

# **M/s HLL Infra Tech Services Ltd. (HITES)**

**(Subsidiary of HLL Lifecare Ltd., A Government of India Enterprise)**

## **TENDER**

**for**

## **ADDITIONAL WORKS IN STAFF QUARTERS AT JIPMER, PUDUCHERRY**

**Volume- III**

## **Technical Specification**

**Tender No: HITES/CHN/18-19/002**

**Dated: 20<sup>th</sup> June 2018**



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**CHAPTER A**  
**TECHNICAL SPECIFICATIONS AND CONDITIONS- CIVIL WORKS**

**1. 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.

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

**3. WOOD WORK:**

- a. Timber required for manufacture of chowkhats and shutters for doors, windows, ventilators, partitions etc shall be Forest Stewardship council (FSC) certified wood and it shall be seasoned and preservative treated.
- b. The moisture contents of the wood used in the work shall not be more than that stipulated in the relevant clause of Latest CPWD Specifications for works. The rate quoted for various items shall be inclusive of kiln seasoning and preservative treatment of wood. In all other respects the wood used in the work shall conform to the provision in latest CPWD specification for works.
- c. The sample of species to be used shall be deposited by the contractor with the Engineer-in – charge before commencement of the work. The contractor shall produce cash voucher and certificate from standard kiln seasoning plant operator about the timber section to be used on the work having been kiln seasoned by them failing which it would not be so accepted as kiln seasoned.
- d. Glass :-
  - i. Transparent sheet glass (Float glass) conforming to IS 1761 – 1970 shall be used.
  - ii. Minimum thickness shall be governed as under, unless otherwise specified in the item.

AREA of Glazing	Max. Unsupported length	Thickness
For glazing area up to 0.5 sqm	120 cm	4 mm
For glazing area more than 0.5 sqm	120 cm	5.5 mm

- iii. Glazing for toilet and in fixed ventilators shall be of frosted type.

e. Shutters:-

- i. Factory made shutters, as specified shall be obtained from factories to be approved by the Engineer – in - charge and shall conform to IS 2202 (Part –I) 1977. The contractor shall inform well in advance to the Engineer – in – charge the name address of the factory from where the contractor intends to get the shutters manufactured.
- ii. The contractor will place order for manufacture of shutters only after written approval of Engineer – in – charge in this regard is obtained. The contractor is bound to abide by the decision of the Engineer – in-charge. In case the factory already proposed by the contractor is not found competent to manufacture quality shutters, the Engineer – in – charge will recommend the name of another factory from the approved list.
- iii. The contractor will also arrange stage wise inspection of the shutters at factory with the Engineer in charge or his subordinate authorized representatives. Contractor will have no claim, if the shutters brought at site are rejected by the Engineer in charge in part or in full lot due to bad workmanship / quality or damages caused during their shifting from factory to site. Such shutters will not be measured and paid and the contractor shall remove the same from the site of work within 7 days after the written instruction in this regards are issued by the Engineer in charge or his authorized representatives.

**4. STEEL GRILL WORK:**

- a. All steel grills shall be according to the detailed drawings and obtained from approved suppliers. These shall conform to Latest CPWD Specifications for works.
- b. In case of grills an approved quality priming coat of zinc chromate shall be applied over and above a shop coat of primer. Nothing extra shall be payable for providing shop coat primer, but the zinc chromate primer, if additionally required, will be paid for separately.

**5. ALUMINIUM WORKS**

- A. The scope of the work is the fabrication, supply and erection at site of all types of Aluminium glazed doors, windows and ventilators in accordance with the drawings and specifications.
- B. The supply and erection will include all parts such as but not restricted to frames, tracks, guides, mullions, styles, rails, couplers, transoms, rails, plates glazing bars, glass, hinges, arrangement, spring catches, cord and pulley arrangements, spring catches, cord and pulley arrangements door closers floor springs etc., required for the whole work whether the parts/ items are individually and specifically referred to in the schedules/ specifications/drawings or not provided that the supply and installation of such parts can be inferred there from and are necessary to make the work complete, unless separate provision is made in the bills of quantities for supply to such parts/items.
- C. The doors, windows, ventilators, will be fabricated to suit the finished clear openings in the building/structure which the tenderer will himself measure.
- D. Materials:-
  - i. The members will be made out of aluminum alloy corresponding to IS:733 and will consist of extruded sections and of other shapes, and to sized gauges as shown in the drawings/ described in accordance with the relevant IS codes. The members shall be chosen to provide strength/ stability and maximum resistance to wear and tear.
  - ii. The Sections will be as per approved makes, extruded sections. As indicated in the drawings the tenderer should specifically mention which sections he is using.

- iii. The weight of sections and the corresponding catalogue numbers are mentioned. The IS specifications are to be strictly adhered.
- iv. The extruder using recycled materials may be preferred.
- v. The alloy of extruded aluminum should be BS or IS old HE9, Alcon 50 SWP. to this effect test certificate has to be provided for the extruder.

**E. Finishing:**

- i. The extruded aluminum section has to be mechanically finished to remove all scratches; extrusion marks etc and subsequently thoroughly cleared in all alkali baths prior to anodizing.
- ii. The polyester powder coating, as required, as per item of work, shall be of desired shade with minimum average thickness to 50 microns or other shades as required and to this effect the tenderer must have to produce test certificate from authorized institutions Bureau of Indian Standard.
- iii. The polyester powder coated material should be properly wrapped in gummed tape before fabrication to avoid scratches during fabricated and erection shall be kept protected till handing over.

**F. Fabrication:**

- i. Before commencing the fabrication the contractor shall submit to the Engineer – in - charge for their approval detailed shop drawings, based on the Architectural drawings and corresponding specification showing junctions, fittings, accessories such as hinges flush bolts, locks, latches, latching arrangements, peg stays, rotor arms, anodize pivots gaskets rubber packing door felts, mastic, sealant etc., including fixing and sealing arrangements . Type and method of scaffolding he intends to use, Fabrication is to be taken up only after approval by the Engineer – in - charge and in accordance with the approved drawings. Sections for fabrication of door/ window/ventilators etc shall be as per architectural drawings or as approved by the Engineer – in - charge.
- ii. A sample of finished door / windows/ ventilator railing etc.shall be fabricated as per the shop drawings approved by the Engineer – in - charge for final approval before under taking mass production/ fabrication,
- iii. The doors, window, ventilators and partitions shall be as per thickness given in the approved shop drawings, Polyester Powder coating shall be as specified in the item specifications.
- iv. All materials shall conform to relevant IS. Codes and in the absence of IS code, they should correspond to the best engineering practice; decision of the the Engineer – in - charge shall be final and binding on the contractor.
- v. Fabrication shall be done true to the drawing/ sample approved and in correspondence to the finished openings at the site. All joints shall be mitred at the corners, true right angles, and joints to be finished neatly to hairlines, with concealed fasteners, wherever possible joints shall be made in concealed locations.
- vi. All fabricated/finished items shall be packed and carted properly to site to prevent any damage in transit. On receipt at site they shall be carefully stacked in protected storage to avoid distortion/damage.
- vii. Site installation shall be with concealed screws, self-tapping or other approved fasteners or may be by welding, due precautions shall be taken to avoid any distortion/ discoloration /damage to the finished items.

- viii. Wood work faces /parts coming in contact with masonry shall before shifting to the site be given a heavy coat of alkali resistance bitumen paint. Steel items coming in contact with other incompatible materials shall be given a thick coat of zinc chromate primer.

**G. Glazing:** Glazing shall be done with flawless sheet glass of best approved quality without waviness, distortion, coloration / discoloration, of specified thickness in sizes as shown in the drawings, fixed as required with special glazing clips, putty, neoprene/PVC gaskets. All glass shall be cleaned thoroughly before they are fixed in position. Unless otherwise specified the minimum thickness shall be 5 mm thick.

## **6. FLOORING:**

- a. The flooring in the building shall be as per the approved floor finish drawings and laid in such a way that limits in floor levels would not exceed the limits provided in the latest CPWD specifications or manufactures specifications.
- b. Wherever Vitrified Tile flooring is done, it shall be with multy grade/range 1<sup>st</sup> Quality tiles.
- c. Slope in floors shall be provided as per architectural drawings, else the levels at any place when checked over a distance of one meters in any direction should not show variation in floor level more than 3 mm.
- d. Rate for the items of flooring is inclusive of provision of sunken flooring and finishing edges of the same in bath kitchen, toilets, cutting holes for traps/ pipes etc., and nothing extra shall be paid on this account unless otherwise specified.
- e. Protective layer to be provided of any type of flooring and nothing extra shall be paid on this account.

## **7. FALSE CEILING: -**

- a. False ceiling items in general are carried out as per the description of the item in the Bill of quantities and also as per the manufacturer's specifications / as directed by the Engineer – in – Charge.
- b. Location of particular type of false ceiling shall be as per relevant drawing, in its absence written approval of the Engineer – in - charge shall be obtained.
- c. The false ceiling tiles from manufacturers using recycled materials shall be preferred.

## **8. MINERAL FIBRE CEILING TILE**

### **a. 16 mm Mineral Fibre ceiling Tile**

#### **i. Material**

Ceiling tiles shall be of made of mineral fibre of dimension 595x595mm with 16 mm thickness humidity resistance 99% Thermal conductivity K = 0.052-0.057 w/mK colour white, fire performance UK Class 0/Class 1 (BS 476 pt -6&7) suitable for green building application (GRIHA Criteria 17 & 29 SWAGRIHA 12) with recycled content not less than 30 % and light reflectance not less than 85%. NRC of 0.55 to 0.6. The tile and grid should carry a limited warranty of one year against sag.

#### **ii. Frame**

The frame work shall consist of G.I. ' T ' Sections for Main runners 15x38x3000mm length, Cross runners of 15x32x1200mm & 15x32x600mm size, 0.33 mm thickness as specified in the item with galvanization of 120 gsm (minimum) and perimeter wall

angle of 0.40mm (minimum) thick gauge having equal flanges of size 24x24mm made from precoated G.I. Coil length of 3.0m fixed to the wall with the help of plastic rawl plugs at 450mm centre to centre with 50mm long dry wall SS screws. The frame work shall be executed in a manner so as to form a grid of 600x600mm as specified in the item.

iii. Fixing of Ceiling Tiles

The frame work shall be suspended from ceiling by L shape level adjuster hangers made of G.I. Of size 85x25x25x2mm having die cut slit for sliding into main T section, also having precut hole so that 6mm fully threaded MS rod length upto 1000mm goes through it and pierces into M6 dash fasteners (Galvanising of 80 gsm minimum) of 6 mm dia 50mm long, fixed to the slab and then tightened with check nuts, subsequently the bottom of 6 mm rod will be tightened with check nuts for adjusting the line & level. The tile shall be laid on 15x32mm wide T section flanges colour white having rotary stitching on all T sections i.e. the main runner, 1200 mm & 600 mm cross Tees with a web height of 32 mm and load carrying capacity of 7.57Kgs/m<sup>2</sup>.

iv. Measurements

Length and breadth of superficial area of the finished work shall be measured correct to a centimetre. Area shall be calculated in square meter correct to two places of decimal. No deduction will be made to openings of areas upto 40 square decimeter nor shall extra payment be made either for any extra material or labour involved in forming such openings. For openings exceeding 40 square decimetre in area, deduction in measurements shall be made but extra payment will be made for any extra material or labour involved in making such openings.

v. Rate

The rate shall include the cost of all the materials and labor involved in all the operation described above including scaffolding etc, if any required.

b. **20mm Mineral Fibre Ceiling Tile**

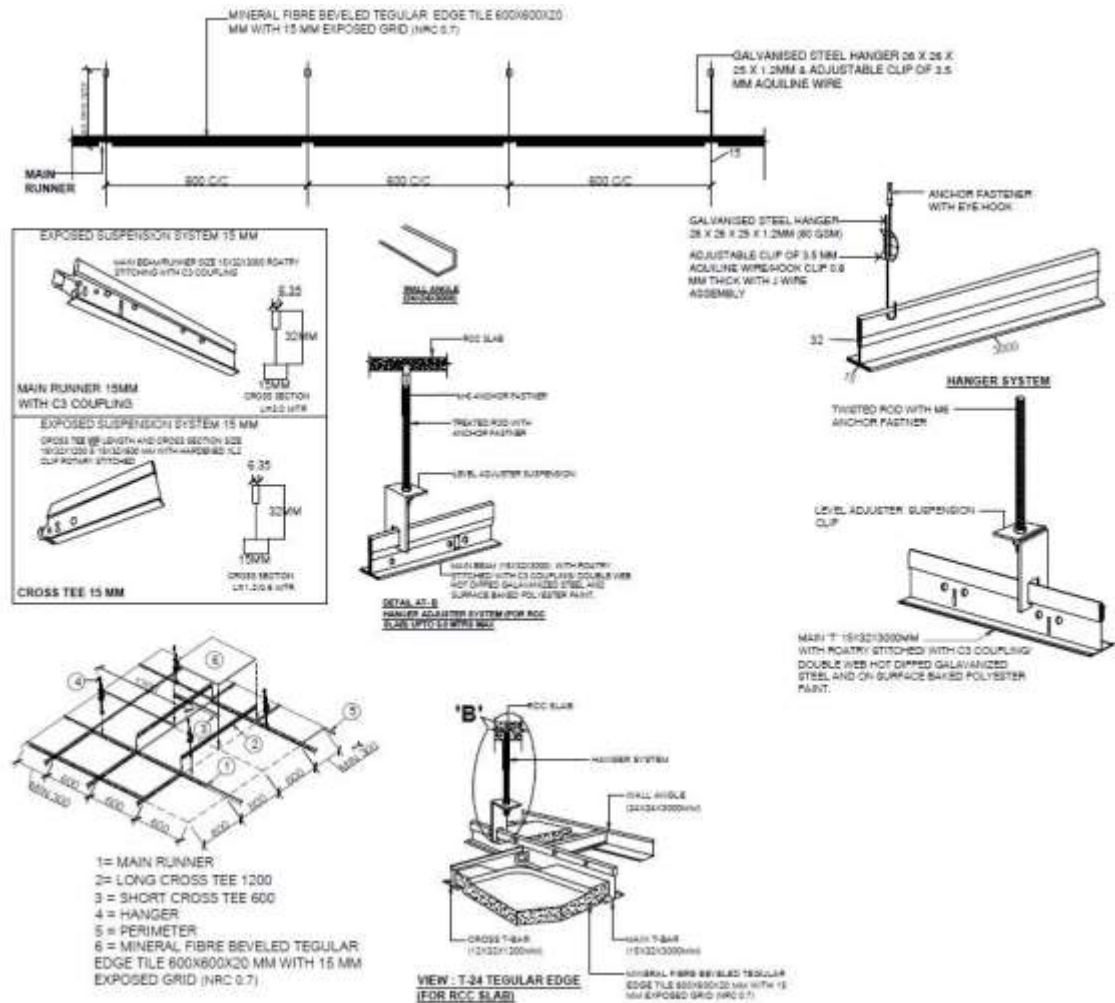
General specification for providing and fixing mineral fibre false ceiling tiles item to be same as **mentioned** in para i. to v. of para a. above except the thickness of mineral fibre tile will be 20 mm and NRC value 0.7.

c. **16mm Antimicrobial Ceiling Tile**

General specification for providing and fixing 16 mm thick beveled tegular mineral fibre false ceiling tiles item to be same as **mentioned** in para i. to v. of para a. above except the tile will be Anti-microbial false ceiling tiles.

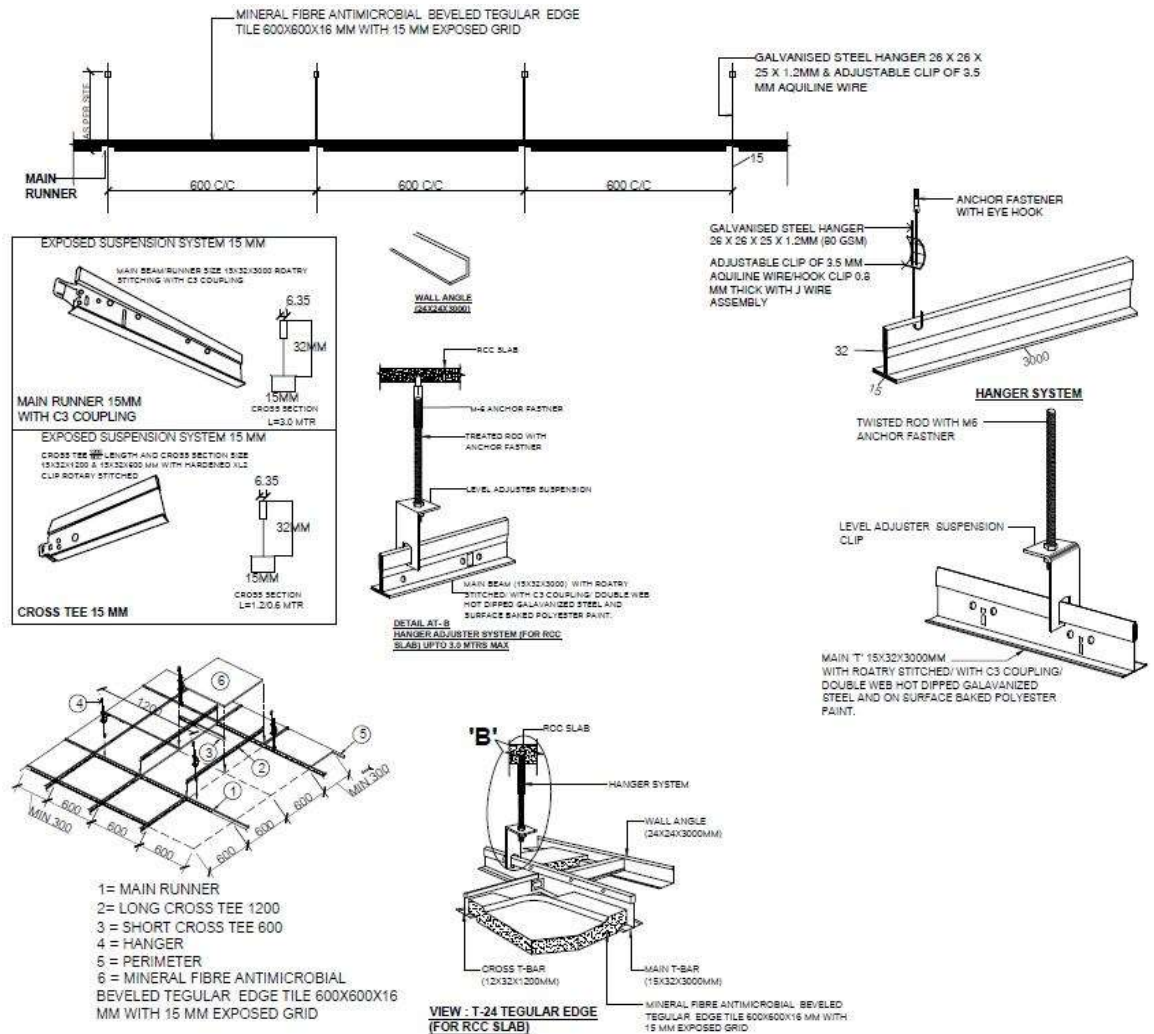
#### d. 20mm Mineral Fibre Ceiling Tile

General specification for providing and fixing mineral fibre false ceiling tiles item to be same as **mentioned** in para i. to v. of para a. above except the thickness of mineral fibre tile will be 20 mm and NRC value 0.7.



### e. 16mm Antimicrobial Ceiling Tile

General specification for providing and fixing 16 mm thick beveled tegular mineral fibre false ceiling tiles item to be same as **mentioned** in para i. to v. of para a. above except the tile will be Anti-microbial false ceiling tiles.



## **9. LIGHT WEIGHT CALCIUM SILICATE FALSE CEILING TILES**

### **a. 15mm Tegular edged light weight calcium silicate false ceiling tiles**

#### **i. Material**

15 mm thick tegular edged light weight calcium silicate false ceiling tiles with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size 595x595 mm of approved texture, design and patterns having NRC (Noise Reduction coefficient) of 0.50 (minimum) as per IS 8225:1987, Light reflectance of 85% (minimum). Non combustible as per BS: 476 (part-4), fire performance as per BS:476 (part 6 &7), humidity resistance of 100%, thermal conductivity  $<0.043 \text{ W/mK}$  as per ASTM 518:1991. The tests shall have average density of  $370 \text{ kg/m}^3$  (minimum) as per ECBC code 2007. The tile shall be primer coated on both sides and the fair surface shall be having a factory finish in two coats of white dispersion type solvent free paint.

#### **ii. Frame**

The frame work shall consist of G.I. ' T ' Sections for Main runners 24x38x3000mm length, Cross runners of 24x32x1200mm & 24x32x600mm size, 0.33 mm thickness as specified in the item with galvanisation of 120 gsm (minimum) and perimeter wall angle of 0.40mm (minimum) thick gauge having equal flanges of size 24x24mm made from precoated G.I. Coil length of 3.0m fixed to the wall with the help of plastic rawl plugs at 450mm centre to centre with 40mm long dry wall SS screws. The frame work shall be executed in a manner so as to form a grid of 600x600mm as specified in the item.

#### **iii. Fixing of Ceiling Tiles**

The frame work shall be suspended from ceiling by L shape level adjuster hangers made of G.I. Of size 85x25x25x2mm having die cut slit for sliding into main T section, also having precut hole so that 6mm fully threaded MS rod length upto 1000mm goes through it and pierces into M6 dash fasteners (Galvanising of 80 gsm minimum) of 6 mm dia 50mm long, fixed to the slab and then tightened with check nuts, subsequently the bottom of 6 mm rod will be tightened with check nuts for adjusting the line & level. The tile shall be laid on 24x32mm wide T section flanges colour white having rotary stitching on all T sections i.e. the main runner, 1200 mm & 600 mm cross Tees with a web height of 32 mm and load carrying capacity of  $7.57 \text{ Kgs/m}^2$ .

#### **iv. Measurements**

Length and breadth of superficial area of the finished work shall be measured correct to a centimetre. Area shall be calculated in square meter correct to two places of decimal. No deduction will be made to openings of areas upto 40 square decimeter nor shall extra payment be made either for any extra material or labour involved in forming such openings. For openings exceeding 40 square decimeter in area, deduction in measurements shall be made but extra payment will be made for any extra material or labour involved in making such openings.

#### **v. Rates**

The rate shall include the cost of all the materials and labor involved in all the operation described above including scaffolding etc, if any required.

### **b. 15mm thick integral densified micro edged light weight calcium silicate false ceiling tiles**

**i. Material**

15mm thick integral densified micro edged light weight calcium silicate false ceiling tiles with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size 595x595 mm of approved texture, design and patterns having NRC (Noise Reduction coefficient) of 0.50 (minimum) as per IS 8225:1987, Light reflectance of 85% (minimum). Non combustible as per BS: 476 (part-4), fire performance as per BS:476 (part 6 &7), humidity resistance of 100%, thermal conductivity <0.043 W/mK as per ASTM 518:1991. The tests shall have average density of 370 kg/m<sup>3</sup> (minimum) as per ECBC code 2007. The tile shall be primer coated on both sides and the fair surface shall be having a factory finish in two coats of white dispersion type solvent free paint.

**ii. Frame**

The frame work shall consist of G.I. ' T ' Sections of 25 micron hot dipped galvanised iron section of 0.40mm thick on Silhouette profile, rotary stitched double webbed white with 6mm reveal profile (white/black) comprising of Main runners 15x42x3000mm length, Cross runners of 15x42x1200mm & 15x42x600mm size to form grid module of size 600x600mm. Galvanised iron perimeter wall angle of size 22x19x0.4mm of length 3000mm to be fixed on periphery wall/partition with the help of plastic rawl plugs at 450mm C/C and 40mm long dry wall SS screws. The work shall be carried out as per specifications, drawing and as per direction of Engineer-in-Charge.

**iii. Fixing of Ceiling Tiles**

The frame work shall be suspended from ceiling by L shape level adjuster hangers made of G.I. Of size 85x25x25x2mm having die cut slit for sliding into main T section, also having precut hole so that 6mm fully threaded MS rod length upto 1000mm goes through it and pierces into M6 dash fasteners (Galvanising of 80 gsm minimum) of 6 mm dia 50mm long, fixed to the slab and then tightened with check nuts, subsequently the bottom of 6 mm rod will be tightened with check nuts for adjusting the line & level. The tile shall be laid on 15x42mm wide T section flanges colour white having rotary stitching on all T sections i.e. the main runner, 1200mm & 600mm cross Tees with a web height of 42 mm and load carrying capacity of 7.57Kgs/m<sup>2</sup>.

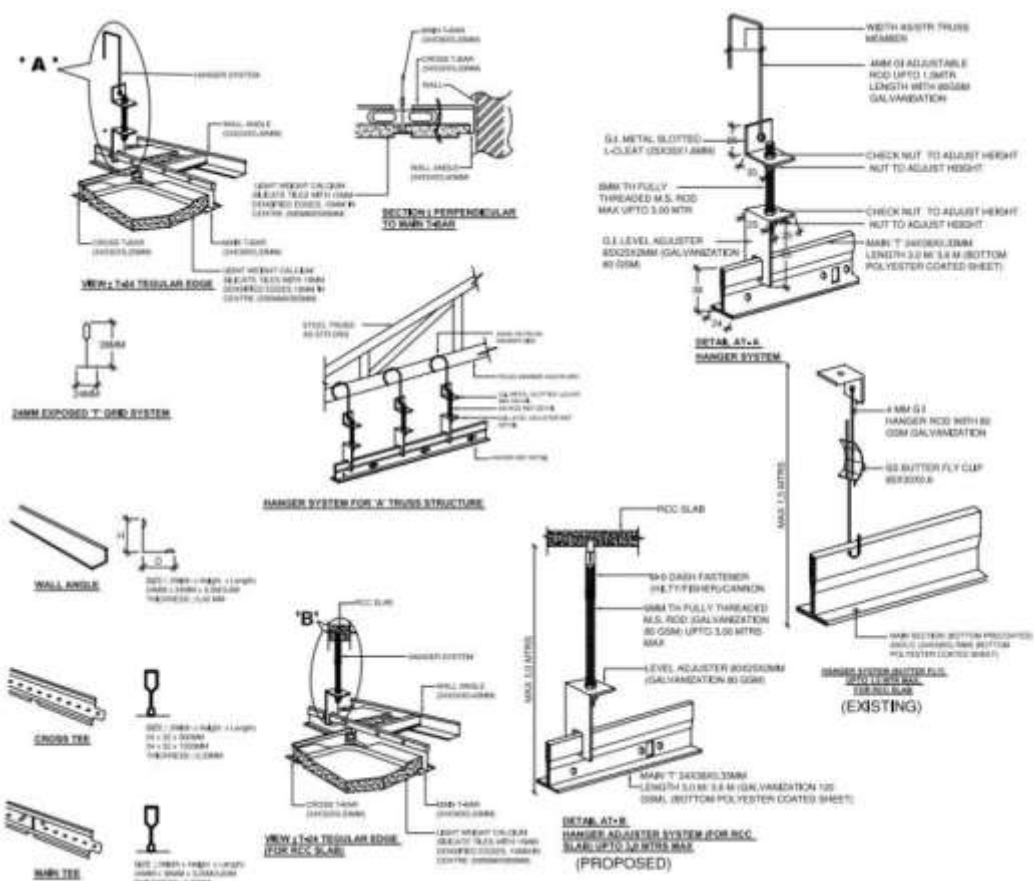
**iv. Measurements**

Length and breadth of superficial area of the finished work shall be measured correct to a centimetre. Area shall be calculated in square meter correct to two places of decimal. No deduction will be made to openings of areas upto 40 square decimeter nor shall extra payment be made either for any extra material or labour involved in forming such openings. For openings exceeding 40 square decimetre in area, deduction in measurements shall be made but extra payment will be made for any extra material or labour involved in making such openings.

**v. Rates**

The rate shall include the cost of all the materials and labor involved in all the operation described above including scaffolding etc, if any required.

**15mm Tegular/integral densified micro edged Light weight calcium silicate false ceiling tiles**



**10. SAMPLES OF MATERIALS:**

- a. Sample of all materials/ fittings and fixture to be used in the work such as doors, windows, tiles, sanitary, water supply, drainage fittings and fixtures shall be submitted well in advance by the contractor for approval from the Engineer-in charge of work in writing before placing orders for the entire quantity required for completion of work. Samples approved by the EIC shall be kept in Sample Room under the charge of Engineer-in-Charge and shall retain till completion of work.
- b. Finished items in respect of typical portion of works of repetitive nature such as typical room, toilet, railing, door, window or any other work desired by the engineer-in- charge shall be prepared by the contractor to the satisfaction of Engineer-in – charge and got approved from him in writing before the commencement of these items for the entire work.
- c. The requirements for preparation of samples shall be observed and fulfilled by the contractor well in advance to avoid any detriment to the general progress of work. In other words, this will not be allowed to have any effects on the general progress of work or on any of the terms and conditions of the contract. No claims of any kind whatsoever including the claims of extension of time will be entertained due to the incorporation of this requirement.

**11. VARIATION IN CONSUMPTION OF MATERIALS:**

The variation in consumption of material shall be governed as per CPWD specification and clauses of the contract to the extent applicable.

**12. MISCELLANEOUS:**

Materials manufacture by reputed firms and approved by Engineer – in charge shall only be used. Only articles classified as “First Quality” by the manufactures shall be used unless otherwise specified. Preference shall be given to those articles which bear ISI certification marks. In case articles bearing ISI certification marks are not available the quality of sample brought by the contractor shall be judged by the standards laid down in the latest CPWD specifications. For items not covered by the latest CPWD specification, relevant ISI standards shall apply.

**13. TESTS:**

- a. Materials brought at site of work shall not be used in the work before getting satisfactory test results for Mandatory tests as per relevant provisions in Latest CPWD Specifications for works. Normally, part rate payment shall be allowed in the running account bills only if the materials are tested and test results are found to be satisfactory to by the Engineer-in-charge. These tests shall be got done from laboratories approved by Engineer-in - charge or the laboratory set up by the contractor at site as per directions of Engineer-in - charge.
- b. The Engineer-in - charge of work shall check the test results and satisfy himself before allowing any payment in the running /final bill.

## ADDITIONAL WORKS IN STAFF QUARTERS AT JIPMER, PUDUCHERRY

### CHAPTER B

#### List of Approved Makes of Materials

<b>Note:-</b>	
1.	The Contractor shall procure and submit to the Engineer-in-Charge, samples of various materials for all the works, for approval. Nothing extra shall be payable on this account.
2.	The contractor will use one of the approved makes as approved by the HITES / Engineer -in-charge.
3.	In case of different quality / pattern of same make, the pattern/ quality shall be approved by the HITES / Engineer – in – charge.
4.	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.
5.	If any item is missing in the below list, its make will be decided by the HITES./ Engineer – in-charge.
6.	If any major equipment is using a small component of make other than that given as a standard component with the equipment, the same shall be accepted.
7.	Similar Makes for the same items may be used for all the subheads.

#### **1. LIST OF APPROVED MAKES / AGENCIES FOR CIVIL & PLUMBING MATERIALS**

<b>S. No</b>	<b>Materials</b>	<b>Manufacturers / Agencies</b>
1	Ready mixed Concrete	RMC/RAMCO/ACC/Birla/Ultratech
2	Ordinary Portland Cement (Minimum 43 Grade)	ACC/UltraTech/India Cement/ Birla/Ramco
3	Reinforcement (Each LOT shall accompany manufacturer's Test Certificate)	SAIL/ TISCO( TATA)/ RINL/ VSP/ JINDAL
4	Stainless Steel	Salem Steel
5	Structural Steel	Conforming to BIS 2062 and approval of source by Engineer (TISCO/SAIL/VSP/JINDAL)
6	White Cement	JK Cement/ Birla White/Asian
7	Sand	Sand / M Sand ( Crushed aggregate) to comply with CPWD spec / relevent IS code spec.
8	Bricks, Stones slabs, Lime,	Material / Sample to be got approved before use

	Neeru Stone aggregate	
9	Vitrified Tiles/Anti Skid Cermaic Tiles	Johnson, Nitco,Kajaria /RAK/Premium/I Quality
10	Flush doors	Samrat,Kanchan Prima, Swastik (Kitply), Century/Kutty/ Greenply/ Uniply/ Archid
11	FRP Doors	Fibrevent / Techno skills/Meena Fibre
12	Aluminium Fittings	Everite, Garnish,Crown Classic
13	Hydraulic floor Spring	Dorma/Everite/Hardwyn/Garnish
14	Aluminium Extruded Sections	Jindal/ NALCO/Hindalco/ Indalco
15	Aluminium Doors/Windows	As approved by E-IN-C
16	Paints/ Synthetic enamel Paint/Distempers/ Acrylic emulsion/Cement primer/Deluxe multi surface paint	Asian, Nerolac, Berger, I Quality
17	Glazing (high performance glass for DGU and SGU)	Saint Gobain / Asahi / Pilkington/Modi float
18	Glass	Saint Gobain / Asahi / Modiguard
19	French Spirit Polishing	Sheeniac/MRF/Touchwood
20	ACP	Alucobond/Alcopla/Eurobond
21	Precast Cement Concrete Tiles	Eurocon/ Ultra make/Approved by E- In- C
22	Paver Block	As approved by Engineer In Charge
23	Water proofing Works	FOSROC/ SIKA / Pidilite / CICO/Penetron / Polyplus
24	Hydraulic Door Closers	Hardwyn, Everite, Garnish
25	Water Proofing Cement Paint	Snowcem India/ ICI/ Nerolac/ Berger/ asian
26	Ceramic / Glazed Floor Tiles	Nitco, Johnson,Kajaria, Somany - Premium I Quality
27	Super plasticizer	CICO, Roff / Pidilite
28	False Ceiling (a) Fibre (b) Galvanized Steel (c) Calcium Silicate	Armstrong / AMF Armstrong/Hunter Douglass Aerolite / Promat/Saint Gobain Armstrong
29	Stainless Steel Works	As approved by Engineer-in-charge
30	Curtain/Wall/Structural Glazing	Specialist Agency to be employed with Prior Approval of E-In-C
31	Adhesive	Pidilite, Araldite
32	Plastic Laminates	Formica, Greenlam, Bakelite HYLAM
33	Powder Coatings	Berger/Nerocoat/Jenson & Nicholson
34	Tile Joint Filler	Bal Adhesives & Grouts,"ROFFE" Rainbow Tile Mate, Silicon Sealnet of GE Bayer Silicon/"Zentrival FM" of MC-Bauchemie (India) P Ltd
35	Resin Bonded Glass Wool	Crown Fibre Glass/Rock lloyd
36	MS Tubes	TATA / Lloyd/NSL/JINDAL
37	Roof Water Proofing	SIKA/Pidilite/Fosroc/ BASF

38	Silicon Sealant	Dow Corning
39	Anchor Fastener	Hilti, Bosch
40	Formwork Release Agent	Fosroc, MBT, MC Baucheme CICO, ADO Conmat
41	EPOXY	FOSROC, SIKa
42	Cast Iron Pipe and Fittings (Soil Pipes)	BIC, HEP, NECO, Ajmera
43	CPVC FITTINGS	ASTRAL / ASHIRWAD/SUPREME/PRINCE/ FINOLEX
44	CPVC PIPES	ASTRAL / ASHIRWAD SUPREME/PRINCE/ FINOLEX
45	Stoneware Pipes & Fittings	Dalmia, Parry
46	Cast Iron Pressure Pipes & Fittings	Tisco, BRM, KESORM
47	GI Pipes (ISI marked)	TATA, Zenith, Jindal, Gujarat Steel, ITC
48	GI Fittings (ISI marked)	'R' Brand KS/UNIK
49	PVC PIPES	SUPREME / PRINCE /ASTRAL/FINOLEX
50	PVC FITTINGS	SUPREME / PRINCE /ASTRAL/FINOLEX
51	PVC floor Trap	SUPREME / PRINCE
52	CP Brass Sanitary and water supply Fittings	Jaguar (Florentine)/ESSESS/HINDWARE/PRAYAG PARRY/METRO/PARKO
53	Sanitaryware	Parryware/Hindware/Cera
54	Polyethylene/Polypropylene CISTERN	EVERLAST/FLUSHFLO/ESYFLO/ CHALLENGER/CHAMPION/COMMANDER, MARVEL /PARRY/HINDWARE
55	CI Fixtures	Ashok Iron Works/Bombay Iron Works/A Husainji / Ismaelji
56	Plywood Products, Particle Boards & Veneers	Duroply (Green Marked, BWR Century Plywood, Green Plywood Kitply, Mysore Boards/SHARON
57	Water proofing System	SIKA/Pidilite/Fosroc/ BASF
58	CP Waste, Spreaders for Urinals	Jaguar / Orient / Parko
59	SFRC Manhole Covers	KK/SK & Precast Concrete
60	PVC Pipes/Fittings	SUPREME / PRINCE /ASTRAL / Finolex
61	SS Sink	Nirali, Hindware, Franke
62	Mirror	Modifloat/Saint Gobain

## 2. LIST OF APPROVED MAKES FOR ELECTRICAL AND SUBSTATION ITEMS

S. No	Materials	Manufacturers / Agencies
1	H.T. Panel	Crompton/ABB/Schneider/Siemens
2	Transformer	Crompton/kirloskar/ABB/BHEL/Schneider
3	RMU	Crompton/ABB/Schneider/Siemens
4	DG Engine	Caterpillar/Cummins/kirloskar/
5	Alternator	Stamford/Caterpillar/Crompton greaves
6	Bus trucking/Rising mains	Schneider/Legrand Control & Switchgear
7	LT Panels	SIEMENS/SCHNEIDER/ ABB
8	APFC Panels	Sprague/EPCOS/INEL

9	ACBs	Same as in (7)
10	MCCBs	Same as in (7)
11	MCBs with DBs	Legrand/Schneider/Siemens/Havells
12	Accessories of HT/LT Panels	As per (1) and (7)
13	HT/LT UG cables	Universal/Gloster/Havells/Polycab,Cable corporation.Nicco
14	Wiring cables – FRLS grade	Polycab/Havells/RR Cables/Finolex,KUNDAN
15	Switches (SFU)	ABB/Siemens/Schneider/GE
16	Modular Switches (SFU)	Legrand/Carbtree/Panasonic/ANCHOR
17	Piano Type switches and Boxes	Anchor/Leader
18	Cubicle Type Fuse Unit	Siemens /GE /Schneider
19	SFUs/Isolators	Siemens/GE /ABB/ SCHNEIDER
20	Starters / Contractor/Bi metal Relay	Siemens /ABB/Schneider
21	Push Button/Indicating Lamps (LED type)	Siemens /ABB/Schneider
22	CTs	Kappa/Intrans/PGR power/Indus/Kapco
23	Control Fuse Base with HRC fuse	GE /Siemens/Schneider
24	Cable trays	Profab/ Elcon/OBO Bettermann/Copper B line
25	Measuring Instruments	AE/Conserv/Rishab
26	MS Conduit	Supreme /BEC/NIL
27	PVC Conduit	Precision/Avon Plast/Clipsal/Balco
28	Light Fittings	Philips/Wipro/Crompton/Havells
29	Capacitors	Siemens / Crompton greaves/Schneider
30	Relays	GE /Siemens/Schneider
31	Digital Meters	Enercon/Alacrity/BHEL
32	Jointing Kits	Rey Chem/3 Birla

### 3. APPROVED MANUFACTURERS LIST - ELV SYSTEM

<b>Public Address system</b>			
Arm. shielded multi pair communication copper cable	Polycab	Finolex	Varsha
Ceiling mounted speaker	Bosch	Philips	Sony
Wall mounted speaker	Bosch	Philips	Sony
Amplifier	Bosch	Philips	Sony
Goose neck microphone	Bosch	Philips	Sony
Table top micro phone	Bosch	Philips	Sony
Call station cum voice alarm router	Bosch	Philips	Sony
Rack	Rittal	Netrack	APW
<b>Voice and Data system</b>			
PVC rigid/flexible conduits	Avone	Emjay	Precision
GI Back boxes	MK	Legrand	BOSCH
6 core optic fiber cable	Legrand	Digi link	AMP

UTP Cat 5 / Cat 6 copper cable	Legrand	Digi link	AMP
Twisted pair multi core unarm. copper cable	RR cable	Finolex	Varsha
RJ 11 socket	Legrand	Digi link	AMP
Face plate	Legrand	Digi link	AMP
Patch cord - 1 mtr	Legrand	Digi link	AMP
Patch cord - 2 mtr	Legrand	Digi link	AMP
Terminal block for telephone	Krone	Connectwell	BOSCH
Patch panel	Legrand	Digi link	AMP
Ethernet switch	Legrand	Digi link	AMP
Rack	Legrand	Rittal	APW
EPABX	Nortel	Avaya	Alcatel/ SIEMENS
<b>Audio Video System</b>			
Projector	Panasonic	Sanyo	BOSCH
Speakers	Bosch	Philips	LG
Amplifiers	Bosch	Philips	LG
Projector screen	Draper	Liberty	Honeywell
Rack	Rittal	Netrack	APW
Cables	Polycab	Finolex	Varsha
<b>CCTV system</b>			
Coaxial cable - CCTV system	RR cable	Finolex	Varsha
Indoor fixed type camera	Panasonic	LG	Honeywell
PTZ camera	Panasonic	LG	Honeywell
Digital Video Recorder	Panasonic	LG	Honeywell
Hard Disk	Thoshiba	Samsung	Seagate
LCD monitor	Panasonic	LG	Samsung
PTZ controller	Panasonic	LG	Honeywell
Power supply unit	MK	-	Honeywell
Rack	Rittal	Netrack	APW
Projector screen	Draper	Liberty	Honeywell
Rack	Rittal	Netrack	APW
Cables	Polycab	Finolex	Varsha
<b>Access System</b>			
Cables	Polycab	Finolex	Varsha
Equipments	Cardkey	Honeywell	LG

#### 4. LIST OF APPROVED MAKES OF FIRE FIGHTING SYSTEM INSTALLATION

S. No.	Details of Materials / Equipment	Manufacturer's Name
1.	Fire / Sprinkler Main Pump / Jockey	Kirloskar KSB Wilo - Mather & Platt Grundfos
2.	G.I. / M.S. Pipes (IS : 1239 / IS : 3589)	Jindal,ZENITH Prakash Tata Steel
3.	Standard M.S. Fittings	Seamless Fittings Pipeline Products
4.	DI / CI / Forged Steel Fittings	Jainsons Industries VS SS Fittings BM Fittings
5.	Double / Single Headed Landing Valve	New Age, Leader Safeguard Minimax
6.	Fire Hose	CRC Jayashree New Age Padmini Safeguard
7.	First Aid Hose Reel (LPCB Approved)	New Age Padmini Safeguard Minimax
8.	Branch Pipe	New Age Safeguard Minimax
9.	Fireman Axe	New Age Safeguard Minimax
10.	Installation Control Valve	Tyco,Audco,Leader Viking Victaulic
11.	Fire Extinguishers	Alert - Tyco Minimax Safefire Safeguard
12.	Water Flow Switch	Honeywell Rapid Control System Sensor Spray Safe
13.	Pipe clamp & supports	Chilly

		Euroclamp Kanwal
14.	GM / Forged Brass Valves	Danfoss, Newage RB Honeywell Zoloto
15.	Butterfly Valve/ check valve	Audco, Newage Danfoss Honeywell
16.	Air Release Valve	Arco, TBS,cimbrio OR RB Zoloto
17.	Anti-Vibration Mounting & Flexible Connections	Cori Dunlop Flexionics Kanwal Industrial Corporation Resistoflex
18.	Pressure Gauge	Emerald,HD,Waree Fiebig H Guru Wika
19.	Welding Rods	ADOR Esab Advani
20.	Fastener	Fisher Hilti
21.	Flexible hose for sprinkler	New Age,Tyco
22.	Sprinkler Head	HD, Tyco, Reliable, Fireshape

**5. LIST OF APPROVED MAKES OF FIRE DETECTION AND ALARM SYSTEM INSTALLATION**

S. No.	Details of Materials / Equipment	Manufacturer's Name
1.	Smoke / Multi criteria/Detectors	Notifier Edwards Honeywell (XLS-3000), Bosch
2.	Heat Detectors	Notifier Edwards Honeywell (XLS-3000) Bosch
3.	Control Modules / Monitor Modules / Fault Isolators	Notifier Edwards Honeywell (XLS-3000)
4.	Main Control Panel	Notifier Edwards

		Honeywell (XLS-3000)
5.	Manual Call Stations / Hooters / Speakers	Notifier Edwards Honeywell (XLS-3000)
6.	Sealed Maintenance free Batteries	Exide, Amaron GS Batteries (Japan Storage Co. Ltd.) Hitachi
7.	PA System	Notifier BOSCH Ates Honeywell
8.	PVC insulated copper conductor FRLS cable	National Polycab Skytone

**6. LIST OF APPROVED MAKES FOR EQUIPMENT & MATERIALS**

<b><u>Sl. No.</u></b>	<b><u>Details of Materials / Equipment</u></b>	<b><u>Manufacturer's Name</u></b>
<b><u>1</u></b>	Elevators	OTIS Elevator Company Kone Elevators India Pvt. Ltd. Johnson lifts

**7. LIST OF APPROVED MAKES OF MATERIAL FOR STRUCTURAL GLAZING WORKS**

<b>1</b>	<b>Aluminium Extrusions</b>	<b>Hindalco, Nalco, Indal, Jindal.</b>
<b>2</b>	<b>Stainless Steel</b>	<b>Salem Steel.</b>
<b>3</b>	<b>EPDM</b>	<b>AMEE Rubber Ind., Bohara Rubber.</b>
<b>4</b>	<b>Fiber Glass Wool</b>	<b>U. P. Twiga Fiberglass Ltd., Lloyds insulations</b>
<b>5</b>	<b>Rock Wool</b>	<b>Vetrotex Ind., Lloyds insulations</b>
<b>6</b>	<b>Aluminium Composite Panel</b>	<b>Alucobond, Alcopla, Alpolic, Reynobond.</b>
<b>7</b>	<b>Clear Float Glass</b>	<b>Shanghai Pilkington/ St. Gobain/ Modi/ Asahi</b>
<b>8</b>	<b>Coated Glass</b>	<b>Shanghai Pilkington / St.Gobain / Asahi.</b>
<b>9</b>	<b>Spider Fittings</b>	<b>Dorma,</b>
<b>10</b>	<b>Aluminium Solid sheet</b>	<b>Hindalco, Nalco, Indal, Jindal</b>
<b>11</b>	<b>Powder Coating</b>	<b>Jotun</b>
<b>12</b>	<b>PVDF Coating</b>	<b>Duramar PPG</b>
<b>13</b>	<b>Expansion Anchor Fasteners</b>	<b>Hilti, Fischer (SS Grade 316)</b>

14	Screws, nuts bolts, washers rivets.	Kundan, Arrow (SS Grade 304)
15	Chemical Anchors	Hilti, Fischer
16	Door & Window Accessories	
	a. Lockset	Giesse, Hafele
	b. S.S. Friction hinges	Seccuristyle, Hafele
	c. Patch Fittings	Dorma
	d. Floor springs and Door Closers	Dorma
	e. Door Handles	Dorma
	f. Panic Bars	Dorma
17	Structural Silicon Sealant	Dow Corning
18	Weather Silicon Sealant	Dow Corning
19	Spacer tapes	Norton
20	Foam Spacers (Backer rods)	Norton

**END OF VOLUME -  
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