

National Institute of Unani Medicine , Kottegalapalaya, Bangalore

Tender

For

Supply, installation, testing & commissioning of Furniture for Auditorium & other miscellaneous works including minor civil, electrical, PHE works etc. for NIUM, Kottegalapalaya, Bangalore

Volume-III

Technical Specification

OCTOBER 2013



HSCC (INDIA) LTD.
(CONSULTANTS & ENGINEERS FOR MEGA HOSPITALS & LABORATORIES)
E-6(A), sector-1, NOIDA(U.P) 201301 (India)

Phone : 0120-2542436-40

Fax : 0120-2542447

PQ tender No. HSCC/NIUM-Fur/2013

TECHNICAL SPECIFICATION

Supply, installation, testing & commissioning of Furniture for Auditorium & other miscellaneous works including minor civil, electrical, PHE works etc. for NIUM, Kottegalaya, Bangalore

❖ **Following Basic Material to be Used for Auditorium Chair/Furniture with prior approval of Client :**

Material Requirements For All Revolving And Tubular Chairs, wherever required :

1. Cushion chairs are made out of flexible polyurethane foam molded to have consistent hardness of 20-24 kg .
2. The polyurethane foam should be molded with density 45 +/- 2 kg/meter cube and hardness 20 +/- 2 kg on hampdness machine at 25% compression.
3. Armrest of chairs should be made out of integral skin polyurethane foam of shore hardness 'a' 50-70 and reinforced with ms steel insert except unless otherwise specified.
4. Gas lift mechanism for height adjustments tested for 100000 cycles of operation.
5. Chair base of the pedestal consists of 5 prongs made of 5 mm thick ms plates.
6. Plastic cladding is provided to make the pedestal look good aesthetically. The ms pedestal should be tested for load bearing.
7. Twin wheel castors are made of nylon and should be tested to carry a load upto 82 kgs on the chair.
8. All steel components should be powder coated conforming to :-
 - ❖ Dry film thickness more than 45 microns.
 - ❖ Salt spray test to withstand corrosion.
 - ❖ Adhesion as per din 53152 standards.
 - ❖ Scratch hardness as per bs 3900/e2
 - ❖ Impact test.
 - ❖ Pencil scratch test

Mandatory Tests To be Done By Manufacturer on Chairs, wherever required:

- Seating Impact test.
- Arms Strength Test
- Back Durability Test.
- Castor/ Chair durability test.
- Base Test.
- Castor retention test.
- Castor Pull Out test.
- Castor Breakability Test.

Powder Coating Tests, wherever required :

All MS components shall be epoxy polyester powder coated using the seven chamber pretreatment process with the powder thickness greater than 40 microns Dry Film Thickness.

Tests to Be Carried Out on Powder Coating :-

- Cross Cut Test- To check Adhesion
- Impact Resistance Test – To 150 kgs/cm as per BS 3900/E3.
- Scratch Hardness- Upto 4 kgs as per BS 3900/E2.
- Salt Spray Test.

Anti Rust Treatment To Be Followed For All Metal Components, wherever required :

The manufacturer should have anti rust treatment facilities for treating all the metal components. The anti rust treatment shall consist of Removal of oil by treating metal Components with sodium carbonate and alkaline phosphate at 60 degrees centigrade followed by Rinsing with water at normal temperature. The rinsed components are to be dipped in phosphoric acid solution at 45 degrees centigrade for 10 minutes minimum for de-rusting followed by Rinsing. Components shall undergo phosphating by dipping in phosphating tank containing iron hydrogen phosphate dissolved in phosphoric acid at normal temperature for minimum 5 minutes followed by rinsing and finally Dipping components in chromic phosphatic acid reducing agent chemical at temperature of 80 degree centigrade(+/-10%) for minimum period of 60 seconds.

Specifications For Materials And Processes To Be Used On Furniture

Specifications For Steel Used In Chairs and Other Items :

- Cold rolled steel for MS sheet shall have thickness ranging from 0.63mm to 1.2mm as per IS:513-1994.
- Hot rolled steel for MS sheet shall have thickness ranging from 2.5mm to 3.15mm as per IS:10748 Group I.
- MS ERW tubes used for tubular components should satisfy IS-7138.

Specification For Fabric To Be Used For Upholstery :

<u>Material Type</u>	<u>Description/ Selection Criterion</u>
100% Polyester, fiber dyed	For a Span of 1.2 Meters shall have weight 330-grams/ meters.

100% poly Propylene	For a Span of 1.2 Meters shall have weight 230-grams/ meters.
---------------------	---

Material Specifications, wherever required :

1) Plain Particle Board (Medium Density) :

Particle boards conforming to IS 2380(1977) with physical characteristics as under

Density	:	600 –900 kg per meter cube.
Moisture content	:	5.10%
Water absorption	:	2 hour test – max 15% 24 hour test – max 40%
Swelling in water	:	2 hour – max. 5% thickness
Swelling due to water absorption	:	max 6%
Tensile strength perpendicular to surface square.(for all thickness)	:	min 0.3 Newton per millimeter
Tensile strength after cyclic test	:	min 0.3 N/mm square
Screw withdrawal strength on face	:	min 1250 N
Screw withdrawal strength on edge	:	min 850 N

2) Medium Density Fiber Boards, wherever required :

Medium Density Fiber Board conforming to IS: 2380-1977 with following physical characteristics

Specific Gravity	:	0.5 to 0.9
Density	:	600 –900 kg per meter cube.
Moisture content	:	5 to 10%
Water absorption	:	2 hour test – max 7% 24 hour test – max 15%
modules of rupture upto 20mm thick	:	min 30 N/mm square.
Modules of rupture above 20 mm thick:	:	min 25 N/mm square.
Linear expansion in thickness due to surface absorption	:	max 5%
Swelling due to general absorption after 24 hour soaking in		
Thickness	:	max 4%
Length	:	max 0.4%
Width	:	0.4 % min.
Tensile strength perpendicular to surface thickness)	:	0.7 N/mm square.(for all
Screw withdrawal strength on face	:	min 1500 N
Screw withdrawal strength on edge	:	min 1250 N

3) Pre Laminated And Twin Particle Boards, wherever required :

Prelaminated and twin particle boards as per IS:2380-1977.

Density	:	600 –900 kg per meter cube.
Moisture content	:	5 to 10%
Water absorption	:	2 hour test – max 15% 24 hour test – max 30%
Swelling in water	:	2 hour – max. 8% in thickness
Modules of rupture	:	min. 15 N/mm square.
Tensile strength perpendicular to surface	:	min 0.5 N/mm square.(for all thickness)
Screw withdrawal strength on face	:	min 1550 N
Screw withdrawal strength on edge	:	min 850 N

The following characteristics are according to annexure of IS:128323-1990.

Resistance to steam- No sign of blister, delaminating or change in surface finish.

Resistance to crack – No sign of crack and delamination.

Resistance to cigarette burn.

Resistance to stain.

Abrasion Resistance (min) in no of revolutions.

4) Post formed Laminate Sheets, wherever required :

The pos formed (high pressure decorative laminate) one side bearing 0.6 or 0.8 mm thick decorative conform to NEMA specification- ANSI/NEMA/LD-3-1991.

The physical characteristics and test requirements are as per NEME-LD-3-1991.

Impact strength - Ball Impact resistance min 20”

Wear resistance - Min 400 cycles.

Gross dimensional change in machine direction - Max. 1.1%

Gross dimensional change in cross machine direction - 1.4% max.

High temperature resistance - slight effect is accepted on specimen at the final examination.

Stain resistance-No effect is acceptable on the specimen.

Formability - Min radius 12.5mm.

Blister Resistance - Min 40 Sec.

Boiling water immersion test (2 hour test) as per IS:2046-1969.

Increase in weight - Max. 30%.

Increase in thickness - Max 30%.

5) Decorative Laminated Sheets, wherever required :

Decorative thermosetting synthetic resin bonded laminated sheets are used in 1.0mm thickness and are of type 1 with having one side bearing the decorative surface. The finish, shade, color and pattern shall be mutually decided by the purchaser and supplier. Physical characteristics and test requirements are as per appendix of IS:1046-1969. Resistance to dry heat – no blistering or appreciable surface deterioration or loss of gloss. Dimensional stability in low humidity test at 70+/- 2deg C for 24 hours.- less than 0.5% in length and width dimensions. Resistance to immersion in boiling water.

Increase in weight - max 5%
Increase in thickness - max 5%

Resistance to staining for 24 hours with standing against agents specified in IS 2046-1969. specimen should not show blistering at the final examination. Cross breaking strength for 0.6mm thick—2000 kg per CM Square.

Cross breaking strength for 1.0 mm and 1.5mm thick – min 4000 kg per CM square.

Impact strength - min 0.035 kg fm

Machinery test - no Slitting or cracking.

6) Epoxy Powder Coating, wherever required.

Epoxy powder used for coating shall be of a standard shade or as specified at the time of tender. The specific gravity of powder 1.6(+/-0.2) gives a DFT of 50-60 microns. Pencil Hardness of 2H; Cross hatch Adhesion(DIN 553151) or GT – ‘O’ gloss @ 60 DIN 67530 of 80 +/- 5% for all standard except black for which it shall be 45 +/-5 for black. The coating should be able to withstand min 500 hour of salt spray test. Impact resistance of 150kgcm.

ITEM SPECIFICATIONS :

Centre Table

Providing and supplying of center table of an overall size 900x450x450 with top made of 12 mm thick bevelled glass and under structure with a shelf is made of 18mm thick pre - laminated particle board with aa exposed edges sealed with 2mm PVC edge banding tape pressed at 200o C with hot melt glue on special machines.

Side Table

Providing and supplying of side table of overall size 450x450x450 with top made of 12mm thick bevelled glass and under structure with as half is made of 18mm thick pre-laminated particle board with all exposed edges sealed with 2mm PVC edge banding tape and unexposed edges sealed with 0.6mm PVC edge banding tape pressed at 200o C with hot melt glue on special machines.

Sofa- Three Seater

Wooden Sofa:- Fully upholstered sofa with good quality seasoned wood duly anti termite treated. In seat, good quality flat spring steel are used and are covered by "U" foam. Seat cushion has premium quality rubber. The back is made of high density foam duly upholstered with fabric or leatherette. The armrest are made of seasoned teakwood duly sprit polished.

Sofa- Two Seater

Wooden Sofa:- Fully upholstered sofa with good quality seasoned wood duly anti termite treated. In seat, good quality flat spring steel are used and are covered by "U" foam. Seat cushion has premium quality rubber. The back is made of high density foam duly upholstered with fabric or leatherette. The armrest are made of seasoned teakwood duly sprit polished.

Podium (Wooden)

Providing and fixing Podium of an overall 600x600x1200/1050 made of 18mm pre - laminated particle board. The top is made up of 25mm thick particle board having post formed edge with 0.6mm thick decorative laminate. The podium also has a shelf below the top made up of 18mm Pre - laminated Particle board to keep papers etc. All exposed edges are sealed with 2mm thick PVC edge banding and unexposed edges sealed and unexposed edges sealed with 0.6mm PVC edge banding tape pressed at 200o C with hot glue on special machines.

Almirah:

Providing & Fixing of storage Units having overall size 900x 450x2100 top & under structure & fascia made of 18mm pre - laminated particle board having openable shutter. All exposed edges sealed with 2mm edge PVC edge banding tape and all unexposed edges sealed with 0.6mm edge banding tape pressed at 200o C with hot melt glue on special machines, with proper locking arrangement. The shelves are made of 18mm thick Pre - laminated particle board direction of engineer-In- charge.

Black Perforated Chairs :

Multi-seater chair with perforated metal sheet duly powder coated with arms in capsule pipe, side in 2" round pipe and bottom support in 3"x1/2" in gauge.

Chair:

High Back Executive wooden with rubber wood as approved by Engineer In charge.

Upholstry/Frame: 12 mm hot pressed ply covered with moulded PU foam in seat & Back with ABS/ PP Cover & Fabric upholstery

Seat & back size : 500 mm (w) x 460 mm (D) , 500 mm (w) x 720 mm (H)

Arms: D-shape steel inserted PU arms

Mechanism : Center tilt mechanism

Height Adjustment : Gas Lift

Base : Steel Inserted nylon base with twin wheel castors

Dias Table : 2.5' x 2.5' as approved by engineer incharge

STEAM GENERATOR FOR STEAM BATH ROOM

Providing, fitting, testing and commissioning of a Steam Generator to provide steam for Steam Bathe room of size 65 cum. should be factory-assembled unit Instant generation of steam complete with the following:

- Highly durable enclosure with argon gas welded stainless steel boiler of suitable capacity with sloped bottom, tested at 5 Kg/ sq.cm.
- Steam Boiler Insulation in 50mm thick LRB mineral wool Boiler Enclosure Made in 16 Swg MS in exclusively chosen powder coated shades with proper lowers for free air circulation.

- Long Life Low Watt Density stainless steel 316 Industrial immersion heaters of suitable capacity with faster & more efficient heating systems.
- Electronically controlled automatic water feed with “LOW “or “NO WATER” cut-off systems.
- Pressure relief valve set at 3 kg /cm².
- Failsafe Imported thermostatic with high limit control inside the boiler. All SS / Brass / Chrome fittings.
- Exclusive control panel with a higher safety factor, greater reliability and lesser maintenance using colored conductors and silver tipped Siemens contactors for years of trouble free “ ON-OFF” operations
- Automatically pressure flushes tank every time unit is shut off (Auto Servicing)

Piping, Fittings, and Valves:

- Water Input: Solenoid valve Italy 1/2-inch (8 mm) orifice diameter PVC Body provide shutoff valve and 10-micron sediment filter.
- Drain: ½” inch (12 mm) diameter; connect to sanitary drain piping.
- Steam Piping: 1/2 inch (12 mm) diameter outlet
- Pressure Relief Valve: 1/2 inch (12 mm)
- Steam Line Pipe Double General Technical recommendations for Steam
- Water tight data link cable for control
- Constant Steam at a Constant Rate.
- Fast start i.e quick generation of steam
- Increased steam efficiency
- Automatic drain valve
- Water tight data link cable for control
- Slim design.
- Overheating protection

HOT AIR GENERATOR

Hot air Generator should be designed for room of size 56cum and the temperature of the room should be raised to 46 deg C or more upto 50 deg C max. Room, hot air generator shall provide temperature quickly and reliably.

Air heaters of suitable capacity along with circulating fan/blower shall be equipped in the system. Thermostatic control shall be for maintaining particular temperature as above in the room. The Generator should have Control with light indicator, temperature controller and On-Off Switch and proper earthing facility. The system should be compact, solid in construction, quick heating facility, overheating protection, overloading protection and high firing resistance.

ALL WEATHER AIR CONDITIONER

All weather Air Conditioner should maintain a comfortable temperature in the room of 55 Cum and 65 Cum in summers and winters with the **1.5 Ton Split AC**. Air Conditioner should have efficient cooling and heating system. Hot-and-cold split ac should cool during summers and keep warm in the winters.

AC should have high energy efficient Rotary Compressor.

LCD display Remote Control, Timer mode and **Sleep mode** functions.

Air Conditioner should secure the breathing quality air using filter Anti dust Active Carbon.

Air Conditioner should have Auto-restart function, IDU of LED display, Low noise levels not more than 48 dB. Refrigerant R-22, Power supply cable 2mtrs. Rated current 8.50 Amp maximum . Rated cooling capacity should be at least 18000 BTU/hr.

IN ADDITION TO THE ABOVE, FOLLOWING TURNKEY WORKS FOR INSTALLATION AND COMMISSIONING OF THE SYSTEM ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR:

- Bidder must take into consideration in its bid, costs to be incurred for any additional work pertaining to Civil, Electrical, Mechanical and any other protections relevant as per State/Central Govt. regulation/local authority, Servo stabilisers, U.P.S. etc. if required for successful installation testing and commissioning of the system and the offered price should include all such costs, each Schedule is to be considered a package in itself and contractor to execute the order package on a “turn key basis”.
- Providing fixing of **Electrical Gadgets** like ELCB, MCB, Power points, etc in the System.
- Installation of all **electrical cabling** must be of IS: 1554 (As per latest amendment) standard and wiring as per IS: 732 standard and proper earthing of the System and other electrical instrument and accessories in the System as per standard guidelines of BIS.

In addition to the above mentioned equipment/appliances, if the contractor thinks it necessary to include any other equipment/appliances, accessories etc. for the System then that may be provided after approval from Engineer in-charge.

The sizes are approximate. Minor variations in sizes shall be acceptable subject to prior approval of the Engineer.

APPROVED MAKE:

1. Cable/Wire SKYTONE/KEI/UNIVERSAL/NATIONAL/RR CABLE
3. PVC Pipe Class III with Fitting FINOLEX/ SUPREME/ PRINCE/ ORI-PLAST

5. G.I. / M.S. Pipe Heavy Class	TATA/ JINDAL/SAIL /SURYA PRAKASH/HSL/ITC
6. MCCB/Contactor/Relay	L&T/ABB/SIEMENS/SCHNEIDER
7. Copper Pipe-	MAXFLOW/RAJCO/PRECISION
8. Pressure Gauges	H.GURU /FIEBIG
9. Stainless steel	TATA/SALEM/JINDAL/MUKUND/ BHAYANDER/ AMBICA
10. Valve	LEADER/ ZOLOTO /CRI/Castle
11. Blower/Pump/ Motor	KIRLOSKAR/ NGEF/ SIEMENS/CROMPTON/ABB

Note :

- **Contractor should provide complete Operation Manual, Equipment Manual and Service Manuals and commonly required spares and consumables for all systems and subsystems.**
- **Final electrical safety test, system test and calibration should be done by authorized person with test instruments.**
- **All electrical accessories like cable wire, electrical outlets, switches etc, should be fire proof of reputed make, certified for electrical safety.**
- **Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of HSCC.**
- **The contractor should provide test certificate for all materials and equipments used for the equipment to be supplied.**
- **Training of personnel of the Institute should be 5 days at least**
- **The contractor should prepare and submit layout plan for installation of the equipment, Electrical Wiring, to HSCC for approval before beginning of supply and installation.**

GENERAL Specification for Civil/PHE/Electrical works etc. :-

- 1.01 The specifications and mode of measurements for Civil and Plumbing works shall be in accordance with C.P.W.D.specifications 2012/13 Volumes I and II with up to date correction slips unless otherwise specified in the nomenclature of individual item or in the specifications. The entire work shall be carried out as per the C.P.W.D. specifications in force with up to date correction slips upto the date of opening of tender.
- 1.02 For the item not covered under CPWD Specifications mentioned above, the work shall be executed as per latest relevant standards/codes published by B.I.S. (formerly ISI) inclusive of all amendments issued thereto or revision thereof, if any, upto the date of opening of tenders.
- 1.03 In case of B.I.S. (formerly I.S.I) codes/specifications are not available, the decision of the Engineer based on acceptable sound engineering practice and local usage shall be final and binding on the contractor.
- 1.04 However, in the event of any discrepancy in the description of any item as given in the schedule of quantities or specifications appended with the tender and the specifications relating to the relevant item as per CPWD specifications mentioned above, or in drawings the former shall prevail.
- 1.05 In general the building floor to floor height is 4.00 mtr unless specified otherwise in the drawing. However, the rates for different items of work shall be for up to 4.5 m floor to floor height at all levels, lifts, leads and depths of the building except where otherwise specified explicitly in the item of work or in special conditions appended with the tender. All works above the top most terraces (main) shall be paid under the level existing below (i.e. machine room, mummy etc)
- 1.06 The work shall be carried out in accordance with the architectural, structural, plumbing and electrical drawings etc. The drawings shall have to be properly co-related before executing the work. In case of any difference noticed between the drawings, final decision, in writing of the Engineer shall be obtained by the contractor. For items, where so required, samples shall be prepared before starting the particular items of work for prior approval of the Engineer and nothing extra shall be payable on this account.
- 1.07 All materials to be used on works shall bear I.S. certification mark unless specifically permitted otherwise in writing. In case I.S. marked materials are not available (not produced), the materials used shall conform to I.S. Code or CPWD specifications, as applicable in this contract.

In such cases the Engineer shall satisfy himself about the quality of such materials and give his approval in writing. Only articles classified as "First Quality" by the manufacturers shall be used unless otherwise specified. All materials shall be tested as per provisions of the Mandatory Tests in CPWD specifications and the relevant IS

specifications. The Engineer may relax the condition regarding testing if the quantity of materials required for the work is small. Proper proof of procurement of materials from authentic manufacturers shall be provided by the contractor to the satisfaction of Engineer. Grade of cement used shall be OPC 43 Grade unless otherwise specified explicitly. The contractor shall get the Design Mix for RCC done by the labs approved by OWNER only. Reinforcement Steel used shall be of TMT Fe-500 unless otherwise specified.

- 1.08 In respect of the work of the sub-agencies deployed for doing work of electrification, air-conditioning, external services, other building work, horticulture work, etc. for this project and any other agencies simultaneously executing other works, the contractor shall afford necessary coordination and facilities for the same. The contractor shall leave such necessary holes, openings, etc. for laying / burrying in the work pipes, cables, conduits, clamps, boxes and hooks for fan clamps, etc. as may be required for the electric, sanitary air-conditioning, fire fighting, PA system, telephone system, C.C.T.V. system, etc. and nothing extra over the agreement rates shall be paid for the same.
- 1.09 Unless otherwise specified in the bill of quantities, the rates for all items of work shall be considered as inclusive of pumping out or bailing out water if required for which no extra payment will be made. This will include water encountered from any source such as rains, floods, or due to any other cause whatsoever.
- 1.10 Any cement slurry added over base surface (or) for continuation of concreting for bond is added its cost is deemed to have in built in the item unless otherwise/explicitly stated and nothing extra shall be payable or extra cement considered with consumption on this account.
- 1.11 The rate for all items in which the use of cement is involved is inclusive of charges for curing.
- 1.12 The contractor shall clear the site thoroughly of all scaffolding materials and rubbish etc. left out of his work and dress the site around the building to the satisfaction of the Engineer before the work is considered as complete.
- 1.13 Rates for plastering work (excluding washed grit finish on external wall surfaces) shall include for making grooves, bands etc. wherever required and nothing extra shall be paid for the same.
- 1.14 The rates quoted for all brick/concrete work shall be deemed to include making openings and making good these with the same specifications as shown in drawings and/or as directed. No extra payment shall be made to the contractor on this account.
- 1.15 Rates for all concrete/plaster work shall include for making drip course moulding, grooves etc. wherever required and nothing extra shall be paid for the same.
- 1.16 Rates for flooring work shall include for laying the flooring in strips/as per sample or as shown in drawings wherever required and nothing extra shall be paid for the same.
- 1.17 The drawing(s) attached with the tender documents are for the purpose of tender only, giving the tenderer a general idea of the nature and the extent of works to be executed.

The rates quoted by the tenderer shall be deemed to be for the execution of works taking into account the "Design Aspect" of the items and in accordance with the "Construction Drawings" to be supplied to the Contractor during execution of the works.

- 1.18 The quoted rate shall be for finished items and shall be complete in all respects including the cost of all materials, labour, tools & plants, machinery etc., all taxes, duties, levies, octroi, royalty charges, statutory levies etc. applicable from time to time and any other item required but not mentioned here involved in the operations described above. The client/OWNER/Employer shall not be supplying any material, labour, plant etc. unless explicitly mentioned so.
- 1.19 On account of security consideration, there could be some restrictions on the working hours, movement of vehicles for transportation of materials and location of labour camp. The contractor shall be bound to follow all such restrictions and adjust the programme for execution of work accordingly.
- 1.20 The contractor has to ensure co-ordination with Institute authorities to maintain the smooth functioning / operation of existing Institute without disruption during the execution of work. This may require working rescheduling the normal working hours, working in restricted period etc. Nothing extra shall be payable on this account.

He shall also ensure that all work sites within the Institute complex are properly cordoned off by means of barricades and screens upto a height of 3.0 m above ground level. The contractor shall use painted CGI sheets which are in good condition mounted on steel props.

- 1.21 Stacking of materials and excavated earth including its disposal shall be done as per the directions of the Engineer-in-Charge. Double handling of materials or excavated earth if required shall have to be done by the contractor at his own cost.

1.22 LIST OF APPROVED MAKES : CIVIL WORKS

Sl.No.	MATERIALS	MANUFACTURERS
1.	Doors & Windows fixtures/ Fittings:	Everite, Hardima, Global, Crown
2.	Door Closer / Floor spring Hardima	: Doorking, Everite, Hardwyn, Amar Darry,
3.	Aluminium Sections.	: Hindalco, Jindal, Indal , Bhoruka,
4.	Clear Glass/ Clear Float Glass AIG / Toughened Glass	: Saint Gobain(SG),Modi,Gujrat Guardian, Tata ,
5.	Laminates	: Formica, Decolam, Century, Marino, Green Ply

6.	Synthetic Enamel Paints	:	Berger (Luxol gold), Asian(Apcolite), ICI Dulux (Gloss), Nerolac (Full gloss hard drying)
7.	Oil Bound Distemper	:	Asian (Tractor), Berger (Bison), Nerolac (Super Acrylic).
8.	Cement Paint	:	Snowcem Plus, Berger (Durocem Extra), Nerolac (Nerocem with titanium),.
9.	Plastic Emulsion Paint	:	ICI, Asian, Nerolac
10.	Other Paints/Primers	:	ICI Dulux, Asian, Berger, Nerolac
11.	Cement	:	OPC 43 grade conforming to BIS-8112 and approval of source by Engineer
12.	Reinforcement Steel	:	TMT steel conforming to BIS-1786 and approval of source by Engineer
13.	Glass Mosaic Tiles	:	Italica, Bizzaza. Pallidio
14.	Back-up Rod.	:	Supreme Industries or equivalent
15.	M.S. Pipe	:	Jindal Hisar, Prakash-Surya, BST, Kalinga, Tata
16.	Polycarbonate Sheets	:	GE Plastics or approved equivalent
17.	Wooden/Metal Fire Check Doors Control,	:	Navair, Shakti-met, Godrej, Pacific Fire Promat
18.	Gypsum Board System	:	India Gypsum, Laffarge, Boral

Sl.No. MATERIALS

MANUFACTURERS

19.	Sunken Portion Treatment	:	Choksey, Roffe, Krytone,Sika,
20.	Admixtures for concrete.	:	Cico, Vam Organics, Roffe, Pidilite,FOSROC
21.	Ceramic Tiles	:	Johnson, Somany, Kajaria, Nitco
22.	Pre-Laminated Particle Board	:	Novopan, Greenlam, Kitlam, Marino

23.	Flush Door Shutters.	:	Century, Kitply, Novapan, Green Ply, Marino
24.	Glazed Tiles	:	Bell, Somany, Johnson, Kajaria, Cera,
25.	PVC Water Stops	:	Supreme, Fixopan or approved equivalent
26.	White Cement.	:	Birla White, J.K.
27.	Powder Coating Material Pure Polyester.	:	Jotun , Berger, Goodlass Nerolac
28.	Masking Tapes	:	Suncontrol , Wonder Polymer.
29.	Stainless Steel Screws For Fabrication and fixing of Windows.:	:	Kundan , Puja , Atul.
30.	Dash Fasteners./Anchor bolts	:	Hilti, Fischer, Bosch.
31.	Stainless Steel Bolts, Washers and Nuts.	:	Kundan, Puja, Atul.
32.	Stainless Steel Pressure Plate Screws.	:	Kundan, Puja, Atul.
33.	Stainless Steel Friction Stay.	:	Securistyle, Earl Bihari.
34.	E.P.D.M. Gaskets.	:	Anand Reddiplex, Enviro Seals
35.	Weather Silicon.	:	Dow Corning, Wacker, GE
36.	Structural Silicon at butt joints	:	- Do -
37.	PVC continous fillet for periphery packing of Glazings /Structural glazings.:	:	Roop, Anand, Forex Plastic.
38.	Floor Springs.	:	Doorking, Opel or equivalent
39.	Water proofing / Injection Grouting	:	Specilized agency as approved by engineer
40.	6mm thick Reflective Glass	:	Glaverbel, Glavermas, Saint Gobain.

Sl.No. MATERIALS

MANUFACTURERS

41.	Door Locks. Mobel	:	ACME, Godrej, Harrison, Hardima,
42.	Door Seal – Woolpile Weather Strip	:	Anand -Reddiplex.

43.	Aluminium Grill Equivalent	:	Hindalco, Decogrille or approved
44.	Vitrified Tiles	:	Restile , Naveen, Bell-Ceramics, Kajaria, Somani,
45.	Carpets	:	Hollitex, Standard, Mohawk
46.	Aluminium Cladding sheets	:	Alstrong , Alpolic, Alucobond, Alucomat Alu Decor
47.	Aluminium Die-cast handles & two point locking kit	:	Giesse, Securistyle, Alu-alpha
48.	Stainless steel D-handles	:	D-line, Giesse, Dorma,Hardima
49.	Fabric for Auditorium	:	ESSMA, Raymonds or equivalent
50.	Stainless Steel Pipes/Flats	:	304 Grade (as approved by Engineer)
51.	Structural Steel	:	Conforming to BIS 2062 and approval of source by Engineer
52.	Ready Mix Concrete	:	ACC,BIRLA, Ahlcon or Approved equivalent
53.	Epoxy Flooring/ wall coating	:	Fosrock, Beck, Famaflor,
54.	SBS bitumen based Self adhesive membrane Material 1.5	:	Grace-Bituthene CP1.5, Texsa-Texself
55.	Acoustic Mineral Fibre	:	USG-Radar, Armstrong, 21 st Century, Acostyle
56.	Curtain wall/Structure Glazing/Hermatic seal Sliding Doors	:	Specialised Agency to be approved by Engineer
57.	Fire Panic bar	:	Briton, Monarch, Von-Duprin, Dorma, Mobel
58.	Ply board	:	Greenply, Kitply, Century, Archid, Marino

Sl.No.	MATERIALS	MANUFACTURERS
59	PVC Doors (Solid Profile)	Rajshri or approved equivalent
60	PVC Doors (Hollow Profile) equivalent	Syntex, Plasopan or approved
61	PVC Flooring	LG, Tarkett, Responsive or approved equivalent
62	SS Railing	Specialised Agency to be approved by Engineer
63	Interlocking Paver Tiles	Ultra, Shree or Approved Equival
64	Wall Clading Tiles	Ultra, Shree or Approved Equivalent
65	Acoustic Seals	Anand Reddiplex , Enviroseal or equivalent
66	Smoke Seals	Pemko or Equivalent
67	Fire rated door closer/Mortice Lock/ Door Co-ordinator	Dorma, Becker F.S. Australian or approved equivalent

Note : Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of Engineer

LIST OF APPROVED MAKES : PLUMBING WORKS

S.No.	Materials	Relevant IS Code	Manufacturers
1.	Vitreous China Sanitary ware	2556	Hindustan Sanitary ware, Cera, Kohler, American standard
2.	White Glazed Fire Clay Sink	771	Sanfire, Cera, Neycer, Hindware.
3.	Stainless Steel Sink		Jayna, Jaguar, Commander, Nirali
4.	Plastic seat cover of W.C	2548	Commander, Cera, Kohler Jaquar, American standard
5.	Geysers		Racold, Jaguar, Rheem, Usha Lexus
6.	C.P. Fittings Mixer/Pillar taps Washers, C.P. brass accessories	1795 4291/4827	Aquabaths, Othello, Jaquar, Kingston, Marc
7.	Centrifugally /Sand cast iron pipes & fittings	3989/1729	Neco, Hepco, SKF
8.	G.I. Pipes	1239 Part I	Jindal-Hissar, Tata, Prakash-Surya B.S.T., SAIL,
9.	G.I. Fittings	1239 Part I	Unik, K.S., Zoloto Zenith
10.	Gunmetal Valves	778	Zoloto, Leader,
11.	Brass stop & Bib Cock	781	Zoloto, Sant, L&K, Jaquar
12.	Ball valve with floats	1703	Zoloto, Leader, Sant, Jayco
13.	Stoneware pipes & Gully Traps	651	IS Marked pipes
14.	R.C.C. pipes	458	IS Marked pipes
15.	D.I. Manhole Covers	1726	RIF, NECO, SKF
16.	Water Tank		Sintex, Polycon, Uniplast
17.	Mirror		Golden, Atul, Modi guard Gujrat Guardian
18.	Hand drier		Kopal, Automat, Euronics
19.	PVC flusing cistern		Commander, Parryware, Duralite
20.	Insulation of Hot water pipes		Vidoflex insulation, Superlon, Paramount Kaiflex

21.	PVC Rain Water Pipes.		Supreme, Prince, Finolex. Oriplast
22.	D.I pipes		Jindal, Tata, Electrosteel.
23.	Sluice valve / NRV		Kirloskar, Kilburn, Zoloto Castle,
24.	Water supply pumps	:	KIRLOSKAR, WILO, GRUNDFOS
25.	Submersible pumps	:	KIRLOSKAR, GRUNDFOS, KSB, Mather & Platt
26.	UPVC pipes & fittings	;	Finolex , Prince, Supreme, Oriplast
27.	Chlorinator	:	ALFA, USA, Ion exchange, Sigma DH Combine Inc.
28.	HDPE Solution tank	:	WATCON, ION EXCHANGE, Water Supply Specialist P (Ltd)
29.	C.P Flush Valves	:	Jaquar, DOCOL(Germany) marketed by GEM, Ideal
30.	C.P Angle Valves, bib cock	:	Othello, Jaquar, Marc, Kingston ,Aquabaths
31.	Decorative bath room fittings	:	Jaquar (Florentine range), Marc (equivalent) Aquabaths (equivalent)

END OF VOLUME