Expression of Interest (EOI) for construction of High Voltage Laboratory.

BHEL, Corporate R & D has been engaged in development of power transmission and distribution (T&D) Equipment and plans to upgrade its test facilities for development of T&D equipment.

To meet this objective a high-voltage laboratory needs to be constructed for accommodating the test equipment and conducting the development tests. The laboratory shall have a clear ceiling height in excess of 20.0 meters in the test area spread over a plinth of approximately 800 sq. meters. Proposed test area is hybrid in construction, realized with metallic and concrete structures. Eight meter high motorized sliding doors are envisaged to facilitate movement of high-voltage equipment to the test area. A dual capacity 15/5T crane is proposed for material handling in the test area. Test area shall be suitably illuminated, ventilated and powered for utilities/ test equipments. In addition to this test area, the laboratory shall have a covered area of approx. 450 Sq. meters for equipment assembly and the design office. A single girder 6.5 T crane shall be provided for material handling in the assembly area.

In this context BHEL wishes to utilise services of a competent EPC agency capable of designing and constructing the laboratory (as per BHEL concept/ specifications) independently against a contract, in a given time frame of maximum 18 months.

Construction agencies/ consultants interested in this project may communicate their expression of interest to participate in such a tender to the undersigned to help initiate process of registration, with BHEL. Draft/preliminary specification of the works involved would be made available on hearing from you.

BHARAT HEAVY ELECTRICALS LIMITED

INVITES EXPRESSION OF INTEREST

FOR

DESIGN, PROCUREMENT, CONSTRUCTION and COMMISSIONING OF CIVIL, STRUCTURAL WORKS OF HIGH VOLTAGE LABORATORY

AT

CORPORATE R&D DIVISION
HYDERABAD

1. INTRODUCTION

1.1. BHEL is a premier engineering and manufacturing organisation, majority owned by Government of India, catering to the core infrastructure sectors of Indian economy viz. Power Generation and Transmission, Industry, Transportation and Renewable Energy. The company has 14 manufacturing units, 4 Power Sector regions, 8 Service centers and 15 Regional offices, besides hosts of project sites spread all over India and abroad. BHEL supplied equipment account for 65% of total thermal generating capacity of India and contribute 73% of the total power generation in the country. The annual turn over of the corporation for the year 2007-08 was USD 5 Billion. With the current order book exceeding USD 20 Billion and growing, BHEL is poised for excellent future growth, approaching an annual production capacity close to 20,000 MW.

1.2. BHEL has an in-house Corporate Research & Development division at Hyderabad (South India) for carrying out research, design and development related to power industry, meeting requirement of technology and processes for its operations.

1.3. More details on BHEL, its establishments, products and operations can be accessed by visiting our website www.bhel.com.

2. PROPOSAL

2.1. The tentative dimensions and the shape of the proposed laboratory are given in attached file (.pdf) / following pages.

2.2. The laboratory is constructed using optimal material (RCC and steel structures). Consists mainly of high voltage test area (800 Sq.m), equipment assembly area and the design center (together 450 Sq.m). Shall be energy efficient construction utilising natural light and draft for illumination and ventilation.

2.3. Features magnetic shielding (around) and earth mat (buried at 1.5 m below ground level). As per BHEL design.

2.4. Civil and structural details shall be designed and worked out by the vendor/ his associates. Laboratory shall be constructed using high quality material to industrial standards in a time schedule of 18 months or earlier and commissioned by demonstrating satisfactory testing and operation of offered equipment (for material handling, pressurization, illumination, ventilation etc).

2.5. Expression of interest is hereby invited to DESIGN, PROCURE, CONSTRUCT and COMMISSION CIVIL and STRUCTURAL WORKS for envisaged HIGH VOLTAGE LABORATORY from interested organisations/ industrial groups having sufficient experience in construction (EPC)/ infrastructural development. Qualifying criteria is as follows:

2.5.1. Sufficient EPC/ BOT experience.
2.5.2. Firms with positive net worth consistently for past five years and annual turn over of minimum INR 50 crs (USD 12.5 Million) for past three year.
2.5.3. Documentary evidence is required to be enclosed along with expression of interest proving capability and competency.

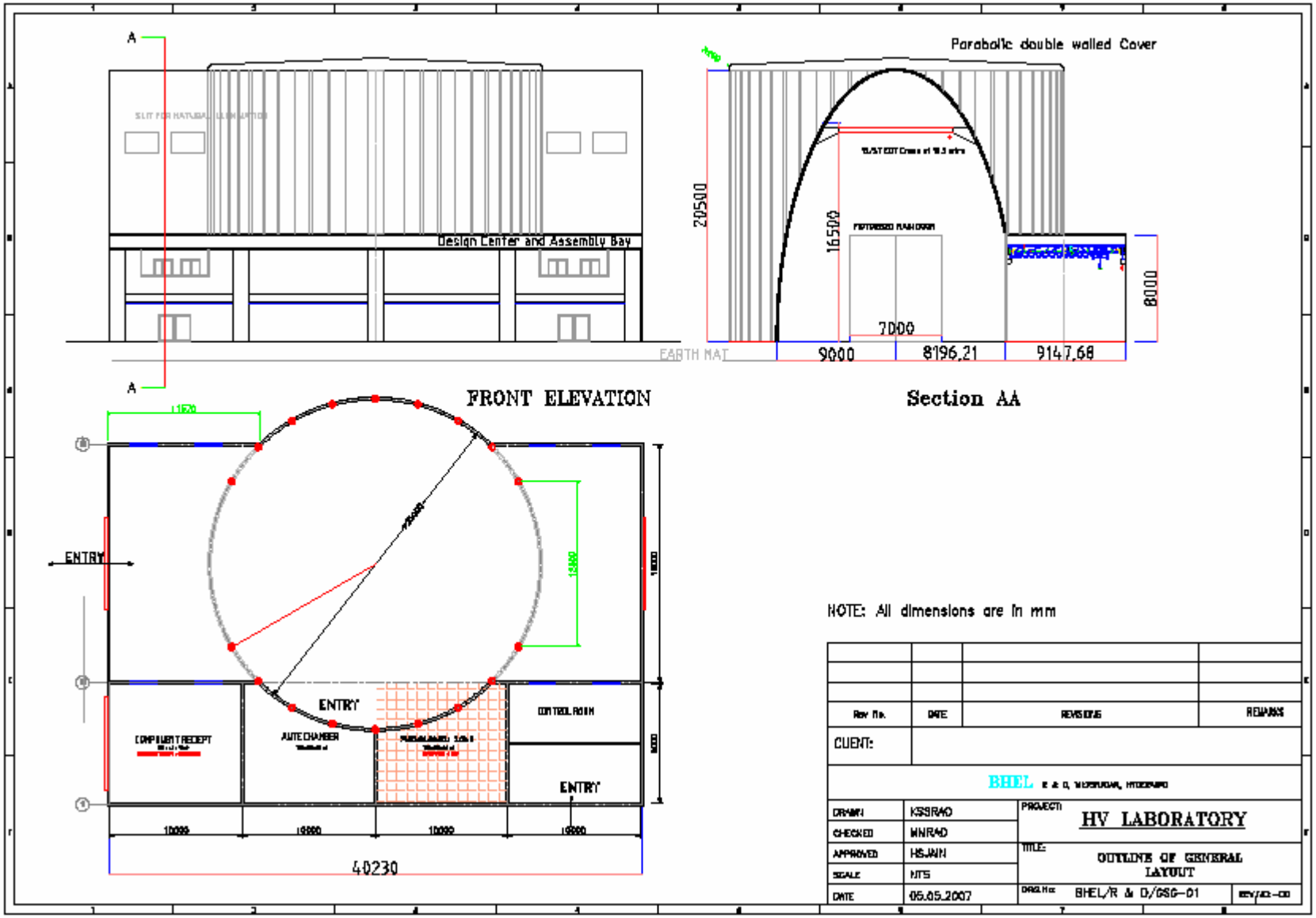
3. For clarifications please contact following executives:

Shri R. Kannan, AGM (HVE)
Ph. No. 9985306512/Land Line: 23778988,
email id: kannan@bhelrnd.co.in

Shri S.K. Chandra, AGM (REP)
Ph. No.9985306542/Land Line: 2377

Mr. H Krishnan, AGM (MM),
BHEL R&D,
Vikas Nagar, Hyderabad-500093
PHONE: (040) 2377
email: krishnan@bhelrnd.co.in

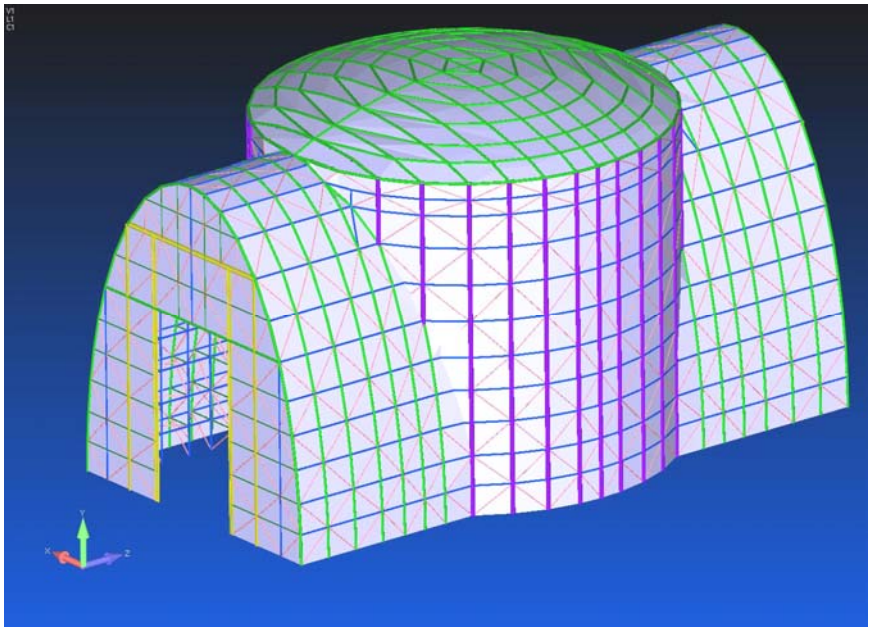
4. The Expression of Interest shall be submitted to above address, on or before 25th July 2008.


A
Design Center and Assembly Bay
EARTH MAT
A
Parabolic double walled Cover
20500
16500
8000
7000
9000
8196.21
9147.68
Section AA
FRONT ELEVATION
ENTRY
ENTRY
ENTRY
CONTROL ROOM
10000
10000
10000
10000
40230
NOTE: All dimensions are in mm
Rev No.
DATE
REVISIONS
REMARKS
CLIENT:
BHEL
DRAWN
KSSRAO
CHECKED
MNRAO
APPROVED
HSJAIN
SCALE
NTS
DATE
05.05.2007
PROJECT:
HV LABORATORY
TITLE:
OUTLINE OF GENERAL LAYOUT
DRG.No:
BHEL/R & D/GSG-01

Preliminary Specifications for High Voltage Laboratory

A facility consisting of a high voltage testing area and a design center is to be created at BHEL Corporate R&D, Hyderabad.

The shape of the high voltage laboratory shall be identical to the wire frame shown below ad shall be a steel structure suitably supported by concrete columns.



The design center shall be RCC structure and shall be suitably connected to the test laboratory.

In addition the area surrounding the laboratory shall be suitably developed.

The broad requirements are listed hereunder:

1. Qualification requirements:

1.1. The vendor shall be a reputed project managing/ consultant.
1.2. Should have a completed minimum ten civil/ structural projects in the range of 2.5 to 10.0 Crores (INR).
1.3. Should have a minimum strength of ten qualified design and project engineers enrolled at any point of time. The staff should be well conversant with relevant standards (IS).
1.4. The design office shall be equipped with civil and structural design soft wares like STADPRO, PRO-E, AutoCAD and Project scheduling/ material monitoring tools.
1.5. The vendor shall have valid PAN, EFT enable bank account and have capacity to furnish performance Bank Guarantees (~ Rs. 50 Lacs) as required for the project.
1.6. The vendor shall have submitted a budgetary proposal and approach on project.
1.7. The vender should have participated the in the pre-bid meeting conducted by BHEL.
1.8. The vender shall have a well established website.

2. Technical requirements
2.1. The contract is an Engineer, procure, construct and commission (EPC) contract.
2.2. The contractor shall generated working drawings based on concept and specification provided by BHEL, interact with BHEL/ design consultants and finalise the complete design.
2.3. On finalisation of design, shall submit four hard copies (A0 size) and one soft copy of design documents/set.
2.4. The contractor shall prepare a detailed schedule of works involved and submit to BHEL for approval. The approved schedule shall be reference for project monitoring.
2.5. The contractor shall carry out civil and structural work as approved with his resources and inputs independently.
2.6. The contractor shall complete all Power, electrical, illumination and utility related requirements.
2.7. The contractor shall install, commission and demonstrate all mechanical equipments like doors and cranes.
2.8. All fitting, fitment and controls shall be commissioned and demonstrated.
2.9. The site shall be cleared of all construction machinery on completion of project.
2.10. The new facility shall be included in existing complex by extension/ modification of cordon wall, as approved by BHEL.

2.11. The supplier shall develop the area around the laboratory providing connectivity, connections for water and sewage to the nearest point, illumination and street lights, extension of road up to entrances etc.

2.12. The supplier shall be extended support for:

2.12.1. Conceptualising and finalisation of design,

2.12.2. Requisite area for construction/green field,

2.12.3. Contractual Finances,

2.12.4. Water and power.

3. Preliminary Technical specifications: Open green field shall be provided by BHEL for this construction. The project consultant shall design and execute complete work in stipulated time schedule of maximum 18 months, from time of signing the contract. The preliminary details for the project are as follows:

3.1. Structural work:

3.1.1. Shape:

3.1.1.1. Elliptical (refer enclosed sketch/drawing) Major axis: 40m, Minor axis: 20m

3.1.1.1.1. Length: two sections of 8.0 meters, Apex height: 20.0m

3.1.1.2. Cylindrical (central portion) Diameter: 24.0 meter (clear), height 20m covered by a dished roof of approx 1.2 m height.

3.1.1.3. Material, hollow rectangular steel section (60x60x4) meshed to form triangular/ square grids/frame as per shape requirements (refer enclosed sketch/drawing).

3.2. Covering/ panels:

3.2.1. Magnetic Sheet steel with thermal insulation, preferably of less than 4 sq. meters/per panel (2mx2m). The surface shall be suitably treated and powder coated for weather protections. The panels shall be held mechanically using rivets/bolts. The panels shall be electrically connected to each other and the frame

3.3. Entries/ doors:

3.3.1. One-Manual mechanized sliding (2-part) door7mX8m (h),

3.3.2. One-Side door 1.6mx2.5m (h)

3.3.3. One-Motorized sliding (2-part) main door size 7mX8m (h),

3.3.3.1. The doors shall be made from metal/ composite material assembled with adequate support frame and shall have weather resistance surfaces.

3.3.3.2. All controls shall be wired up to a convenient height with all safety interlocks and shall have local and central control panel.

3.3.3.3. Drives shall be powered by 415 V, 50 Hz mains.

4. Material handling:
   4.1. A double girder, dual speed, dual capacity (15T/5T) EOT crane at a height of 14.5-15.5m with a long travel 8.0m and cross travel as per limitation of structure.
   4.2. A single girder, dual speed (2.5T) motorized hoist at a height of 6.5m with a long travel 8.0m and cross travel as per limitation of structure.
   4.3. A motorized swing/telescopic hoist (capacity 500kg) at an adjustable maximum arm length of 12.5m. The hoist shall be mounted at an elevation of 12.5m from ground level in cylindrical section.
      4.3.1. Above equipment shall be powered by 415 V, 50 Hz mains.

5. Ventilation:
   5.1. The roof of the cylindrical section shall be provided with sufficient, minimum six, ventilation ducts and devices to promote/ induce effective ventilation in the covered space. The elliptical sections shall have necessary vents (at ground level) for entry of fresh air in the covered area.
      5.1.1. The vents at ground level and at the roof shall be rain and storm proof.

6. Illumination:
   6.1. Energy efficient fitting in adequate quantity to be provided in the covered area for day light intensity in covered area. The fittings shall be suitably wired and connections brought to power control panel located inside this facility.

7. General:
   7.1. Structures/ spans to be designed to carry the structural loads (dead weight, wind load, seismic load etc)
   7.2. Crane shall be supported on independent columns without support from main structure.
   7.3. Natural illumination and ventilation ducts/ devices to maintain adequate ventilation and light during the day. Insulated covering

with necessary ventilation ducting shall be provided to insulate the laboratory against sun.

7.4. The air draft, if required, may be induced using appropriate induced draft fans.

7.5. The structure shall be designed, assembled and finished by the supplier to the agreed design, demonstrating satisfactory performance.

7.6. Motorized doors and the associated equipment shall be of standard make.

7.7. All equipment shall be designed for 415V-3Φ + N, 50Hz system.

8. Civil Work:

8.1. Design approval and model:

8.2. The project execution agency shall interact and complete design in association with BHEL and shall submitted A0/A1 size drawings in both soft and hard versions. A 40:1 model of approved design shall also be made available with-in 4 weeks of design approval. During this period all detailing / project engineering shall be completed and details submitted to BHEL.

8.3. Surveying shall be taken up by the execution agency in the identified area to facilitate marking.

8.4. Clearing vegetation and Cordoning: The execution agency shall arrange to clear the vegetation in the marked area including boulders etc, if necessary.

8.5. Cordoning construction space: The agency shall cordon the identified area to safeguard surroundings from work related risks and shall work without interfering in day to day operations of existing laboratory. The cordon shall be removed on completion and the new construction included in existing establishment by extending boundary wall as required.

8.6. Earth work: The marked area shall be leveled for contours prior to start of excavation for foundations and earth mat.

8.7. Earth Mat: This is a welded grid (pitch 1.25-1.5 m) of 65mm NB class-c steel pipes 1.5 meter below ground level. The grid is further connected electrically to earths (min.4) spread over entire laboratory. The details grid design shall be made available to executing agency.

8.8. Foundations: Column foundations as per suggested design shall be carried out by the execution agency.

8.9. Plinth Beam: Plinth beams are recommended considering length and width of the laboratory. The design shall ensure self supported and sink free floor for the life of the laboratory.

8.10. Plinth slab: The plinth shall be a RCC slab of suitable thickness (not less than 112mm) shall be capable of bearing minimum 1250 kg/sq.m

8.11. Trenches: Utility trenches shall be provided to run electrical cables as necessary. Wider trenches if suggested shall be covered with modular metal covers and respective grouted frames.

8.12. Sewage/ drainage connections: Sewage and drainage connections shall be planned and executed in time avoiding rework and damage to main structure at a later date. Such rework shall not be permitted.

8.13. Crane support columns: It is proposed that the cranes shall be supported on independent columns. The crane loads shall not be transferred to the main steel structure supporting the panels. These and associated columns shall rest on suitably designed foundations.

9. Design center and assembly bay

9.1. An area, approximately 360 sq. m (9mx40m) houses the design center and assembly bay.

9.2. The assembly bay has a ceiling height of 8 meters and a depth of more than 25 meters. A 6.5 T single girder dual speed hoist is specified for assembly area.

9.3. The balance area is utilised for a two storied (4meter ceiling height) design center. A circular stair case shall be available to access second floor of design center. The center shall be designed with sanitation facilities. An area (9mx6m) on second floor shall be utilised for an air handling and cooling unit. The foundation details for this unit will be made available during execution of the work.

9.4. Power wiring, illumination fittings and similar other materials for the design center shall be made available by the execution agency.

9.5. Single girder hoist/Crane for 6.5 T in assembly bay shall be procured and commissioned by the execution agency. Qualification criteria and the specifications shall be made available in detailed specifications.

10. Furniture and fittings

10.1. All Windows, glass panels, doors, door fittings at design center shall be best of class. The doors proposed are with swipe card controlled electronic latches.

10.2. A glass walled control room (4m x 8m - 4m high), with two sliding doors, facing the cylindrical hall shall be provided in the design center. Proposed to be located at a convenient location to be finalised during detailing.

11. Fire and safety installations: Fire and safety provisions as per industrial norms shall be arranged by the execution agency. The equipment and BOQ shall be approved by BHEL.

12. Power wiring and illumination:
    12.1. Power and utility wiring, illumination equipment installation and wiring, central/ local control panels for entire building shall be in the scope of the execution agency.
    12.2. 415 V, 3P+N armored cable of adequate capacity will be laid and made available by BHEL at the central power panel.

13. Landscaping: The landscape scheme shall be designed and executed for the laboratory rendering a soothing, natural ambience.

14. De cordoning and Site handing over: The building shall be handed over and the cordon shifted such that the new area is integrated to exiting laboratories. The cordon or the boundary and fence shall have design identical/ matching to that of present design.

15. General
    15.1. Only ready mix concrete shall be used for construction.
    15.2. Steel reinforcement shall be standard and rust free, preferably coated/painted to prevent rust.
    15.3. Steel sections employed shall be as per IS.
    15.4. Water and power shall be available from BHEL during construction activity.
    15.5. Power, illumination, interlocks and other fitting offered shall be standard and from IS approved brands.
    15.6. Safety implements, Fire extinguishers/ fire fighting equipment offered shall be NEW and IS approved.
    15.7. Furniture and fittings, fitments offered shall be of standard/recognized make.
    15.8. Glass partitions shall be from corning/ saint-gobain other make can used only on approval by BHEL.
    15.9. Electronic interlocks and door closing equipment vendor shall be approved by BHEL.
    15.10. Equipment foundations and special ducts for the facility shall be as per BHEL directives during execution of work.

16. Tantative Bill of materials/quantities for the project are listed in the Tables below:

16.1. Civil Work:

#	Item	Size	Qty	Remark
1	Cordoning	180m		
2	Earth work	40x33x1.5m		
3	Foundation	As per design		
4	Earth Mat			
4.1		Steel pipe 65 NB	2000m	
4.2		Steel pipe 100 NB	25m	
4.3		Cross 65mm	450	
4.4		Flange 150 dia-16tk	4	
4.5	Filling and leveling	LS		
5	RCC Casting of Plinth Beams	As per design		
6	RCC Casting of Plinth slab/ floor	1200 sq m		
7	RCC Columns	As per design		
8	Walls, Lintels	As per design		
9	Casting RCC Roof slab	450 sq m		
10	Doors & Windows	As per design		
11	Partitions and Glass panels	As per design		
12	Flooring	450 Sq m		Antiskid ceramic
13	Plastering, painting	As per design		
14	Electrical wiring	As per design		
15	Sanitation work	As per design		

16.2. Structure:

#	Item	Size	Qty	Remark
1	Main Columns	180X450x20000mm	12	Circular steel section, Acceptable
2	Roof Trusses	As per design	12	
3	Frames	As per design	LS	
4	Cover Panels	2000x2000mm	As required	
5	Main Doors	7000x8000x 200mm	2 Sets	
6	Crane Columns	As per design	LS	
7	Crane Breams	As per design	LS	
8				

16.3. Electricals:

#	Item	Size	Qty	Remark
1	Main control Panel	400 A	1	All standard make, work to be carried out by licensed sub contractor
2	Auxiliary Control Panels	160A	3	
3	Power Cable	160A	LS	
4	Power wiring			
4.1	Distribution Cable/wiring	16A	LS	
4.2	Illumination wiring	16A	LS	
4.3	Street light/ utility wiring	16A	LS	
4.4				

16.4. Material Handling

#	Item	Size	Qty	Remark
1	Crane	15/5 T	1	Concealed / insulated DSL, Dual beam, dual speed, local/remote controlled
2	Crane	6.5T	1	Single girder, dual speed, local/remote controlled
3	Door drives	As per design	1 set	
4				

16.5. Safety

#	Item	Size	Qty	Remark
1	Fire Hydrants	180m		All standard make, work to be carried out by licensed sub contractor
2	Hydrant conduit/piping	40x33x1.5m		
3	Soda/ CO2 devices	As per design		
4	Electronic sensors/alarm	As required		

17. Schedule and stages of payment

17.1. Payment shall be released as per schedule of work and shall be linked to completion of agreed activity and delivery of agreed quantities.

18. Commercial terms and conditions:
    18.1. The contract shall be awarded to the lowest bidder.
    18.2. Time schedules higher than 18 months shall not be accepted. If offered will be loaded at a flat rate of Rs. 2.5 Lacs/ per week for arriving at the lowest cost.
    18.3. Delay in project execution shall attract LD at 0.5% of project cost / week.
    18.4. Security deposit/ EMD as applicable shall be payable for participation in tender.

19. Safety and Insurance: The vendor shall ensure full safety, at site, of the material, work in progress, personnel, equipment employed etc against fire, theft and life. BHEL shall not take any responsibility whatsoever for any mishap during the period of contract/work.

20. General