TECHNICAL SPECIFICATION

FOR

STORAGE CLOSED SHED 60 M X 15 M

WITH

SIDE RACK

Bharat Heavy Electricals Limited
Project Management Department
Power Sector – Eastern Region
Salt Lake, Kolkata

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This volume shall be construed as part of tender document and shall be read along-with others volumes of tender. Unless otherwise specified, in case of any confusion of any clause/ provision of this volume or any conflict/ inconsistency of any clause/ provision of this volume with that of other volume, the same shall be brought out by the bidder in writing to BHEL for clarification or during pre-bid discussions, if applicable, failing which most stringent interpretation in favour of BHEL shall be adopted and the same shall be binding to the bidder. Unless otherwise specified, all terms & conditions shall be applicable for entire scope of the tender.

CLAUSE NO	DESCRIPTION
1.0	NAME OF WORK
	Design, Manufacturing, Supply, Receipt at Site, Erection including Civil works and Handing over etc of Removable / Re-erectable type Pre-Engineered, Pre-fabricated Steel closed Storage Sheds with supply and supply & erecting of side rack as per specification including an internal cabin of 3 M x 3 M with false ceiling & partition all complete.
2.0	BROAD SCOPE OF WORK
	This specification covers Design, Manufacturing, Supply, Receipt at Site, Erection, Site Painting etc. including Civil and Handing over of Removable/ Re-erectable type Pre-engineered, Pre-fabricated steel closed storage sheds (Approx. 900sqmt each),
3.0	DESIGN CONSIDERATIONS
3.1	BROAD CONSIDERATION
3.1.1	Size of each Closed Shed shall be 15M c/c X 60M c/c (approximate).
3.1.2	Clear Height of closed Shed (between FFL & Bottom of truss/ Structural Member) shall be 6.0M.
3.1.3	Columns shall be spanning – 6.0M c/c maximum long span & 5.0M c/c maximum short span.
3.1.4	All design work of sheds shall be of pressed steel sections & have to be vetted by BHEL Engineer.
3.1.5	All side cladding/ roof sheets shall be fitted in such a way that they can be removed at any point of time.
3.1.6	Sliding doors (4.65 M Width x minimum 5 M Height) shall be provided at front & back entrance of each covered shed at center location. Suitable arrangement shall be made for easy operation of gates (gear operated).
3.1.7	One man-entry gate to be provided at one side of each shed (front entrance by the side of sliding door).
3.1.8	For local site conditions, bidder to refer to enclosed write up (refer SCC). The bidder should submit a guarantee / warranty for 12 months of operations for the materials supplied and erected by him.
3.1.9	All designs have to be carried out as per relevant IS code
3.2	CIVIL WORK
3.2.1	Design & Execution of civil works shall be carried out as per latest IS codes, standard specification and drawings as per the instruction of Engineer In- charge.
3.2.2	Grade of RCC shall be confirming to M25 & Reinforcement Steel shall be confirmed to Fe-500.
3.2.3	Grade of PCC 1:3:6.
3.2.4	Brick masonry using first class brick of strength 50 Kg/Sq.cm. with masonry with Cement Mortar 1:5, plastering with Cement Mortar 1:6 of min. 12 mm thick.
3.2.5	Flooring shall consist of concrete base of 150 mm thick PCC 1:2:4 over a layer of 150 mm thick mechanically compacted stone (63mm down) & filling the voids with sand over compacted earth.
3.2.6	RCC Foundations for Columns, floors & 230 mm thick Brick cladding from 300 mm (minimum) below ground level over tie beam up to 0.900 m height along periphery.
3.2.7	All the exposed face of Masonry & concrete should be painted with cement base paint of approved brand and colour.
3.2.8	Height of RCC Column foundation shall be 0.60 m above existing levelled Ground Level. However, before starting the work the Vendor has to visit site to collect actual information. No extra cost shall be paid for rise in elevation due to site conditions
3.2.9	RCC Ramp to be provided at the entrance of closed storage shed.
3.2.10	HDPE Rain Water Down Pipe shall be provided with suitable gutters for drain out of rain water with all around plinth protection of 600 mm wide & surface drain with brick.
3.3	STRUCTURAL STEEL WORK
3.3.1	Design of structural steel work shall be carried out as per latest IS codes, standard Specification and drawings as per the instruction of Engineer In-charge. All materials for structural steel works have to be supplied by the contractor and necessary test certificates of the materials procured for this work has to be submitted for scrutiny. All fabrication and erection of structures must be executed

	according to the specification and drawings. Erection of trusses is true to line and level and aligned properly, as per drawing and instruction of Engineer In- charge.
3.3.2	Primary members: the column and rafter (the primary members) shall be manufactured from high strength (min YS of 450 Mpa) galvanized steel with coating mass min 275 GSM confirming to IS-277or ASTM A 653M or epoxy painting with grit blasting and primer. Total thickness of epoxy painting shall not be less than 150 micron. Secondary members Supply of Galvanized secondary members are cold-formed from steel coils conforming to ASTM A653M (or equivalent) having a minimum yield strength of 345 / 450 MPa with zinc coating to Z120 designation (120 g/m2) or epoxy painting as stated above. The roof truss should have bolted joints at crown and at both ends
3.3.2	All accessories like G.I. bolts, EPDM washers and nuts complete from reputed manufacturer shall be included in the scope. All bolts, nuts (IS 4759) shall be galvanised (hot dip) min. 270gm/m2. Galvanised spring/ plain washer shall be as per IS 1573.
3.3.3	Since these are re-erectable sheds & to be in repetitive use at different locations, proper marking (permanent) shall be made for identification to ease re-erection. The stores shed shall be so designed that it can be dismantled at any time and may be transported to be re-erected at other location
3.3.4	Cladding: Roof and Side Cladding with Galvalume Sheet confirming to ASTM A 792 of thickness 0.45 mm with galvalume coating not less than 150gm/Sq.m (both side mass) of minimum yield strength 550 Mpa (min) of approved make. Translucent (Poly Carbonate) sheet of approved make shall be provided for alternative bays (10% of the sheeting area). Both roof and side cladding are to be made "Water Tight. ". Purlins for wall & roof cladding shall be 'z' shape made-up with pressed steel. Liner panel / Partition- Supply of colour coated panels are roll formed from nominal 0.45 mm base metal thickness of minimum yield strength of 550 MPa, coated with an aluminum /zinc alloy (i.e.Zincalume or equivalent), AZ150 (min 150gm/m2 total on both side), conforms to Australian standard AS1397, pre-painted steel quality paint coat as per AS/NZS 2728 Class 3. The paint finish thickness shall have a total coating thickness of 35 μm, comprising of nominal 20 μm on exterior face and nominal 5 μm reverse coat on interior face over nominal 5μm epoxy primer coat on both surfaces of approved colour shade or equivalent. The manufacturer's test certificate for the chemical and mechanical properties of steel must be submitted for approval by the concerned authority prior to installation. The sheet shall have brand marking of the manufacturer giving product details on the back of the sheet at every 1meter c/c for confirming genuinely of the material. Profile dimensions: Profile sheeting shall have 1110 mm effective cover width profile with nominal 3.5 mm deep ribs at pitch of nominal 48 mm centre to centre distance
3.3.5	Purlin & wall runners for sheeting shall be 'z' shape made-up with pressed steel or equivalent.
3.5	MISCELLANEOUS
3.5.1	Providing ventilators 900 mm (W) x 600 mm (H) – 16 nos. should be at a height of 3.5m from FFL, made of suitable Aluminium section with wired / toughen glass open-able type for closed shed only.
3.5.2	Store in-charge room (minimum 3 M x 3 M) shall be of 50 mm Thick PUF insulated sandwich panels. These panels are made out of 0.50 thick colour coated G.I. Sheet as exterior on both sides with PU Foam of density 38 kg/Cu.Mtr and tensile strength of 4 kg/Sq.Cm inside. Compressive strength(10 % deformation) 2.1 Kg/Sq.Cm. Thermal conductivity at 10 Deg 0.02 W/M Deg k Temperature Range - 80 Deg C to + 100 Deg C The PU Foam thickness is 60 mm.
3.5.3	False ceiling shall be provided with sandwich panels of thickness 30mm thick.
3.5.4	2nos. table of 1200m width X 600mm depth X 750mm height consisting 3 drawer unit left side, should also have CPU & keyboard provision(table in beech / black colour), 2nos executive chair (Width - 70.0 Cm, Depth - 70 Cm, Height -84.0 Cm- 96.5 Cm Seat Height - 46.5 - 59.0 Cm) & 4nos visitor chairs (Width - 52.5 Cm, Depth - 61 Cm, Height -80 Cm- 119.0 Cm Seat Height - 43.0 Cm) of approved make shall be provided.
3.5.5	1nos. file cabinet consisting 4 drawers of size 470 mm width X 1320 mm height X 620 mm depth and 1nos. single side steel file/book rake consisting of 3 rakes of size 900 mm width X1850 mm height X316 mm depth shall be provided.
3.5.6	Suitable long span shelve system shall be provided throughout the length of both opposite longitudinal spans of closed sheds. It should have two shelves with one shorter top & one wider middle rack at height of 600mm from floor adding to a total height of 1200mm. The shelves shall be design to with stand SKU loading (not less than 125 Kg/Sq.M) with suitable angle section. The width of top shelf shall be of 600mm & intermediate/middle shelf is 750mm.

3.6	ELECTRICAL WORK
3.6.1	Supply & installation of electrical items are to be carried out strictly as per approved drawings and executed through licensed electricians.
3.6.2	Bidder to supply & install electrical items like Main switch (64/32 A TPN), ELCB, wires, conduit, tees, bends, clamps, JBs, Switch boards, earthing wires etc. 2nos. EXHAUST FAN on both sides on the gable ends and 2nos. EXHAUST FAN on longitudinal side of size 900mm of suitable capacity to be supplied and fitted for the covered store. Inside store to be illuminated with at least minimum 18 nos. (80W) High Bay LED lamp and Outside 8 no. LED lamp of approved type shall be provided for four sides. Lighting fixtures should be of Bajaj, Philips, Havells, GE or equivalent make and the type of lighting fixture shall be equivalent to "DURANTO" model of Bajaj make having catalogue no: BGHB80W GV.
3.6.3	Fixing of LED luminaires (80W) hanging from structural roof truss of the Store Building with pipe/structural support and suitable clamps etc Scope Includes supply of all fixing/ supporting accessories complete and flexible wire for connection between ceiling rose & fitting.
3.6.4	Electrical cables shall of Finolex/ Havells/ Universal/ Delton/ Paramount and fixtures/fittings shall be of Havells / Crompton / Bajaj / Philips or any other approved make.
4.0	GENERAL
4.1	All works shall be carried out in proper workmen like manner. Items of works covered by the following specification shall be carried out as per the best practices and according to the direction of the Engineer In-charge / BHEL Site Engineer and to his satisfaction. Unless otherwise specified in this section or in the description of item, the cost of stage of works mentioned hereunder shall be deemed to have been included in the rates of items provided in the schedule.
4.2	Bidders may take note of the following points while sending their offers:
4.3	The quoted prices shall include transit freight, handling at site, assembly and erection. BHEL reserves the right to modify the size of the shed in line with the requirement and space constraint at site. In such special cases, in line with the BOQ submitted by the bidder, the quantities for the shed can be re worked and the amount can be revised.
4.4	Agency shall submit two sets of proposed drawings of the shed to BHEL before commencement of work for approval. Five sets of final drawings, along with one soft copy in CD and one reproducible, shall be handed over to BHEL immediately after finalization of design.
4.5	Bidders are requested to visit Project Site to see the site condition, prevailing local laws etc. No claim shall be entertained to lack of knowledge of site condition.
4.6	The materials and workmanship must be of good quality and accepted standards and specifications. The site engineer reserves the right to reject any material not up to the specification. All taxes, levies and duties on construction materials will be on contractor's account. After completion of work, the building and areas around them should be cleared of all rubbish, debris etc. and handed over in fit condition for occupation.
5.0	DRAWINGS
5.1	Typical Drawings enclosed along with the tender is strictly for the guidance of the Bidders