Municipal or other authorities require the employment of licensed or registered workmen for various traders, the contactor shall arrange to have the work done by such registered or licensed personnel. In case of manufactured materials, the Contractor shall have, with no additional cost the owner, the services of the supervisors of the manufacturers to achieve that the work is being done according to the manufacturer's specifications.

7.0 TEMPORARY WORK

All scaffoldings, staging, temporary bracing and other necessary temporary work required for proper execution of the Contract shall be provided by the Contractor at his own cost and inclusive of all materials, labour, supervision and other facilities.

The layout and details of such Temporary work shall have the prior approval of the Engineer as agreed, but the Contractor shall be responsible for proper strength and safety of the same. All Temporary work shall be so constructed as not to interfere with any permanent work or with the work by other agencies. If it is necessary to remove any of the temporary work at any time to facilitate execution of the work or with the work of other agencies, such removal and re-erection, if required, shall be carried out by the Contactor at the discretion of the Engineer without any delay and any extra cost on this account shall be borne by the Contractor.

8.0 INTERFACE WITH STRUCTURES UNDER OTHER'S SCOPE

a) In cases of interface e.g. structures under other's scope of supply being supported on structures under scope of this contractor, the same will be discussed and suitably addressed.

b) Modification in layout of foundation/structure during detail engineering stage may be necessary to avoid fouling with those under other's scope. Necessary changes on this account will be made without any extra cost to Owner.

c) Necessary engineering is to be done and provisions are to be kept accordingly by the Contractor to construct foundations/underground structures, etc. without disturbing/ endangering the constructions done under the scope of other contracts.

9.0 INSPECTION, TESTING AND QUALITY CONTROL FOR MECHANICAL WORKS

Sampling and testing for major items of fire system mechanical works viz structural steel work (including welding) etc. shall be carried out in accordance with the requirements of this specification and field quality plan (FQP).

The bidder shall submit for BHEL's approval a detailed field quality assurance programme for fire works before starting of the construction work. This shall include frequency of sampling and testing nature/type of test, method of test, setting of a testing laboratory, arrangement of testing apparatus/equipment, deployment of qualified/experienced manpower, preparation of format for record, Field Quality Plan, etc. Tests shall be done in the field and/or at a laboratory approved by the Engineer and the Bidder shall submit to the Engineer, the test results in triplicate. In addition, the bidder shall furnish the original test certificate from the manufacturer's of various materials to be used in the construction.

If any work found to be of inferior quality or sub-standard, the same shall be dismantled and shall be redone as per approved quality or relevant standard. BHEL reserve the rights to reject the work of inferior quality. All expenses on account of dismantling and rework shall be born by contractor.

Contractor shall arrange for conducting the initial and field test for the welding and hydro test, holiday test of wrapping coating , testing of fire fighting system as per latest BIS/ CPWD guidelines. The contractor's finally accepted rates shall include cost of such field tests with standard equipments and IMTEs

10.0 CONSTRUCTION / ERECTION METHODOLOGY

- Construction excavation activities shall be fully mechanized from the start of the work.
- All excavation and backfilling work shall be done using excavators, loaders dumpers, dozers, poclains, excavator mounted rock breakers, rollers, sprinklers, water tankers, etc. Manual excavation can be done only on isolated place with specific approval of engineer.
- Dewatering shall be done using the combination of electrical and stand-by diesel pumps.
- For concreting, weigh batching plants, transit mixers, concrete pumps, hoists, etc. shall be used.
- All fabrication and erection activities of structural steel shall be carried out using automatic submerged arc welding machines, cutting machine, gantry cranes, crawler / wheel mounted heavy cranes and other equipments like heavy plate bending machines, shearing machines, lathe, milling machines etc. Use of derricks shall not be permitted.
- All handling of materials shall be with cranes. Heavy tailors shall be used for transportation.
- Mechanized modular units of scaffolding and shuttering shall be used.
- Grouting shall be carried out using hydraulically controlled grouting equipment.
- Roadwork shall be done using pavers, rollers and premix plant.
- All finishing items shall be installed using appropriate modern mechanical tools.

- Manual punching etc. shall not be permitted.
- Heavy duty hoist for lifting of construction materials shall be deployed.
- Compressors for cleaning of foundations and other surfaces shall be used.
- Field laboratory shall be provided with all modern equipment for survey, testing of aggregates, concrete, welding etc. For testing of steel works, ultra sonic testing machines, radiographic testing machines, dye penetration test equipment, destruction testing equipment, etc shall be deployed.
- All persons working at site shall be provided with necessary safety equipment and all safety aspects shall be duly considered for each construction/erection activity. Moreover, only the persons who are trained in the respective trade shall be employed for executing that particular work.
- Fabrication and Erection of all fabricated columns shall be done in single piece unless otherwise provided for in the approved drawings. Main columns of the power house building can have maximum of one number of the erection splice. All shop and site splice shall suitably staggered. The erection splice shall be provided with full strength splice cover plate over the butt weld. Contractor shall submit the erection scheme for the erection of all type of structures and carryout the erection work only after approval of the scheme by the owner.

11.0 FIELD LABORATORY FACILITIES AT SITE FOR MATERIAL TESTING:

Contractor shall provide field testing facilities at site laboratory built by the contractor as per list of apparatus at annexure-A-1.

12.0 MAKE OF BOUGHT OUT MATERIAL:

Contractor shall supply bought out items as per the list attached at annexure-A-2 of this section.

ANNEXURE – "A-1"

BIDDER SHALL PROVIDE MINIMUM FOLLOWING FACILITIES IN SITE IN THE FIELD LABORATORY FOR MATERIAL TESTING

General Equipment

Sl.No.	Description	Sl.No.	Description
1.	Balances	10.	Burette stand
2.	Drier	11.	Pippette
3.	Thermometer	12.	Wooden mallet
4.	Hydrometer	13.	Hair brush
5.	Hand-scoop	14.	Wire Brush
6.	Glass beakers	15.	Buckets
7.	Measuring Cylinder	16.	Test Tubes
8.	Desiccator	17.	Working platforms
9.	Burette	18.	Alcometer

Annexure-"A-2"

INDICATIVE LIST OF APPROVED MAKE OF BOUGHT OUT MATERIAL TO BE ARRANGED BY THE CONTRACTOR AT HIS OWN COST

The following list may be read in conjunction with the relevant make/ makes of materials mentioned in the BOQ or elsewhere in this tender document.

LIST OF APPROVED MAKE OF MATERIAL

Note: The following is the list of products and names of approved manufacturers against each product. Where more than one manufacturer is listed, the names are given in order of preferences Tenderer shall quote rates for the various items of work based on the material of FIRST preference, after ascertaining the availability, delivery schedule, etc. of the same. Unless the Contractor stipulates to the contrary in his tender, it shall be presumed that rates quoted are for First Preference makes.

In the event the Contractor is permitted to use materials of lower preference, because of valid reasons, the contract rates for the relevant items of work shall be suitably adjusted on the basis of the variation in prices of materials of preference and those actually used. If the prices of materials used are higher than than the prices of materials of first preference, the owner shall not be liable to make any payment for the affected item of work on this account.

All Pump impeller shall be factory adjusted to achieve required duty points.

S.No.	Description	Make
1.	GI/MS Pipes	Jindal, Hissar Prakash
2.	Malleable GI fittings	Zoloto UNIK
3.	Sluice/NRV	Kirloskar/ Kalpana IVC
4.	CP GM Ball Valve	Zoloto RB
5.	Air Release Valve	Sukan Newage
6.	Fire Hydrant Valve	Geetech/Superex
7.	RRL Hose	Jayshree Newage
8.	Branch Pipe	Geetech/Safeguard/Suerex
9.	GM Coupling	Sperex/Geetech
10.	Pumps	Maxflow/Kirloskar Marther & Platt
11.	Fire Extinguishers	ISI Marked of Superex/Geetech/Safeguard
12.	Rubber Tube for Hose reel	DUNLOP JYOTI
13.	Paint	J&N
14.	Welding rods	Advani
15.	Fasteners(Galvanised)	GKW
16.	Dash fastners/clamps	Fisher/HILTI
17.	Hose Box/Hose reel drum	Fabricated from 14 SWG Sheet (Powder Coated)
18.	Anti vibration pads	Dunlop Kanwal
19.	Mechanical Seal	As per manufacturer.
20.	GM Siamese Connection	Newage/Padmini

		Sukan
21.	Draw out Connection	Newage
		Sukan
22.	Pressure switch	Indfoss
23.	Pressure Gauge	H.Guru/Fiebig
24.	Cables/wire	RR Kabel/CCI
		Finolex
25.	PVC/MS conduit	BEC/AKG
26.	Control panel (FIRE)	Edward
		Alert
27.	Switch Gear	L&T
28.	Battery	Exide
41.	Strainer	WJ
		Strainwell
42.	Sprinklers	Grinnell
		Spraysafe
43.	Installation Valve	Grinnell
		Spraysafe
44.	Flow Switches	Grinnell
45.	Signage	PAN
		Glo-sign
46.	Butterfly Valve/Check Valve	Audco/Kalpana
47.	Motor control panel	Advance Electro/Tricolite
		Trident Switchgear
		Milestone
48.	Anti-corrosive treatment	Coatak
49.	MS Forged Fittings	VS
50.	MV Nozzles	Grinnell/HD
51.	Multiple control valve	Grinnell
		HD
52.	MS flanges	ISI Marked
53.	Fireman's Axe	Minimax/Newage

We have noted the above and confirm that our tender is based on the first preference of the approved makes indicated above.

Signature of tenderer

LIST OF STANDARD CODES

S.No.	IS Code No.	Description
1.	IS:1729:1979	Specification for sand cast iron spigot and socket soil, waste and ventilating pipes, fittings and accessories (1st rev.) (Amendment 4)
2.	IS:651:1992	Specification for salt glazed stoneware pipes and fittings (5th rev.) (Amendment 1)
3.	IS:456:1978	Code of practice for plain and reinforced concrete (3rd rev.) (Amendment 2)
4.	IS:3114:1994	Code of practice for laying of CI pipes (2nd rev.) (Amendment 2)
5.	IS:782:1978	Specification for caulking lead (3rd rev.)
6.	IS:783:1985	Code of practice for laying of concrete pipes (1st rev.)(amendment 1)
7.	IS:4127:1983	Code of practice for laying of glazed stoneware pipes (1st rev.)
8.	IS:780:1984	Specification for sluice valve for water works purposes (6th rev.) (50 to 300 mm size) (amendment 3)
9.	IS:1172:1993	Code of basic requirements for water supply, drainage & sanitation (4th rev.)
10.	IS:1200 (Part-16):1979	Code of practice for methods of measurements of building and civil engineering works: Part 16 laying of water and sewer lines including appurtenant items (3rd rev.)
11.	IS:1200(PART-19):1981	Code of practice for methods of measurements of building and civil engineering works: part 19 water supply, plumbing and drains (3rd rev.)
12.	IS:1742:1983	Code of practice for building drainage (2nd rev.)
13.	IS:13095:1991	Butterfly valves for general purposes
14.	IS:5312 (part 1):1984	Swing heck type reflux valves (non-return valve): part 1 single door pattern (1st rev.)(amendment 1)
15.	IS:1726:1991	CI manhole covers & frames (3rd rev.)
16.	IS:884:1985	Fire aid hose reel for fire fighting
17.	IS:901:1988	Coupling double male and female instantaneous pattern for fire fighting
18.	IS:903:1984	Fire hose delivery coupling, branch pipe, nozzles and nozzles spanner
19.	NBC-SP-7-1983 Part IV	National building code of India 1983, amendment No. 3
20.		Central public works division (CPWD) Part-V, wet riser system for fire fighting 1985, Govt. of India
21.	IS:3844-1989	Code of practice for installation and maintenance of internal fire hydrants and hose reels on premises
22.	IS:13039:1991	Code of practice for external hydrant system provision and maintenance
23.	IS:2190:1992	Code of practice for selection and maintenance of first-aid

S.No.	IS Code No.	Description
		fire extinguisher
24.	IS:6382:1984	Code of practice for design and installation of fixed system carbon dioxide fire extinguishing system
25.	SP:35 (s&t)-1987	Hand book on water supply & drainage by bureau of Indian standards
26.		National Building code (sec-ix)
27.	IS:2065:1983	Code of practice for water supply in buildings
28.	IS:5290-1983	Specifications for landing valve
29.	IS:933-1989	Specifications for portable chemical from fire
30.	IS:2171-1985	Specifications for portable fire extinguishers, dry power