HLL INFRA TECH SERVICES LIMITED (HITES)

(Subsidiary of HLL Lifecare Limited
A Government of India Enterprise)

TENDER

FOR

PROVIDING REINFORCED CEMENT CONCRETE FOUNDATION, HARDSTAND, CHAIN LINK FENCING, GATES, VEHICLE BARRICADES, FIRE AND SAFETY PROTECTION SYSTEM, MEDICAL GAS PIPELINE SYSTEM AND ELECTRIFICATION WORKS FOR LIQUID MEDICAL OXYGEN PLANT IN JAWAHARLAL INSTITUTE OF POSTGRADUATE MEDICAL EDUCATION AND RESEARCH (JIPMER), TERTIARY EDUCATIONAL INSTITUTION IN PONDICHERRY, INDIA.

Volume- IV

TECHNICAL SPECIFICATION

Tender Notice No. : HITES/FM/JIP/Civil/2020-21/002 Dated: 11.09.2020

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TECHNICAL SPECIFICATIONS

A BRIEF OF REQUIREMENT OF THE WORK:

1. **General Scope of Work :**

   Providing Reinforced Cement Concrete foundation, Hardstand, Chain link fencing, Gates, Vehicle barricades, Fire and Safety Protection System, Medical Gas Pipeline System and Electrification works for liquid medical oxygen plant in JIPMER, Puducherry.

2. **The following are the salient features of the Works:**

   a) Demolishing cement concrete, brick work manually/ by mechanical means, Cutting road and making good the same.

   b) Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings.

   c) Earth work in excavation by mechanical means/manual means.

   d) Providing and laying in position PCC/ RCC of specified grade.

   e) Brick work with common burnt clay F.P.S. (non modular) bricks.

   f) Providing Hardstand, Chain link fencing, Gates and Vehicle barricades.

   g) Fire and Safety Protection System.

   h) Medical Gas Pipeline System.

   i) Electrical Installations.

3. The work shall, in general, conform to the Latest CPWD Specifications for Civil with up to date correction slips for all sub heads of work as applicable, and, Technical Specifications included in the tender documents, wherever applicable. Wherever any aspect of design / construction / material standards is not covered under the above mentioned specification, relevant standards shall be referred to in the order of precedence which shall be as follows. In the case of discrepancy between the Schedule of Quantities, the Specifications and /or the Drawings, the following order of preference shall be observed –

   a. Description of Schedule of Quantities
   b. Particular specification and Specific Condition, if any
   c. Drawings
   d. CPWD Specifications
   e. Indian Standard Specifications of BIS/ NBC/ IRC/ BS/ ASTM/ DIN
   f. For items not covered by any of the above, the work shall be done, as per sound engineering practices and as directed by the Engineer-in-charge.

CHAPTER - A

TECHNICAL SPECIFICATIONS AND CONDITIONS- CIVIL WORKS

1. **EARTH WORK:** As per relevant CPWD specifications.

   a. Irrespective of the stipulations in the relevant CPWD Specifications or elsewhere in the Contract, the excavated earth shall be disposed of by the contractor at his own cost to the place as directed by Engineer – in-charge and/or permitted by the local authority after obtaining written permission of the Engineer – in-charge and no payment will be made by the HITES for disposal of this excavated earth.

   b. The Contractor shall, at his own expense and without extra charges, make provision for all shoring, pumping, dredging or bailing out water, encountered from any sources such as rains, floods, springs, subsoil water table being high or due to any other cause whatsoever.

2. **PLAIN CEMENT CONCRETE AND REINFORCED CEMENT CONCRETE WORK:**

   A. STONE AGGREGATE:

   i. Stone aggregate used in the work shall be of hard broken stone to be obtained from approved source (Quarries to be approved by the Engineer in charge) and shall conform to relevant provision in the Latest CPWD Specifications for works.

   B. SAND

   i. Sand to be used for the work shall be of as specified in CPWD Specifications 2019. Sand shall be obtained from the source to be got approved by the Engineer in charge and washed if required, with appropriate equipment to bring down the chemical, inorganic and organic impurities within the permissible limits as per the direction of the Engineer in charge. The same shall consist of hard siliceous materials.

      Note: Where only one variety of sand is available the sand will be sieved for use in finishing work as directed by the Engineer – in – charge in order to obtain smooth surface and nothing extra will be paid on this account.

   ii. Nothing extra shall be paid for screening or washing the sand as prescribed above.

   C. FLYASH

   Flyash conforming to grade 1 of IS 3812 (Part 1) may be used as part replacement of OPC provided uniform blending with cement is ensured in accordance with clauses 5.2 and 5.2.1 of I.S.456-2000 in the items of BMC and RMC. However this shall not override the provisions of the respective items.

D. CENTERING SHUTTERING AND SCAFFOLDING:

i. All Scaffolding centering for RCC shall be with properly designed system and brought to site well in advance so that the progress of the work is not hampered for non-availability of the same.

ii. All shuttering for RCC work except soffits of slab shall be in water proof shuttering Ply. Shuttering for slab and soffits shall be in water proof shuttering ply or in good quality mild steel plates free of dents, bends or warping and rusting as approved by the Engineer in charge.

iii. Contractor should deploy complete one set of shuttering materials for minimum one complete floor and the shuttering material for beam bottom shall be minimum for two complete floors.

E. REINFORCEMENT:

i. TMT reinforcement steel shall be used shall be as per design and conforming to IS: 1786 pertaining to Fe 500D OR Fe 550D grade of steel.

ii. TMT steel bars manufactured by main producers, as per list of makes, shall be allowed in the work. Contractor shall produce manufacturer Test Report for each dia and each lot Tests. Nothing extra will be paid for "straightening of bars" received from market in coils or with bends. All incidental charges of any kind whatsoever including cartage, storage, safe custody of materials, cutting and wastage etc. shall be borne by the contractor.

iii. The actual average sectional weight for dia up to 10 mm shall be arrived at from one meter long samples (minimum 3 from each dia) taken from each lot of steel. The discretion of the Engineer – in – charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute the single lot for this purpose.

iv. The weight of each lot of a particular diameter of 10mm and below shall be reckoned as the weight as per actual issue multiplied by a factor equal to the standard sectional weight of the particular diameter divided by the average sectional weight of the particular dia in a particular lot worked out as per above para. Adjustment for the steel shall be effected on the basis of the weight as modified above for quantity payable.

F. Concrete Mix Design

The mix design shall be for MODERATE exposure and GOOD degree of quality control, unless otherwise specified.

3. **BRICK WORK**

a. Bricks used in the work shall be obtained from kilns to be got approved from the Engineer in charge and shall be best quality well burnt ground moulded bricks as available in the vicinity. They shall have a compressive strength of not less than 75 Kgs/sq.cm and an absorption percentage of not more than 15 (Fifteen) % of its dry weight when immersed in water for 24 hours. In all other respects they shall conform to the provision in Latest CPWD Specifications for works.

b. Both the face of wall of thickness more than 23cm shall be kept in the proper plane. Walls of half brick thickness or less shall be measured separately and paid in sqm.

c. Bricks wall beyond half brick thickness shall be measured in multiple of half brick (i.e. more than 115mm or equivalent) which shall be deemed to be inclusive of mortar joints. In all other respects they shall conform to the provision in relevant specifications of the work.

d. For mortar, use of PP Cement shall be preferred.

4. **CEMENT PLASTER: -** The use of PP Cement shall be preferred.

The joints in the brick work, concrete blocks, shall be raked to a depth of 15 mm while the masonry is green. Concrete surfaces to receive plaster shall be suitably roughened. All walls shall be washed with water and kept damp for 10 hours before plastering. The plaster unless specified otherwise shall be average of 12 mm thick on walls. The finished texture shall be as approved by the HITES. The mix for plaster unless otherwise specified, shall be one part cement and four parts sand, to walls. All plaster work shall be kept continuously wet for seven days.

TECHNICAL SPECIFICATIONS AND CONDITIONS - MGPS WORKS

1. DISTRIBUTION PIPING

1.1 Piping specifications

Copper pipe should be as per standard BS: EN 13348 :2008 standards; Solid drawn, seamless, deoxidized, non-arsenical, half hard, tempered and degreased copper pipe conforming to the standard. All copper pipes should be degreased & delivered capped at both ends. The pipes should be accompanied with manufacturers test certificate for the physical properties & chemical composition.

Copper fittings should comply with EN 1254:1 factory degreased and brazing filler metals should comply with EN 1044. Fitting should be degreased, individually packed for medical use.

6.2 Installation & testing

Installation of piping shall be carried out with utmost cleanliness. Only pipes, fittings and valves that have been degreased and fittings shall be used at site. Pipe fixing clamps shall be of nonferrous or no deteriorating plastic suitable for the diameter of the pipe. Inert gas welding technique should be used by passing oxygen Free Nitrogen Gas inside the copper pipes during silver brazing, in order to avoid carbon deposition inside the copper pipes. Only copper to- copper joints are permitted on site except threaded or flanged joints may be made where pipelines are connected to items such as valves and control equipment. No flux shall be used for joining Copper to Copper joints and on for joints made on site. Copper to copper joints shall be brazed using a 5% silver-copper phosphorous brazing alloy CP104. One of the joint shall be cut out for examination to establish the quality of the joints being made on site. The insides shall be clean and free from oxides and particulate matter and the minimum penetration of the brazing alloy at any point shall be three times the wall thickness of the tube. If the joints examined do not conform to these requirements, then adjacent joints shall be cut out and examined until the extent of faulty workmanship has been made good. Copper-to-brass or gunmetal joints shall only be made under controlled conditions off site. The joints are ordinarily used to join short copper pipe tails to brass, gunmetal or bronze fittings to permit their connection into the pipeline. The sub-assemblies shall be degreased and individually sealed in bags or boxes before delivery to site. Adequate supports should be provided while laying pipelines to ensure that the pipes do not sag. Suitable sleeves shall be provided wherever pipes cross through walls / slabs. All pipe clamps shall be non-reactive to copper. After erection, the pipes are to be flushed with dry nitrogen gas and then pressure tested should be tested.

TECHNICAL SPECIFICATIONS AND CONDITIONS – STREET LIGHT WORKS

1. Supplying and Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kVA Armour cable With Fire Retardant Low Smoke (FRLSH) of approved make.
2. Supplying and fixing cable route marker with 10 cm X 10 cm X5 mm thick G.I. plate. For LT cable in the ground.
3. Supplying and embedding following dia G.I. pipe (medium class) as per ISI standard.
4. Supplying and laying 6 SWG G.I. wire at 0.50 meter below ground level for conductor earth electrode as per ISI standard.
5. Supplying and fixing 20A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker (MCB) as per approved make.
6. Supplying and fixing of 63A 4 way Connector terminal with approved weather proof enclosure.
7. Supplying and Fixing of Non-Flammable LED Street Light with IP:66 140W as per approved make.

CHAPTER - B

LIST OF APPROVED MAKES OF MATERIALS

Sl No.	Materials	Make / Manufacturer
1	Cement	Ultratech, Birla, ACC, J K Cement, Chettinad
2	Concrete Additive	Sikka / Pidilite/ Fosroc
3	Reinforcement Steel / Structural Steel	SAIL/ TATA Steel / Jindal Steel/ JSW / IISCO/Vizag
4	Brick, Aggregates	As approved by Engineer-in-Charge.
5	CPVC Pipes & Fittings	Supreme/ Astral/ Finolex/ Prince
6	P.T.M.T. Fitting	Cera/ Prayag/ Polytuf
7	Paints	Asian / Nerolac/ Berger/ Nippon
8	R.C.C Pipes	Indian Hume Pipe/ Pragati Concrete Udyog/ Daya/ KK/ JSP
9	Aluminium Composite Panels	Aludecor / Alucobond / Alstone
10	Vinyl Graphics & Signage	3M

Sl No.	Materials	Make / Manufacturer
11	Copper pipe	Mexflow
12	Fire Extinguisher	Safex/ Safeguard/ Safety First/ Minimax
13	FRLSH XLPE 1.1 kVA Armoured Cables	Polycab/ RR Kable/ Havells
14	Non-Flammable LED Street Light IP:66 140W	Havells/ CG/ Bajaj
15	MCB	Schineder/ Legrand

Note:-	
1.	The contractor will use one of the approved makes as approved by the HITES / Engineer -in-charge.
2.	In case of different quality / pattern of same make, the pattern/ quality shall be approved by the HITES / Engineer – in – charge.
3.	All the items included in the list or otherwise to be used in the work should conform to CPWD and relevant BIS specifications / relevant codes, as applicable.
4.	If any item is missing in the above list, its make will be decided by the HITES/ Engineer –in-charge.