



**BHARAT HEAVY ELECTRICALS LIMITED**  
**Jagdishpur**

**Tender for Preparation of Engineering Design, Documents  
, Drawings and consultancy services for civil, structural,  
architectural, electrical, plumbing & sanitary, fire systems,  
airconditioning & ventilation systems, landscaping etc and  
other related infrastructural works for Fabrication Plant  
and township at Jagdishpur**

**Tender enquiry No: BHE/FP/CVL/001**

**SECTION - 5**

**TECHNICAL SPECIFICATION**

## SECTION -5

### TECHNICAL SPECIFICATION

#### 1. Brief Description of Project

BHEL is setting up a manufacturing plant at Jagdishpur; district Sultanpur UP, for production of steel fabricated products. The new facility will be located adjacent to the existing insulator plant of BHEL and the upcoming centralised stamping unit (CSU). The site area is about 100000 square meter. The major facilities to be created is as follows:

S No	Activity
1	Manufacturing Facility consisting of 5 no bays.
2	Administrative Building
3	Misc. facilities e.g canteen, stores,electrical substn,etc etc
4	Township for 262 quarters ,transit flat, club, shopping centre, dispensary, services, lifts, sewage treatment plant, electrical sub station, DG sets and misc facilities

The project is to be executed in single stage.

#### 2. Scope of Work

- i. The scope of work consists of preparation of designs, documents and drawings for all areas of the plant and township complying the requirement of standards and codes e.g BIS, Indian electricity rules, CPWD specs, factory act and requirements of state, central and statutory & regulatory bodies and also providing assistance during project execution. The design work shall include architectural, civil, structural, electrical, ventilation, plumbing, air-conditioning, fire systems , sewage disposal, land development, landscaping, drainage ,rain water harvesting and other related infrastructural works required for construction of the complete plant and township. Based on the documents prepared by the Contractor, BHEL will issue separate tender(s) for appointment of construction contractors.
- ii. The work shall include submission of technical specifications, working & design philosophy, planning drawings, field quality plan, bill of quantities, de-packaging, detailed estimates of various packages as per de-packaging list to be floated for works tender based upon latest schedules e.g DSR/UP PWD or non-schedule items as per latest trends of factory and township construction , preperation and approval of designs and drawings from IITs /IT-BHU or other engg. institutions of repute approved by BHEL and arranged by the bidder . Work to also include submission of a comprehensive design and drawing submittal list, Plot master plan, General Arrangement (GA) & Reinforced Concrete (RC) and structural detailed drawings, architectural details, preparation of composite layout of plot ,electrical layout for cable trenches and lighting poles, earthing layout, finishing schedule, room book , single line diagrams for electrical, water supply, sewage, fire etc etc ,functional drawings and mechanical & electrical arrangement drawings etc. and submission of as-built drawings after work completion. . Scope to also include

visits to site and BHEL's Delhi office as and when required by BHEL and also to supervise the daily field quality control at site as per CVC guidelines and CPWD manual and scope also covers preparations of statutory submittals required for obtaining NOC from local authorities and Govt. bodies as per Govt. directives and law in force e.g town & country planning, local municipal authority, urban development ministry, UPSIDC, environment ministry, fire department etc (Statutory fee as per demand note of Govt. body shall be paid by BHEL).

- iii. The scope of work of soil investigation covers execution of soil investigation under supervision and instructions of IIT/ IT-BHU officials (arranged by the bidder) and soil testing report/ recommendations to be accepted and approved by IIT/ IT-BHU .
- iv. The major facilities both for plant and township to be constructed are:
  - a) Main Plant: - 5 bays of approximately 192 X 24 M size each with bay height up to crane rail of about 12 M.
  - b) Open and covered storage yards
  - c) Administrative Building: – Double story, air-conditioned, floor area about 1000 square meters.
  - d) Canteen bldg , acetylene, oxygen plant house, X-ray room / pit/lab etc
  - e) Earthing pits, lightening conductors
  - f) Sub Station: - 11 kV & 33KV, LT/ HT with DG sets and transformers, panels etc with interconnection to the existing plant.
  - g) Emergency DG Sets
  - h) Electrical distribution system with switch boards etc including lighting in the whole area.
  - i) Service Air compressors and controls
  - j) Service and potable water supply through bore wells (with overhead & underground tanks ) suitable for fire system as well.
  - k) Drainage and sewage disposal
  - l) Sewage treatment plant.
  - m) Security building, entry and exit gates, fencing , boundary wall etc.
  - n) Open area common toilets, Open and covered parking for vehicles
  - o) Land development, approach roads, peripheral roads and roads with in the plot.

- p) Landscaping and horticulture of whole area
- q) Office furnitures, office equipments, LAN for complete IT integration
- r) Lift provision in township blocks

ii. The work shall include:

- a) Preparation of Technical Specifications including bill of quantities (BOQ):

These documents shall be self-sufficient and shall clearly indicate the scope of work, material make and work specifications, method of measurements, specific technical requirements etc. and a detailed Bill of Quantities (BOQ) i.e. various items of work required to be executed and their quantities. The quantities indicated in the BOQ shall be reasonably accurate.

Based on these Technical Specifications and BOQ, BHEL will issue tenders for appointment of construction contractors.

- b) Detail Design, preparation of design documents & drawings:

The Contractor shall perform all engineering and consultancy services required for detailed design and preparation of drawings and documents.

The detailed design shall include, but not limited to:

- A. Verification of all data, criteria and information contained in the contract documents.
- B. Generation of all data, criteria and information required for the completion of work including liaison with BHEL.
- C. Preparation of single line diagrams (wherever applicable) and design of all systems.
- D. Stress analysis of all structures and structural components including their foundation. Design to be done keeping seismic criterion as per latest code of practice
- E. Preparation of all construction drawings required for the complete execution of the works, material selection and material take-off. Sufficient detailing shall be done in all drawings so that the contractor faces no difficulty during construction.
- F. Preparation of technical specification of equipments.
- G. Preparation of Bar Bending schedule for civil works.
- H. Preparation of bill of material (BOM) for supply items.
- I. Preparation of Field Quality Plan.(FQP)
- J. Any other item not specifically covered above but required for completion & proper functioning of the project shall be deemed to form part of scope.

- c) Co-ordination with the construction contractors.
- d) Visits to site and BHEL Office.
- iii. The Contractor will be required to depute their engineers to site, and BHEL' office at New Delhi for any clarification and technical supervision etc. The Contractor shall be paid separately for these visits and manpower deployment as per the rates quoted in relevant items of Price Schedule.

## **2. General**

- i. Basic design data for various works including drawings will be provided by BHEL / their suppliers. However, detailing has to be done by bidder.
- ii. The bidder will be required to give break-up of quantities of each item as appearing in BOQ with respect to each drawing / sub-section either on the drawing or annexure separately.
- iii. Description of items provided in the BOQ should be self-explanatory, so that no separate procedure is to be written and if at all it is necessary the procedure should be given along with specification.
- iv. All calculations shall be performed and supervised by qualified and experienced personnel and shall be checked to ensure their correctness and completeness and shall be prepared in a neat, sequential & comprehensive form.

## **3. Technical Inputs and Coordination**

- i. The technical inputs shall be provided by BHEL from time to time after award of work.
- ii. Preliminary drawings for the Plant are attached. The Contractor is expected to assess the total work involved and quote accordingly for items mentioned in Price Schedule. However, the drawings are only for information and may undergo changes during detail design stage. No price variation will be allowed due to this.
- iii. After award of work, all other necessary inputs required for preparation of Specifications & designs shall be provided by BHEL. The Contractor is expected to interact closely with BHEL for any inputs/ clarifications.
- iv. There may be certain cases, when on account of revision or change of inputs; certain designs/drawings may be required to be redone. No claim of additional payment on account of this shall be entertained and the Contractor is expected to have quoted considering all such eventualities. However, BHEL will try to limit these changes to the minimum.
- v. The Contractor shall promptly reply any clarification required at site or suggestion / clarification required due to any deviation in work with respect to specifications / drawings prepared by Contractor.

#### 4. Documentation

- i. All Specifications and Design Documents, STAD analysis etc shall be neatly printed on A4 size paper. The format of design document shall be as approved by BHEL.
- ii. All drawings shall be prepared on latest AutoCAD or any other approved CAD software. All drawings shall be prepared on standard sizes (viz. A0, A1, A2, A3, & A4). The 'Title Block' shall be as per BHEL approved design. All prints of the drawings shall be clear and legible.
- iii. Upon completion of construction, the design drawings shall be revised to reflect accurately the Plant facilities as built. The drawings shall be issued under the appropriate revision and marked "AS BUILT".
- iv. The number of copies of design documents and drawings required to be submitted shall be as follows: -

For approval	3
Design Calculations / reports / documents	3
Drawings / documents required for Construction/ Procurement	8
After completion of work:	
Drawings ("As Built")	4
Drawings in Soft copies in CD	2
Design Calculation (Final) (Hard Copy & in CD)	2