



REQUEST FOR PROPOSAL

TECHNICAL SPECIFICATIONS

VOLUME III

**Development Of Integrated Group Housing Facility
At Kantodia vas Municipal Staff Quarters TPS-02
(Kakriya) FP 66/Paiki On PPP Basis under Gujarat
State Govt's Redevelopment of Public Housing
Scheme 2016**



**ISSUED BY,
MUNICIPAL COMMISSIONER
AHMEDABAD MUNICIPAL CORPORATION**

PART III

TECHNICAL SPECIFICATIONS

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A. Minimum Technical Specifications (Conventional Technology):

1. Waterproofing:

- a. Brick bat coba / concrete as per specifications with china mosaic for waterproofing with min 10 years guarantee.

2. Plumbing:

- a. U-PVC pipe (SWR) confirming to IS no. 13592 (Type "B") of approved make for soil and waste discharge system at all floor levels including all fixtures like bends, tees, shoe etc. jointed with resin of approved brand & manufacture.
- b. U.P.V.C. composite pressure pipe of confirming to IS 13592 (Type A) of approved make for internal water supply line at all floor level incl. fixture like bends, tees, shoe etc. jointed with resin of approved brand and manufacture.
- c. G.I lines from OHT & terrace, From Terrace downward to all floors UPVC composite pressure pipes and fittings confirming to IS code, as per approved design.
- d. C.P brass screws down bib tap with bright polished.
- e. Gun metal check or non-return full way wheel valve at all floor level.
- f. U-PVC pipes of confirming to IS 13592 (Type A) of Approved make for rain water at all floor levels, including all fixtures like bends, tees, shoe etc. jointed with resin of approved brand and manufacture.

3. Electrical (Modular) :

- a. Point wiring for Light, Fan, Bell and Primary point with 2-1.5 sq. mm & earth wire of 1.5 sq. mm. (green) both are of ISI marked 1.1 kv grade FRLS PVC insulated multi strand copper wires, in following type of pipe to be erected concealed in / flushed on wall / ceiling, completed with 6A Tissino Type ISI marked flush type switch / bell push and accessories erected on Metal / PVC Box covered with 3 mm thick PC (Polycarbonate) / Acrylic sheet with necessary Lamp holder / ceiling rose / H.D. Connector as directed.
- b. Point wiring for Looped Plug with Tissino type single pole ISI marked Switch and Socket erected with necessary connections erected on wooden / Metal / PVC Box covered with 3 mm thick PC (Polycarbonate) / Acrylic sheet for open / concealed wiring for following size.
- c. One fan point two light point and one plug point in each room.

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- d. Supplying, fixing & Erecting Mains with 1.1 KV grade FRLS PVC insulated ISI marked stranded Copper conductor wire in following type of pipe to be erected concealed in / flushed on wall/ ceiling, with 2.5 sq.mm copper conductor FRLS PVC insulated stranded wire of green colour for earth continuity of following size- with medium class rigid PVC pipe and accessories.
- e. Providing and Fixing approved make ELCB confirming to IS as directed
- f. Approved make self-priming domestic inbuilt Mono block Submersible Water Pump As per Sufficient with panel board and motor starter etc. complete as directed.
- g. Modular bases board, Switches and etc required

4. Power Supply & Street Lighting:

- a. Electrical Substations.
- b. HT & LT cables and conductors as per IS codes.
- c. Distribution network, Poles, Feeder Pillar Boxes, Switchgears, circuit breakers, Service Lines, service connections, Meters, etc. as per IS codes.
- d. Street lighting network comprising poles, fixtures, lamps, switches, fuses, etc. as per IS codes.

5. Mandatory Minimum Specifications:

Indicative Minimum Specification for various types of Affordable Housing dwelling Units shall be as under:

Flooring and Skirting (Table-1)						
Living/Dining/ Kitchen	Bedroom	Bath & Toilet	Balcony	Utility/Chowkdi	Corridor & Landing of staircase	Staircase
Vitrified Tile (Double Charge) (600 mm x 600mm); with skirting 0.075m height.	Vitrified tiles (Double Charge) (600 mm x 600mm); with skirting 0.075m height.	Anti skid / Matt Finished Ceramic Tile (300mm x 300 mm)	Matt finished Vitrified tiles (Double charge) (600mm x 600mm); with skirting 0.075m height	Min. 20mm thick polished Kota stone (Min. 250 mm x 250 mm)	Matt finished Vitrified tiles (Double charge) (600mm x 600mm); with skirting 0.075m height	Riser and Tread: Min. 18 mm thick polished Granite Min. length of Granite 750mm with half bullnose & three grooves for anti-skid with skirting 0.075m height

Wall Tiling / Dado (Table-2)				
Kitchen	Wash basin area	W.C.	Bath	Utility/wash area
Ceramic tiles (glossy finish) of 300 mm x 450 mm size from platform top to Lintel Level	Ceramic tiles (glossy finish) of 300 mm x 450 mm size from top of wash basin	Ceramic tiles (glossy finish) of 300 mm x 450 mm size from Finished floor level to slab level		Ceramic tiles (glossy finish) of 300 mm x 450 mm size up to parapet height from Finished floor level on all four sides of wall.

Painting(Table-3A)		Doors(Table-3B)	
External Paint	Internal Paint (Wall & Ceiling)	Door and Shutters - Main Door / External Door / Bath and WC door	Fixtures and Fastening
Rustic Texture paint of 1.5 to 2.0 mm thick and One coat Primer andmin. threecoatsof Water-based 100% Acrylic EmulsionPaint of approvedby EIC.	two coats white putty and minimum two coats of emulsion distemper paint of approved by EIC.	<p>WPC Door frame: factory made High density single extruded WPC (Wood Polymer Composite) solid door & other frames/Chowkhat comprising of virgin PVC polymer of K value 58-60 (Suspension Grade), calcium carbonate & natural fibers (wood powder/rice husk/wheat husk) and nontoxic additives (maximum toxicity index of 12 for 100 gms) fabricated with miter joints after applying PVC solvent cement and screwed with full body threaded star headed SS screws having minimum frame density of 850 kg/cum,</p> <p>WPC door Shutter: factory made High density single extruded WPC (Wood Polymer Composite) solid plain flush door of required size comprising of virgin PVC polymer of K value 58-60 (Suspension Grade), calcium carbonate & natural fibers (wood powder/rice husk/wheat husk) and nontoxic additives (maximum toxicity index of 12 for 100 gms) having minimum frame density of 650 kg/cum.</p> <p>Main Door Shutter shall be figured and shall be polished on site. Design of figure shall be selected by EIC.</p> <p>Main door frame, Internal Door Frame and internal all shutter including three coats of enamel oil pain with primer.</p> <p>Main door frame size shall be 125 mm x 63 mm and Bed Room door, & Wash Area frame shall be 100 mm x 50 mm.</p>	S.S.304Fixturesand Fastening (Min.heavy duty 125mmHinges- 3nos,200mmdoorhandle – 1 pair, Aldrop – 2 nos, tower bolt – 1 no, doorstopper–1no, etcperdoors shutter)

Windows(Table-3C)	Plastering(Table-3D)		Kitchen(Table-3E)
Window Frame/Shutter/Fixtures and Fastening	External Plastering	Internal Plastering	Platform
<p>AluminumColour Anodized Sliding Windows (25mm series). 2 tracks (for opening width upto 1.2 m) or 3 tracks (for opening width more than 1.2 m) Min thickness of aluminum extrusion shall be 1.2mm and coating shall be 25 micron thick.5 mm thick transparent glass with all fixtures and fastening shall be provided. Mirror polished green marble frame on four sides of the window. The width of marble frame shall be 6 mm more than thickness of sill wall. Green marble stone to be fixed in two parts /up- down all four sides to prevent rainwater movement in the room. Silicon sealant shall be applied inside and outside at the joints between marble and aluminum section</p> <p>Safety grill should be provided.</p>	<p>20.0 mm thick double coat Mala (one coat 12mm thick withCM 1:3 and anothercoat8mm thickCM1:1)</p>	<p>Smooth mala plaster of 12 to 15 mm thick in CM (1:4).</p>	<p>Sandwich platform.</p> <p>Top and Faciapatti having mirror Polished Z-black Granite Stone, bottom one side polished Kota Stone and verticals both side polished kota stone.</p> <p>Min. thickness of Granite shall be 18 mm & Kota Stone shall be 25 mm. SS 304 Sink of shall be provided</p> <p>Faciapatti shall be full bull nose.</p>

Railing (Table-4A)	Parapet(Table-4b)	RCC Work(Table-4C)
Staircase	Terrace	Columns, Beams, Slabs & Lintels
<p>1.15m high from FFL or as per GDCR whichever is more, MS railing in the staircase of the approved design (Min. 40 mm NB MS tube hand rail, Min. wt. of railing above floor shall be 14 kg/m. using medium class steel. Vertical members shall be embedded in waist slab. MS railings shall be painted with zinc chromate primer and 3 coats of synthetic enamel paint of approved make.</p>	<p>Parapet on the terrace shall be 1.2 m (or as per prevailing GDCR whichever is more) above the finished terrace level. Min. 115 mm thick RCC coping shall be provided at top of parapet. Plastering shall be done at the top of the parapet with slope inside. Thickness of parapet wall shall be as per relevant IS codes.</p>	<p>The detailed dimensions & mix of RCC to be adopted as per approved structural design / minimum requirement given in the tender whichever is more. Min. 1(one) Loft slab shall be provided in kitchen / Bath - toilet area / Bed Room / wherever is feasible.</p>

Water Supply System (Table – 5a)				
Internal Water supply	External Water Supply	Painting of GI/MS pipes	Fittings	Overhead tank & Sump
uPVC composite pressure pipes and fittings confirming to IS/ASTM code, as per approved design.	uPVC composite pressure pipes and fittings confirming to IS/ASTM code as per approved design. External water supply lines shall be fitted on GI clamps approved by EIC fixed at suitable distance to keep pipes away from walls (Projected Clamp)	Min. 3 coats of oil paint over primer.	CP brass fittings, ISI marked as per approved by EIC.	Overhead tank shall be 6 layer PVC Tank with 10 years guarantee as decided by EIC. UG Sump to be provided as per design & shall be as per approved by structural engineer.

Sanitary System (Table – 5b)				
W.C.Pan	Wash Basin	Building Drainage & Rainwater pipes	Manhole	External Drainage & Storm Water Disposal pipes
Off-White / colour Orissa pan of approved make as approved by EIC	One Off-White vitreous China flat back wash basin as suggested by EIC, with one CP brass pillar tap of Min.wt.0.5 Kg. and CP brass waste coupling ISI mark of approved make and quality.	<p>Doule stack system 110/90mm bore dia uPVC SWR quality pipes confirming to IS/ASTM code including all relevant fittings of approved make and as per approved plumbing design.</p> <p>External drainage & rainwater lines shall be fitted on GI clamps approved by EIC fixed at suitable distance to keep pipes away from walls (Projected Clamp)</p>	Brick masonry with min. 35 kg/cm ² compressive strength of brick and size as per the approved design approved with SFRC cover.	<p>GT to Chamber: Corrugated DWC HDPE Pipes (non-pressure pipes) as per approved design.</p> <p>Chamber to MH & Storm Water : Foam Core Pipes as per approved design (Min. 150mm dia. to be provided).</p>

Miscellaneous (Table – 6)

Lift	Parking flooring	Hook for fan	Boundary wall with gates	Numbering of Flats	Rain Water Harvesting	Landscape
<p>Minimum Eight person (But not less than GDCR requirement) capacity lift shall be provided confirming to relevant BIS Code and façade and entrance shall be clad with granite slab at every floor (18–20mm thick). Lift Car & all Doors shall be of SS. Lift well, all wall & Lift pit shall be of RCC.</p>	<p>Anti-skid heavy duty pavit tiles of 300 x 300 mm approved by department, over M20 RCC grade slab of 100 mm thick with 10 mm dia TMT bar (300 mm c/c spacing) over 100 mm thick M15 PCC base.</p>	<p>Fan hook shall Be provided in all rooms including kitchen.</p>	<p>1.5m high or as per prevailing GDCR whichever is more, boundary wall constructed with Bricks Masonry or CC block or grill above plinth level with required no of MS gates, Design of MS gate (Min. wt. 40 kg/sqm) & Grill (min. wt. 15kg/Sqm) as approved by EIC.</p>	<p>The font size 75 mm and height of plates shall be 125 mm Width and Min. 4 mm thick.</p>	<p>As per AMC Norms Efficient Rain Water harvesting network/ system to be laid / installed.</p>	<p>Environment friendly material (green) to be used as far as possible. Good landscape, lawn and tree plantation is to be provided with Setting areas. Necessary signage boards of required size as instructed</p>

Miscellaneous (Table – 6)			
Common Area	Guarantee Card	Ceiling Fan &Lightning Fixtures	Ventilation Size & Louvers
LED light fittings shall be provided in all common areas	Guarantee cards of all equipment provided in common amenities shall be handed over to the committee	Lightning fixtures and ceiling fan shall be provided in Aanganwadi, Health Center, Pump Room.	Ventilation window shall be provided with Adjustable Louvers

Internal Roads, Parking and Pathway – Table 7(A)

Sub grade	Road	Utility Services Area	Kerb Stone	Paths	Plinth protection	Parking Patta
Sub grade to be prepared by excavating earth to an average depth of 23 cm. dressing to complete and consolidating with road roller 8-10 tonne with GSB of required thickness to reach upto FGL as per IRC specifications & as per approved design. (GSB mix should be of 25 – 40mm 40%, 40 – 65 mm 40% black trap machine crushed & 20% sand)	Trimix Concrete road in M25 grade Min. 150 mm thick with 10 mm dia TMT bar (300 mm c/c spacing) and expansion joint filled with sealant over 100 mm thick M15 PCC base.	For external service like water supply, cabling etc. Min M35 grade Concrete rubber molded paver block shall be provided as directed by EIC.	CC 1:2:4 Precast Kerb stone min. 0.3m X 0.3m X 0.15m section complete as per CPWD specifications & as per direction of EIC	65 mm thick min. M 35 grade rubber molded paver block over 50mm sand bedding over 100mm thick PCC M15 bed as per approved design.	65 mm thick Rubber moulded paver blocks (M35) with 50 mm sand bedding over 100 mm thick PCC M15	Parking patta shall be 75mm wide Yellow color thermo-plastic paint as per direction of EIC.

Note:

- (1) Any earth filling, if required in hollow plinth or margin area shall be done by good soil only. No construction waste will be allowed for filling.
- (2) Developer shall have to use plate compactor to compact the soil to achieve desired density.
- (3) Ramp for disabled people with railing shall be provided wherever required.
- (4) Anti-termite treatment, shall be carried out in hollow plinth area and surrounding of the building.

(Electrical Work – Minimum Requirement for DU) Table - 7(B)

Each Bed Room	Living Room	Kitchen	Toilet / Bathroom	General	Switches and Sockets
2 nos. 6 AMP points with Switches And sockets, 1nos of 6/16 AMP Point with Switch and socket, 1 Fan point & light point	2 nos. 6 AMP points with Switches and sockets, 1nos of 6/16 AMP point with Switch and socket, 1nos Fan point, light point, Telephone point & TV point	2 nos of 6 AMP points with Switches and sockets, 1nos of 6/16 AMP point with Switch and socket, Fan point, light point & Exhaust fan Point	Provision of Switches and socket for geyser in bath & Exhaust fan point in toilet & 1 Light Point in Toilet /Bath	<p>Electrical work with copper wires in concealed PVC conduits. Provision shall be made for sufficient lighting and power points for interior and exterior.</p> <p>Required Switches and sockets for Fridge in Kitchen. Other areas and each dwelling unit shall be provided MCB switch with ELCB or ELMCB of req. capacity. Provision of telephone and T.V. points shall be made with cabling.</p> <p>A fan regulator shall be provided with each fan point. Provision for mixture point, water purifier and exhaust point in kitchen shall be made.</p> <p>One Bell point with Bell shall be provided for each Dwelling Unit.</p> <p>Earthing wire to be provided for each light point, fan point, socket outlets etc.</p>	Modular

6. General Specifications:

Sr. No.	Description	Minimum Specifications
1	Plinth protection	80 mm thick paver block M30 grade over 100 mm thick CC (1:2:4) and 100mm thick CC kerbing at the edge
2	UG sump, Pump room and pumps	UG RCC sump. Capacity of the UG sump shall be min. 500 litres per HH, MS rungs alongwith required capacity of pumps and pump room with RCC slab. Overhead Triple layer PVC tank covered with brick masonry wall with 1 mtr. Height with 150mm thick M-25 RCC coping shall be provided for each block
3	Separate UG Tank	Separate UG tank for fire safety is to be provided as per norms.
4	Electrical Line	Underground Electrical cable line shall be provided inside the campus.
5	Street light	LED Street light shall be used.
6	Wall	In case of AAC block Masonry, External wall thickness shall be Min. 200 mm and Internal wall thickness shall be Min. 100 mm (Excluding Plaster) as per IS code with stub column and bond beam. In case of Brick Masonry, External wall thickness shall be Min. 230 mm and Internal wall thickness shall be Min. 115 mm (Excluding Plaster). In case of solid block/stone, relevant IS code to be followed. In case of internal wall of precast lightweight concrete hollow core wall min. thickness shall be 92 mm, M20 grade and should be approved specs by BIS/PWD/BMTPC/R&B/IIT. All the joints between RCC and masonry will be bound by 200 mmwide chicken wire mesh before plastering.
7	Mortar	Chemical Mortar shall be used in AAC block masonry work. In brick masonry, cement mortar shall be used as per IS.
8	Fire Fighting	Provision of Firefighting system shall be made as per GDCR & regulation of local authority.
9		
10	Safety Grill	Safety Grill shall be provided in windows& ventilation for all

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		DUs as approved by EIC
11	Slab Thickness	Slab thickness shall be Min. 115 mm or as per design whichever is more.
12	Plinth Level	Plinth level shall be min. 0.60 m above from nearby highest Existing finished road level.
13	Lift well Paint	Water bound distemper shall be used.
14	Stilt Parking	Acrylic paint to be used.
15	Wall Painting	Wall painting on dead wall of the building should be done on the basis of theme given by Architect/AMC
16	Carpet Area	Carpet area shall be measured from plastered wall to plastered wall for all rooms and kitchen. And wall dado to dado for toilet bath and wash area. Column offset shall not be considered in carpet area measurement.
17.	Cable /wire	Copper wire to be used in internal and external works as per design.
18.	Items specifications	PWD specifications to be followed for items detailed specification. If not available in PWD then EIC decision will be final.
19.		
20.	External Services	For Gas pipeline and other services like telephone cable, TV cable etc separate DWC pipe / U/G Hume pipe to be laid as directed by EIC. Control valve to be provided in each unit as per requirement
21.	Grade Slab	RCC grade slab is mandatory at Ground Floor.
22	Passage, Lobby and Corridor	Passage /corridor shall be provided for Lobby.
23	Distance between two and more blocks	Two blocks/buildings should not be attached to avail maximum lighting and ventilation and Row house type planning will not be permitted.
24	External side of balcony, wash area and stairportion	Water based 100% acrylic paint to be applied.

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25	Grey water recycling	Grey water recycling shall be provided for flushing and gardening purposes. For that Grey water treatment plant, double plumbing, treated & raw water tank etc shall be provided as per design.
26	Sanitary Fittings	
a	Bath	Bib tap for cold water (Min. Wt. 0.45 kg.), Nahni Trap (SS),
b	Toilet	Bib tap (Min. wt. 0.450 kg.), Flush cock (Min. Wt. 1.015 kg.), W.C as approved by EIC.
c	Wash	Bib cock (Min. wt. 0.450 kg), Nahni trap (SS), soap dish
d	Kitchen	Sink (SS 304), Sink cock (Min. Wt. 0.788 kg.), Nahni trap (SS)

33. GUARANTEE BOND TO BE EXECUTED BY SELECTED BIDDER FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER PROOFINGWORKS.

The Agreement made thisday of.....Two thousand
and.....between.....son of
.....(hereinafter called the Guarantor of the one part) and the ULB/DA/GHB,
WHEREAS THIS Agreement is supplementary to a Contract (Hereinafter called the Contract)
dated..... And made between the GUARANTOR OF THE ONE part and the
ULB/DA/GHB of the other part, whereby the Selected bidder, inter-alia, undertook to render the
buildings and structures in the said Contract recited completely water and leak-proof.

AND WHEREAS THE GUARANTOR agreed to give a Guarantee to the effect that the said structures
will remain water and leak- proof for Ten years to be reckoned from the date after the Maintenance
Period prescribed in the Contract.

NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render
the structures completely leak- proof and the minimum life of such water proofing treatment shall
be Ten years to be reckoned from the date after the maintenance period prescribed in the Contract.

Provided that the Guarantor will not be responsible for leakage caused by earthquake or structural
defects or misuse of roof or alteration and for such purpose:

Misuse of roof shall mean any operation which will damage water proofing treatment, like chopping
of firewood and things of the same nature, which might cause damage to the roof;

Alteration shall mean construction of an additional storey or a part of the roof or construction
adjoining to existing roof whereby water proofing treatment is removed in parts;

The decision of the Engineer-in-charge with regard to cause of leakage shall be final. During this
period of guarantee, the Guarantor shall make good all defects and in case of any defects being
found, render the building water proof to the satisfaction of the Engineer-in-Charge at his cost and
shall commence the work for such rectification within seven days from the date of issue of the
notice from Engineer-in-Charge calling upon him to rectify the defects failing which the work shall

be got done by the Department by some other Selected bidder at the GUARANTOR'S risk and cost. The decision of the Engineer-in-Charge as to the cost, payable by the Guarantor shall be final and binding.

That if, Guarantor fails to execute the water proofing or commits breach there under then the Guarantor will indemnify the Principal and his successors against all loss, damage, cost, expense or otherwise which may be incurred by his by reason of any default on the part of the GUARANTOR in performance and observance of this Supplementary Agreement. As to the amount of loss and/or damage and/or cost incurred by the ULB/DA, the decision of the Engineer-in-Charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligor_____ and by_____ and for an on behalf of the ULB/DA, on the day, month and year first above written. SIGNED, SEALED AND DELIVERED BY OBLIGATOR IN THE PRESENCE OF -

C)

D)

SIGNED FOR AN ON BEHALF OF ULB/DA/GHBBY_____in the presence of -

1. _____

2. _____

34. Site of work shall have a Laboratory equipped with the following equipment:

- Balances:
 - 7 kg. to 10 Kg. capacity, semi-self-indicating type, accurate to 10gm.
 - 500 gm. Capacity, semi-self-indicating type, accurate to 10gm.
 - Pan Balance Type – 5 Kg., accurate to 10gm.
- Ovens:- Electrically operated, thermostatically controlled up to 110C - sensitivity 1C
- Sieves: as per IS:460
 - IS Sieve – 450mm internal dia. of sizes – 100mm, 80mm, 63mm, 50mm, 40mm, 25mm, 20mm, 10mm, 6.3mm, 4.75mm completed with lid and pan.
 - IS Sieves – 200mm internal dia. (brass frame) consisting of 2.36mm, 1.18mm, 504 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns, with lid and pan.
- Sieve shaker capable of 200mm and 300mm dia. Sieves, manual operation with timing switch assembly.
- Equipment for slump test – slump cone, steel plate, tamping rod, steel scale, scoop.
- Dial gauges – 25mm travel – 0.01mm / division least count – 2Nos.
- 100 tonnes compression testing machine, electrical-cum-manually operated.
- Graduated measuring cylinders, 200ml capacity – 3 Nos. broken one, if any to be replaced by the selected bidder at his own cost.
- Enamel Trays (For efflorescence test) of bricks:-
 - 300mm x 250mm x 40mm – 2Nos.
 - Circular plate of 250mm dia. – 4Nos.
- 15cm moulds for concrete cubes – adequate numbers.
- Other instruments like steel tapes – 3m & 30m, Vernier Caliper's, a good quality plumb bob, spirit level minimum 30cm long with 3 bubbles for horizontal, vertical, wire gauge (circular type) disc, foot rule, long nylon thread, magnifying glass, screw driver 30 cms long, ball pin hammer 100 gms, plastic bags for taking samples etc.
- Micrometer screw 25mm gauge.
- Rebound hammer for testing concrete dynamic penetrometer.
- Moisture meter for timber.
- Any other testing equipment/ machine required for testing of various other materials shall also be provided installed at the site lab with the technical staff well trained to operate such equipment/machine.

B. SPECIFICATION FOR HORTICULTUREWORKS

- The work will be carried out as per CPWD specification 2009 Vol.I&II with up to date correction slips.
- The all liabilities of the labour is the responsibilities of the selected bidder and that of not of ULB/DA.
- 250 Nos. of trees, 1000 Nos. of shrubs, 2500 nos. of hedge plants, creeper etc. will be planted / hectare. Listenclosed.
- At least 225mm good earth will be provided by the selected bidder for lawn area and 25mm cow dungmanure.
- At least one tube well required with pump houses with irrigation system for lawn area and planters etc. the maximum distance of the hydrant of 20mm size will be25mtr.
- Green area will be bounded by 60cm. high boundary wall from adjoining path/Road and 1 mtr. Height railing over thiswall.
- The selected bidder shall arrange his own T&P required for development as well as maintenance.
- Tree plants will be protected by the treeguard.
- Tree/shrub/creeper/hedge plant will be approved by the Engineer-in-charge from the enclosed list.
- The quantity can be increased or decreased by 20% as per sole discretion of Engineer-in-charge.
- Trenching in ordinary soil up to a depth of 30cm. including removal and stacking of serviceable materials and then disposing of spreading an neatly leveling with an a lead of 50m and making up the trenched area to proper levels by filling with earth or earth mixed with sludge or/and manure before and after flooding trench withwater.
- Supplying and stacking of good earth at site including royalty and carriage up to all leads and lifts.
- Supplyingandstackingcowdungatsiteincludingroyaltyandcarriageuptoallleadsandlifts.
- Fine dressing the ground to levelsspecified.
- Spreading of cow dung manure or/and good earth in requirethickness.
- Grassing with 'doob' grass including watering and maintenance of the lawn for till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed. Grass to be planted in rows 5cm. apart in eitherdirection.
- Preparation of beds for heading and shrubbery by excavating 60cm. deep and trenching the excavated based to a further depth of 30cm, refilling the excavated earth after breaking clods and mixing with cow dung manure in the ratio of 8:1(8part of stacked volume of earth after reduction by 20%:1 part of stacked volume of cow dung manure after reduction by 8%) flooding with water, filling with earth if necessary, watering and finally dressing, leveling etc. including stacking and disposal of materials declared unserviceable and surplus earth by spreading and leveling as directed within lead of 50m, lift upto 1.5mcomplete.
- Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manureofsludgeintheratio2:1byvolume(2partofstackedvolumeofearthafterreduction

by 20%:1 part of stacked volume of cow dung manure after reduction by 8%) flooding with water dressing including removal of rubbish and surplus earth, if any with all leads and lift (cost of manure sludge or extra good earth, if needed is to be provided without any extra cost).

- Holes 0.90m dia and 0.90m deep.
- Holes 60cm. dia and 60cm.deep.
- Supplying best quality grown healthy trees in pot of 90-120cm height, species as specified. All trees to be approved before planting.
- Supplying best quality, pots grown healthy climber plants with minimum 90cm Stem length of species specified, inclusive of preparation and cultivation. All plants to be approved before planting by Dir.(Hort).
- Supplying best quality pot grown healthy climber plants with minimum 60cm. tail of species specified inclusive of preparation and cultivation of shrub beds as specified. All plants to be approved before planting by Dir.(Hort).
- Supplying and applying chemical emulsion of approved quality in sealed container for terminators 50ml. per sq. m. Including delivery as specified.
- Providing and fixing of M.S. circular tree guard 40cm. internal dia. With over all height of 1.82m. Frames at 3 nos. of vertical angle iron size 25x25x3mm with 75mm slatted bottom ends, welded full in length at meeting point with 3 nos. MS flat rings made of 25mmx3mm including welding and fixing steel wire mesh fabric of 1.30m high and 10 SW gauge of 5.0x7.5cm size wire mesh including painting with ready mixed paint of approved brand and manufacture and require shade over a priming coat of ready mixed zinc chromate yellow primer complete in all respects, as per drawing and direction of Engineer-in-Charge.

GENERAL SCOPE

All plant materials shall be healthy sound vigorous free from plant diseases insect, pests, or their eggs and shall have healthy, well-developed root system. All plants shall be hard under climatic conditions, similar to those in the locality of the project. Plants supplied shall conform to the names listed on both the plants and the plant list. No plant material will be accepted if branches are damaged or broken. All material must be protected from the sun and weather until planted.

All necessary stock shall be inspected and approved by the Director, landscape. Architect/Engineering-in-charge/Director. All plants shall conform to the requirements specified in the plant list, except that plants larger than specified may be used, if approved but use of such plant shall not increase the contract price.

If the use of such the large plant is approved, the spread of roots or ball of earth shall be increased in proportion to the size of the plant. Plants to be delivered with legible identification labels.

Topsoil: (Good earth PH. Range from 6.5 to 7.5).

Top soil or good earth shall be a friable loam typical. It shall be free of subsoil stones earth clods, sticks roots or other objectionable extraneous matter of debris. It shall contain no toxic material. No topsoil shall be delivered in a muddy condition. The PH value of the soil in between 6.5 to 7.5.

Fertilizer:

Dry farm yard manure shall be used. Measurement shall be in stacks with 8% reduction for payment. It shall be free from extraneous material harmful bacteria insects or chemicals.

Root system:

The root system shall be conducive to successful transplantation. Where necessary the root ball shall be preserved by support with hessian or other suitable material. On soils where retention of a good ball is not possible the roots should be suitable/protected in some other way which should not cause any damages to roots.

Marking:

Each specimen of tree and shrub, or each bundle, shall be legibly labeled with the essential particulars.

Tree planting:

Trees should be supplied with adequate protection as approved. After delivery, if planting is not to be carried out immediately, balled plants should be placed check to check and the ball covered with sand to prevent drying out. Bare rooted plants can be heeled in, by placing the roots in a prepared trench and covering them with the earth which should be watered in, to avoid air pockets around the roots.

Planting:

No tree pits shall be dug until final tree positions have been pegged out for approval. Care shall be taken that the plant sapling when planted is not buried deeper than in the nursery, or in the pot/polythene bag. Planting should not be carried out in water logged soil.

Plants/ trees at the original soil depth, the soil marks on the stem is an indication of this, and it should be maintained on the finished level allowing for setting on the soil after planting. All plastic and other imperishable containers should be removed before planting. Any broken or damaged roots should be cut back to sound growth.

Fertilizing:

Fertilizing shall be carried out by application of chemical (NPK) fertilizers @ 1 quintal per acre per year in the end of winter.

Organic well-rooted dry farmyard manure 0.05 cum. or 1 (one) 'tassla' Urea 25 gm Or Potassium Sulphate 25gm.

All shrubs which are supplied pot grown shall be well soaked prior to planting.

Watering in and subsequent frequent watering of summer planted container grown plants is essential.

In the absence of rain, in the Monsoon, the lawn shall be watered with sprinklers every three days, soaking the soil through to a depth of at least 20cm.

Damage failure or dying back of grass due to heat etc. shall be the responsibility of the selected bidder.

The selected bidder is to exercise care in the use of rotary cultivator and mowing machines to reduce to a minimum, hazards of flying stones and brickbats. All rotary mowing machines are to be fitted with safety guards.

Nursery stock:

Planting should be carried out as soon as possible after the plant material has arrived at the site. Where planting is delayed, care should be taken to protect the plants from pilfering or damage from people or animals. Plants with bare roots should be heeled-in, as soon as received or otherwise protected from drying out, and others set closely together and protected from the wind and frost. If planting is to be delayed for more than a week packaged plants should be unpacked, the bundles opened up and each group of plants separately and clearly labeled. If for any reason, the surface of the roots becomes dry, the roots should be thoroughly soaked before planting.

A 'NO Claim Certificate' in the prescribed form or a list of claims not included in the final bill with full details.

The Engineer-in-charge shall examine and certify the final bill for payment after satisfying that the works have been satisfactorily completed and that all properties, works and things removed or disturbed or damaged in consequences of the works, have been properly replaced and made good, and all expenses and demands incurred or made by one company or in respect of any damage or loss by/ from or consequences of the works have been satisfied, all materials have been returned and the site cleared.

Completion Certificate:

The works shall be deemed to have been completed in all respects, on the day the Engineer-in-charge certifies that the work have been so completed in accordance with this contract, take over the completed works and issues a certificate to that effect. The defect liability period will start from the said date of completion/handling over of the work.

Penalty:

If, at any time during the tenure of the contract, it is found that any material like manure, sweet earth etc. has not been brought/less quantities utilized in the work-than specified, the cost of the difference of materials less brought/utilize will be deducted as under:

- The cost of the material will be worked out at current market rate as assessed by the Engineer-in-charge adding 30% (thirty percent) extra of above cost as departmental overhead charges.
- Once this cost deduction is made as above from the bill. in no case the same will be refunded

Selected bidder's Co-ordination:

If during the course of the selected bidder's work, other works of the department or of the other selected bidders are also in progress within the same site, the selected bidder is to use his best efforts to work in harmony with all the others and in the best overall interest of the Project/Work.

The payment of all the horticulture works/items as mentioned above will be made of actual work done and will be deemed to have been including in the quoted tendered amount.

LIST OF TREES:

- Saptparni
- Neem
- Sisam
- Jambu
- Gulmohar
- Garmalo
- Sevan
- Kadam
- DesiAsopalav
- Pipal
- Badam
- Any other (suitable to the localclimate)

LIST OF SHRUB:

- Bougainvillea (Varieties)
- Hibiscusrosasinensis
- Indianoleander
- Any other (suitable to the localclimate)

LIST OF CREEPERS:

- IndianVernonia
- Any other (suitable to the localclimate)

LIST OF GROUND COVER:

- Altermanthera (Red)
- Alternanthera (Green)
- Asparagussprengeri
- Lantanadepreessa.
- Any other (suitable to the localclimate)

Maintenance for Work of Lawns

The grass in lawns shall regularly cut with garden swords and moved with lawn mowers. The thickness of the grass shall not be allowed to increase beyond 60mm. The minimum thickness of grass shall be maintained as 50mm. The thickness shall be measured from top of the soil surface. The grass shall also be kept free from all kinds of weeds.

The grass lawns shall be kept constantly rolled to give cushioning effect to the grass. Manuring of the grass lawns shall also be done regularly so as to keep the grass green. The manuring of the lawn shall be spread in the months of December and January or as directed by the Engineer-in-charge.

For maintenance of curbing for the fire control measure:

- The grass in area shall regularly be cut with garden swords and mowed with lawn mowers. The thickness of the grass shall not be allowed to increase beyond 60mm. The minimum thickness of grass shall be maintained as 50mm. Thickness shall be measured from top of the soil surface. The grass shall also kept free from all kind of the wildgrass/bushes.
- The existing grass shall be scrapped, if required or as directed by the Engineer-in-charge. The scrapped materials shall be disposed of at convenient point to be decided by the Engineer-in-charge. Thereafter, the area will be suitably flooded with water and left for a fortnight for new grass to come up.
- Manuring of the grass area shall also be spread in the month of December/January or as directed by the Engineer-in-charge.

For work of Tree Plants and Trees:

- The area around the tree plants up to a minimum of two feet around, from trunk of the tree plants shall be kept free from grass and all kinds of weeds. Hoeing of this area around the trees shall be done regularly. The plants shall also be watered regularly as required and as directed by the Engineer-in-charge. Hoeing shall also be done after every watering as per the direction of Engineer-in-charge. For proper upkeeps of the tree, unwanted branches of the trees/tree plants shall be removed at regular intervals as required and as directed by the Engineer-in-charge. The tree plants/trees shall also be kept free of any diseases, insects or pest by regularly spraying insecticides as required and as directed by the Engineer-in-charge.

- The complete area where the tree plants/trees are planted in open field shall be kept free from grass and all kinds of weeds throughout theyear.

For work of Hedges:

- The area around hedges plants shall be kept free from all kids of grass and weeds. Hoeing of the area around hedge plants shall be done regularly as required and as directed by the Engineer-in-charge. The hedge plants shall be watered regularly as required and as directed by theEngineer-in-Charge.
- Pruning and trimming are the most important items for proper shaping of hedges, therefore, special care and attention shall be paid to prune and cut the hedge as required and as directed by theEngineer-in-charge.

For work of flower beds:

The selected bidder will maintain seasonal flower beds and rose beds including preparation of bed, supply of seeds and seeding chemicals, cow dung manure, watering, inter-culturing etc. as per direction of the Engineer-in-charge so that maximum healthy flowers/plants are available throughout the year for flowerbeds as per the requirement. In case any casualty flower due to negligence or poor maintenance by the selected bidder occurs the same will be replaced by a healthy and acceptable plant, as per the direction of Engineer-in-charge.

OTHER SPECIFICATIONS

The following yardstick should be followed to maintenance of horticulture works.

- Minimum one Mali for one acre onlawn.
- Minimum one Mali for 250 nos. of road sidetrees/plants.
- Minimum one Mali for 3000 running meters ofhedges.

C. LIST OF MAKES :

CERTAIN MATRERIALS ACCORDING TO WHICH THE MATERIALS TO BE PROVIDED

1.	Ordinary Portland Cement	Ambuja, Ultratech, Sanghi, Siddhi, Hathi, J.K. Laxmi, Kamal, Binani, Siddhi, Wonder, Nuvoco
2.	White Cement	J.K. White, Birla White, Nihon White
3.	Reinforcement Bar	Fe-500d conforming to IS-1786:1985 (reaffirmed 2008) SAIL, TISCO, Sulekhram, Grace, Thermax, Bharat, Germen, Nilkanth, God Parmeshwar, Electrotherm, Rudra, Vibrant, Vinayak, STEEFO, Friends.
4.	Structural Steel	SAIL, TISCO, RINL, Asian, conforming to relevant IS CODE
7.	Kota Stone / Marble / Granite / Jaisalmer Stone 22mm thick with +/- 2mm tolerance.	As per approved sample.
8.	Ceramic Tiles, Vitrified Tiles, Chequered cement tiles, parking tiles, Decorative tiles, Glazed tiles (White, Colored, Anti- Skid)	Cera, Dakshinamurti, Varmora, RAK, Swastik, AGL, Somani, Crystal, Bell Ceramics, Kajaria, Nitco, Johnson.
12.	Interlocking paver blocks	As per approved sample.
14.	WPC door Frame Shutter	Greenply, Centuryply, Ecoste, SV Woods, EKOTimber, Alstone, pathways,
19.	Aluminium Section	Hindal, Jindal, Banco, Hindalco,
20.	All Aluminium Hardware, Fittings	Everite, Garnish, Arches, Kausal, NuliteAlif, Shalimar (Bombay) Singla, Opel, Bolt, Arhish
21.	Aluminium Doors,	As approved by EIC/Consultant / Competent Authority
	Windows, Partitions Fabricators	
22.	Stainless Steel Hardwares Fittings	Kitch, Dorma
23.	Glass/Float/Sheet	Saint Gobain, Modi, Hindustan Pilkington , Hindustan , Tata , Asahi, Triveni, Shree Vallabh
24.	Door Closer / Floor Spring	Godrej / Everite, Opel, Doorking/ Hardwin, Nulite, Hyper, Ezec,
25.	Locks	Godrej, Harrison, Plaza, Golden, Doorset , Europa
26.	Door fitting / Hinges.	As per approval Engg. – in – charge and shall be fitted after testing and

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		approval.
27.	Rolling Shutters	' Standard', 'Swastik', 'Diana', 'Hercules', As per approved fabricator.
	Door Shutters	As per approval of Engg. – In – Charge and shall be fitted after testing and approval
28.	Polysulphide Sealant For Expansion Joints All Windows	Chokesy Chemical, Structure Proofing Co Pidilite, GESilicon, Tuffseal
29.	Synthetic Enamel Paints / Oil bound distemper satin finish	ICI / Dulux, Johnson & Nicholson, Asian Paint, Dulux, Berger
30.	ExtreiorColour (weather shield max)	ICI/Dulux, Asian Paint Ultima, Berger
31.	Plastic Emulsion paint	J & N, ICI, Asian, Berger, Dulux
32.	Dry Distemper / Oil Bound Distemper	Shalimar', ICI', 'GoodlassNerolac', , Berger, Johnson & Nicholson, Asian Paint, Dulux
33.	Duco Spray Paint	ICI or equivalent
34.	Polyurethane Paint	MRF or equivalent
35.	Water Proofing Compound	' CICO' , Fosroc, GE silicon Pidilite, MC-Bauchmie, Sika, Roff, Perma, Dr. Fixit
36.	Weather Sealent / Silicon sealent / Poly isobutylene sealent	Fosroc, Pidilite, MC-Bauchmie, Wecker 789, Dow corning 789 or equivalent
37.	Hardeners	'Ironite', 'Ferrok', 'Hardonate'.
38.	Wire Mesh	Sterling Enterprises, Trimurti, Welded Mesh.
39.	Anti-Termite Treatment	Thyodin by Hoechst, Lyntric by Bayer India, Durmet by Cynamid India, Nocil Pyramid, Item syour
40.	Polycabonate Sheets	Lexan, GE or approve by Engineer – in – charge.
41.	M.S. Tubes	TATA, Asian, Zenith, Jindal
42.	Aluminium Composite Panel	Flexibond-UmiyaFlexifoam Pvt. Ltd., Aludecor Lamination Pvt.Ltd., Indobond-ACP Marketing Pvt. Ltd., Eurobond, Ultrabond, Durabuild, Ultra panel
43.	Pre coated Sheets	Tata Blue scope, Multicolor steels, Interarch, Kirby, Tiger steel
44.	Lift	Kone/ Schindler/ OTIS/Mitsubishi/ ThyssenKrupp/Techno Indutries Ltd./ Orbis / Hitachi/

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		Omega/Johnson.
45.	Polyester Fibre	Recron 3S or approve by Engineer – in – charge
46.	Welding Rod	Advani, Philips, Sunarc, Eshab
47.	Fly ash Bricks	As approved by EIC / Consultant / Competent Authority
48.	Construction Chemicals	Fosroc, MC-Bauchmie, Sika, Pidilite, Roff, Perma
49.	Putty	J.K. white, Birla white, Berger
50.	AAC Block and jointing mortar	Aerocon, Magicrete, Biltech, Litecone, Ecolite, Xtralite, Ecogreen, Suryashree, Brixo, N J Eco, Accurate, Float, Aerocon, Wonder, Pravin, Satyam buildtech, Iolite, Ultratech, J K Smart, Fairmate . Make (autoclaved aerated block) as approved by EIC/Consultant.
51.	Drainage line network	NP 3 class RCC pipe or as approved by EIC.
52.	Water supply network	DI Pipes
53.	Glazed Tiles	H & R Johnson, Somani, Nitco, Cera, Bell, Kajaria, Asian
54.	(a) PVC Drainage lines (U-p.v.c. pipe (SWR) confirming to IS 13592 (Type “B”))	Astral, Supreme, Prince, Finolex, Ashirvad, Kisan/KSR, Laxmi, Dutron, Prakash, Jain .
	(b) PVC Rain water Pipes (U-p.v.c. pipe (SWR) confirming to IS 13592 (Type “A”))	Astral, Supreme, Prince, Finolex, Ashirvad, Kisan/KSR, Laxmi, Dutron, Prakash, Jain .
	PVC pipes (6 kg f/cm2)	Astral, Supreme, Prince, Finolex, Ashirvad, Kisan/KSR, Laxmi, Dutron, Prakash, Jain .
55.	Kitchen Sink	Nirali, Diamond, Cobra, Jayna
56.	C.P. brass screw down Bib trap/Piller cock/Stop cock conform to I.S. 781 – 1977- (wt. 400 gm.)	Prince, Jaquar, ESSCO, Plumber, CERA, Hindware or equivalent as approved by EIC.
Plumbing Items		
1	Cast Iron Pipes and Fittings (LA Class)	TISCO/KESHO SPUN Co. - Calcutta E.L.C. Standard approved manufacturers of any other brand of fittings having ISI marking.)
2	R.C.C. Pipes conform to I.S. 458	Indian Hume Pipe Co., Alcock Cement Products, Patel Spun (Surat)

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	- 1971	
3	G.I. Pipes conform to 1239 - 1968	Jindal,Tata,BharatSteelTube,Bombay,Zenith,G.S.T.Unik("C"Class)
4	G.I. Fittings	" R " Mark, Unik.
5	Gun Metal Valves (Heavy)	Leader Engineering Works, Jallandhar, Crown / prince - Surat Bombay Metal Co Annapurna Metal Work, Calcutta'Sant' brand, Jallandhar, L&K, Bombay metal & Alloy man. co. Bomaby, Premier,Aatco,Atlas,BR,BS,NN.
6	Brass fittings (Heavy)	Leader Engineering Works, Calcutta L & K Mathura, Crown / Prince - Surat Annapurna Metal Works, Calcutta, Perko, Kingstone Ark, EnclssWillians, Chilly, AquvaPlus,Nova,Kingstone,Driple, RanutrolHansa.
7	C.P. Fittings (Heavy)	Ego Metal Works, Ballabhgarh,; GEM, New Delhi; Soma Calcutta; Bilmet, Bombay 'ESSCO', Delhi. Rajka Metal Works, Delhi Eng. Co. Metal Works, Calcutta Everite, NU-Lite Navbhart Shalimar Crown, Prince
8	W.C. Pan / Wash basin / Urinals / flushing cistern	E.I.D. Parryware, Hindware , Neycer, Johnson, Parshurm, Jaquar, CERA
9	Flushing Cistern - Cast iron	Overhead - 'Nomos' 'ELCO' 'A-1'AUTOMATIC-EID Hindustan Sanitaryware, Calcutta, Nelson flush valve, SRIF(Agara), Parrys - Madras
10	E.W.C. Seats (solid)	E.I.D. Parry, Hindware, CERA, Neycer, Hindustan
11	Stainless Steel Sinks	Nirali, Diamond, Cobra
12	Mirrors	Atul Glass Works , Haryana Sheet Glass Vallabh Glass Works, Modi Float glass, Asahi, Saint Gobin
13	Plumbing / Sanitary Fixtures / Accessories	Jaquar, continetal, CERA, Hindustan sanitaryware / Parry India, Hindware, Kohlar, Rak.
14	C.I. Sluice valve, Check valves	Kirloskar, IVC,Burn,William Jacks, Indian Valve(IVC)
15	HDPE pipes	Duraline , Pennwalt Agru , Nocil, Jain, Supreme

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15A	Foam Core ECO Pipes	Astral, Ashirwad, Supreme, APL Apollo
16	Fibre reinforced R.C.C. Manhole Cover	Pratibha, CIDCO, Himalya, A-1 approved brand
17	C.I. Manhole cover with frame	ISI approved make
	(a)P.V.C. Pipes & Fittings	Astral, Supreme, Prince, Finolex
	(b)PVC water supply pipes (SCH – 80)	Astral, Supreme, Prince, Finolex
	(c) PVC water supply pipes (SCH – 40)	Astral, Supreme, Prince, Finolex
19	P.V.C. / H.D.P.E Water Tanks	As approved by EIC.
20	Ball Cock	GPA Brand by Govardhan Das Jullunder, L & K Brand by L. K. Industries Mathura, Sant Brand by Sant Press Metal Works Jullundhar
21	UPVC Pipes (Solvent Welded Joints)	Astral, Supreme, Prince, Jain
22	C.P.V.C. Pipes & Fittings	Astral, Supreme and Prince
23		
24	Fire Hydrant Valve & Air Valve, Scour Valve	ISI approved make
25	SWR Pipe	Astral, Supreme, Prince. Finolex
26	U.P.V.C. Borwell column pipes	Astral, Supreme, Prince, Ashirvad Pipes, Duke, Kisan, Precision.
Electrical Items		
1	Lift	Kone/ Schindler/ OTIS/Mitsubishi/ThyssenKrupp/Techno Industries Ltd./

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		Orbis / Hitachi/ Omega/Johnson.
2	Luminaries	Phillips/GE/Schredder, Crompton, Bajaj
3	Flexible CopperWires (FRLS)	R.R.Kable/Finolex/Polycab/Havells, Darshan plus/Avocab/Mecab
4	Switches and Accessories (Modular)	Anchor/Allwyn/Pointer/Vinay/Alex/Promot
5	Cable	Finolex/Torrent/Havells/KEI/RR Kabel/Polycab/Avocab
	ARMOURED Cables	CCI/Universal/Incab/Gloster/Tropodure
6	Pump Set	Kirlosker/Crompton/ Lubi/ CRI
7	MCB/ELCB/RCCB /Distribution Board / Change over switch / SFU/SDF/Motor Starter	Siemens/L&T/Hager/Havells/ABB/Legrand/C&S/Schneider/ IndoAsian/Standard/HPL
8	D.G. Sets	Engine : Cummins / Greaves / Kirloskar / Caterpillar Alternator : Crompton / KEC / Stamford
	Pump Set	Kirloskar, Crompton, Lubi
9	RIGID pipes & Accessories for concealed wiring	Finolex / Precision / Nihir / Polycab
10	Liquid Level Controller	GELCO/ OCLEG/ C&S/BCH/Siemens
	Earthing / Lighting Arrestor	E-link, Ashlok, Rip, Etp
11	LED Aviation Light	Alpha lite / AvidsTechnovators Pvt. Ltd
12	DWC Pipes	Rex / Gemini / Duraline
13	Street Light Pole (Octagonal)	Bajaj/ Transrail / Valmont
14	Ceiling and	Crompton /Orient/Havells/bajaj/Usha

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	Exhaust Fans	
15	Lamps	Philips/Crompton/Wipro/Surya
16	LED light	Phillips, Crompton, Bajaj
Fire System Item		
1	G.I. Pipe / Fittings	Jindal / Tata / Asian
2	Forged Fittings	VS/ JK/True forge/DRP
3	Cast iron butterfly valves	Audco/ IVC / Kirloskar / Fouress
4	Gun metal valves	Audco/ IVC / Kirloskar / Fouress
5	Wrapping & Coating tape	IWL /Coatek/Rustech
6	Epoxy Paint	Asian/ICI/Jenson & Nicholson
7	Hydrant valves & accessories	Nawage/ Essel / Aaag/Swati
8	Hose Pipes	Nawage / CRC /Essel
9	Hose Reel	Minimax / Newage/Essel
10	Flow Switch	System Sensor /Pootter/Honeywell/Rapid Control
11	Pressure Guage	Fiebig / Pricol / Bells control
12	Anti – Corrosive Material	IWL / Rustech/Euroclamp/Gripple/Chilly
13	Fire Pumps	Kirloskar / Crompton / KSB / Lubi
14	Fire Extinguishers	Safex / Minimax / Kenex

All above brands are suggested for use, however bidder can use equivalent material subjected to confirmation on the basis of testing as per relevant IS Code. Such equivalent material shall be approved by architect and engineer in charge.

Notes:

- a)** The Developer shall produce samples of the materials for approval of the EIC/PMC/Architect. The materials of the makes out of the above as approved by the EIC/PMC/Architect shall be used on the work.
- b)** In respect of materials for which approved makes are not specified above, these will be of makes to be decided by the EIC.

D. ISCODES:

IS Code No.	Subject
GENERAL	
IS 4082	Stacking & storage of construction materials and components at site – Recommendations
IS 1200	Method of measurement of building and civil engineering work.(All Parts)
IS 1141	Seasoning of Timber – Code of practice
EARTH WORK	
IS 3674	Safety code for excavation work
IS 1498	Classification and identification of soils for general engineeringpurposes.
IS 1200 (Pt-1)	Method of measurement of earth work
IS 1200 (Pt-27)	Method of measurement of earth work (by Mechanical Appliances)
IS 4081	Safety code for Blasting and related drilling operation
IS 4988 (Part-IV)	Excavators
IS 6313 (Pt-II)	Anti-Termite measures in buildings (pre-constructional)
IS 6313 (Pt-III)	Anti-Termite measures in buildings for existing buildings
IS 6940	Methods of test for pesticides and their formulations
IS 8944	Chlorpyrifosemulsifiable concentrates
IS 8963	Chlorpyrifos – Technical specifications
IS 12138	Earth moving equipments
MORTARS	
IS 269	Specification for 33 grade ordinary Portland cement
IS 455	Specification for Portland slag cement
IS 650	Specification for standard sand for testing of cement
IS 1269	Specification for 53 grade ordinary Portland cement
IS 1542	Specification for sand for plaster
IS 2116	Specification for sand for masonry mortar
IS 2250	Code of practice for preparation and use of masonry Mortar
IS 3025	Method of sampling and test for water
IS 3406	Specification for masonry cement
IS 3812 (Part-I)	Specification for flyash for use as pozzolana in cement mortar and concrete
IS 3812 (Part-II)	Specification for flyash for use as admixture in cement mortar and concrete
IS 8041	Rapid hardening Portland cement
IS 8042	Specification for white cement
IS 8112	Specification for 43 grade ordinary Portland cement
IS 1298	Methods of test for determination of free lime in portland cement
IS 6452	High alumina cement for structural use
IS 1489	Portland Pazzolana Cement
CONCRETE WORK	
IS 383	Specification for coarse and fine aggregate from natural source for concrete
IS 303	Coarse and fine aggregates from natural sources for concrete

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IS 2430	Methods for sampling of aggregates for concrete
IS 2386	Method of test for aggregates for concrete
(a) Part-I : Particle size and shape	
(b) Part-II : Estimation of deleterious materials and organic impurities	
(c) Part-III : Specific gravity, density, voids absorption and bulking	
(d) Part-IV : Mechanical properties	
(e) Part-V : Soundness	
IS 2505	General requirements for concrete vibrators – immersion type
IS 2506	General requirements for concrete vibrators – screed board concrete vibrators
IS 2645	Specification for integral water proofing compounds for cement mortar and concrete
IS 761 (Part-I)	Code of practice for extreme weather concreting (Part-I) recommended practice for hot weather concreting
IS 7861 (Part-II)	Code of practice for extreme weather concreting (Part-II) recommended
IS 9103	Specification for concrete admixtures
IS 460	Test sieves
IS 1607	Methods for dry sieving
IS 1834	Hot applied sealing compounds for jointing concrete
REINFORCED CEMENT CONCRETE WORK	
IS 1904	Structural safety of buildings, shallow foundation
IS 1893	Criteria for earthquake resistant design of structures
IS 432 (Part-I)	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement part-I mild steel and medium tensile steel bars
IS 432 (part-II)	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement part-II hard drawn steel wire
IS 456	Code of practice for plain and reinforced concrete
IS 516	Method of test for strength of concrete
IS 1199	Method of sampling and analysis of concrete
IS 1200 (Part-II)	Method of measurement of building and civil engineering work – concrete work
IS 1200 (Part-V)	Method of measurement of building and civil engineering work – concrete work (Part 5 – Form work)
IS 1566	Specification for hard drawn steel wire fabric for concrete requirement
IS 1599	Method of bend test
IS 1343	Code of practice for Prestressed Concrete
IS 1786	Specification for high strength deformed steel and wires for concrete reinforcement
IS 1791	Specification for batch type concrete mixes
IS 2502	Code of practice for bending and fixing of bars for concrete reinforcement
IS 2751	Recommended practice for welding of mild steel plain and deformed bars for reinforced construction
IS 4925	Batch plants specification for concrete batching and mixing plant

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IS 4926	Ready – Mixed Concrete
IS 6523	Specification for precast reinforced concrete door, window frames
IS 10262	Recommended guidelines for concrete mix design
IS 13311 (Part-I)	Indian standard for non-destructive testing of concrete. Method of test for ultrasonic pulse velocity
IS 13311 (Part-II)	Indian standard for non-destructive testing of concrete. Method of testing by rebound hammer.
IS 3370	Concrete structures for storage of liquids
IS 1568	Wire gauge for general purposes
IS 1139	Hot rolled mild steel and medium tensile steel deformed bars for concrete reinforcements
IS 2502	Code of practice for bending and fixing of bars for concrete reinforcement
IS 2751	Code of practice for welding of mild steel bars used for reinforced concrete work
STEEL WORK	
IS 226	Structural steel
IS 2062	Steel for general structural purpose
IS 800	Code of practice for use of structural steel in general in steel construction
IS 806	Code of practice for use of steel Tubes in general building construction
IS 816	Code of practice for use of metal arc welding for general construction in mild steel
IS 818	Code of practice for safety and healthy requirements in electric and gas welding and cutting operations
IS 822	Code of procedure for inspection of welds
IS 1038	Steel doors, windows and ventilators
IS 1081	Code of practice for fixing and glazing of metal (Steel and aluminium) doors, windows and ventilators
IS 1161	Steel tubes for structural purposes
IS 1200 (Pt. VIII)	Method of measurements of steel work and iron works
IS 1367	Technical supply conditions for threaded steel fasteners
IS 1821	Dimensions for clearances holes for bolts and screws
IS 2074	Ready mixed paint, air drying red oxide zinc chrome priming
IS 4736	Hot – dip zinc coating on mild steel tubes
IS 4923	Hollow steel sections for structural use – specification
IS 6248	Metal rolling shutters and rolling grills
IS 7452	Specification for hot rolled steel sections for doors, windows and ventilators
BRICK WORK	
IS 712	Specification for building limes
IS 1077	Common burnt clay building bricks
IS 1200 (Part 3)	Method of measurements of brick works
IS 2212	Code of practice for brick work (1 st Revision)
IS 3495	Method of test for burnt clay building bricks
IS 5454	Methods of sampling of clay building bricks
IS 13757	Specification of burnt clay fly ash bricks
IS 2691	Burnt clay facing bricks

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MARBLE WORK	
IS 1122	Method of test for determination of true specific gravity of natural building stones
IS 1124	Method of test for determination of water absorption, apparent specific gravity and porosity of natural building stones
IS 1130	Marble (blocks, slabs and tiles)
IS 4101 (Part-I)	Code of practice for external facing and veneers: Stone facing
IS 14223 (Part-I)	Polished Building Stones (Part-I) Granite
WOOD WORK AND P.V.C. WORK	
IS 204 (Part-I)	Specification for tower bolts (ferrous bolt)
IS 208	Specification for door handles
IS 287	Recommendations for maximum permissible moisture contents of timber used for different purpose
IS 303	Specification for plywood for general purposes
IS 401	Code of practice for preservation of timber
IS 453	Specification for double acting spring hinge
IS 710	Specifications for Marine Plywood
IS 1003 (Part-I)	Specification for timber paneled and glazed shutter Part-I (Door shutters)
IS 1003 (Part-II)	Specification for timber paneled and glazed shutter Part-II (Window and ventilator shutters)
IS 1200 Part-XIV	Method of measurement of building and civil engg. Work glazing
IS 1200 Part-XII	Wood work and joinery
IS 1328	Specification for veneered decorative plywood
IS 1341	Specification for steel butt hinges
IS 1659	Specification for block boards
IS 1823	Specification for floor door stopper
IS 1868	Specification for anodic coating on aluminum and its alloy
IS 2046	-do- Decorative thermosetting synthetic resin bonded laminated sheet
IS 2095	Specification for gypsum plaster board
IS 2202 (Pt I)	Specification for wooden flush door shutter, solid core type (plywood face panels)
IS 2209	Specification for mortice lock (Vertical Type)
IS 2547	Specification for gypsum plaster
IS 3097	Specification for veneered particle board
IS 3564	Specification for door closer (hydraulically regulated)
IS 3847	Specification for mortice night latch
IS 5930	Specification for mortice latch
IS 7196	Specification for hold fast
IS 8756	Specification for mortice ball catch for use in wooden almirah
IS 9308 (Part-II)	Specification for mechanically extracted coir fibres (Mattress coir fibres)
IS 12817	Specification for stainless steel butt hinges
IS 12823	Specification for wood products – Prelaminated particle Boards
IS 14900	Specifications for transparent float glass
IS 4021	Timber door, windows and ventilator frames.

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IS 2191	Wooden flush door shutters (cellular and hollow core type)
FLOORING	
IS 1200 (Part-XI)	Method of measurement of Building and Civil Engineering work (Part 11) paving, floor finishes, dado and skirting
IS 1237-Edition 2.3	Specification for cement concrete flooring tiles
IS 1443	Code of practice for laying and finishing of cement concrete flooring tiles
IS 2114	Code of practice for laying in-situ terrazzo floor finish
IS 3622	Specification for sand stone (Slab & Tiles)
IS 4457	Acid and / or alkali Resistant tiles
IS 5318	Code of practice for laying of hard wood parquet and wood block floors
IS 5766	Code of practice for laying of burnt clay brick floor
IS 13630 (Part-1 to 15)	Methods of Testing for ceramic tiles
IS 13712	Specification for ceramic tiles, definition, classification characteristic and marking
IS 15622	Specification for pressed ceramic tile.
ROOFING	
IS 277	Galvanized steel sheets (Plain and corrugated)
IS 651	Glazed stoneware pipes and fittings
IS 1200 (Pt IX)	Method of measurements of building and civil engineering work : Part-9 Roof covering (including cladding)
IS 1200 (Pt X)	Method of measurements of building and civil engineering work : Part-10 ceiling and lining
IS 2095 (Pt-1)	Gypsum plaster boards (Pt. 1) plain Gypsum plaster boards
IS 2935	Specification for flat transparent sheet glass
IS 459	Corrugated and semi corrugated asbestos cement sheet
FINISHING WORKS	
IS 1542	Sand for plaster
IS 1661	Code of practice for cement and cement-lime plaster finishes on walls and Ceilings
IS 1625	Code of practice for preparation and use of lime mortar in buildings
IS 2250	Code of practice for preparation and use of masonry mortars
IS 712	Building limes
IS 1635	Code of practice for field slacking of lime and preparation of putty.
IS 427	Distemper, dry colour as required
IS 428	Distemper, oil emulsion, colour as required
IS 6278	Code of practice for white washing and colour washing
IS 106	Ready mixed paint, brushing, priming for enamels for use on wood.
IS 102	Ready mixed paint, brushing, red lead, non- setting, priming
IS 123	Ready mixed paint, brushing, finishing, semi-gloss, for general purposes
IS 1477	Code of practice for painting of ferrous metals in buildings
IS 2074	Ready mixed paint, red oxide-zinc chrome priming
IS 2339	Aluminium paint for general purposes in dual container
IS 2932	Enamel, synthetic, exterior, type 1
	(a) under coating,

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	(b) finishing, colour as required
IS 137	Specification for ready mixed paint, brushing, matt or eggshell flat finishing interior to Indian Standard colour as required
IS 1131	Specification for enamel, interior
	(a) under coating
	(b) finishing.
IS 129	Specification for ready mixed paint, brushing, grey filler for enamel for use over primers
IS 533	Specification for gum spirit of turpentine (oil of turpentine)
IS 101	Methods of tests for ready, mixed paint, & enamels
IS 124	Specification for ready mixed paint, brushing finishing semi glossy for
(Part I) general purposes	
IS 2933	Enamel, Exterior
(a) Under Coating	
(b) Finishing	
IS 5410	Cement Paint
IS 5411	Plastic emulsion, Paint Part- I for interior use
IS 419	Specifications for putty for use in window frames
ROAD WORK	
IS 164	Ready mixed paint for road marking
IS 278	Specification for galvanized steel barbed wire for fencing
IS 1838 (Pt.1)	Specification for performed filters for expansion joint in concrete pavements and structures (non extruding and resilient type / bitumen impregnated fibre)
IS 73	Paving bitumen with bitumen felts
IS 73-1992	Specification for paving bitumen
IS 1203	Method of testing tar and bituminous material Determination of penetration
WATER SUPPLY, SANITORY INSTALLATIONS & DRAINAGE	
IS 771 (Pt.1)	Specification for glazed fire clay sanitary appliances : part 1: General requirements
IS 1703	Water fittings – copper alloy float valves (horizontal plunger type) – Specification
IS 1729	Cast iron / Ductile iron Drainage Pipes and pipe fittings for Over ground non-pressure pipe line Socket and Spigot Series
IS 1795	Specification for pillar taps for water supply purposes
IS 2326	Specification for Automatic Flushing Cisterns for Urinals (Other than plastic cisterns)
IS 2548 (Part-1)	Plastic seats and covers for water closets Part 1 : Thermo set seats and covers – Specifications
IS 2548 (Part-2)	Plastic seats and covers for water closets Part 2 : Thermoplastic seats and covers specification
S 2556	Vitreous sanitary appliances (vitreous chine) – Specifications
IS 2556 (Part-1)	Part-1: General requirements
IS 2556 (Part-2)	Paart-2 : Specific requirements of wash-down water closets
IS 2556 (Part-4)	Part-4 : Specific requirements of wash basins
IS 2556 (Part-6)	Part-6 : Specific requirements of Urinals & Partitions plates

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IS 2556 (Part-7)	Part-7 : Specific requirements of accessories for sanitary appliances
IS 2963	Specification for copper alloy waste fittings for wash basins and sinks
IS 3076	Specification for low density polyethylene pipes for potable water supplies
IS 4827	Specification for electroplated coating of nickel and chromium on copper and copper alloys
IS 4984	Specification for high density polyethylene pipes for potable water supplies
IS 4985	Unplasticised PVC pipes for potable water supply – Specifications
IS 7231	Plastic flushing cisterns for water closets and urinals – Specifications
IS 13983	Stainless steel sinks for domestic purposes – Specifications
IS 774	Specification for flushing cistern for water closets and urinals
IS 775	Specification for cast iron brackets and supports for wash basins and sink.
IS 778	Specification for cast copper alloy gate and check valves for water works.
IS 651	Specification for salt glazed stoneware pipes and fittings.
IS 3597	Method of test for concrete pipes
IS 1239	Mild steel tubes and tubulars
IS 1711	Self closing taps
IS 1726	Cast iron manhole covers and frames intended for use in drainage works
IS 1742	Code of practice for building drainage
IS 2065	Code of practice for water supply in buildings
IS 2470	Code of practice for design and construction of septic tank
IS 2693	Non-ferrous waste fittings for wash basins and sink
IS 4127	Code of practice for laying of glazed stoneware pipes
IS 4346	Washers for water taps for cold water services
IS 778	Gun metal gate, globe and check valves for water services
IS 7634	Laying and jointing for polythene pipes and PVC pipes (Part I to III)
IS 8008 Part I	Specification for injection Moulded HDPE fittings for potable to IV) water supplies
IS 3844	Code of practice for installation of internal fire hydrants in multi storey buildings
IS 780	Specification for sluice valves for water works purposes (50 to 300 mmsize)
IS 781	Specification for cast copper alloy screw down bib taps and stop valves for water services
IS 782	Specification for caulking lead
IS 909	Underground fire hydrant, sluice valve type – Specification
IS 2692	Ferrules for water services – Specification
IS 15450	PE-AL-PE Pipes for hot and cold water supplies – Specifications
IS 15778	Chlorinated Polyvinyl Chloride (CPVC) pipes for potable hot and cold water distribution supplies – Specifications

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IS 1230	Cast iron rain water pipes and fittings
IS 1626	Asbestos cement building pipes, gutters and fittings (Spigot and socket type)
IS 2527	Code of practice for fixing rainwater gutters and downpipes for roof drainage
IS 458	Pre-cast concrete pipes (with and without reinforcement)
IS 783	Code of practice for laying concrete pipes
IS 1728	Specification for Cast Iron Manhole Covers and Frames
IS 4127	Code of practice for Laying of Glazed Stone Ware Pipes
IS 12592	Pre-cast Concrete Manhole Covers and Frames-Specifications
IS 5382	Specification for rubber sealing rings for gas mains, water mains and sewers
IS 13592	Un-plasticized polyvinyl chloride (UPVC) pipes for soil and Waste discharge system for inside and outside building
ALUMINIUM WORK	
IS 733	Wrought Aluminum Alloys, Bars, Rods and Sections (For General Engineering Purposes) – Specification
IS 737	Wrought Aluminum and aluminum alloy sheet
IS 1285	Wrought Aluminum and Aluminum Alloy, Extruded Round Tube and Hollow sections (for General Engineering Purposes) – Specification
IS 1868	Anodic coating on Aluminum and its alloy – Specification
IS 1948	Specification for Aluminum Doors, Windows and Ventilators
IS 5523	Method of testing anodic coating on aluminum and its alloys
IS 6012	Measurement of coating thickness by Eddy Current Method
IS 6315	Floor springs (Hydraulic regulated) for heavy doors – Specifications
IS 6477	Dimensions of extruded hollow section and tolerances
IS 14900	Transparent Float Glass – Specifications
WATR PROOFING TREATMENT	
IS 3370 (Part 1)	Code of practice for concrete structures for the storage of liquid : Part-1 General Requirements