HLL INFRA TECH SERVICES LIMITED

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

TENDER No. HITES/IDS/21/02 dated 25.05.2021

TENDER

FOR

CONSTRUCTION OF UNDERGROUND SUMP, PUMP ROOM, SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF FIRE FIGHTING SYSTEM AT REGIONAL VACCINE STORE, EDAPPALLY, ERNAKULAM

PART- III

Technical Specifications

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FIREFIGHTING SYSTEM FOR VACCINE STORE AT EDAPPALLY

1. SCOPE

Proposed area for Storage building will be provided with Fire protection system as per NBC 2016.Type of Building Occupancy as per NBC 2016 is Storage Building (H-2: Below 15 m in height and covered area more than 250 m^2- (i) Ground Floor Only). The building shall be provided with Wet riser system and automatic sprinkler system. Automatic detection and Fire alarm system shall be provided. Fire extinguishers shall be provided as per relevant IS codes.

2. CODES AND STANDARDS

NBC: National Building Code 2016, Part 4, Fire and Life Safety

TAC: TAC Protection Manual / 1998 (Guidance only)

& as per the direction given by the local fire force department

3. PUMPING SYSTEM

Sl No	Pump Details
1	Main Electric pump near underground Static Water storage water tank .Fire Pump with minimum pressure of 3.5 kg/sq.cm at terrace level (electrical of capacity 2280 l/min)
2	Stand by pump diesel pump Near underground Static Water storage water tank. Fire Pump with minimum pressure of 3.5 kg/sq.cm at terrace level of 2280 l/min
3	Jockey pump Near underground Static Water storage water tank. Fire Pump with minimum pressure of 3.5 kg/sq.cm at terrace level of capacity 180 l/min)
4	Terrace Fire Pump with minimum pressure of 3.5 kg/sq.cm (electrical of capacity 450 l/min)

Positive suction arrangement is considered for firefighting pump sets. UG Sump of 1, 00,000 L capacity shall be considered exclusively for Firefighting application, considering future extension. In addition to the same, an additional terrace tank of 10,000 L capacity shall be provided.

4. DESIGN PARAMETERS

- The yard hydrants will be fixed on the stand post at 30 m intervals around the buildings.
- In each floor, in each riser, tapping will be taken for connecting a Single headed hydrant valve and a hose reel drum having 19 mm dia rubber hose of 30m long with nozzle at one end.
- Each single headed hydrant valve will be provided with 2 Nos. of 15 m hose and 1 No. of branch pipe.
- Pipes will be laid in ring form around the area protected. Isolating valves will be provided from maintenance point of view as will be provided from maintenance point of view as well as fire service requirements.
- The wet riser system piping will be as per relevant IS standards.
- The hydrant mains will be sized for the entire aggregate pumping capacity considering velocity of 5 m/s.
- Minimum pressure of 3.5 kg/cm^2 will be ensured at the remotest hydrant point.
- All the hydrants will be used oblique type with the outlet angle towards ground.
- All the outdoor hydrants will be provided with two (2) Nos. RRL hoses (63 mm size x15m long with couplings) and one (1) no. branch pipe with nozzle (20mm bore).
- At every internal hydrant location, one (1) no. of hose reel arrangement will be provided except for terrace level.
- In addition there shall be a set of fire department connections mounted on the external wall of the property near the main entrance. These shall comprise of 4 Nos. 63 mm dia male outlets capable of directly filling the complex's static fire storage tanks.
- The system will be automatic in operation.
- The power supply to MCC & control panel of the firewater pumps will be directly from the sub-station without any tapping.

5. AUTOMATIC SPRINKLER SYSTEM

Automatic sprinkler system shall be provided as per requirements of NBC 2016.

The main electric pump is used for the sprinkler system. The sprinkler riser mains will be charged with water to the system design pressure. The operation system will be automatic

through the pressure switches installed in the system. When the sprinkler bulb breaks due to fire break-out, the pressure will drop down in the pipe line. The drop in pressure is being sensed by the pressure switch. The pressure switch is connected to the MCC. The MCC will trigger the prime movers to run when it get signal from the pressure switch.

- At least one number sprinkler is to be provided per 12 sq.m of coverage area.
- Tapping is taken from the sprinkler riser for all the sprinklers at the respective floors.
- Isolating valve is considered at the tap off points, from maintenance point of view.
- The Automatic sprinkler system piping will be as per relevant IS standards.
- The Sprinkler mains will be sized based on the number of sprinklers.
- The sprinklers used will be of Pendant type with rosette plate, Upright and Sidewall type.
- The system will be automatic in operation.
- The power supply to the MCC & control panel of the firewater pumps will be independent and taken directly from the substation.

6. PIPE AND FITTINGS

- Pipe for firefighting will be MS pipe conforming to IS: 1239 / IS: 3589 (Heavy grade for Wet riser / hydrant system and sprinkler system) including all fittings like bends, elbows, tees anchor fasteners, couplings etc., and will be of reputed make.
- Pipes 150 mm dia and below will conform to IS: 1239.
- For pipes 50mm dia and below, socket welded joints, will be used and fittings will be of forged steel. For pipes above 50 mm dia, Butt welded joints will be used.
- Flanges will have appropriate number of holes as per the relevant IS Standard fastened with nuts, bolts and 3mm thick compressed rubber gasket.
- Shock absorbers for absorbing and to sustain water hammering in the firefighting and supply water pipe line to be provided at regular distance.

7. PIPE PROTECTION

- All pipes above ground and in exposed locations will be painted with one coat of red oxide primer and two coats of synthetic enamel paint as per IS : 5 (Shade 536).
- All pipes under floors or below ground will be protected against soil corrosion

by wrapping and coating.

8. PIPE SUPPORT

All pipes will be adequately supported from ceiling or walls from existing inserts by structural clamps fabricated from M.S. structural e.g. rods, channels, angles and flats or by using anchor fasteners type as per site conditions. All clamps will be painted with one coat of red oxide and two coats of black enamel paint.

9. PORTABLE FIRST-AID FIRE EXTINGUISHERS

The portable first-aid fire extinguishers shall be provided for all the buildings as per requirements of NBC 2016.

The extinguishers are used to put-off small fires. The extinguishers will be used in the incipient stage of fire. Fire extinguishers are easy to handle. This is useful to put off the fire in the initial stage itself and thus avoiding major losses.

10. FIRE ALARM CONTROL PANEL (FACP)

The Fire detection system shall comprise of a central unit, connected by two wires to field devices. Including fire detection devices, alarm devices and control devices, located throughout the protected building area. The control unit shall continuously monitor the status of all sensing devices, and initiate action when a fire or smoke, Heat condition is present. The alarm management shall be field configurable from the control panel via a key pad to enable the system and to permit future changes. This configuration shall be maintained under power failure conditions. The Fire alarm panel shall be designed to communicate with the sensors and field devices. It shall be a microprocessor based unit, and shall incorporate all hardware and software to enable it to make decisions upon information received from sensors, and operate appropriate outputs to initiate required alarm and signals. The panel shall comply with IS 2189 code of practice. The control unit shall have a front panel comprising of indicating LED's, control keyboard, and LCD display. The panel shall have 16x2 characters LCD monitoring & programming setup through menu option. Alarm and Fault signalling and its annunciation shall be capable of zone wise by means of LED and LCD display. The panel shall be capable to do and indicate the zone wise disablement. The LCD message shall have priority when there is

multiple even persists; Alarm should have higher priority than Fault. However, it must be possible to view all other events currently in the system, including, alarm, fault and disable. The visual indications must be arranged so that the different warning are clearly distinguished.(i.e. amber for fault, red for alarm) The internal audible signal device may be the same for all alarms, but either tone variation shall be used to differentiate the signals. Outputs shall be provided for audible alarms, control functions and remote repeater. The panel shall have number of zones as required by site conditions (tenderer shall specify the number of zones). The zones must be fully field programmable to permit sensors to be allocated to any zone.

Panel Indicators

All visual indicators shall be LED's and no incandescent lamps are to be used. The following LED's must be provided:

System ON.

AC Power ON.

Standby ON.

Hooter Fault.

Silenced.

Zone wise Fire

Zone wise Fault

Zone wise Isolate

Panel Display

The LCD text display must be able to simultaneously display a minimum of the following information in each display mode.

Zone Display Mode:

- Type of alarm (Fire/ Fault)

- Alarm count
- Total number of alarms
- Total number of Faults

Panel Controls

The panel is to incorporate a keyboard with the following functions:

Numeric keyboard

System reset button

Silence alarm button

Menu button

Enter button Left / Right Arrow button

The panel shall have 3 potential free contact form C relay (2 for fire and 1 for fault)

Optional: Zone wise Relay & zone wise Sounder, provided based on requirement.

Technical Specifications:

Power

- 120-240 VAC, 50 Hz.
- Wire size: 1.5 Sq. mm with 600V insulation

Battery (Lead Acid only)

- Charging Voltage: 27.9 VDC.
- Charging Capacity: 7 AmpHour Battery Max.
- System Quiescent Current: 50mA + (4.2mA per zone)

Initiating Device Circuits (Zone Circuit)

- All zones are Class B wiring supervisory

- Normal Operating Voltage: Nominal 24 VDC
- Alarm Current: 20 -35mA threshold
- Short Circuit Current: 40mA Maximum
- Loop resistance: 50 ohms Maximum
- End-Of-Line Resistor: 4.7K, 1/4watt
- Standby Current: 6.8mA (2.4mA for Detectors)

Notification Appliance Circuits (Sounder/Hooter Circuit)

- Class B wiring Supervisory
- Operating Nominal Voltage: 24 VDC
- Hooter (NACs) output: 1 Amps.
- End-Of-Line Resistor: 4.7K, 1/4watt

Remote Outputs

- Fire Contact (C, NO, NC): 0.5A @ 220v AC/30v DC@ 2A
- Fault Contact (C, NO, NC): 0.5A @ 220v AC/30v DC@ 2A (Optional)

VDC Power For remote devices

- Operating Voltage: 24VDC, 500mA Max.

CONVENTIONAL UL APPROVED DETECTORS:

Conventional Optical Smoke Sensor Detector:

The Optical Detector shall confirm to the relevant standards having the following features-

1. Detector shall be UL approved.

2. It shall have smoke sensitivity of 1.9 +/- 0.6 %/ft

3. All the detectors shall have a visible dual blinking LED to indicate the healthiness/ trouble/

alarm condition of the detector. The LED shall be located in such a way that it shall be visible from the 360º.

4. It shall possess False alarm immunity and a superior signal to noise ratio.

Conventional Heat Detector:

The Heat Detector shall confirm to the relevant standards having the following features:

1. Detector shall be UL approved.

2. The detector should have fixed temperature rating of 59◦ C and rate of rise of 11.1◦C/min.

3. All the detectors shall have a visible dual blinking LED to indicate the healthiness/ trouble/ alarm condition of the detector. The LED shall be located in such a way that it shall be visible from the 360º.

4. It shall possess False alarm immunity and a superior signal to noise ratio.

Standard base:

1. The base shall be UL Listed

2. The base shall be common for PHOTO, THERMAL AND MULTI SENSOR.

3. Terminals of base shall be rust resistant. The base shall have separate in and out terminals. 4. The base shall have terminals to connect remote indicator.

Manual Call Points (MCP):

The Manual call points (MCP) shall confirm to the relevant standards having the following features.

1. MCP shall be resettable Type.

2. MCP shall be either surface mounted or flush mounted.

3. The MCP shall have a LED to indicate Alarms

4. The MCP ABS type and red in colour.

Conventional Sounder:

The Sounder shall conform to the relevant standards having the following features.

1. The Sounder shall be a Conventional sounder. (Bidder shall consider external power supply - Sounders)

2. The sounder shall have an audibility level of 85dB

3. The sounder shall have the capability of being tested from the FACP.

4. The sounder ABS type and red in colour.

11. STATUTORY AUTHORITIES' TESTS AND INSPECTIONS

The Tenderer shall be responsible for the submission of all necessary forms and drawings to the Statutory Authorities which shall conform to the latest architectural plans submitted to and kept by these Authorities. Tenderer shall be responsible for obtaining the final NOC from Statutory Authorities. Statutory fees will be paid by the contractor as per the GO, which shall be reimbursed on producing the actual bill.

12. FINAL ACCEPTANCE TESTS

Following commissioning and inspection of the entire installation, and prior to issue of the Completion Certificate, the Tenderer shall carry out final inspection from fire and rescue department and obtaining the Final NOC.

Should the results of the acceptance tests show that plant, systems and/or equipment fail to perform to the efficiencies or other performance figures as given in this Specification, the Tenderer shall adjust, modify and if necessary replace the equipment without further payment in order that the required performance is obtained.

13. REJECTION OF INSTALLATION

Any item of system or component which fails to comply with the requirements of this Specification in any respect whatsoever at any stage of manufacture, test, and erection or on completion at site may be rejected by the in whole or in part as he considers necessary/appropriate. Adjustment and/or modification work as required by the Architect / Consultant/ Client/ Project Manager so as to comply with the Authority's requirements and the

intent of the Specification shall be carried out by the Tenderer at his own expense and to the satisfaction of the Authority/Architect/Consultant.

After works have been accepted, the Tenderer may be required to carry out assist in carrying out additional performance tests as reasonably required by the Architect/Client/ Consultant/ Project Manager.

14. WARRANTY AND HANDOVER

The Tenderer shall warrant that all plant, materials and equipment supplied and all workmanship performed by him to be free from defects of whatsoever nature before handover to the Owner.

15. HANDING OVER OF DOCUMENTS

All testing and commissioning shall be done by the Tenderer to the entire satisfaction of the Client/ HITES. And all testing and commissioning documents shall be handed over to the Client/ HITES.

The Tenderer shall also hand over all maintenance and operation manuals, all certificates and all other documentation as per the terms of the contract to the Client/ HITES.

LIST OF APPROVED MAKES

FIRE FIGHTING SYSTEM INSTALLATION		
S. No.	**Details of Materials / Equipment**	**Manufacturer's Name**
1	Fire Pump	Kirloskar, Wilo-Mather&Platt, Grundfoss, Lubi
2	Diesel Engine	Cummins,Greaves,KOEL, Eicher
3	Motor	ABB,BharatBijlee,Kirloskar,Siemens, Lubi
4	G.I. / M.S. Pipes (IS : 1239 / IS : 3589)	Jindal,Prakash,Tata Steel
5	DI / CI / Forged Steel Fittings	JainsonsIndustries,VS,SSfittings,BM fittings
6	Paints	Asian Paints,Berger,ICI,Shalimar Paints
7	Single Headed Landing Valve	New Age, Minimax, Aaag.
8	Fire Brigade Inlet	New Age, Tyco, Viking, Aaag.
9	Fire Hose	New Age,Safeguard, Minimax
10	First Aid Hose Reel	New Age,Safeguard, Minimax
11	Branch Pipe	New Age,Safeguard, Minimax
12	Fireman Axe	New Age,Safeguard, Minimax
13	Installation Control Valve	Tyco, HD, New Age
14	Sprinkler Heads	Reliable, Tyco, Victaulic, Viking, Newage, HD, Sharp
15	Water Flow Switch	Honeywell, Rapid Controls, System Sensor
16	Pipe Protection Wrapping	IWL – Pypkote, Rustech - Coatek
17	Pipe clamp & supports	Chilly, Euroclamp, Kanwal
18	GM / Forged Brass Valves	RB, Honeywell, Zoloto
19	Sluice Valves	Zoloto, Indian Valve

		Company,Kirloskar,Kalpana
20	Butterfly Valve	Audco,Zoloto, Tyco,Viking
21	Check Valve – Wafer Type	Advance, Zoloto ,Kirloskar
22	Check Valve – Dual Plate	Advance, Audco, Zoloto
23	Air Release Valve	Arco, OR, RB, Zoloto
24	Mechanical Seal	Burgmann,Sealol
25	Y Strainer	Emerald , Sant, SKS, Zoloto
26	Couplings	Lovejoy
27	Anti-Vibration Mounting & Flexible Connections	Cori, Dunlop, Flexionics, Kanwal industrial Corporation,Resistoflex
28	Pressure Gauge	Emerald ,Fiebig, H Guru, Wika
29	Flexible hose for sprinkler	New Age, Tyco, Flexdrop, Monsher
30	Welding Rods	ADOR, Esab
31	Fastener	Fisher,Hilti
32	Switch gears and control switches and other items for fire control panel	L&T,ABB, Schneider
33	Pressure Switch	Indfoss, Danfoss, Waaree
34	Power Cable	Finolex, Polycab, Havells
35	Hosebox	NewAge, Aaag, Friends
36	Fire Extinguishers	Minimax, Ceasefire, Safegaurd

LIST OF APPROVED MAKES (ELECTRICAL)

Sl No	Item	Makes
1	XLPE/PVC LT CABLES	Havells, Finolex, Polycab, KEI
2	CABLE GLANDS & LUGS	Comet, Dowells, Multi-pressing, Hex, Jainson
3	CABLE TRAY & ACCESSORIES	Profab, Patny, Ercon, Sumip, OBO Betterman
4	PVC CONDUITS AND ACCESSORIES	Precision, Konseal, Balco, Avonplast
5	PVC WIRES - FRLS (COPPER)	Finolex, RR kabel, Polycab, KEI, Bonton
6	MODULAR SWITCHES & SOCKETS	Legrand (Myrius), MK (Blenze), Crabtree (Athena). North-West (Stylus)
7	CEILING ROSE, BUZZER, BATTEN HOLDER	Anchor, Havells, GM
8	INDUSTRIAL PLUG & SOCKET	Legrand, MK, HPL, Indoasian, Havells, Hager
9	MCB DISTRIBUTION BOARDS	Legrand, MK, Crabtree, North-West, Hager
10	MCB's, RCCB, ISOLATORS	Legrand, Hager, Schneider, Havells, L&T
11	LIGHT FIXTURES	Jaquar, Wipro, Crompton
12	CEILING, EXHAUST, WALL FAN	Crompton, Usha, Orient

LIST OF APPROVED MAKES- CIVIL & PLUMBING SERVICES		
S.No	**Details of equipment/ material**	**Make/ Manufacturer**
1	Adhesive for Ceramic tiles	Cico / Pidilite / Ardex Endura / Sikka / Fosroc / BASF
2	Adhesive for Wood Work	Fevicol/ Vamicol/ Dunlop
3	Aluminium Composite Panels	Aludecor / Alucobond / Alstone
4	Aluminium Extrusion/ Sections	Hindalco / Jindal / Indal
5	Aluminium Fabricator	To be approved by the Engineer-in-Charge
6	Anchor Fastner	Hilti/ Fischer/ Bosch/ Canon
7	Anti – Termite Treatment	It should be done by permanent members of IPCA as approved by Engineer-in-Charge.
8	Automatic variable temperature control / fixed temperature control faucets	Jaquar/ Parry/ Angash
9	Back up rod	Supreme Industry or equivalant
10	Ball Cock	Sant/ L&T/ Audco/ Gpa
11	Ball valves with floats	Zoloto/ Leader/ Sant/ Jayco
12	Batch Mix Concrete (BMC) / Ready Mix Concrete (RMC)	The contractor to install his own computerized batching plant of suitable capacity and arrange for Transit Mixers, pumps etc. as per approval of Engineer – In- Charge. **OR** The RMC shall be procured from the source as approved by Engineer- In- Charge. RMC producing plants of the main Cement producers shall be preferred.
13	Brass stop & Bib Cock	Jaquar / Hindware / Parryware/ Crome/ Cera
14	Butterfly valves	GM / Uday / Parthiv / Zoloto
15	C.I. Manhole Covers	Neco/ R.I.F./ B.I.C./ Hepco/ SKF/ Kajeco
16	C.P. Fittings Mixer / Pillar taps/ C.P brass angle valve/ Valves Washers, C.P. brass accessories	Parko / Jaquar/ Parry ware / Hindware / Cera
17	C.P. Waste, Spreaders, Urinal	Parko / Jaquar/ Parry ware / Hindware / Cera
18	Carpet Flooring & Skirting (Floatax)	Forbo/ Polyflor/ Tarket
19	Cement	ACC/ Ultra tech/ JK Cement/ Ambuja/ India Cement/ Ramco/ Dalmia/ Malabar Cement/ Birla/ Chettinad/ Cement Corporation of India/ Bharati
20	Cement: White	Birla White/ JK
21	Clear Glass / Clear Float Glass / Toughened Glass	Modi/ Saint Gobain (SG)/ Asahi India Safety Glass Ltd/ Modiguard
22	Cockroach Trap	Chilly/ Player/ Camry/ Viking

LIST OF APPROVED MAKES- CIVIL & PLUMBING SERVICES		
23	Compressed Chequered tiles	Somany/ Kajaria/ Nitco/ Orient/ Johnson
24	Concrete Additive	Sikka/ CICO/ Pidilite/ Fosroc/ Fairmate/ MC Bauchemie / BASF
25	Copper Fittings (Capillary)	Yorkshire Imperial, U.K./ Rajco Metal Works Mumbai/ IBP Conex Ltd.
26	CPVC Pipes & Fittings	Supreme/ Astral/ Finolex/ Prince
27	Curtain Rod/Drapery Rod	Vista work/ Mac Decor
28	Dash Fasteners	Hilti/ Fischer/ Bosch/ Canon
29	Disc Filter	Azud/ Spain/ Amaid/ Arkal
30	Door closer / Floor spring	Everite/ Hardwyn/ Master/ Doorma (Frameless Door)/ Godrej
31	Door Locks	Godrej/ Harrison/ Link
32	Door Seal – Woolpile Weather Strip	Anand Reddiplex/ Enviroseal
33	Doors & Windows Fixtures / Fitting.	Everite/ Classic/ Crown/ Earl Bihari
34	Drainage Pumps	Grundfos/ KSB/ Salmson/ Kirloskar/ DP Holland
35	Ductile Iron Fittings (IS:9523)	Electrosteel/ Kesoram/ Tisco/ Jindal
36	Ductile Iron Pipes (IS:8329)	Electrosteel/ Kesoram/ Tisco/ Jindal
37	E.P.D.M Gaskets	Anand Reddiplex/ Enviro Seals
38	Epoxy Flooring	Fosroc/ Dr. Beck/ Flamaflor/ BASF/ Ardex Endura
39	False Ceiling - Calcium Silicate Boards & Tiles	India Gypsum/ Aerolite/ RAMCO (Hilux)/ Saint Gobain (Gyproc)
40	False Ceiling - Metal	Armstrong/ Hunter-Douglas/ USG/ Unimet or equivalant
41	False Ceiling - Mineral fibre	Armstrong/ Decosonic/ USG/ AMF/ Saint Gobain (Gyproc)
42	Fire rated Doors & Frames	Shakti-Hormann/ Navair/ Pacific
43	Fire Rated Glass	Asahi India Safety Glass Ltd./ Modi/ Saint Gobin
44	Fire Retardant Paint	Viper FRS 881/ Nullifire/ Berger
45	Fire Seal	Sealz/ Alstroflam/ Abacus
46	Fire: Door Closures, Mortice Dead locks	Becker Fire Solution/ Inersoll Rand LCN Series/ Dorma TH Series/ Godrej
47	Fire: D-Type Pull Handles	Becker Fire Solution/ Dorma/ Hardwin/ Godrej
48	Fire: Hinges	Becker Fire Solution/ Inersoll Rand/ Dorma
49	Fire: Panic Exit Devices	Becker Fire Solution/ Inersoll Rand LCN Series/ Dorma PHA Series/ D-line
50	Fire: Tower Bolts	Suzu/ Nulite/ Dorset/ Dorma
51	Glass : Float & Mirror	Saint Gobain/ Asahi India Safety

LIST OF APPROVED MAKES- CIVIL & PLUMBING SERVICES		
52	Glass for Aluminum Doors/ Windows/ Structural Glazing	Modiguard/ Saint Gobain/ Asahi India Safety Glass Ltd.
53	Glass Wool / Insulation Boards	Rockwool/ UP Twiga/ Lioyd Insulation
54	Grab bars and Disabled Hardware	Dorma/ D-line/ Cera/ Jaguar/ Hindware
55	Gypsum Board / Gypsum False Ceiling/ Gypsum Partitions	Boral Gypsum/ India Gypsum/ Saint Gobain (Gyproc)
56	Hand Drier	Kopal/ Utech Systems/ Euronics Automat
57	MS Saddle with G.I. Riser	Harvel/ Alprene/ Rain Bird, USA
58	Night Latch	Godrej/ Harrison/ Link / Ozone
59	OT: Conductive Tile Flooring: ESD-Control Tile Flooring	Tarkett/ Gerflor/ Armstrong
60	P.T.M.T. Fitting	Cera/ Prayag/ Polytuf
61	Paints - Cement Based	Snowcem Plus/ Asian/ Dulux/ Berger/ Nerolac
62	Paints - Epoxy paint	ICI Dulux/ Nerolac/ Cico/ Sikka/ BASF/ Berger/ Pidilite
63	Paints - Other Paints / Primer	ICI Dulux/ Asian / Nerolac/ Berger/ Nippon
64	Paints - Plastic Emulsion Paint	ICI Dulux/ Asian / Nerolac/ Berger/ Nippon
65	Paints - Synthetic Enamel Paints	ICI Dulux (Gloss)/ Asian (Apcolite)/ Berger/ Nerolac
66	Paints - Texture paint	Spectrum/ Unilite Heritage/ Asian/ Berger
67	Plywood/Block board/Ply board	Duro/ Greenply/ Century/ Kitply/ National/ Archiply/ Merino
68	Polycarbonate Sheets	Galina/ GE Plastic / Skyarch/ Polytechno/ Tuflite
69	Polyethylene Storage Tank	Sintex / Polycon/ Fusion
70	Powder Coating Material pure Polyester	Jotun / Berger / Goodlass Nerolac
71	Pre-coated Galvanised Steel Sheet	Tata BlueScope / Llyod Insulations India Ltd / S.R.Metals
72	Pre-Laminated Particle Board	Novapan /Century /Green Ply /AK Plywood/ Merino
73	PVC Doors	Sintex/ Polyex/ Rajshri
74	PVC Flooring	LG Floors / Gerflor / Premier Vinyl flooring / Armstrong
75	PVC flushing cistern	Commander / Parryware / Hindware/ Jaquar/ Cera
76	PVC Pipes & fitting, Waste & Vent Pipes and fittings, Type B PVC Casing & Screen Pipes	Prince / Supreme / Finolex / Astral
77	PVC Water Stops	Prince /Supreme/ Finolex /Astrol
78	R.C.C Pipes	Indian Hume Pipe/ Pragati Concrete Udyog/ ISI Marked Pipes/ Daya/ KK/ JSP
79	R.O. Water Purifier Unit	Eureka Forbes/ Kent/ Zero B/ Dr. RO / Hindustan Lever

LIST OF APPROVED MAKES- CIVIL & PLUMBING SERVICES		
80	Reinforcement Steel / Structural Steel	SAIL/ RINL/ TATA Steel Ltd./ Jindal Steel & Power Ltd./ JSW Steel Ltd./TISCO/VSP/IISCO/Vizag
81	RQRC Hydrant	Harvel/ Alprene/ Rain Bird, USA
82	RQRC Key	Harvel/ Aqua/ Drip & Drip
83	Sensor Operated Auto Flushing System Urinals	Jaquar/ Hindware/ Parryware
84	C.I. Manhole Covers	Neco/ R.I.F./ Hepco/ SKF/ Kajeco
85	Silicon sealants /Weather Sealant / Structural Glazing Sealant	GE- Silicon/ Pidilite/ Forsoc/ CICO/ Sikka
86	Sluice valve / NRV	Kirloskar/ IVC/ Kilburn/ Zoloto/ Castle/ Leader/ L&T/ Audco
87	Stone ware pipes & Gully Traps	Perfect / SKF/ R.K/ Hind/ Anand/ Burn
88	Submersible Drainage pump	Crompton/ Kirloskar/ Grundfos/ Wilo -Mather & Platt / JS/ ITT
89	Sunken Portion Treatment	Sika/ CICO/ BASF/ Bostik/ Dr. Fixit/ Ardex Endura
90	Super plasticizer	CICO/ Roffes Construction Chemicals/ Pidilite Industries/ Bostik
91	Tiles: Ceramic tiles	Kajaria / Nitco / Orient-Bell / Spartek/ Johnson/ RAK/ AGL
92	Tiles: Glazed (Ceramic) tiles	Kajaria /NITCO/ Orient-Bell/ AGL/ RAK
93	Tiles: Heat Resistant Terrace Tiles	Thermatek or equivalent
94	Tiles: Vitrified Tiles (Double / Multy Charged)/ Germ free	Kajaria/ Nitco/ Orient-Bell/ Johnson/ RAK
95	UPVC Pipes & fittings	Finolex/ Supreme/ Astral/ Prince
96	Vacuum Dewatered Flooring	Tremix/ Sun Build/ Avcon technics
97	Valve Box	Rain Bird/ Carson Brook/Dura
98	Veneered Particle Board	Greenply/ Century/ Novapan
99	VFD Pump	Crompton/ Kirloskar/ Grundfos/ Wilo -Mather & Platt
100	Vibration Eliminator Resisto-flex Pads & Connections	Relay Corpn./ Kanwal
101	Vitreous China/ Sanitary ware/ WC Pan/ Europian WC/ Urinal/ Wash basin/ PVC Waste Pipe/ Waste coupling/ Towel Rail	Hindware/ Parryware/ Jaquar/ Cera
102	Water Cooler	Blue Star/ Voltas/ Usha/ Godrej
103	Water Meter	Kranti/ Anand/ Kant/ Aristo/ Dasmesh/ Chambal
104	Water Proofing treatment Agencies	To be approved by the Engineer-in-Charge
105	Water Proofing Materials (Bitumenistic)	BASF/ Fosroc/ Sikka/ CICO/ Pidilite/ STP/ Ardex Endura
106	Water supply pumps	Grunfos/ Kirloskar/ Crompton/ Wilo -Mather & Platt

LIST OF APPROVED MAKES- CIVIL & PLUMBING SERVICES		
107	Gun Metal gate valve	Leader/ Kriloskar/ Sant/ Zoloto/ Cera/ Jaquar
108	Brass Ball Valve	Supreme/ Finolex/ Astral/ Kirloskar
109	CP Brass Fittings	Jaquar/ Hindware/ Crome/ Cera
110	SS Gratings/ Soap Dish/ Towel Rail and other SS fitting	Camry/ Glacier/ Gem/ Jaquar/ Grohe
111	SW pipes & gully trap	Perfect/ S.K.F/ R.K/ Hind/ Anand
112	RCC NP2 Pipes	Spun pipes/ Hume pipes/ MCP
113	Safety foot Steps	MCP/ GP/ Surabh
114	PVC Floor trap	Jay/ Saffron/ Platinum/ Khodiyar/ Supreme/ Finolex
115	Centrifugal pump set	Kriloskar/ DP Holland/ CR pumps/ Wilo -Mather & Platt
116	Crash Guard/ Corner Guard	MDD/ TSI/ LSR/ Radius
117	Door Shutter - Flush	Duro/ Greenply/ Archiply/ Century/ Merino/ AK Plywood
118	Fire: Sealant	Birla/ 3M/ Hilti
119	OT: Anti -Fungal Paint	Ardex Endura/ Sikka by Liquid Plastic/ Viesmann/ SSK/ TRILUX
120	Paver blocks/ Tiles (All Types)	KK/ Uni Stone Products (India) Pvt. Ltd/ Hindustan Tiles/ NITCO
121	Polyethylene Storage Tank	Sintex/ Polycon/ Fusion
122	Stainless Steel Sink	Hindware/ Neelkanth/ Nirali/ Jayna
123	UPVC Doors & Windows	Fenesta/ Lingel/ CASSA/ Evolution/ Kommerling/ NCL Wintec/ Duroplast
124	UPVC Toilet Doors	AMD Overseas/ Fenesta/ Lingel/ CASSA/ Evolution/ Kommerling/ NCL Wintec/ Duroplast

END OF VOLUME - III