TENDER DOCUMENT

FOR REDEVELOPMENT / RECONSTRUCTION WITH DEMOLITION OF THE EXISTING BUILDINGS IN PREMISES

OF

COSMOPOLITAN-II CO.OP.HSG SOC LTD

(Registration No. N.B.O.M/CIDCO/H.S.G (O.H) 768/J.T.R/199-2000 dated 28.04.1999)

PUNIT PARK, PLOT NO.182 C, SECTOR-17, NERUL, NAVI MUMBAI - 400 607.

VOLUME - II

TECHNICAL SPECIFICATIONS

Serial No. : COSMO-2CHSL /

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To: _____

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TECHNICAL SPECIFICATIONS

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TECHNICAL SPECIFICATIONS

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VOLUME – II

SECTION NO. 1

TECHNICAL SPECIFICATIONS

FOR

BUILDING FOUNDATION, MASONRY & TERRACE

VOLUME – II	TECHNICAL SPECIFICATIONS	SECTION No. 1

BUILDING FOUNDATION, MASONRY & TERRACE		
Item	**Specification**	**Make**
Building Life Expectancy	The structure shall be designed considering life of **100** years	
Seismic factor	The bidder to consider the seismic factor for the design the structure of the buildings	
Soil Study	Bidder to conduct soil study from reputed institute, accordingly the foundation to be designed	
Structure	Earthquake resistant design for Zone III	
Roof /Terrace loading	In addition to design load considered for the terrace slab, the load of solar system panel & structure to be considered as 50 kg. per Sq.Mtrs. for the installation of RTPV	
Anti-Termite Chemical Treatment	Anti-Termite Chemical Treatment to the surrounding soil at foundation level with chemicals. Also apply anti-termite chemicals to the foundation and at later stage to the pillars & flooring. The Procedure & quality plan to be submitted by the successful bidder for the approval of Society. The procedure is to be followed as per the IS 6313(part-2).	Bayer, Pidilite, Syngenta
HDPE membrane with a pressure-sensitive adhesive, The water table level of our plot is @ 3 meters	Basements Rafts and Retaining Walls It is recommended to thick high density polyethylene (HDPE) membrane with a pressure-sensitive adhesive. this forms a bond with the wet concrete poured over it and becomes monolithic part of the structure. This prevents water ingress tracking between the unbonded membrane and structure	Reputed make
Building foundation	Raft foundation, **the foundation slabs are reinforced with double**	

	reinforcement i.e .	

Raft Foundation	**two steel bar meshes , one placed at the lower fibers and one at the upper fibers (minimum 300 mm thick)**. the design calculations of the raft slab shall be submitted to the society for verification The retaining wall shall be constructed on all side of the foundation raft to arrest soil erosion and enhancing aesthetic appeal. Raft foundation detail drawings , raft foundation detail plan area and section view in detail information, concrete cement ration and portion in foundation , reinforcement concrete detail etc. to be submitted to the society.	
Design Mix Concrete (Ready mix concrete)	Shall be in accordance with IS: 10262 & SP 23 with strength not less than as given in IS 456. The Design Mix will vary from M **35** & above for various structural elements.	Ultratech /ACC / Binani
Fusion bonded Epoxy coated Reinforcement TMT Bars OR Corrosion Resistant Steel (CRS) Bars	Fusion bonded epoxy coating reinforcement steel bars IS 13620 (2004) The test certificates of at least one batch shall be produced to the PMC/Society (Coating thickness/Impact test/Hardness test/Cathodic disbondment test/chemical Resistance test/Salt spray test /continuity of coating) . Rebar confirming to IS 1786. Fe 550 D /Fe 600 D grade TMT steel of Minimum dia. Size of 10 mm.	TMT bars: Metro Ispat, Guardian, JSW, TISCO / TATA steel
Masonry	As specified in IS 2185 (part 1,2 &3) and IS 2572. Cement: sand ratio should be 1:4 in Mortar. Internal Solid block / AAC Blocks masonry	

	wall with minimum 125 mm thickness	
External walls & End wall (open to atmosphere)	All the external walls must be constructed with MIVAN construction, brick construction is not acceptable.	
Concrete compaction and vibration	Concrete compaction Vibrators for all concrete slabs, columns & beams more particularly for all slabs. Please ensure Concrete compaction & vibrators to removing entrapped air voids and consolidating the mixture to enhance its strength and reduce permeability. Also concrete may be	
	tested at the specified laboratories (VJTI & IIT is preferred) in stages.	
Internal Plaster	Cement plaster to the internal surface of walls and ceiling shall be of 20 mm thick in two coats. The junctions between the masonry and concrete members will be provided with galvanized chicken mesh /24 gauge of 12 mm size projecting 50mm on either side of junctions. Bond coat should be applied on RCC surface before plastering.	
External Plaster (sand face)	Will be of 25 mm thick applied in two coats with water proofing compound. Bond coat should be applied on RCC surface before plastering. Recron or similar fibre to be added. Racking of joints before external / internal plastering	
RCC members below ground level	All the columns / beams shall be coal tar epoxy painted	

Waterproofing	All wet areas like toilets, sunken portions, terraces and exposed roof surfaces will be waterproofed. Performance warranty for a minimum of 10 years should be given.	
DPC	Damp Proof Concrete course in Foundation as per IS specification.	
Premises floor Tiling (Out side building)	checkered tiles to be laid around building	Reputed make
Exterior Paint on the building walls & Primers (minimum 10 years warranty of paint)	External wall paint Dirtproof, waterproof, high UV resistance, and anti-algae properties, crack-bridging ability Primers: of the same brand	• Asian Paints Apex Ultima Protek Duralife • Birla Opus Calista Neo Star Shine

		• B90 Ultra Luxury Waterproof Coating • Nerolac Excel Top Guard

A. TERRACE;

1. While designing roof of the building, the loading of 50 Kg / Sq. Mtrs., may please be added towards loading of the Roof Top Photovoltaic Solar System (RTPV).
2. Sufficient space to be provided for solar on grid system
3. RCC Parapet wall shall be four feet high and nine inch thick with drip moulding (with sufficient provision for drain water outlet pipe hole as per norms of NBC.
4. Parapet walls and handrails provided on the edges of roof terraces, podium, balcony, varandah and recreational floor shall not be less than 1.0m. and not more than1.2m.
5. Provision shall be made on parapet wall for fixing the dish antennas (steel structure), same provision shall be made on the top of the overhead water tank also.
6. Water Pipe / fire pipe line laying on terrace shall not make any obstacles.
7. Water proofing - Brick Bat Coba Water Proofing with china mosaic /or with a topping of two coats of water proofing paint / or suggest better option
8. Water proofing: As per technical Specifications with 10 years guarantee.
9. The slope on terrace to be maintained to drain complete water accumulation.
10. Door: Water resisting door shutter with locking facility shall be provided with granite frame.
11. Lights: Solar powered LED lights of reputed make to spread even illumination of minimum 100 LUX With motion sensor and timer.
12. Ladder to water tank & lift machine room.
13. Lightning arrester: As per Technical Specifications.

Water Proofing Treatment

i. Applying 2 coats of reputed make of chemical on the clean raw RCC slab and on all walls up to 2'6' ht as per manufacture's specifications.
ii. Work shall be tested by ponding method for 72 hours.
iii. Providing & laying necessary water supply and drainage pipes as specified.
iv. Providing & laying brick bat coba in cement mortar 1:5 with water proofing compound of reputed make as per specifications.
v. Applying 1coat of reputed make of W/P chemical in chased wall area before the pipes are laid.
vi. Applying final 1 coat of reputed make of W/P chemical floor and plastered wall surface up to 2'-6 height.
vii. Performance Guarantee for water proofing shall be for 10 years.

VOLUME - II

SECTION - 2

TECHNICAL SPECIFICATIONS FOR INTERNAL

LIVING ROOM, BEDROOMS, KITCHEN, LOBBIES & TOILET

A. Living Room

Item	Specification	Make
Height of Flats	All the flats of the society shall have a clear minimum height of 10 feet after flooring and plaster of the celling. This condition applicable to all floors	
External walls (open to atmosphere)	All the external walls must be constructed with MIVAN construction, no brick construction is acceptable.	
Internal Wall (Partition walls)	AAC/block construction	
Flooring	Vitrified tiles 800 mm x 800 mm / 600mm x 1200 mm or larger premium quality Fixed in cement mortar in 1: 4 proportion Joints to be fixed with epoxy grout of Approved /Reputed make Skirting will be done after laying of floor tiles.	Kajaria, AGL or HR JOHNSON
Foyer in living room	To be provided & included in the design of flat	
Skirting	4" the same material as use for Flooring. It shall be flushed with the wall. It bis to note that the skirting shall rest on floor tiles.	
Gypsum punning on walls	Gypsum shall be applied on cement plastered surfaces of walls. All corners / sharp edges of beams, column or walls should be smooth rounded off with gypsum, as approved by society	St Gobain – India Gypsum

Interior Paint on walls	3 coats of Premium- acrylic luxury Emulsion paint on the prepared surface of all sides of wall. PRIMER: same company primer to be used SHADES TO BE DECIDED BY DEVELOPER IN CONSULTATION WITH SOCIETY	Dulux – Velvet Touch / Asian Paints - Royale
Ceiling paint	3 coats of Premium acrylic Emulsion paint White Color on the prepared surface. 2 MS Hooks of appropriate size for Ceiling Fan & 1 / 2 hooks for chandelier to be provided.	Asian Paint/ Dulux
Main Door	40 / 45 / 50 mm (as per CFO requirement) thick Solid core pinewood flush door of 7' x 3'6" size with both side Veneer (3mm) with both side matt lamination polish, with heavy duty Brass hinges fitted with brass screws and all other necessary fittings such as SS Tower Bolt, SS safety chain, Kundi, Night latch, Magnetic Door Stopper & decorative handle all of Brass metal from both sides etc. Eye hole with 200 degree angle. Decorative Wooden Safety Door of same size with the above mentioned accessories to be provided.	Night Latch- Hafele / Yale / Godrej / EUROPA
Doorframe (Burma TEAK WOOD (BTW) FRAME or CP TEAK WOOD)	Doorframe should be of BTW with proper anti-termite treatment surface. Both, frame surface and wall should be properly treated for any future weather changes. Holdfast (4 nos.) should be put and has to be embedded with concrete. It shall be free from cracks. Doorbell shall be provided. The size of the door frame shall be 7 feet high & 3'6" feet wide	Solid Core Flush Door with decorative laminate finish. /

Door Video Phone	Wireless or Hardwired Video Quality - 1080p HD Night Vision – Infrared Audio – Two way Smart Platform integrations : Alexa, IFTTT, Google Assistant, Apple Home Kit AI: Person detection, facial recognition	Legrand, Godrej, Yale , Panasonic, Xiaomi & wipro smart wi-fi video doorbell
Anodised Aluminium Sliding (coloured) French Windows with Mosquito net- Netlon provision throughout section	Three/four track heavy section of minimum 27 mm and 16 gauge anodized Aluminium sliding windows with 5 mm clear / tinted brown color glass with interlocking arrangement resting on jambs, top should be Aluminium sub frame. Glass or stainless steel railing shall be provided and invisible grill can be provided above railing. The minimum height of windows shall be four feet Complete system shall be warranted for minimum 10 years against design & workmanship details The same specifications are applicable to all the windows of the buildings	Aluminium – Jindal / Geeta or based on Domal sections – 30mm Glass-Asahi / Saint Goblin **SS mosquito net**
Providing & fixing Window Jambs and Jamb liners	Granite Jambs on all four sides The Jamb liners to be provided to keep the window securely in place and to seal gaps and cracks, and for added insulation makes windows more energy efficient.	
Internet connectivity / internal CCTV	All rooms shall have fiber optic / cat 6 output for high speed fiber optic internet, which shall be fully fiber optic network and have provision for cable / dish TV, cable routing	
Ceiling fans	As per area (1 or 2 nos. as per size of the room)	Atomberg (Preferably), Havells, orient, Polycab, Bajaj, USHA,

		Crompton,
Air conditioner (Split AC)	1.5 Ton & 5 star rated high wall units Outdoor unit fixing brackets for AC and opening in wall for Ac piping in wall.	Daikin / Mitsubhishi / Carrier / LG / Hitachi
Electrical (Concealed)	Only ISI approved copper wires of 1.5 sq mm for lighting circuits, 2.5 sq mm for power circuits and 4.0 sq mm for AC or Geyser circuits through PVC conduits. Separate conduits for TV Cable / Internet / Telephone with adequate spacing to be provided at appropriate locations. All the wires / cables shall be fire resistant	Wires – Polycab / Kei – FRLS type / Havells India / R R Kabel Conduits – Precision / prince – heavy duty
	Sufficient no. (As approved by society.) Modular switches) & 20 / 16 / 6 Amp. Power points.	Switches – Legrand – Myrius / Anchor – Roma
	Main supply after Electric meter shall be through ELCB Room wise MCB shall be provide	L&T, Snider & Legrand
	Developer to provide sleeves in RCC for drain pipe and cable / copper tubing for split Air Conditioners	Proper routing of the AC drain to the nearby terrace drain and further to be connected to the GROUND water recharges or to the bore well. (Rain water harvesting)

B. KITCHEN :

Item	Specification	Make
Providing & Fixing Door Frame	**Granite frame shall be provided**	
<u>Providing & Fixing Door Shutter</u>	• Approved make 35mm thick solid core Green flush door, with both sides 4mm thick natural teak veneer/laminate factory finished & lapping on all sides. • Approval make S.S. butt hinges with S.S. pin, fixed with S.S. screws • Approved make S.S. handle CSSM 14, mortise lock CLB 10, brass cylinder CCY 22 from outside, bolt latch CBL 09 & round button CBL 13 from inside • Reputed make 12" long S.S. (304 grade) tower bolt. • Reputed make Magnetic door stopper. • Finished with Melamine Polish.	
Door Frame	The door frame shall be black granite, 5.5 inch wide, double patti, moulded on edges or chamfering	
Flooring	Vitrified tiles of min 800 mm x 800 mm Fixed in cement mortar in 1: 4 proportion	As per living room or society's decision
Dado	Dado on all walls till up to full height Fixed in cement mortar in 1:3 proportion Joints to be filled with epoxy grout of reputed make	RAK, Kajaria, AGL, H R Johnson Epoxy grout make: Asian paint, Weber saint gobain, MYK Laticrete
Wall Finish	Cement plastered – rough to receive tiles	FULL LENGTH TILES ENVISGAGED ON ALL WALLS
Ceiling	Same as Living Room	

Kitchen Platform	Platform in granite either L shaped or parallel counters as approved by individual flat owners with fascia in front – molded vertical partitions in Indian sandwiched / thick marble, (12"X12") 300 mm x 300 mm ceramic tiles below counter. The granite platform shall be 27" wide, with patti (one inch above platform) to protect spilling of water.	**Telephone Granite**
	Height of the platform = 850 /900 mm (3')	
	Stainless steel sink from Nirali 28" x 22" x 10", or approved make shall be provided, with all fittings	
	Kitchen shall have an extra tap for borewell water	
	Provision shall be made for dishwasher and washing machine. With water taps/connection	
	One water purifier Aqua guard	
	12'' x 12'' ivory color ceramic tiles below the kitchen platform on all the periphery of platform.	Kajaria / H R Johnson/ Nitco
	Additional Water taps for water purifier, Washing Machine and dish washer to be provided along with necessary angle cocks	
	Sink water tap – long neck – swivel type with pull out.	Jaquar
DRY Balcony attached to the KITCHEN	Utility space for washing machine with pipe & water connection.	
Mahanagar Gas Limited Gas pipe line, Gas meter	Appropriate location for GAS meter (mostly outside flat at the entrance of flat / lobby) Gas leak detector to be provided	

Flush Door	35 mm thick Flush door with both side laminate, with heavy duty Brass hinges fitted with SS screws and all other necessary fittings such as handle and mortice lock from both sides etc. CFO norm shall be followed.	Mortice lock – Godrej / Ozone / Enox
Provision for Refrigerator & dish washer in platform.	Kitchen platform to be designed to accommodate Refrigerator & dish washer	
Window	Heavy section Aluminium sliding / openable Anodised windows with 5 mm clear color glass with interlocking arrangement resting on frame of similar material as that of dado on all four sides. Window jambs specification as per Living room and applicable to all French windows	Aluminium –Jindal / geeta or domal type Glass-Asahi / Modi / Saint Gobain
LOFT	One full length concrete loft 24" wide to be provided	
Provision of LPG Line	Mahanagar Piped gas line on the counter. LPG meters should be installed at a free FSI area for all the flats at a common location. LPG gas connection pipe line should also be provided in kitchen.	
Provision of ducting for chimney	Necessary opening in the wall to be provided for exhaust and routing to be designated.	
Plumbing	All internal plumbing work should be concealed. Pipes and fittings used for plumbing should be of CPVC pipes **Providing & Fixing Nahani Trap** PVC trap with cockroach proof jail should be fixed in floor with proper PVC outlet, sealed with Approved chemical mixed in cement. Master Stop Cock (Isolating valve) to stop the water supply during any repairing work	CPVC – Astral / Prince/ Finolex

	Extra tap for borewell water to be provided.	
Electrical (Concealed)	Same as Living Room (Addl. Plug point for Small Devahara)	Wires – Polycab / Kei – FRFS type / Havells India / R R Kabel
	One no. of Ceiling fan	Atomberg (Preferably), Havells, orient, Polycab, Bajaj, USHA, Crompton,
	Exhaust Fan of appropriate size – 200 mm sweep, with louvers, to be provided in the window	Havels, Orient or equivalent
	Min. 10 electrical points to be provided)	20 A/16A/5A
Modular kitchen	The developer shall provide modular kitchen which will consist of tandem units, pull out trolleys, shutters, overhead storage units for L shaped and parallel counters measuring 14 feet in length. Hardware (Soft closing type channels, tandem , soft closing type hinges) shall be from Hafele or equivalent as approved by society. All shutters shall be from marine grade plywood. Finished in hi-gloss laminates. It shall be provided with chimney from Glen, Faber, Kaff along with a 4 burner Hob from Faber, Kaff. Water purifier from Aquaguard or Kent	Godrej /

C. Master bed room

ITEM	SPECIFICATION	MAKE
Flooring	Same as living room / Marble/Wooden as per choice of	

	society	
Skirting	4" thick same tile as use for flooring flushed with the wall	
gypsum punning on walls	Same as living room	
Paint on walls	Same quality as Living Room	
Ceiling	Same as Living Room	
Flush Door (solid)	35 mm thick Flush door – pinewood with both side 1mm laminate, with heavy duty Brass hinges fitted with SS screws and all other necessary fittings such as, Door Stopper & handle and mortice lock etc.	Handle / lock – Godrej / Enox/ Ozone/Century
Door Frame	The door frame shall be black granite, 5.5 inch wide, double patti	
Windows	Heavy section Aluminium sliding anodized windows with 5 mm clear/ colour tinted glass with interlocking arrangement resting jamb as specified in living room.	
Grills on all the windows & Balconies	No box type grills are envisaged in this project. Stainless Steel Exterior Invisible Balcony Grill is envisaged and to be provided by the successful bidder.	
Electrical (Concealed)	Power supply point provision for 1.5 ton AC. / Tube / Fan / Light / TV /Computer (Min 12 points to be provided 6 Amp plug point. Telephone / TV Cable conduit & switches to be provided. Two way switches shall be provided in each bedroom to control one light point and one fan point. Provision for WI fi broadband connection	Same as living room

Ceiling fans	As per area (1 or 2 nos.)	Atomberg (Preferably) Havells, orient, Polycab, Bajaj, USHA, Crompton,
Air conditioner (Split AC)	1.5 Ton & 4/5 star rated high wall units Outdoor unit fixing brackets for AC and opening in wall for Ac piping in wall.	Daikin / Mitsubhishi / Carrier / LG / Hitachi
Wardrobe	2 door wardrobe with sliding doors, upto full height shall be provided. Length of wardrobe shall be 7 feet. It shall be made with 19mm marine plywood from Anchor, Greenply, Century and finished in veneer from Green or Natural Veneersor solid color in laminates from Greenlam, Formica, Marino – 1mm thick as approved by society. It shall have a drawer 100 mm high. The depth shall be 600mm i.e. 24".Inside finishing of wardrobe shall be in 1mm thick. HP laminate including edge finishing. All required ironmongery like spring loaded hinges, soft closing channels drawers from Hettich, Hafele, locks. Etc. complete	Godrej
LOFT	L shape One full length concrete loft 24" wide 4" thick to be provided (covers two wall)	

D. **Master Bed Room Attached Toilet / Bathroom :**

ITEM	SPECIFICATION	MAKE
Flooring (Concept Tiling)	12" X 1 2" Anti- Skid vitrified (Premium quality), water and scratch-resistant, flame finish stone as approved by society, slope to be maintained to the nahani trap	Kajaria / HR Johnson

"Under pinning" under bathroom walls	4" rich mix concrete under bathroom walls is a must provide.	
Dado (Concept Tiling)	1' x 2' or larger vitrified Tile (Premium quality) up to ceiling height (Glossy).	Kajaria/ H R Johnson
Bathroom fittings	Single lever diverter mixer with head shower & hand shower	Jaguar / kohler
EWC	Wall mounted P trap EWC with all fittings like concealed flush tank, soft closing seat cover, brackets, PVC connector, angle cock, 2 way Bib Cock with health faucet, Nahani trap with cockroach repellent S.S. Jali etc. Toilet paper holder Option to be given to the flat owner for Indian toilet seat (Provision to be made for one such toilet)	EWC- Jaquar / Hindware
Plumbing	All internal plumbing work should be concealed. Pipes and fittings used for plumbing should be of CPVC SDR 11 Master Stop Cock (Isolating valve) to stop the water supply during any repairing work	Astral /prince
Electrical (Concealed)	one Points (20 Amp), 1 Exhaust fan (6A), 2 light (6A) All the cables/wires should be as mentioned in the Technical specification.	Wires – Polycab / Kei – FRFS type / Havells India / R R Kabel
Water storage heaters (Geysers)	One Number instant geyser, with 25 Amp MCB, supply point.	Spherehot / Racold / Bajaj / Havell
Counter	Table top or semi recessed type wash basin. With all accessories / cabinet of appropriate size & color	Same as EWC

Water Proofing Treatment	• Providing rich cement concrete M 25 grade, 50 mm with water proofing compound. • Applying 2 coats of reputed make of S/P chemical on the clean raw RCC slab and on all walls up to 2'6' height as per manufacture's specifications. • Work shall be tested by ponding method for 72 hours. • Providing & laying necessary water supply and drainage pipes as specified. • Applying 1coat of reputed make of W/P chemical in chased wall area before the pipes are laid. • Applying final 1 coat of reputed make of W/P chemical floor and plastered wall surface up to 2'-6 height. • Performance Guarantee for water proofing shall be for 10 years. • 4" rich mix concrete under bathroom walls is a must provide.	
Plumbing Accessories	Single lever diverter mixer with thermostat Overhead shower/ hand shower / spout / two in one Bib cock with health faucet / Angle cock / Stop Cock / gate valve / tall boy basin pillar cock as per society's requirement	Jaquar, vignette prime, Opal,
Bathroom door	Fiber Reinforced Plastic door (FRP) and keyless cylindrical lock.	Permafinish doors
Door Frame	The door frame shall be black granite, 5.5 inch wide, round molding with facia	
Exhaust fan	Exhaust fan to be fitted in window	Havels, Orient or equivalent
Toilet / Bathroom Window	Aluminium frame and glass ventilators with mosquito repellent net (louvered windows / openable with marble sills.) With opening for exhaust fan.	
M.S. Grill	Reputed make/design	
Accessories	Towel Rack/ Robe Hook / glass mirror/Soap	

	dish	

E. **Bedroom Other than Master Bedroom :**

Item	Specification	Make
Flooring	Same as Master Bedroom No. 1	
Skirting	Same as Master Bedroom No. 1	
Gypsum Punning on walls	Same as Living Room	
Paint on walls	Same as Living Room	
Ceiling	Same as Living Room	
Flush Door	Same as Living Room	
Door Frame	Same as Living Room	
Window with Mosquito Netlon	Heavy section Aluminium sliding anodized windows with 5mm clear /tinted color glass with interlocking arrangement resting on 18 mm thick Granite frame on all four sides.	Aluminium – Jindal / Geeta Glass – Asahi / Modi / Saint Gobain
M.S. Grill / invisible grill (No box type grills are envisaged in this project)	Same as Living Room	
Electrical (Concealed)	Same as Living Room with Telephone / TV Cable conduits & Switches Concealed	
Ceiling fans	As per area (1 or 2 nos.)	Atomberg (Preferably) Havells, orient, Polycab, Bajaj, USHA, Crompton,
Air conditioner	1.5 Tn 4/5 star rated high wall units from	Daikin / Mitsubhishi / Carrier /LG / Hitachi
wardrobe	Same as master bedroom	
LOFT	One full length concrete loft 24” wide to be provided	

F. **PASSAGE / LOBBY (inside flat)**

Item	Specification	Make
Flooring	Same as Living Room	
Full dado up to ceiling	Vitrified glazed tiles	Kajaria , HR Johnson
Skirting	Same as Living Room	Skirting
POP Punning on walls	Same as Living Room	
Paint on walls	Same as Living Room	
Ceiling	Same as Living Room	

G. **Common Toilet / Bathroom**

Item	Specification	Make
Flooring	1' X 1' anti-Skid vitrified Tile (Premium quality)	Same as master toilet
Dado	2' x 1' vitrified Tile (Premium quality) / up to ceiling height	Same as master toilet
EWC	European WC with concealed flush tank, bib cock angle cock, Nahani trap etc Option to be given to the flat owner for Indian toilet seat (Provision to be made for one such toilet)	Same as master toilet
Plumbing Accessories	Single lever diverter mixer Overhead shower/ hand shower / spout / two in one Bib cock with health faucet / Angle cock / Stop Cock / gate valve / tall boy basin pillar cock as per society's requirement	Jaquar, vignette prime, Opal,
Plumbing	All internal plumbing work should be concealed. Pipes and fittings used for plumbing should be CPVC Master Stop Cock (Isolating valve) to stop the water supply during any repairing work	Same as master toilet

Wash Basin	Same as master bathroom	Same as master toilet
Door	35 mm marine grade flush door	Same as master toilet
Door frame	Same as master bathroom	Same as master bathroom
Window	Al. frame and glass ventilators with mosquito repellent net	Same as master toilet
Accessories	Towel Rack/ Robe Hook / glass mirror/Soap dish	Same as master toilet
M.S. Grill	Same as Living Room	
Water storage/instant heaters (Geysers)	One No. , 25 Amp MCB	Spherehot / Racold / Bajaj / Havell
Exhaust fan	Exhaust Fan of appropriate size	Same as master toilet
Lofts	Lofts shall be provided above toilets to the members who desire the same.	
Additional wash basin outside bathroom:		
Wash basin in passage and cabinet with mirror, Napkin holder and soap dish / stand		

VOLUME - II

SECTION – 3

PROVISIONS OF MAHARERA FOR SENIOR CITIZENS AND DIFFRENTLY ABLED PERSONS

PROVISIONS OF MAHARERA FOR SENIOR CITIZENS AS PER MAHARERA CIRCULAR DATED 02.02.2024

Also refer Chapter - 13 of UDCPR 2020 for differently abled persons and apply scrupulously all the provisions while designing of the building;

A. Building Design

i. All buildings of more than one floor must be provided with lifts that are suitably equipped to accommodate users requiring assistance and using wheelchairs and similar equipment/mobility tools.

ii. All the internal and external design of building spaces should consider the free movement of wheelchairs.

i. Door openings (between jambs) should not be less than 900 mm in width.

ii. Preferably sliding windows should be used

iii. Easy to grip door knobs and lever types handles of large size to be used

iv. Ergonomic design of furniture specific to the requirements of senior citizens.

v. Furniture should be lightweight, sturdy and without sharp edges

B. Green Building Principles

i. In order to minimize the exposure of senior citizens to the fumes and exhaust arising from combustion of fossil fuels, it is desirable that there should be maximum (near -total) use of non-polluting and renewable energy sources in the building.

ii. The norms defined in chapter 10 and 14 of model building bylaws 2016 should be complied with fully.

C. Lifts and Ramps

i. All lifts must have audio and visual signage and signaling systems and to accommodate users requiring assistance and using wheelchairs and similar equipment/ mobility tools.

ii. Mandatory ramps to be incorporated into throughout the building to provide for wheelchair access

D. Staircase

i. Provision of clear width not less than 1500 mm.

ii. Handrails should be fitted on both sides of stair flights.

iii. Treads and risers should be as per the standards prescribed in the harmonized guidelines applicable to senior citizens

iv. avoid long flights of steps; in no case with more than L2 treads in a single flight.
v. Projecting nosing and open stairs should not be provided to minimise the risk of stumbling. Spiral stairs should be avoided.
vi. Illuminated / fluorescent / radium strips should be installed on all stairs to act as guides, especially in low light and night time conditions.
vii. Specification of lighting and ventilation of staircases as per NBC.
viii. Handrails should be extended12 inch at top and bottom of the staircase and ramps. Ends of handrails should be rounded.

E. Corridors

i. Steps should not be introduced into corridors. If change in level is unavoidable, then ramp may be provided.

ii. Where there is difference in the floor level, the steps must be distinguished with contrasting strips on the edges.

iii. It is essential to provide handrails along the walls on either side of the corridor, at suitable heights above the floor level.

F. KITCHEN

I. The design of kitchen shall be as per NBC with natural lighting and ventilation
II. Mandatory gas leak detection system shall be installed in all kitchen and rooms with attached kitchen.

G. Bathrooms

1. Wash basins should be provided with provision of grab rails.
2. Toilet paper roll dispensers should be able to withstand heavy loads and hand rail shall be provided near commode.
3. Bathrooms must have anti-skid tiles.
4. Bathrooms shall be provided with outward opening doors so bathrooms can be accessed in an emergency when the senior citizen is inside the bathroom.

H. Lighting and Ventilation

(i) Power back up facilities to be provided in each apartment of the building and with mandatory connection in bathroom and kitchen

(ii) The lighting and ventilation for all buildings and components to be in compliance to MBBL and NBC.

(iii) Advocate lightings in the common areas including corridors, lobby and lifts to be supplied undisrupted electricity with power backup facility

I. Safety and Security

- Incorporate alarm system in the premises, especially with separate switches in main entry doors, bathroom, bedroom and common areas.
- Emergency alarm and lights controls at bedside and bathrooms near toilet

Seat.

- Appropriate safety measures in all electrical equipment
- Properly trained and skilled security personnel at all required locations to be deployed. Security guard(s) shall be deployed at ground floor at each entry and exit gate(s) with access to intercom facilities and basic telephone facilities.
- Security personnel(s) to restrict trespasser in society, entry passes for all visitors including service providers to be issued.
- CCTV cameras to be installed on each floor of the premises near lift area and in all the common areas, lobbies/ reception all the gates, parks, etc. Surveillance of these CCTV footage to be monitored on regular basis by the security personnel(s).
- Emergency fire-fighting services, disaster preparedness for evacuation to be provided.
- Emergency and important contact numbers should be provide to all residents and displayed in all common areas i.e. outside lifts.

SECTION – 4

TECHNICAL SPECIFICATIONS

FOR

DOMESTIC WATER SUPPLY, PUMP HOUSE, STORAGE TANKS, PIPING, VALVES

VOLUME - II	**Domestic Water Supply/ pump house / storage, Piping, valves etc.**	SECTION - 4

Domestic Water Supply/ pump house / Storage, Piping, valves etc. :

Item	Specification	Make
Water in-take pipe line to Under ground storage tank	Should be of CPVC of sufficient dia. As specified by the NMMC or Galvanized pipes of reputed make, which can withstand the pressure of intake. The size & nos. of supply line will be decided by the NMMC, inline with the water requirements. CPCV CLASS – ¾ PIPES, IS 4985:2000	C PVC – astral / prince Galvanized pipes of *Jindal, TATA or* reputed make
Overhead Tank drainage line to be connected to the water recharge pit (rain water).	UPVC pipes – low noise /cast iron pipes GI pipes	UPVC pipe – Astral / Prince Galvanized pipes of reputed make
Water meters	Nos. of supply line & Pipe diameter as decided by NMMC Preferably separate connection for each wing or building	Stainless steel / Brass Kranti water meters, Captain or any other reputed make.
Discharge Pipe line, bends, socket/coupling, nipple, union joints, TEE, Reducers, pipe clamps etc.	Should be of UPVC of sufficient dia. As specified by the NMMC or Galvanized pipes of reputed make (not to be laid along length of the terrace to avoid obstacle and clear space for solar on grid power system) UPCV CLASS – 6 PIPES, IS 4985:2000	UPVC pipe – Astral / Prince Galvanized pipes of reputed make
Valves CI/GM	Gate / Globe valves / Ball valves/Butterfly valve/Air valves / NRV's	L&T, Leader valves

Overhead Tank	RCC / Water proof tank with capacity of one day storage and Separate water to store Bore Well Water for the Toilet flushing. Separate tank for fire fighting in each wing	
UG Tank	RCC / water proof tank shall have two days storage Provision of separate tanks for each wing for NMMC water and separate meters.	
Pump House	Separate building for pump house for each wing or building to be constructed at ground floor, can be placed exactly above Underground tank	
Trenches	Piping layout through trenches with concrete/fiber cover, 40 mm steel grating or SS grating	
Pumps & motor	With approved capacity Pumps With one standby for each wing tank (2 x 100%) Furnish the data sheets of the motor / pump sets chosen for this project	Pump: Crompton, Jyoti, Kirloskar, Grundfos, Havells Motor: KEC, Bharat Bijlee, Crompton, Jyoti
Three Phase water pump starters	Three phase, 415 V, heavy duty starters	L&T, Crompton, Havells
Water Level Controller with DOL Digital Starter, for overhead & underground water tanks	Fully Automatic Water Level Controller with Dry Run Protection Refer section 7 of Volume II I	Complete water level controller system of reputed make
Interconnection pipe line with each over head water tank & valves	Should be of UPVC of sufficient dia. as specified by the NMMC or Galvanized pipes of reputed make UPCV CLASS – 3/4 PIPES, IS 4985:2000	Valves : Leader valves, Forbes, Kirloskar & L&T
Electric supply Board / panel in Pump house	Switch gear / Starters	Crompton, Siemens, L&T & Cutler Hammer

Bore well	a. Construction of <u>new borewell</u> Following process to be carried out for the construction of deep bore well **i.** Groundwater exploration (Bore well survey) <u>ii. Bore well drilling</u> iii. Bore well endoscopic Camera scanning. The bore well depth shall be deep enough to fulfill the water requirement of the Society (High or medium capacity bore well) Deep Bore has a casing diameter of 6 inches or more. The specification as mentioned in the following IS CODE for bore well to be followed scrupulously. The IS 2800 (Part 1): 1991 "Code of Practice for Construction and Testing of Tubewells/borewells", and IS 8110:2000 "Well Screens and Slotted Pipes", are to be followed. Casing pipe shall be of mild steel conforming to IS Code 4270:2001. However, in areas where borewells are known to give water with high levels of TDS (>1000ppm), chlorides (>500ppm), high acidity (pH <6) the casing pipe and screens made of corrosion resistant material like PVC and alloy steels shall be used (refer IS:12818:2010 Unplasticized polyvinyl chloride (PVC-U) Screen and casing pipes for Bore/ tubewells – specification) b. The Existing well will be provided with the pump and necessary pipe arrangement to satisfy the additional requirement of flushing & cleaning	

	water (with interconnection from main line). The depth of the same may be increased to cope with the additional requirement c. One Tap of bore water will be provided at Gr. Level for gardening & car wash purpose. Water softener to be provided, as per capacity as decided by society. The existing bore well shall be drilled to fulfil the requirement of the water flushing d. With a provision to collecting rainwater through appropriate storage facilities, such as rain barrels or underground tanks to increase ground water level.	

VOLUME – II

SECTION - 5

TECHNICAL SPECIFICATIONS FOR SOCIETY OFFICE, FITNESS CENTER & SECURITY ROOM

VOLUME – II	TECHNICAL SPECIFICATIONS FOR SOCIETY OFFICE, FITNESS CENTER & SECURITY ROOM	SECTION No. 5

A. Society Office :

Item	Specification	Make
Flooring	2' x 2' vitrified floor tiles of approved shade and design	H R Johnson / Kajaria
Skirting	3'' thick same tile as use for flooring flushed with the wall	H R Johnson / Kajaria
Gypsum punning on walls	Gypsum on plastered surface of walls. All corners/sharp edges, of Beam, Column or walls should be smooth rounded off with gypsum.	
Paint on walls	3 coats of Premium paint on the prepared surface of all sides of wall	Asian paint – Royale / Dulux – Velvet Touch
Ceiling	3 coats of Premium paint on the prepared surface.	Asian paint – Royale / Dulux – Velvet Touch
Window	Heavy section Aluminium sliding Anodized windows with 5 mm clear color glass with interlocking arrangement resting on 18mm thick marble/Granite frame on all four sides. 1.5 Tr AC to be provided by Developer.	Aluminium – Jindal / Geeta Glass-Asahi / Modi /Saint Gobain.
Flush Door	Flush door with both side laminate with heavy duty Brass hinges fitted with S.S. screws and all other necessary fittings such as Tower Bolt, Kundi, handle from both sides etc.	
Personal Computers	Two branded personal computers, with printer come scanner	DELL/HCL

Electrical	ISI approved Copper wires of appropriate size through PVC conduits conceal Shall be provided with DVR, 42" flat screen display for CCTV monitoring Air conditioner min 1.5 Tn Additional electric points for computer & printer Ceiling fans – 2/3 fans as the case may be and one table fan	Polycab / Havells Luminaries- Phillips/ Havells Orient, Havells
	Modular switches (White color) with LED Light fittings & ceiling fan to be provided by Developer.	Anchor ROMA
Ceiling fans	As per area (1 or 2 nos. as per size of the room)	Atomberg (Preferably), Havells, orient, Polycab, Bajaj, USHA, Crompton,
Air conditioner (Split AC)	1.5 Ton & 4/5 star rated high wall units Outdoor unit fixing brackets for AC and opening in wall for Ac piping in wall.	Daikin / Mitsubhishi / Carrier / LG / Hitachi
LOFT	Full length loft of 24" width on two side walls	
Fix Furniture	2'0" ht. Overhead storage units placed on the loft on two sides of the office, made of good quality 18mm thick commercial ply bounded with 1mm thick laminate. Internal sides of the unit and internal part of the door shutters should be polished. It shall be fitted with all other necessary fittings such as hinges, bolts, brush steel handle & locks	
Almirah	Four steel Almirah	Godrej or any other reputed make as approved by the Society

Loose Furniture	2 New brand office table with lock & key arrangement. 12" X 8" size Letter Box outside the Society Office Room. & 1 no. of Aluminium Ladder (Ghoda) of 15' ht. One oval shape table for committee meeting, having capacity of 14 persons	Table – Godrej Chairs revolving
Drinking water provision	One Aquaguard /Kent water purifier	
Attached Toilet	Same as Room Toilet specifications Wash Basin with mirror	

B. Fitness center :

Item	Specification	Make
Flooring	2' X 2' vitrified floor tiles as approved shade and design by society, wherever required wooden flooring / PVC flooring / sports grade flooring as decided by society shall be provided.	H R Johnson / Kajaria
Skirting	4" thick same tile as use for flooring flushed with the wall	
Gypsum punning on walls	Gypsum as plastered surface of walls. All corners / sharp edges of Beam, Column or walls should be smooth rounded off with Gypsum	
Paint on walls	3 coats of Premium emulsion paint on the prepared surface of all sides of wall.	
Ceiling	3 coats of Premium emulsion paint on the prepared surface	

Window	Heavy section aluminum sliding windows with 5 mm clear / tinted color glass with interlocking arrangement resting on 18mm thick Granite frame on all four sides. Provision for air conditioned zones.	Aluminium – Jindal / Geeta Glass – Asahi / Modi / Saint Gobain
Toilet	Separate for Ladies & Gents (with urinals) Mirror, wash basin etc. As specified elsewhere	
Flush Door	Flush door with both side laminate, with heavy duty Brass hinges fitted with S.S. screws and all other necessary fittings such as Tower Bolt, Kundi, handle from both sides etc.	
Electrical	ISI approved Copper wires of appropriate size through PVC conduits Sufficient no. (as approved by society) Modular switches (White / colour) with Light fittings.	
Amenities	Fully equipped gymnasium with tread mill, elliptical, weights, dumbbells, multi gym equipment An indoor game area for table tennis, carrom etc. which can be converted into Yogalaya, garden area with jogging/walking track, kids play equipment at terrace.	
Loose Furniture	As required zone wise	
Air Conditioners	Tonnage & Numbers to be decided after sizing of the fitness center.	Daikin / Mitsubhishi / Carrier / LG / Hitachi
Ceiling fans	Sufficient numbers to cover whole area	Atomberg (Preferably), Havells, orient, Polycab, Bajaj, USHA, Crompton

C. SECURITY ROOM		
Item	**Specification**	**Make**
Flooring	Kotah tiles of Approved shade and design	
Skirting	3" thick same tile as use for Flooring flushed with the wall	
Exterior Paint on walls & Primers (minimum 10 years warrantee)	External wall paint Dirt proof, waterproof, high UV resistance, and anti-algae properties, crack-bridging ability Primers: of the same brand	• Asian Paints Apex Ultima Protek Duralife • Birla Opus Calista Neo Star Shine • Nerolac Excel Top guard
Electrical Wires	ISI approved Copper wires of appropriate size through PVC conduits	Polycab / havells Luminaries- Phillips/ Havells
Electrical fixtures	Sufficient no. (as approved by society) Modular switches (White / color) with Tube Light fittings & ceiling fan CCTV monitoring / camera console / security intercom	Anchor ROMA /
Window	Aluminium sliding anodized windows with 5 mm clear glass with interlocking arrangement resting on 18mm thick marble / Granite frame on all four sides.	Aluminium – Jindal lass – Asahi / Modi / Saint Gobain
Ceiling fans	One or two as per size of room	Atomberg (Preferably), Havells, orient, Polycab, Bajaj, USHA, Crompton
Flush Door	Flush door with both side oil paint with heavy duty Brass hinges fitted with s. s screws and all other necessary fittings such as Tower Bolt, Kundi, handle from both sides etc.	

Furniture	2’0” ht. storage units placed along the periphery of all sides of all wall, made of good quality 18mm thick commercial ply bounded with 1mm thick laminate. Internal sides of the unit and internal part of the door shutters should be polished. It shall be fitted with all other necessary fittings such as hinges, boltage, brush steel handle & locks. One Wash basin with Mirror to be provided.	

SECTION – 6

TECHNICAL SPECIFICATINS

FOR

LIFT LOBBIES, STAIRCASES & ENTRANCE LOOBIES, REFUSE AREA

VOLUME - II	TECHNICAL SPECIFICATINS FOR LIFT LOBBIES, STAIRCASES & ENTRANCE LOOBIES	SECTION – 6

A. LIFT LOBBY		
Item	**Specification**	**Make**
Flooring	Green Kota stone – without Polished of 1'' thick (color will be decided in consultation with the Society.)	
Dado on staircase wall	Full height, matt finish ceramic tiles, as approved by society.	
Ceiling	3 coats of paint on the prepared surface.	Asian paint – Royale/ Dulux velvet Touch / Burger
False ceiling	As approved by Society, to cover firefighting piping	
Electrical	ISI approved copper wires of appropriate size through PVC conduits	Polycab / Havells
Electrical Switches	Sufficient no. (As approved by society.) Modular switches (white color) with light fittings	Anchor ROMA /Havells

B. STAIRCASE		
Item	**Specification**	**Make**
Flooring	Green Kotah stone – without Polished of 1'' thick on trade and riser and also on mid landing with antiskid strips. Edges should be half round molded. Or restile vitrified slabs	
Dado on staircase wall	Full height, matt finish ceramic tiles, as approved by society.	
Railing	Teak wood / SS pipe hand rail as approved by society.	

Support Railing on wall for senior citizens	Stainless Steel pipe hand rail as approved by society (preferably SS 304)	
Ceiling	3 coats of Apex Ultima paint on the prepared surface.	Asian paint/Nerolac/ Damanis
Electrical	ISI approved copper wires of appropriate size through PVC conduits	Polycab Luminaries-Phillips/ Havells
	Sufficient no. (As approved by society.) Modular switches (White color) with Tube light fittings.	Anchor ROMA
Window	Louvered structure for fresh air ventilation / top hung openable ribbon glazing	

C. **Entrance Lobby**		
Item	**Specification**	**Make**
Flooring	Italian Marble /vitrified slabs pattern of approved shade and design	
Dado	Full ht. Italian Marble / vitrified slabs same as Flooring	
Gypsum punning on walls	Gypsum on plastered surface of walls. All corners/sharp edges, of Beam, Column or walls should be smooth rounded off with gypsum	Full wall tiles to be provided in Lobbies
Paint on walls	3 coats of Premium luxury acrylic emulsion on the prepared surface of all sides of wall	Asian paint – Royale / Dulux – Velvet Touch
Ceiling	3 coats of Premium paint on the prepared surface.	Asian paint – Royale / Dulux – Velvet Touch
Electrical	ISI approved copper wires of appropriate size through PVC conduits	Polycab / Havells Luminaries-Phillips/ Havells

	Sufficient no. (as approved by society) Modular switches (White color) with LED light fittings. Access Controlled Shall be covered with CCTV Module of Video door phone	Anchor ROMA
Notice Board	Notice Board of appropriate size with Glass cover & Locking system in each wing of the Bldg.	
Name Plates of flat owners	Decorative name plates of uniform size with letters embossed on it will be placed on the walls of entrance lobby as approved by society.	

REFUSE AREA: Provision as per Chapter 9 of UDCPR 2020

Section 9.29.6 Refuge Area

For buildings more than 24 m. in height, refuge area of 15 sq.m. Or an area equivalent to 0.3 sq.m. Per person to accommodate the occupants of two consecutive floors, whichever is higher, shall be provided as under:

The refuge area shall be provided on the periphery of the floor or preferably on a cantilever

Projection and open to air at least on one side protected with suitable railings.

a) For floors above 24 m. and up to 39m. height-One refuge area on the floor immediately above 24 m.

b) For floors above 39 m height-One refuge area on the floor immediately above 39 m. and so on after every 15 m.

Refuge area provided in excess of the requirements shall be counted towards FSI. However, area remained in excess because of planning constraints, shall not be counted in FSI, provided, such excess area does not exceed 100% of the required refuge area.

VOLUME - II

SECTION: 7

TECHNICAL SPECIFICATION
FOR
WATER SUPPLY, WATER TANKS, WATER LEVEL CONTROLLER SYSTEM

TECHNICAL SPECIFICATION OF WATER SUPPLY TANKS, WATER LEVEL CONTROLLER SYSTEM

a) WATER TANKS (FOR EACH WING / SEPARATE BUILDING)

One overhead separate water tanks for NMMC water and one overhead separate Boring water tank with separate connections. One fire fighting water tank (separate or partitioned) for each wing In addition to this wing wise one underground water tank for NMMC water. (Refer section -4 of Volume- II, Technical specification)

Water Tank capacity (wing wise or Building wise):

a. Overhead Tank : one day stock for each wing / bulding, consumption to be calculated as per NMMC norms (NMMC water)
b. Underground Tank: Two days stock – double the over head tank (NMMC water). The under ground tank shall be common to whole complex or one under ground tank for each building or wing.
c. Separate water tank for firefighting purpose as per fire department's norms & standards.
d. All the overhead tank drains shall be provided with valve and drain line to be connected to the terrace / sewage drainage line.
e. Proper vents to be provided on each over head tanks

Waterproofing of underground water tank/s;

i. It is recommended to thick high density polyethylene (HDPE) membrane with a pressure-sensitive adhesive. this forms a bond with the wet concrete poured over it and becomes monolithic part of the structure. This prevents water ingress tracking between the unbonded membrane and structure
ii. Fusion bonded Epoxy coated Reinforcement BARS
iii. Cement based polymer/acrylic modified highly flexible *waterproof* coating
iv. The inner portion shall be fitted with white tiles on complete wall in full
v. Considering water table the external portion after water proofing shall be fitted with shahabadi farshi / tile

Water Pumps ;

- Drinking water (NMMC) supply pumps / wing or Building : one running & one standby water pump(2 x 100% capacity)
- Bore well Water pump : One running & one standby (2 x 100% capacity)
- Fire fighting pump : Refer fire fighting section

Water level controller System: AUTOMATED WATER MANAGEMENT IN BUILDINGS WITH 3-PHASE PUMPS

The water management & monitoring is to be done manually as well as through electronic water tank level controller. The provisions are provided to start/stop pumps manually from the pump panel/starter, in addition to this pumps also have an 'automated control' option on their panel, besides the manual control. This option allows an external controller to signal them to be turned ON/OFF. When the manual option is not used, an external controller, typically a Direct Digital Controller (DDC) would have to be used to perform this automated control activity. Such a DDC would have to be fed with information from sensors about the water level from various tanks and would use that information to control the pump(s), by using its connection to the pump panel.

So typically, this system entails the following:

- 2 Digital Water level (float) sensors for the lower tank(s) – one triggers by min level and the other by max level
- 2 Digital Water level (float) sensors for the upper tank(s)– one triggers by min level and the other by max level
- A Direct Digital Controller (DDC) that connects to the 3-phase Pump Panel and to these sensors

This is a wired system where a twisted pair connects the DDC with the various sensors. The distance that can be covered is almost 300m between the sensors and the DDC, which would effectively address even most high-rise deployments.

The DDC logic is automated to operate as follows,

- If the upper tank has water at or below its minimum level, while the lower tank has water above its min level, the DDC will operate the pump ON
- If the upper tank has water at or above its max level, then the DDC will operate the pump to be OFF
- If the lower tank has water below its minimum level then the DDC will operate the pump to be OFF irrespective of the situation of the upper tank.
- If the setting on the pump is set to Manual, then the DDC cuts off the automated operation of the pump, but still displays both the water tank levels

VOLUME - II

SECTION – 8

TECHNICAL SPECIFICATION: MISCELLANIOUS

VOLUME - II	TECHNICAL SPECIFICATION: MISCELLANIOUS	SECTION - 8

Miscellaneous		
Item	**Specification**	**Make**
Paint to Building Exterior /stilt /podium area	Durable, weather-resistant paints like 100% acrylic emulsion, ensuring proper surface preparation, and applying multiple coats for optimal protection/weather shield and aesthetics with ABP primer with minimum 10 yrs. Warranty of shade fading. Water proofing coat should be applied before paint coat.	1. Asian Apex Ultima/Dulux Power Flex/ weather shield max 2. Birla Opus
Stilt Area	The parking area and pathways shall be finished in heavy duty concrete interlocking paver block / vacuum dewatered concrete. Sufficient light & Ventilation to be maintain.	
Podium Area	Same as stilt area	
Electric Meter Room	As per the N M M C / MSEDCL suppliers governing rules	
Letter Box	12'' x 8'' size decorative wooden polish letter box fixed from outside of the main door of each flat. OR at Common at entrance lobby	
EPABX Facility – security intercom / door videophone	EPABX system – security intercom to be provided free of cost to all existing members connected with Security Cabin as per society. Multi apartment type Door videophone shall be provided	Legrand / Commax as approved by society
External Site Development	The landscape proposal will be of low maintenance plantation.	

Compound Wall	Concrete wall for side & rear periphery of the plot of 8' height	Reconstruction of rear compound wall and side wall towards plot no. 182 B & D
Main Gate	Designed Cast Iron decorative gates with paint finish with lighting mast on top of the gates pillar. (large for vehicular movement and small wicket gate for pedestrians or as per the final layout agreed by the society)	
External Signage Board	Decorative Name plate publishing Society name should be put on the signage board with proper lighting.	
Waste Disposal Management – Organic Waste Converter (OWC)	As per the provisions of the UDCPR	
Terrace	Garden landscape not required. The terrace is kept free for Solar power system	
Podium Garden	The developer to design a landscape garden on podium top, with children play area, jogging track, Gym.	
Grey water treatment	Grey water shall be treated and reused for flushing, gardening, misc. usages	
STP – Sewage treatment Plant	Design, Supply, Installation, Testing & Commissioning of sewage treatment plant (STP) with Membrane Bio Reactor (MBR) OR Sequencing Batch Reactor (SBR) technology of capacity as approved in sanction for environmental clearance. Sewage treatment plant/solid waste management, size & type will be finalized after Environmental Clearances, accordingly the successful bidder to fulfil the requirements.	

SECTION –9

TECHNICAL SPECIFICATION FOR LIFTS / ELEVATORS

LIFTS specification:

a) Approved make machine room, good cum passenger lifts, for 16 person capacity (1088 kg) shall be provided with proper internal dimension to accommodate stretcher.
b) Number of lifts provided will as per NBC (National Building Code) and NMMC rules.
c) All the Lifts shall be provide with the following facilities:
   - ❖ Door with a clear opening for stretcher movement.
   - ❖ S.S. Hairline finishes on walls with mirror on rear wall to aid people on wheel chair to see behind without turning around.
   - ❖ Black sea floor finish.
   - ❖ S.S. grab bar placed horizontally at proper height from floor level, on all the three sides of the lift.
   - ❖ Call button outside & inside the elevator with clear (no objection) floor space for a person on wheel chair to access it.
   - ❖ Control panel inside the lift placed at a height approachable to a person on wheel chair.
   - ❖ LED lights, Ceiling fan, Emergency phone & siren switch
   - ❖ Voice announcement system along with visual display to indicate floor levels.
   - ❖ CCTV dome type camera
   - ❖ Annual Maintenance Contract of Lifts for minimum of one year excluding guarantee period.
   - ❖ The lift shall reach to the nearest floor after power failure or any break down.

Reputed approved make

- Kone Elevator Company (India) Limited.
- Schindler India Private Limited.
- Mitsubishi Elevator India Private Limited.

IS CODE FOR ELEVATORS / LIFTS

IS 14665: Part 1: outline dimensions of *lift* cars for passenger, goods, service and hospital *lifts*. The corresponding well sizes, pit depth, headroom.

IS 14665 Part 2: CODE OF PRACTICE FOR INSTALLATION, OPERATION AND MAINTENANCE

Elevators : Minimum two high speed lifts for each wing (Passenger cum goods lift, accommodate stretcher)		
Item	**Specification**	**Make**
Passenger /stretcher and goods lift	Minimum 2 nos. of high speed elevator of min. 16 passenger capacity (infra-red door curtain, Fireman's switch, 2 way communication system and Automatic rescue device with SS hairline / mirror or other finish in SS. **It shall have wireless CCTV camera** Each lift shall be fitted with side railing for senior citizens One lift shall accommodate Stretcher service elevator with vandal proof finishing.	Mitsubishi / Schindler / Kone
Fire lift	At least one elevator shall be fire lift and both lifts to have alternate power supply	

SECTION – 10

TECHNICAL SPECIFICATION

FOR

DIESEL GENERATOR SET

VOLUME - II	**TECHNICAL SPECIFICATION FOR DIESEL GENERATOR SET**	SECTION - 10

Scope:

Diesel Generator sets as a back-up power to be provided (standby auxiliary). The DG set must be star labelled for the housing society to cater load of lifts, water pumps, premises common lighting. The three phase Diesel Generating sets consisting of a Reciprocating Internal Combustion engine driven by diesel as fuel, Alternating Current (A.C.) generator, any associated control gear, switchgear and auxiliary equipment.

Noise Level: As per the norms of the Indian Central Pollution Control Board (CPCB) diesel generator sets (DG) shall comply with noise standards of less than 75 dBA and has to be tested following the ISO 8528 standard for noise level. These generators are manufactured with acoustic enclosures to get optimum performance of noise level and power. Specially designed to meet stringent MoEF/ CPCB norms of 75 dBA @ 1mtr at 75% load under free field conditions

Engine:

Four Stroke, multi cylinder, radiator cooled engine

Well designed air handling system with Dry type, Replaceable paper element air cleaner with restriction indicator Air to air aftercooling, The Engine shall have closed loop lubricating system.

Optimised turbocharger for increased altitude capabilities

Best in class fuel economy with

— Inline fuel pump with A1 class mechanical governing / Electronic governing

— Spin on fuel filter

Standard integral set-mounted radiator system, designed and tested for 50°C ambient temperatures

Full flow spin on lube oil filter

First fill of lube oil and coolant

Electrical starter motor with soft start engagement feature

Battery charging alternator 1 X 12 V DC battery

Silencer

Critical grade silencer suitably optimized to meet stringent sound emission standards laid down by MoEF / CPCB

Alternator

Brushless type, Screen protected, Revolving field, Self excited alternator conforming to IS/IEC 60034-1

Better motor starting capability, Best in class efficiency, Compact design with sealed bearings for longer life and lesser maintenance

Impregnation on all wound components for better mechanical strength

Fuel Tank 250 Ltr. 1st Fill of Lube Oil & Coolant. Battery, AVM Pads, Std.

Control Panel With Microprocessor Controller With Engine Safeties & Protections. Residential Silencer.

With KRM Unit & AMF Logic Panel – (A Type) - only Auto Start & Stop.

Mounting Arrangement :

Engine and alternator are mounted on a common MS fabricated base frame with AVM pads.

Base frame with integral fuel tank is provided with drain plug, air vent, inlet and outlet connection, level indicator and provision for cleaning

Star Rating:

"Star rating or star level" means the grade of energy efficiency based on specific fuel consumption (SFC) in g/kWh (electrical unit), displayed on the label of the generating set. The five star rating for DG set has been envisaged for this project.

Certifications (Mandatory):

Provide diesel engine driven generator sets certified test record of the following final production testing:

i. Safety shutdown device testing
ii. Voltage regulation

Wiring Diagrams (Mandatory):

Submit wiring diagrams for diesel engine driven generator units showing connections to electrical power panels, feeders, and ancillary equipment. Differentiate between portions of wiring that are manufacturer installed and portions that are field installed.

Mandatory:

- Manufacturer shall submit test report of engine and alternator as per Indian Standard IS 10000, IS 10001 & IS 4889: 1968. However if engine & alternator are tested more stringently (compared to IS 10000, IS 100001 1980, IS 13364 & IS 4889: 1968), then the parameters where the greater stringency has been applied should be declared by the manufacturer in the test report.
- Bidder shall submit *Central Pollution Control Board (CPCB)* compliance report/certificate for complete DG set.
- Bidder shall submit BIS certificate for diesel engine.

TECHNICAL SPECIFICATION FOR Automatic mains failure (AMF) PANEL (For DG & Engine)

1) The AMF shall start the DG set in case of AC mains failure and transfer the load from normal

source to diesel generator without any human intervention. Similarly on restoration of mains supply it shall be able supply and switch off the DG automatically.

The AMF panel shall be equipped with following minimum instrumentation:

a) Microprocessor based relay with composite meter for digital display of:

i. AC mains Voltage & Generator Voltage

ii. Generator Current

iii. power Factor

iv. Output KW meter

v. Output AC frequency meter

vi. RPM indication

vii. Over speed indication

viii. Engine hours indication (Cumulative)

b) Mode selector switch for setting the panel on any one position such as OFF or Auto/manual/Test. The operation of the DG set shall be possible in aby of the modes.

c) Engine ON/OFF switch (push button type)

d) Emergency Stop switch(push button type)

e) ON delay timer for load change over

f) ON delay timer for engine shut off.

g) Suitable battery charger complete with voltage regulator, float or booster selector switch, on- off switch, digital voltmeter and ammeter for charging the battery from mains operating

240V/50 Hz

h) MCCB of suitable rating

i) Two no. contactors of suitable rating (one for DG set and one for AC mains) with overload relay.

j) Under voltage relay for Mains

k) Instrument and control fuses.

l) Any other switch, instrument, relay, or contactor etc. essential for smooth and

trouble-free functioning of DG set with AMF panel.

2) Standard colour codes and numbered ferrules shall be used for wiring the AMF panel. Sensing and control relays shall be of continuous duty, industrial control grade type. The transfer breaker shall be rated for continuous duty. The breaker shall be interlocked to ensure non-paralleling SEB power supply and DG supply.

3) Following indication lamps for purposes mentioned as under shall be provided in AMF Panel;

i) Pilot indicating lamp for the following.

a) Mains ON

b) Alternator ON

c) Charger ON/OFF

d) Breaker ON/OFF

e) Main LT Supply ON/OFF

TECHNICAL SPECIFICATION FOR AMF PANEL (For DG & Engine)

ii) Visual annunciation shall be provided for set shut down due to:

a) Engine overheating (HCT/HWT)

b) Low oil pressure (LLOP)

c) Low fuel level

d) DG failed to start in 30 secs after receiving the first start impulse

e) DG Over-speed trip

f) DG Overload

DG Set Mode of Operation

Operation of DG set shall only be allowed when the selector switch is Manual/Automatic/Test positions. Moving the selector switch to the OFF position shall in the properly shut down the generator set, remove it from the AC loads and inhibit it from starting in any mode. The DG set shall be capable of operation in the following modes;

Start Operation

a) Auto mode

b) Manual mode

c) Test mode

Auto mode

In the 'AUTO' mode, the DG Set shall start on receipt of control input from Automatic Mains Failure (AMF) panel (Auto changeover from MSEDCL to DG Set and vice versa by using) . The automatic start shall try the start-up of the generator set for three successive attempts. If the primary AC returns during the start-up attempt, the start-up sequence shall be stopped.

All required cabling, interconnection like extension of control cables from existing PIU/IPMS or

contractor supplied AMF to DG set shall be provided by the Contractor to support the above controls. If at any time during operation of the generator set the selector switch is set to 'OFF' position, the generator shall shut down and be disabled from starting.

Manual Operation

When the control switch is in "MANUAL" position, the generator set can be started using the manual

start push-button on the control panel. The generator set will be stopped by setting the control switch

back to the "OFF" position or by pressing stop button on the AMF panel. During manual operation, all

main and AC source breakers must be operated manually to transfer load to or from the generator set.

Test Mode

A test operation of DG set shall be possible by putting the control switch in "TEST" position from where the generator shall initiate an automatic start, just as if there had been a power interruption to the primary power. Upon removal of the selector switch from "TEST" position, the generator shall initiate an automatic shutdown sequence. However, there shall be interlock such that Main circuit breaker of DG set is in 'OFF' condition while the engine is started in "TEST" position.

TECHNICAL SPECIFICATION FOR AMF PANEL (DG & Engine)

Construction features:

1) The enclosure shall be fabricated out of CRCA sheet of minimum 1.6 mm thick.

2) The AMF panel shall be indoor type, floor/wall mounted (as per site conditions), dust and vermin proof in sheet steel construction.

3) All incoming and outgoing power and control cables shall be from the bottom or back side.

DG set specification:

Fuel Type	Diesel
Phase	3 Phase
Star Rating	5 Star
Power Factor	0.80 lagging
Rating	- - - kW

Frequency	50 Hz
Insulation class	H
Cooling system	Air Cooling
Electric Battery	12 VDC
Noise Level	< 75 dBA

Battery Charger (Voluntary):

The battery charger shall be readily accessible and designed that it shall not be damaged and shall not trip its circuit protective device during engine cranking or it shall be automatically disconnected from battery during cranking period. The charger shall be mounted inside the emergency generator enclosure. The charger shall have a 7-day/24- hour timer control.

Fault Indicators (Mandatory):

Individual press to test fault indicator lights for low oil pressure, high water temperature, low water level, over speed, over crank, and for aboveground storage tank and high and low fuel level shall be provided. Provide relay dry contacts for interface of fault alarms with SCADA system.

Circuit Breaker (Mandatory):

A generator circuit breaker shall be installed as a manual load circuit interrupter and an automatic overload and short circuit protection device should be used to interrupt load circuit.

Testing Procedure:

The testing procedure for specific fuel consumption norms under standard and labeling program for DG sets with Diesel engines conforming to IS 10001 (< 19 kW) and alternator conforming to IS 4889 is proposed as under: -

a. The DG set will be set up as per the standard procedure of the manufacturer and connected to the standard electrical load. Earthing shall be provided as per IS 3043: 1987.

b. DG set shall run on 100% loading for 15 minutes after reaching thermal stability (as defined clause 8.7 of IS/IEC 60034 part 1: 2004). Then DG set load shall be gradually reduced to 75%

load. After reaching 75% loading, 0.8 Power Factor and normal ambient conditions, fuel consumption and other parameters shall be recorded for 4 hours at an interval of 30 minutes each. Average SFC of 4 hours will be considered for test result.

c. The data will be recorded as per the parameters given in Annexure I. The kWh will be taken from power analyser / Energy meter.

Mandatory Submission:

- Operation & Maintenance Manual – 2 copies
- All the circuit diagram drawings
- Any other drawings, documents
- Required O & M/mandatory spares and consumables

Codes & Standard

The D G Set confirms to the following codes & Standards

- **ISO 8528 : Certification of Diesel Generators: Noise, Vibration, and Temperature Measurements**
- **IS 10001 ; Diesel engine for AC generator.**
- **IS 13364 (Part 1) : 1992 (Reaffirm to 2003)- AC GENERATORS DRIVEN BY RECIPROCATING INTERNAL COMBUSTION ENGINES**

Specification Value – Data Sheet for Diesel Generator Package

Specification	Value
DG Set complete unit	
KVA Rating @ 0.8 Power Factor	
Control Panel (Manual/Automatic)	
Size - Length × Width × Height (mm)	
Fuel Tank Capacity (litres)	
Radiator capacity	
Specific Fuel Consumption (SFC) in g/kWh	
Ambient Temperature	
ENGINE	
Engine Model	MAKE: KIRLOSKAR, preferred
Gross Power 100% (100%) hp	
Rated Output (HP)	

Type (Stroke)	
Rated RPM	
Cooling (Water cooled/Air cooled)	
Cylinders- Bore × Stroke	
Governing System (Mechanical or any other type shall be mentioned by Manufacturer)	
Turbocharger (type)	
Exciting/Starting system (Applicable only if DG set includes a battery starter)	
Battery Capacity (Ampere Hour)	
Battery Rated DC Voltage	
Alternator	
Make	STAMFORD preferred
Type (Synchronous or any other type shall be mentioned by Manufacturer)	
No. of Phases (Electrical)	
Rated kVA	
Rated Frequency (HZ)	
Rated Voltage (V)	
Rated Current (AMP)	

FOUNDATION DRAWING AND BASE PLATE DRAWINGS TO BE PROVIDED

VOLUME - II

SECION – 11

SPECIFICATIONS FOR FIRE FIGHTING SYSTEM

Fire Fighting System

The High rise building is envisages in the redevelopment project of the society. The rules & regulations as established by the National Building Code, firefighting and the state / Central government are to be followed scrupulously. The provisions as made in the said regulations shall be made applicable in to our redevelopment project.

As per National Building Code, the building/s should have Smoke Detectors, Sprinklers, First Aid Fire Fighting system, PA system, Adequate water supply, Fire pumps, Fire escape routes, Fireman Lift, Service shaft enclosures, compact mentation, approved electrical system, refuse area etc.

1. The bidder shall abide to the National Building Code and should have the

   Following built-in fire fighting features and equipment:

   - Wet riser: a vertical pipe connected to the water tank built underground
   - Down comer: vertical pipeline for overhead tank
   - Dry riser: vertical pipeline kept dry at all times so the water doesn't freeze (if applicable).
   - Hydrant: horizontal pipeline connected to the water tank.
   - Water tanks: Underground water tank (capacity between 50,000 to 2,50,000 litres) and terrace water tank (capacity between 10,000 and 20,000 litres).
   - Automatic and manual fire alarm systems.
   - Fire detection system.
   - Manual/automatic sprinkler system.
   - Fire extinguishers (All purpose)
   - Standby generator as an alternate power source (to run corridor lights, pressurization fans, blowers, etc).
   - 2-way communication for evacuation scenarios.
   - Public address system
   - Escape routes
   - Illuminated exit signs

- First aid fire fighting appliances
- Hose reels and boxes
- Dedicated pump house for fire fighting pumps

Staircase provisions and rules

According to the fire safety rules for high-rise residential buildings, each high-rise building should have two staircase exits with a width of 1 to 2 metres so that there's no panicked rushing in case of an evacuation. One of the other staircases can be used as a fire escape route if the fire has broken out in one.

The staircase should be enclosed, properly ventilated and not be made to extend to the basement (a separate staircase should lead from ground to basement) to stop fire and smoke from spreading.

Fire doors should be made with 2-hour fire resistance and placed on escape routes and at the entrance of the lift lobby and staircase.

2. All the fire fighting systems shall be duly approved by the Chief fire officer of the Navi Mumbai Municipal Corporation. The successful bidder shall obtain No objection certificates from NMMC prior / after installation of the system.

3. As per Sec-3(3);Rule 4(2) of Maharashtra Fire Prevention & Life Safety Measures Act-2006, make available Form-A &/or Form-B Certificate (as the case may be) from authorized Licensed agency regarding Fire-Fighting & Fire-Protection system/equipment stipulated/installed on the premises.

4. The successful bidder to furnish the file to the society containing the copies of all the documents / drawings (in original) submitted to Chief Fire Officer for approval & obtaining necessary no objection certificates (NOC's), Form A & Form B and any other documents (if any). The bidder to submit two sets of as built drawings / all piping drawings in original to the society.

5. The fire fighting system shall have following systems / Equipment's, additional systems / equipment's as approved by the Chief Fire Officer, NMMC to be provided/supplied.

(A) Pump Room & Courtyard Hydrant Equipment's and Accessories;

i. Supply, Installation & Testing of Commissioning of Electric Motor driven Main Pump set (single / multi stage) rated, 415V, 50Hz, 3Phase In Suction Back Pull out Foot mounted Centrifugal Main Pump. The discharge of pumps (LPM), Head (Mtrs.) & speed to be decided during the design of the system. (Kirloskar Make / Grundfos make).

ii. Supply, Installation & Testing of Commissioning of Electric Motor driven Jockey Pump set rated 415V, 50Hz, 3Phase. In Suction Back Pull out Foot mounted Centrifugal **Main Jockey Pump.** The discharge of pumps (LPM), Head (Mtrs.) & speed to be decided during the design of the system. (Kirloskar Make / Grundfos make).

iii. Supply, Installation & Testing of Commissioning of Electric Motor driven Main Pump set rated 415V, 50Hz, 3Phase In Suction Back Pull out Foot mounted Centrifugal **Sprinkler Pump.** The discharge of pumps (LPM), Head (Mtrs.) & speed to be decided during the design of the system. (Kirloskar Make / Grundfos make).

iv. Supply, Installation & Testing of Commissioning of Electric Motor driven Jockey Pump set rated 415V, 50Hz, 3Phase In Suction Back Pull out Foot mounted Centrifugal **Sprinkler Jockey Pump.** The discharge of pumps (LPM), Head (Mtrs.) & speed to be decided during the design of the system. (Kirloskar Make / Grundfos make).

v. Supply, Installation & Testing of Commissioning of Electric Motor driven Booster Pumpset rated 415V, 50Hz, 3Phase complete with all accessories coupled with TEFC Motor mounted on common MS Frame **Booster Pump.** The discharge of pumps (LPM), Head (Mtrs.) & speed to be decided during the design of the system. (Kirloskar Make / Grundfos make, Teromax Make).

vi. Supply, Erection, Testing & Commissioning of **MCB** (as per designed current rating) with Box for Booster Pump.

vii. Supply, Installation, Testing, and Commissioning of **Electrical Control Panel Wall Mounted** for fire **Main Hydrant Pump, Main Jockey Pump, Sprinkler Pump and Sprinkler Jockey Pump** set to all Systems such as Voltmeter Ammeter. Indicating lamps, on off push buttons, auto and manual mode made out of M.S. sheet and all wiring as per TAC requirements all part must be (siemens or L & T make only).

viii. Supply, Installation, Testing, and Commissioning of **Electrical Starter panel** wall mounting for fire **Booster Pump.**

ix. Supply, Installation, Testing, and Commissioning of **Remote switch** for Booster Pump (Two Ways Switch). (Top Three Floor)

x. Supply, Erection, Testing & Commissioning of **Pressure gauge IPS 200, 4" Dia. (** H. Guru, PCI Instruments or any other Reputed make)

xi. Supply, Erection, Testing & Commissioning of **Pressure Switch** for Auto System.(Danfoss or any other Reputed make)

xii. Supply, Erection, Testing & commissioning of designed sizes of **Armoured Cable** (with Cable Glands, Saddle etc.) for complete fire fighting systems. (Make Polycab).

xiii. Supply, erection, testing & commissioning of **GI "C" class Pipe IS 1239** (please check possibility to replace GI pipe with suitable high pressure fire resistance CPVC pipe of reputed make like Blaze master, KPT PPR pipe) with suitable T, Reducer, Bends and colour for water line with hanging accessories like Threaded rod, clamp and Anchor fastener. Every Three meters supported. Of all welded construction, but weld type flanges (2) coats of RED LEAD primer, Red coloured Synthetic enamel finish point). (Lotus, Jindal Star & Steelman Make).

xiv. Supplying, installing, testing and commissioning of C.I. **Non-return valves** as per IS: 5312 (Part I) 1984, swing check type with required flanges, nuts, bolts and gaskets etc. complete.

xv. Supply, Erection, Testing & Commissioning of **Butterfly valve** (suitable for test pressure of 16 kg / sqm) with flanges, nut bolts, gaskets and necessary pad locking arrangement complete required. (150/80).

xvi. Supply, Erection, Testing & Commissioning of **Football Stainer valve** (suitable for test pressure of 10 kg / sqm) with flanges, nut bolts, gaskets and necessary pad locking arrangement complete required. (150/80)

xvii. Supply, Installation, Testing and Commissioning of **Single Headed**, SS **Hydrant Valve**, oblique type 63mm dia with flanged inlet with blank cap & chain as per IS:5290 with ISI Mark.**(Courtyard Hydrant).**

xviii. Supply, Installation, Testing and Commissioning of **Fire Hose Cabinet** wall mounting or free standing type, **Double Door** & keys arrangement, **"Fire Red".** & RRL hose pipe confirming to IS: 636 Type - A, bearing ISI mark with 63mm Male / Female SS Coupling 15 Mtrs Long X 2 Nos with 63mm SS Branch Pipe with Nozzle.

xix. Supply, installation, Testing and Commissioning of 4-way Fire Brigade Inlet Connections GI body having 150mm NB flanged outlet with 4 numbers of inbuilt SS NRV (Body Type) with blank cap and Chain Hydrant System and Sprinkler System.

B. Wet Riser-cum-down Comer System.

i. Supply, erection, testing & commissioning of **GI "C" Pipe IS 1239 (** please check possibility to replace GI pipe with suitable high pressure fire resistance CPVC pipe of reputed make like Blaze master, KPT PPR pipe - **all sizes)** with suitable T, Reducer, Bends and colour for water line with hanging accessories like Threaded rod, clamp and Anchor fasteners. Every Three meters supported. Of all welded construction, but weld type flanges (2) coats of RED LEAD primer, Red coloured Synthetic enamel finish point). (Lotus & Steelman Make).

ii. Supply, Erection, Testing & Commissioning of Butterfly valve (suitable for test pressure of 1.5 times the system pressure) with flanges, nut bolts, gaskets and necessary pad locking arrangement complete required.

iii. Supply, Installation, Testing and commissioning of Twin Headed, SS Hydrant Valve, oblique type 63mm dia with flanged inlet with blank cap & chain as per IS:5290 with ISI Mark. For each residential floor.

iv. Supply, Installation, Testing and Commissioning of First Aid Hose Reel wall mounted, swinging type fitted with 20mm dia X 30 Mtr long, high pressure hose with 5mm outlet PVC shut off nozzle with ball Valve.

v. Supply, Installation, Testing and Commissioning of Fire Hose Cabinet wall mounting or free standing type, Double Door & keys arrangement, "Fire Red". & Reinforced Rubber Lined (RRL) hose pipe confirming to IS: 636 Type - A, bearing

ISI mark with 63mm Male / Female SS Coupling 15 Mtrs Long X 2 Nos with 63mm SS Branch Pipe with Nozzle.

vi. Supply, Installation, Testing and Commissioning of Ball Valve 25 NB with Air Release Valve 25 mm dia.

C. Automatic Sprinkler System and Car Parking area fire system

i. Supply, erection, testing & commissioning of GI "C" Pipe IS 1239 (please check possibility to replace GI pipe with suitable high pressure fire resistance CPVC pipe of reputed make like Blazemaster, KPT PPR pipe) with suitable T, Reducer, Bends and colour for water line with hanging accessories like hangers, Threaded rod, clamp and Anchor fastener. Every Three meters supported. of all welded construction, but weld type flanges (2) coats of RED LEAD primer, Red coloured Synthetic enamel finish point). (Lotus & Steelman Make).

ii. Supply, Installation, Testing and Commissioning of SPRINKLER BULB: Standard / Quick Suppression Fast Response Pendent Type and Side Wall Sprinklers of temp. range 68° C with K-factor K-200, 3/4" NPT Chrome finish Fusible solder type. (Reputed make)

iii. Supply, Erection, Testing & Commissioning of **Butterfly valve** (suitable for test pressure of 1.5 times the rated pressure) with flanges, nut bolts, gaskets and necessary pad locking arrangement complete required. (150/80).

iv. Supply, Erection, Testing & Commissioning of GM **25mm Ball Valve**.

v. Supply, Erection, Testing & Commissioning of Ball Valve 25 NB with Air Release Valve 25 mm dia Make (or suitable design size of the fire fighting system).

D. Fire Drencher System at Podiums (Ground to top of podium floor)

i. Supply, erection, testing & commissioning of GI "C" Pipe IS 1239 (please check possibility to replace GI pipe with suitable high pressure fire resistance CPVC pipe of reputed make like Blazemaster, KPT PPR pipe) with suitable T, Reducer, Bends and colour for water line with hanging accessories like Threaded rod, clamp and Anchor fastener. Every Three meters supported. of all welded construction, but weld type flanges (2) coats of RED LEAD primer, Red coloured Synthetic enamel finish point). (Lotus & Steelman Make).

ii. Supply, Installation, Testing and Commissioning of Water Curtain System Spray Nozzle standard / Quick Suppression Fast Response Side Wall Type.

iii. Supply, Installation, Testing and Commissioning of Butterfly valve (suitable for test pressure of 1.5 times the system pressure) with flanges, nut bolts, gaskets and necessary pad locking arrangement complete required.

E. Automatic Smoke Detection System and Fire Alarm with Public Address System

i. Supply, Installation, Testing and Commissioning of Conventional 24 Zone Fire Smoke Detection and Fire Alarm with Public Address Panel.

ii. Supply, Erection & Testing of Conventional Smoke Detector with Base at (In Society Office, In each shop, In Fitness Centre, In Lift Machine Room, In Meter Room in electric duct at each floor level with connected to main console panel on ground floor level).

iii. Supply, Erection & Testing of Conventional Manual Call Point Cum Hooter.

iv. Supply, Erection & Testing of Conventional Zone Card for Smoke Detector.

V. Supply, Installation, Testing and Commissioning of 1.5sq. mm. X 4 Core Copper Flx Cable (with Cable & Saddle etc.) (Polycab Make).

vi. Supply, Installation, Testing and Commissioning of 1.5sq.mm. X 2 Core Copper Flx Cable (with Cable & Saddle etc.) (Polycab Make).

F. Portable Type Fire Extinguisher

i. Supply & Installation Stored Pressure ABC dry chemical powder type (all purpose) portable fire extinguisher 9 kg capacity manufactured as per IS 15683 with BIS Mark. (In near all electric panels, Meter Rooms, Lift Machine Room, In Society Office, In each Shop, In Fitness Centre, In each floor as well as refuge floor).

ii. Supply & Installation Stored Pressure ABC dry chemical powder type (all purpose) portable fire extinguisher 9 kg capacity manufactured as per IS 15683 with BIS Mark. (Car Parking Area On Ground Floor & On Each Podium Floor).

iii. Supply and fixing of Fire bucket with wall mounting bracket 9 litrs capacity. (Meter Room, Lift Room and Car Parking area).

iv. The quantity shall be decided as per approved norms of the fire department of NMMC.

G. Underground piping shall be routed through the trenches covered with chequered plates or gratings, considering long life of the building the buried piping is not allowed.

H. Staircase provisions and rules

According to the fire safety rules for high-rise residential buildings, each high-rise building should have two staircase exits with a width of 1 to 2 metres so that there's no panicked rushing in case of an evacuation. One of the other staircases can be used as a fire escape route if the fire has broken out in one.
The staircase should be enclosed, properly ventilated and not be made to extend to the basement (a separate staircase should lead from ground to basement) to stop fire and smoke from spreading.
Fire doors should be made with 2-hour fire resistance and placed on escape routes and at the entrance of the lift lobby and staircase.

I. The bidder after completion of the project to handover the following mandatory spares of the fire fighting system to the Society.

i. Pressure gauges – 2 nos. of each type

ii. All valves (each type, size, service) – 10% of total quantity or minimum one no.

iii. Sprinkler bulbs – 10% of total quantity

iv. Pressure gauge – Two nos.

v. Water pipe line with hanging accessories – 5 % of total quantity

vi. Hydrant lugs, washers & caps - 5 % of total quantity

vii. SS/gunmetal nozzle - 5 % of total quantity

viii. Fire Hose coupling - 5 % of total quantity

ix. Any other items – quantity to be decided with successful bidder

J. Fire Escapes or External Stairs:

a) Fire escape shall not be taken into account while calculating the number of staircases for a building.

b) All fire escapes shall be directly connected to the ground.

c) Entrance to the fire escape shall be separate and remote from internal staircase.

d) The route to fire escape shall be free of obstructions at all times except the doorway leading to the fire escape which shall have the required fire resistance.

e) Fire escape shall be constructed of non-combustible materials.

f) Fire escape stairs shall have straight flight not less than 125 cm wide with 25 cm treads and risers not more than 19 cm.

g) Handrails shall be at a height not less than 100 cm.

h) Fire escape staircase in the mercantile, business, assembly, hotel buildings above 24 m. height shall be a fire tower and in such a case width of the same

shall not be less than the width of the main staircase. No combustible material shall be allowed in the fire tower.

The successful bidder to obtain the necessary permissions/NOC's from Chief Fire Officer Navi Mumbai Municipal Corporation (NMMC), for their design requirements as per the provisions laid down by the fire department.

SECTION – 12

TECHNICAL SPECIFICATIONS

FOR

CCTV & SURVILIANCE SYSTEM

Technical Specifications of Smart IP CCTV Cameras Monitoring & Recording System

A. **IP video Surveillance System SCOPE**:

1. The specification of Video Surveillance System cover up technical specifications and requirement of H.265+ compression based Smart Video Analysis IP Video surveillance system incorporated of features and function of Video Analytics, Lowest space consumption, Early alert management, Motion Detection, System Alarm, Network Alarm, Low Light Colour Image Capturing and as per technical specification of system. System incorporated components of IP Fixed Dome & Bullet camera, Network Video Recorders (NVR), LED Display Monitor, Network Switches, and this all supported on indoor & Camera outdoor Weather Conditions, Video management Software built in NVR, etc. for video surveillance of Society premises
2. The System shall be based on non-proprietary open architecture Open Network Video Interface Forum (ONVIF) S Profile Compliance; it can work and integrate with any make of ONVIF Compliance Hardware & Software. Similarly cameras should be compatible with minimum 5 brands of Video Management software. In the Same Way Network Video Recorders should be compatible with minimum 5 brands of ONVIF Compliant cameras.
3. The System can be supported difference types of video analytics such as face detection, people counting, object detection, crowd detection, tripwire, perimeter, scene and de focus detection, motion detection & many more and that should Triggering alarm activation and it automatically generate alarm trigger sends message command to control centre and its supports trigger action for a start object monitoring, Video capturing, snapshot, Single screen display, alarm sound, E-MAIL, third party equipment controls and many more.
4. Entire System should be IP surveillance systems shall essential H.265+ and H.264+ Main & High Profile combined video compression and Entire System has to be capable of generating 25/30 fps on each stream to viewing on LAN/WAN and Network Video Recorders supported Video & Audio Stream Recording and it is

capable to record 25/30fps with up to 4K Input Camera Resolution for each Channel.

B. CCTV CAMERAS

Internet Protocol ONVIF Compliant cameras (WiFi or a Power over Ethernet (PoE) cable) :

a) Adequate numbers of vandal resistant CCTV, High Speed dome type Day/Night IP PTZ / IP Box type HD cameras shall be installed to monitor & record all entry and exit points and the all the common areas (all the lift lobbies & corridor, parking areas, terrace, stilts, podium, lifts, garden areas, building surroundings).

b) The camaras shall be fitted to cover all the shops & marginal spaces of the building (front side of the building facing 20 M main road).

c) Static camera shall be provided to ensure that, upon entry the front of the vehicle is viewed. Registration plate is easily readable when the vehicle is stationary at the barrier and view of front seat occupant is visible.

d) Lens Zoom : 18X Optical & 10X Digital

e) Resolution : 1080p (Full HD) or higher resolution:

f) Lens Type and Field of View : Varifocal Lenses

g) Wide-Angle & Narrow Field of View:

- Wide-Angle Lenses: For premises, main gates, podium top, building terraces & parking area
- Narrow Field of View: all the lobbies, corridors, passages, building entry exits lifts Focus on specific areas, providing detailed monitoring of smaller zones.

h) Frame Rate:

- 25-30 fps for entry / exits of premises and entrance lobbies
- 15fps building terrace and corridors, passage

i) Camera Sensor:

- Charge-Coupled Device(CCD): entry / exits of premises and entrance lobbies
- Complementary Metal-Oxide-Semiconductor (CMOS): for terrace cameras

j) Low-Light Performance

Low-light performance is crucial for night time surveillance. Features such as infrared LEDs enable cameras to capture images in complete darkness . Night

vision capabilities ensure clear footage even in low light. Effective night vision is essential for 24/7 surveillance, ensuring continuous security coverage regardless of lighting conditions.

k) Dynamic Range

Wide Dynamic Range (WDR) allows cameras to handle high-contrast lighting conditions, capturing clear images in scenes with both bright and dark areas.

l) Compression Standards

Common Compression Formats: H.265 (High Efficiency Video Coding -HEVC)

m) **IP Rating : (**Weatherproofing and Durability)

Ingress Protection (IP) ratings – IP 67

n) Power Supply Options :
Power over Ethernet (PoE) - both power and data through a single cable

o) Integration with Other Systems

CCTV cameras can integrate with smart home systems, allowing for features like remote monitoring and automated alerts.

p) Recording and Storage

Network Video Recorders (NVRs)

Network Video Recorders store footage from IP cameras on a hard drive. They provide centralized storage and management of surveillance footage.

C. **MONITORS**:

Particulars	Bid Specifications	Bidders Offer
Make/Brand	LG/Samsung/Sony	
Monitor Technology	LED, latest version	
Screen Size of Monitors	• Society Office & Security Cabin – 48" or more	

	• Security desk at entrance lobbies of each wing/building – 22”	
Resolution	UHD 3840 x 2160 will be preferred	
Wide View Angle	178^0 (H) / 178^0(V) or better	
Multiple Inputs	HDMI, VGA	
Power Consumption	---- Watt	
Supply Voltage	240 V. / 50 Hz.	
Connectivity	USB	
Speaker	Built in	
Operating Hours	24 Hrs.	
Accessories	Standard accessories to be supplied	
Warranty	Minimum 3 years	

D. GENERAL REQUIREMENTS:

a. Company should have experience in field of CCTV for at 3 years and should have installed Banks / Educational Institutes/High rise buildings.

b. Original Equipment Manufacturer / authorized distributors of Video Surveillance System shall have their registered office with technical support function and service support in Mumbai. GST registration certificate to be submitted along with the tender.

c. Camera’s and NVR’s should be of the same make or of reputed make

d. In case of failure of NVR, the same will be converted to DVR.

e. The minimum period of warrantees / guarantees shall be mentioned.

f. The cost of Annual maintenance contract (AMC) after guarantee period shall be quoted.

VOLUME - II

SECTION - 13

TECHNICAL SPECIFICATION

FOR

ROOF TOP SOLAR SYSTEM

TECHNICAL SPECIFICATION OF SOLAR SYSTEM

As per CHAPTER – 13, SPECIAL PROVISIONS FOR CERTAIN BUILDINGS of UDCPR 2020, Solar ROOF TOP PHOTOVOLTAIC (RTPV) SYSTEM shall be mandatory in all types of buildings to be constructed on plot area of more than 4000 Sq. Mtrs.

Capacity of the Solar System (KW);

The bidder has to calculate the power requirement for common utilities includes followings places;

i. All lifts
ii. All water pumps
iii. Firefighting pumps
iv. Common lighting (lobbies, premises, podium, corridors, terrace, Security office, all common toilets, fitness centre & society office including Air conditioners fitted in fitness centre & office)

Over & above this bidder to consider 20% additional capacity (future loads) and obtain the meters from MSEDCL with this installed capacity. So that the solar system will be designed accordingly.

In order to facilitate the installation of RTPV System, the buildings shall have the following provisions:-

i) All such buildings where RTPV are to be installed will have open sunny roof area available for the installation of RTPV.
ii) The roof loading adopted in the design of such building should be at least 50 kg. per Sq.Mtrs. for the installation of RTPV.
iii) At least 25% of the roof area shall be utilized for installation of the RTPV system.
iv) Precaution should be taken that architectural elevation treatment should not cast shadow on terrace space. As far as possible, parapet of south, east and west sides of the terrace shall be of railing type (above 1 feet) such that it will not cast shadow on the solar collectors and maximum terrace space can be utilized

REQUIREMENTS OF ROOF TOP PHOTOVOLTAIC (RTPV) SYSTEM

- **Proposed Rooftop Based PV Plant Capacity**: -------- **kWp** (Grid Tied Net Metered System / ON GRID)

(Better Capacity of each panel, Voltage at Max Power (Vmax), Open Circuit Voltage (Voc),Current: Current at Max Power (Imax) , Short Circuit Current (isc)

- **Bifacial panels** Solar Module **Monocrystalline** PERC HALF CUT
- **Nano Coating for Solar Modules**
- **Pathway for the Emergency Evacuation and Solar Module Cleaning**
- **Panels** performance warranty 30 years
- **Inverters**
- **Power Optimizer**
- **Inverter performance warranty up to 30 years**
- Solar Module Mounting Structure (MMS) designed to withstand wind velocity **170 km/hrs.**
- **5 Year** Compressive maintenance (AMC) **with two times monthly manually cleaning.**
- Panel Mounting Clamps-Mid & End clamp (Alu),Power snap GI, Nut and Bolt **SS316**
- **DC Cable**
- **Steel Wire Rope**
- **Net Metering - Each Wing / building**
- **Shall have Excellent** Low light performance in low visibility in clouds, evening, and morning
- BIS certified as per IS/IEC standards which is mandatory for all solar panels.
- Best in Class conversion efficiency
- Better Shading Tolerance
- Excellent Hot Spot Performance
- Less Micro Crack Impacts
- Lower Resistive Losses

Details of the ON GRID RTPV solar system

S.No.	ITEM	Make / Specification
1	Module	Technology: Bifacial Monocrystalline Passivated emitter and rear contact (PERC) panels, Half Cut Make: Reputed make approved by the society Model: Module Efficiency: Warranty : 30 years Total Module Quantity:
2	Inverter	Technology: 3rd Generation Inverter Make: Solar edge or Reputed make approved by the society Model: Total Module Quantity
3	Power Optimizer	Technology: Latest designed Make: Solar edge or Reputed make approved by the society Model: Total Module Quantity: Synergy Unit : Reputed make approved by the society
4	Mounting Structure	Technology: Hot Dipped Galvanized steel Make: Parco, Sancore or Reputed make approved by the society
	Fasteners	Specification: SS 304 A2- 70
5	D C Cables	Make : Polycab or any other reputed make approved by the society Specification: 4 Sq.mm UV/Ozone/Temp/hydrolysis resistance copper Cable service life: 25 years Standard: BS EN 50618
6	A C Cables	Make: Polycab or any other reputed make approved by the society Specification : 70 Sq. mm
7	Earthing Cable	Make: Polycab or any other reputed make approved by the society Specification: to be decided by the manufacturer
8	Earthing kit: Earthing pits & Earthing rods	Make: Polycab or any other reputed make approved by the society Specification: Copper bonded Earth Electrode which gives high protection against corrosion, 25 mm GI Patti(Hot Dipped Galvanized), FRP reinforce Plastic pits

9	Lightening Arrester (LA)	Make: Ravi earthing or any reputed make Specification: Coverage radius 750 mtrs., copper bonded 1000 mm, nos. of LA to be decided during detailed engineering
10	AC / DC Junction Box, AJB, ACDB, MCB, RCCB, SPD, MC4	Make: ABB
11	Automatic Solar PV Module cleaning system	Make: Jain or any other reputed make approved by the society
12	Water Pipe - UPVC	Make: Prince /Astral
13	Net Meter	Technology: Make: Model: Total Module Quantity
14	Wire rope	Make: **Usha Martin**

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SECTION – 14

TECHNICAL SPECIFICATION FOR

RAIN WATER HARVESTING SYSTEM

RAIN WATER HARVESTING SYSTEM

1. As per the NOTIFICATION No. TPB-4307/396/CR-124/2007/UD-11 dated 6th June 2007, Government have decided to take effective measures for collection of rain water from roof tops, paved / unpaved surfaces etc. and to use it either for recharging ground water or storing it in storage tanks. For this, it has been further decided that henceforth, no building permission be granted unless provision is made for Rain Water Harvesting Scheme.

And

Also as per Section 13.3, Chapter – 13 of UDCPR-2020, for RAIN WATER HARVESTING SYSTEM

The provision for Rain Water Harvesting shall be made as under:-

All the layout open spaces/amenity spaces of housing societies and new constructions/ reconstruction/ additions on plots having area not less than 500 sq.m. shall have one or more Rain Water Harvesting structures having a minimum total capacity as detailed in Schedule. Provided that the Authority may approve the Rain Water Harvesting structures of specifications different from those in Schedule, subject to the minimum capacity of Rain

Water Harvesting being ensured in each case.

a. The Rain Water Harvesting System is for storage of water for non- potable purposes or recharge of groundwater at all times. Rain Water Harvesting in a building site includes storage or recharging the ground water by rainwater falling on the terrace or podium top

b. The society has covered well, shall be used for the water harvesting in addition to the recharging pits provided in the society premises. Rain water may be channeled and allowed to filter for removing silt and floating material. The well is presently covered to be provided with ventilating covers. The water from the open well may be used for non-potable domestic purposes such as washing, flushing and for watering the garden and fire fighting etc.

c. Rain Water Harvesting for recharge of groundwater may be done through a recharging pits. The rechargeable pit of 1m. width may be excavated upto a depth of at least 3m. and refilled with stone. Nos. of recharging pits to be decided during detailed engineering of the building. bore-well around

d. Roof top rain water may also be diverted to a borewell

e. Settlement / filter tank of required size has to be provided. which a aggregate and sand. The filtered rain water may be channeled to the refilled pit for recharging the bore-well.

f. An impressive surface/underground storage tank of required capacity may be constructed in the setback or other open spaces and the rain water may be channeled to the storage tank. The storage tank shall always be provided with ventilating covers and shall have draw-off taps suitably placed so that rain water may be drawn off for domestic, washing, gardening and such other purposes. The storage tank shall be provided with an overflow to the sewage /storm drain.

g. The surplus rain water, after storage, may be recharged into ground through percolation pits or trenches or combination of pits and trenches. Depending on

the geomorphological and topographical conditions, the pits may be of the size of 1.20 m. width X 1.20 m. length X 2m. to 2.50 m. depth. The trenches can be of 0.60 m. width X 2 to 6 m. length X 1.50 to 2 m. depth. Terrace water shall be channeled to pits or trenches. Such pits or trenches shall be back filled with filter media comprising the following materials :-

i. 40 mm stone aggregate as bottom layer upto 50% of the depth.
ii. 20 mm stone aggregate as lower middle layer upto 20% of the depth.
iii. Coarse sand as upper middle layer upto 20% of the depth.
iv. A thin layer of fine sand as top layer.
v. Top 10% of the pits/trenches will be empty and a splash is to be provided in this portion in such a way that roof top water falls on the splash pad.
vi. Brick masonry wall is to be constructed on the exposed surface of pits/trenches and the cement mortar plastered. The depth of wall below ground shall be such that the wall prevents lose soil entering into pits/ trenches. The projection of the wall above ground shall at least be 15 cm.
vii. Perforated concrete slabs shall be provided on the pits/trenches.
viii. If the open space surrounding the building is not paved, the top layer up to a sufficient depth shall be removed and refilled with coarse sand to allow percolation of rain water into ground.

h. The terrace shall be connected to the open well/bore-well/storage tank/ recharge pit/trench by means of HDPE / PVC pipes through filter media. A valve system shall be provided to enable the first washing from roof or terrace catchment, as they would contain undesirable dirt. The mouth of all pipes and opening shall be covered with mosquito (insect) proof wire net. For the efficient discharge of rain water, there shall be at least two rain water pipes of 100 mm. dia. for a roof area of 100 sq.m.

i. Rain Water Harvesting structures shall be sited as not to endanger the stability of building or earthwork. The structure shall be designed such that no dampness is caused in any part of the walls or foundation of the building or those of an adjacent building.

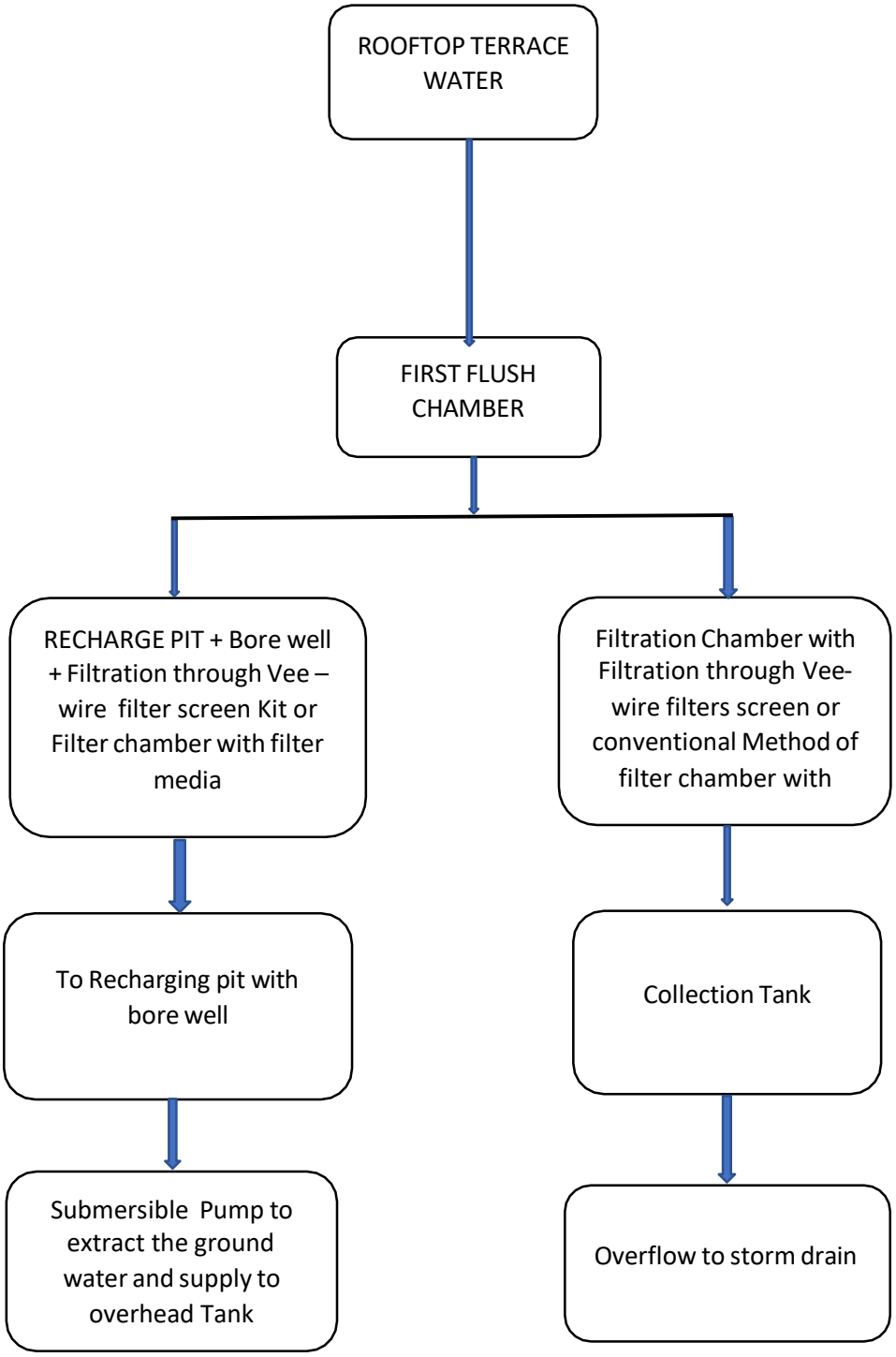
j. The water so collected/recharged shall as far as possible be used for non-drinking and non- cooking purpose. Provided that when the rain water in exceptional circumstances will be utilized for drinking and/or cooking purpose, it shall be ensured that proper filter arrangement and the separate outlet for bypassing the first rain water has been provided. Provided further that, will be ensured that for such use, proper disinfectants and the water purification arrangements have been made. The structures constructed under this provision shall not be counted towards FSI Computation

k. Run-off water from the open surface as well as from rooftops would be channelized to filtration units in chronological order;
    a. Sedimentation tank
    b. Filtration through micro-filter of FRP tank or similar arrangement
    c. Sand filter with geotextile layer at the top.

2. Successful bidder to submit the followings to Society / PMC for approval;
    i. The bidder to calculate the rain water quantity according to annual rain fall in Nerul, the average annual rain fall in Navi Mumbai is @ 2000 -2500 mm.

ii. The storage tank capacity to be designed to store maximum quantity
iii. Design the scheme of Rain Water Harvesting system for the complete building.
iv. Layout drawing at Ground floor (zero meter level & minus level) indicating storage tank, recharge pits, pipe trenches, filtration units and any other and if required elevation drawings
v. The piping layout (with all valves) covering all the down take (Down comers from terrace), recharge pit, under ground storage tank, existing well and newly constructed bore well.

Rain water harvesting through Rooftop Terrace Water



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SECTION – 15

TECHNICAL SPECIFICATION

FOR

SEVERAGE / DRAINAGE WATER SYSTEM

TECHNICAL SPECIFICATION FOR SEVERAGE / DRAINAGE/STORM WATER SYSTEM

A. Basic Design of drainage systems;

- Sanitary fitments
- Above ground drainage
- Below ground drainage (+ sewage disposal)

B. Aim: To remove waste, foul & surface water

- Waste water - basins, sinks, baths, showers
- Soil or foul water - from toilets or W.C.
- Surface water - rainwater or storm water
- Systems will last as long as the building

C. Design concepts;

Objectives

- Maintain healthy conditions in the building
- Remove effluent quickly & quietly
- Free from blockage, durable and economic
- Blockages may occur when
- It is overloaded with solids
- It suffers restricted flow at some bends or joints
- Thus, each discharge pipe section must be accessible for inspection & internal cleaning

D. Types of drainage pipes;

- Waste pipe (WP): e.g. connected to basins & baths
- Soil pipe (SP): e.g. connected to W.C.
- Ventilating/Vent pipe (VP)
- Rain water pipe (RWP)
- Anti-siphonage pipe: preserve water seals of traps

- Air-conditioning condensation drainage pipe
- Use of traps (control foul gas or odour)
- U-trap: a U-shaped running trap
- P-trap and S-trap

E. Fully ventilated one-pipe or Two pipe system

- The Waste water & Soil water are provided with separate vent pipes
- Each trap with an anti-siphon or vent pipe connected to the discharge pipe in direction of the flow of water at a point between 75 - 450 mm from trap crown
- Vent stack connected to the discharge stack near to the bend to remove compressed air at this point
- The vent pipe opening must be located at least 900mm above any building or to the highest point of the building. The vent must also be protected, either with a wire cage or perforated to prevent debris or birds from entering the system.

F. The Waste water & Soil water did note combined until they reached the below ground drainage system.

G. The terminal point/s of the building sewage main drain/s to be ascertained from Navi Mumbai Municipal Corporation, so that it will be connected to NMMC sewage line outside plot premises. However the slope shall be maintained to drain all the sewage. The slope of a sewer is also important, as it determines the speed at which the wastewater will flow. Sewers are typically sloped at a rate of 1% to 2%.

H. All the sewerage lines shall be at sufficient distance from the drinking water lines.

I. The sizing calculations for the sewerage line and drawings (piping layouts (isometric) & plans) shall be prepared indicating all sewerage chambers/manholes, trenches (if any)

J. Material for

i. Soil, waste, and rainwater (SWR) pipes - HDPE pipes

ii. Pipe fittings (HDPE)

- Branch and boss pipe
- Pipe tees
- Pipe caps
- Pipe reducers
- Couplings
- Pipe clips / Socket clips
- Bends
- Conversion bends
- Air admittance valves
- Solvent cement / solvent weld fittings shall be of reputed make

UDCPR:

13.5 SOLID WASTE MANAGEMENT

It shall be mandatory for:-

i) Housing complexes, Commercial establishments, hostels, hospitals having aggregate built-up area more than 4,000 sq.m. Or more.

ii) All three star or higher category hotels.

To establish a dedicated Solid waste management system to treat 100% wet waste being generated in such buildings.

The treatment of wet waste shall be done through an organic waste composters/ vermiculture pits

Or other similar technologies of suitable capacity installed through reputed vendors.

The disposal of dry waste, e-waste, hazardous waste shall be carried out through authorised recyclers or any other system as specified by the Authority

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SECTION - 16

TECHNICAL SPECIFICATIONS FOR ELECTRICAL POWER SUPPLY & INSTALLATION

ELECTRICAL POWER SUPPLY & INSTALLATION (Single phase – General lighting / Air conditioner & Three phase - Elevators / All pumps)

A. Load estimation

The Bidder to calculate the estimate of the electrical load of the building, which is the amount of power required by the various appliances, devices, and systems in the building. The load estimation of the building/s shall be of residential, commercial, or mixed-use, and the expected occupancy, usage patterns, and peak demands. The load estimation also considers the future expansion and growth of the building (minimum 20% load shall be considered i.e. over & above the estimated load) and the potential impact of renewable energy sources, such as solar panels. (For backup power from Diesel Generator capacity, please refer Section No. 10 of Volume – II, Technical specification)

B. Requirements

1. Planning of Electrical Installation

   The design and planning of an electrical installation involve consideration of all prevailing conditions and planning to meet the requirement of various functional needs, efficiency, economy, energy conservation, aesthetics, appropriate technology, safety and avoidance of possible fire hazards, so the efficient cable management is crucial. Vertical cable management solutions, such as basket cable trays and wire mesh cable trays. The Vertical cable management systems enable clear separation and segregation of cables, simplifying identification, maintenance, and troubleshooting processes. The cable tray accessories like dividers, covers, and clamps to further enhance cable organization.

2. False Ceiling Coordination

   False ceiling electrical layout will be coordinated with the Architect and the Civil Engineer so that reflected drawing provides for symmetrical and aesthetic layout of the following:

   Fans / Light fittings / Fire detectors /Sprinklers /Speakers etc.

3. Power Distribution Panels / Boards etc.: Rating - 240 – 415 Volts (suitable to high amperage), made from mild steel, IP rating – IP 44. MCB distribution boards, Junction boxes, MCB boxes, Cable trays. The distribution boards are manufactured as per IS 2675:1983 and IS 8623 : 1977 referred for Control Panels, regarding technical aspects and testing requirements

4. Other specification for indoor electric fitting are as mentioned elsewhere in the technical specification.

C. Wiring Layouts, electrical loading;

a. The bidder to prepare the wiring layout of the complete open premises, pump rooms, all flats & other rooms/ facilities, lobbies, staircases etc.
b. The Main distribution boards of all the electric supplies (every utilities) shall be provided with **Earth Leakage Circuit Breakers** (ELCB) of *Mitsubishi Electric, Eaton, Honeywell, Siemens, and Schneider Electric, Legrand, ABB, Havells (*reputed make).
c. The Modular boards & Switches shall be fire resistant and procured from the reputed brands like M/s ABB, Anchor (by Mitsubishi), L&T (**Oris**), Wipro, Schneider Electric, Legrand & Havells
d. The Concealed conduit wiring shall be provided with PVC conduits that are hidden behind walls, ceilings, or floors.

e. Components of Concealed Conduit Wiring

Conduits and Conduit Materials:

PVC (polyvinyl chloride) or Aluminium Metal conduits of reputed make

f. Electrical Cables and Wiring Types:

1. Non-Metallic Sheathed Cable (NM cable):

2. Armored Cable (AC):

3. Underground Feeder (UF) cable:
FRLS (Flame Retardant Low Smoke) wire will be preferred

The approved cables and wiring shall be RR Kabel, Polycab Wires, Anchor by Panasonic, V-Guard Industries, Havells, Kei – FRLS type

g. Junction Boxes, Electrical Enclosures & Connectors, Couplings, and Fittings;
: Metal or PVC of reputed make.

h. Cable routing **electrical cable tray**

Cable tray material: *Perforated* galvanized steel, *Perforated* stainless steel, aluminium, or glass-fibre reinforced plastic, PVC FRLS. The cable trays to be procured from the reputed brands like M/s Eaton, Vinfab,Bravo, Divya, M.G Cable & Phoenix

Cable Tray Accessories

There are many cable tray accessories specifically designed for vertical cable management systems. These cable trays have accessories like dividers that are used for segregating cables, materials to secure cables and some covers to provide extra protection.

D. Distribution Transformer

The transformer (oil filled or dry type) shall be located at suitable location from where the power distribution shall be done with ease. The transformer shall be installed in the room with proper ventilation, earthing etc. However the bidder to follow the guidelines issued by the Maharashtra State Electricity Distribution company limited (MSEDCL).

The said transformer 's MVA rating shall be designed with 25 % additional capacity over & above the design MVA rating (expected future load growth).

The plot layout shall indicate the location of transformer room with proper size to accommodate transformer/s.

The transformers shall be suitable for indoor / outdoor installation and they should be suitable for service under fluctuations in supply voltage as permissible under Indian Electricity Rules.

All transformers supplied shall as per requirement of Maharashtra State Electricity Distribution company Limited (MSEDCL), with a guaranteed for a period of more than five years from the date of commissioning.

Inspection & Testing of the Transformer & oil

All routine, type and special test shall be done as per applicable codes & standard. The Developer to submit the inspection & testing report to the Society / MSEDCL

The Manufacturer shall possess the BIS license for offered product and be in the approved list of MSEDCL or the reputed manufacturer.

E. ELECTRIC VEHICLE (EV) CHARGING SYSTEM GUIDELINES

Bidder to install the charging station / points in parking areas for electric vehicle inline with the Safety Advisory/ Standard Operating Procedure for EV Charging Stations (EVCS) issued by the Office of the Chief Electrical Inspector, Industries, Energy & Labour Department of Govt. of Maharashtra.

ELECTRCAL SAFETY PROVISIONS RELATED TO CHARGING STATIONS

1. Each EV charging installation shall have sufficient sanction load to accommodate house load along with EV charging in addition to it. Adequate measures shall be observed to mitigate the load requirements for EV charging by the owner. Also, augmentation of the wiring and cabling along with protection system must be carried out
2. Each electric vehicle charging points shall be supplied individually by a dedicated final sub-circuit protected by an over current protective device such

as MCB complying with IS/ IEC60947-2, IS/IEC60947-6-2 or the IS/IEC60269 series and the over current protective device shall be part of a switchboard

3. All electric vehicles charging stations shall be provided with protection against the overload input supply and output supply fittings.
4. Suitable lightning protection system shall be provided for the electric vehicles charging stations as per Indian Standards Code IS/ IEC 62305.
5. The electric vehicle charging station shall be equipped with a protective device against the uncontrolled reverse power flow from vehicle.
6. in case EV Charging station is being used for public charging purpose an emergency push button shall be provided at the power incomer side for disconnection of power supply to public EV charging station.
7. Three phases Electrical Vehicle Supply Equipment (EVSE) shall be equally loaded in all phases.
8. All residual current device for the protection of supplies for electric vehicle shall,

   (a) Have a residual operating current of not greater than 30 mA.

   (b) interrupt all live conductors, including the neutral; and

   (c) Have a performance at least equal to Type A and be in conformity with IS732
9. Where required for service reasons, discrimination (selectivity) shall be maintained between the residual current device/miniature circuit breaker of suitable type protecting a connecting point and installed upstream.
10. A Surge Protective Device (SPD) shall be installed upstream of residual current device to limit transient over voltages due to lightning or switching
11. All electric vehicle charging stations shall be provided with an earth continuity monitoring system that disconnects the supply if the earthing connection to the vehicle becomes ineffective.
12. Earthing of all electric vehicle charging stations shall be as per IS 732
13. The cable may be fitted with an earth-connected metal shielding and the cable insulation shall be wear resistant and maintain flexibility over the full temperature range.
14. No flammable or combustible material, other than those which form parts of the vehicle and their associated chargers, should be stored within the designated charging area.
15. Enclosure for charging station shall be made of fire-retardant material with self-extinguishing property and free from halogen
16. Fire Detection, alarm and control system shall be as per relevant Indian Standards.
17. The power cables/wires laid for EV charger(s) shall not be taken along other service pipes, gas lines and fire exit paths.

18. Power supply cables used in charging station or charging points shall conform to IEC 62893-1 and 17505(Part-1) (Standard for Fire Survival Cables) and its relevant parts.

The Installation shall conform to the following Act, Rules, and Regulations & Standards:

1. Electric Vehicle (EV) policy Maharashtra 2021
2. The relevant provisions of the Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010 and The Electricity Act, 2003.
3. Central Electricity Authority (Measures Relating to Safety and Electric Supply) Amendment Regulations, 2019.
4. Central Electricity Authority (Technical Standards for connectivity of the Distributed Generating Resources) Amendment Regulations, 2019. Ministry of Power, Government of India revised guidelines & standards order N,12/2/2018-EV (Comp No. 244347) dated 14/01/2022
6. IS 17017 Series of Standards & IS/ISO 15118
7. Various orders/circulars related to EV charging stations published by CEI Maharashtra government

F. EARTHING AND LIGHTING ARRESTER :

Factors to Consider While Choosing Earthing Systems

An effective earthing system equates personalized planning and execution. There is no universal blueprint for this process. Always consider the following factors:

1. Soil Resistivity

The conductivity of the soil influences how effectively fault currents dissipate. Areas with high resistivity (e.g., rocky terrains) require advanced methods like chemical earthing.

2. Moisture Content

Moisture improves soil conductivity. Additional counter-measures, such as water-retaining chemicals, may be required to improve performance in arid regions.

3. Corrosion Resistance

The earthing system will last longer if corrosion-resistant materials like copper are used, particularly in regions with saline or acidic soils

The IS Code for earthing : IS 3043 : 1987 CODE OF PRACTICE FOR EARTHING

G. LED aviation obstruction lights;

The regulations prescribe the provision of Aviation Obstruction Lights (AOLs) for hazard indication on tall structures. The International Civil Aviation Organization (ICAO)

specifies the mandatory use of aviation obstruction lights as per the following nomenclature for installation on structures of different heights (ICAO standard Annexure 14, Paragraph 6.3.13):

- Below 45 meters: Low Intensity AOLs – A minimum directional (radial) light intensity of 10 candela (cd) in red.
- From 45m to 150m: Medium Intensity AOLs – A minimum directional (radial) light intensity of 1600cd (in each direction), in flashing red

The above requirements are statutory, and are also mandated by the regulatory agency in India, the Directorate of Air Routes and Aerodromes (DARA)

The AOL's specifications are as under;

Lighting type	:	LED (Twin)
Voltage	:	240 V
IP Ratting	:	65
Glass material	:	Polycorbonate (RED)
Material	:	Aluminum Die Casting

The bidder to provide the AOL's of reputed make and proper fixtures

H. The location of transformer, feeder pillars, HT panels, DG sets and meter room is important point to be considered, So sufficient space should be available for ventilation & maintenance purposes.

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SECTION – 17

TECHNICAL SPECIFICATION

FOR

INSPECTION & TESTING OF MATERIAL

Site Supervision:
Space for the office of PMC & Society managing committee shall be provided, the Engineering In-charge of PMC & Managing committee member or their representative will available to ensure the quality of the construction work in situ condition and construction work as per approved layout. The site in-charge of the Developer shall cooperate with the team of the Society & PMC.

Inspection at Site: The PMC will test the materials as & when required at site.

Testing;

1. Hydrostatic Pressure Testing for all the piping's of all systems, sanitary fittings & CP fittings should be done to the full satisfaction of Engineer appointed by the Society.
2. Testing of all size TMT rebars to be carried out by the bidder or test certificates of the manufacturer to be submitted to the society.
3. All test certificates of electrical items (including motors, starters etc.) to be submitted if required then tests are to be carried out on such items.
4. Inspection test Certificate of following bought out items:

   Copies of all the inspection reports / certificates and test certificates of the lots supplied to the redevelopment project, shall be submitted to the Society for review & records. The Items covered are as under;

   - Steel
   - Bricks
   - Tiles and Stones
   - Glass products inspection
   - Aluminium products inspection
   - Wood products inspection
   - PVC Pipes inspection
   - Ceramic and tiles Products inspection
   - Electrical Wires quality control
   - Concrete (batch wise sample testing)
5. All shop testing reports /certificates Diesel Generator set.
6. The quality Assurance Plan (QAP) for Coarse Aggregate for Concrete filters, Fine Aggregate, Water, Cement, Staging, shuttering and forms, Mix design, Concrete Conveying, Placing and Compaction, Tests on Green Concrete, Reinforcement Steel, Brick masonry, Sheeting & Allied works, Test on Bricks, Structural Steel works, TMT /CRS reinforcement. All construction material shall confirm ISI specifications & testing

has mentioned in the draft quality Assurance Plan (QAP) approved by the society/PMC, same is enclosed for reference.

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SECTION – 18

CODES AND STANDARDS

APPLICABLE CODES AND STANDARDS / SPECIFICATIONS

The following specifications, standard and codes are made a part of this tender document. All standards, specifications, codes of practice referred to herein shall be the latest editions/revision including all applicable official amendments, revision and all relevant parts:

EXCAVATION AND EARTHWORK:

IS: CODES	DESCRIPTION
IS- 3764	Safety code for excavation work.
IS- 4081	Safety code for blasting and related drilling operations.
IS- 10379	Code of practice for field control of moisture and moisture and Compaction of soil for embankment and sub-grade.
IS- 783	Code of practice for laying of concrete pipes
IS- 3385	Code of practice for measurement of civil engineering works.
IS- 2720	Determination of Water content/ Dry Density

CONCRETE AND ALLIED WORKS:

IS- 8112/12269	Ordinary Portland cement (M43 & M53 grade).
IS- 8042	White Portland cement
IS- 1489	Portland-Portland cement
IS- 383	Coarse and fine aggregate from natural sources for concrete.
IS- 2386	Methods of test for aggregate for concrete.
IS- 2430	Methods of sampling of aggregate for concrete?
IS- 4925	Concrete batching and mixing plant.
IS- 10262	Recommended guidelines for plain and reinforced concrete.
IS- 456	Code of practice for plain and reinforced concrete.
IS- 1199	Methods of sampling and analysis of concrete.
IS- 516	Methods of test for strength of concrete.
IS- 3370	Code of practice for concrete for concrete structures for the storage of liquids.
IS- 2571	Code of practice for laying in-situ cements concrete flooring.
IS- 2645	Integral cement waterproofing compounds.
IS- 4990	Plywood for concrete shuttering work.
IS- 1786	High strength deformed steel bars & wire for concrete reinforcement..

IS- 432 Mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement

IS – 13620 (2004) Fusion bonded epoxy coating reinforcement TMT steel bars IS 13620 (2004)

IS- 1521 Methods for tensile testing of steel wire.

IS- 1608 Method of tensile testing of steel products.

IS- 2502 Code of practice for bending and fixing of bars for concrete reinforcement.

IS- 2751 Code of practice for welding of mild steel plain and deformed bars fo reinforced concrete construction.

IS 2950-1: Code of practice for design and construction of raft foundations, Part 1: Design

IS 2571: *Code of practice for laying in-situ cement concrete flooring*

IS- 8989 Safety codes for erection of concrete framed structures.

IS- 2722 Portable Swing weigh batches for concrete (single and double bucket type).

IS- 2506 Screed Board Concrete Vibrators.

IS- 1791 Batch Type Concrete Mixers.

IS- 1489 Portland Pozzolana Cement (PPC).

IS- 8112 Ordinary Portland cement (OPC) Grade 43 Cement

IS- 12269 Ordinary, Portland cement (OPC) Grade 53 Cement

IS- 4634 Method of testing Performance of batch-type Concrete Mixers

IS – 13920 Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces

IS : 2911 Code of practice for designs and construction of pile foundation.

IS – 3025 Method of Sampling and Test (Physical and Chemical) for water used in Industry.

IS – 3558 *Code of practice for use of immersion vibrators for consolidating concrete*

MASONARY WORK:

IS- 1077 Common burnt clay building bricks.

IS- 3495 Methods of tests for burnt clay building bricks.

IS- 5454 Methods of sampling of clay building bricks.

IS- 2212 Code of practice for brick work.

IS- 1597 Code of practice for construction of stone masonry.

IS- 2572 Code practice for construction of hollow concrete block masonry.

IS- 2250 Code practice for preparation and use of masonry.

IS- 1905 Code of practice for structural safety of masonry mortars.

IS- 2645 Integral cement water proofing compounds.

IS- 2116 Sand for Masonry Mortars.

~~IS- 2393 Code of practice for application of lime plaster finish.~~

PLASTERING AND POINTING:

IS- 1542 Sand for plaster.

IS- 1661 Code of practice for application for cement and cement lime plaster finishes.

PAVING, FLOOR FINISHING AND DADO:

IS- 6509 Code of practice for installation of joints in concrete pavements.

IS- 1237 Cement concrete flooring tiles.

IS- 1443 Code of practice for laying and finishing of cement concrete flooring tiles.

IS – 777 Glazed earthenware tiles.

IS- 2114 Laying in situ terrazzo floor finish.

IS- 2571 laying in situ concrete flooring.

IS – 6509 Code of practice for installation of joints in concrete pavement

DOORS, WINDOWS AND VENTILATORS:

IS- 4021 Timber door, window and ventilator frames.

IS- 1003 Timber panelled and glazed shutters.

IS- 2191 Wooden flush door shutters (cellular and hollow core type).

IS- 2202 Wooden flush door shutters (solid core type).

IS- 2338 Code of practice for finishing of wood based materials.

IS- 1948 Aluminum doors, windows and ventilators.

IS- 1949 Aluminum windows for industrial buildings.

IS: 3548 Glazing in building.

IS: 4020 Methods of tests for wooden flush doors: Types tests.

IS- 5807 Method of test for clear finishes for wooden furniture.

PAINTING:

IS- 2395 Code of practice for painting, concrete, masonry and plaster surfaces.

IS- 2933 Specification for enamel, synthetic, exterior, type-II

IS- 2932 Specification for enamel, synthetic, exterior, type-

MISCELLANEOUS WORKS:

IS- 6313 Code of practice for anti-termite measures in building.

ROAD WORKS:

IRC- 37	For bituminous roads.
IRC- 58	For concrete roads.
IS: 215	Road Tar.
IS: 383	Coarse and fine aggregate from natural sources for concrete.
IS: 458	Pre-cast Concrete pipes (with and without reinforcement).
IS: 460	Test Sieves.
IS: 2386	Methods of test for aggregate for concrete
IRC ~~IS~~: 19	Standard specification & code of practice for water Bound Macadam.

POTABLE WATER SYSTEM

IS 4985:2000	**UNPLASTICIZED PVC PIPES FOR POTABLE WATER SUPPLIES**
IS 8008	**INJECTION MOULDED/MACHINED HIGH DENSITY POLYETHYLENE (HDPE) FITTINGS FOR POTABLE WATER SUPPLIES**

SANITARY, WATER SUPPLY AND DRAINAGE WORKS:

IS- 2556	Vitreous Sanitary appliance (Vitreous china).
IS- 5329	Code of practice for sanitary pipe works above ground for building Cast iron brackets and supports for wash basins and sinks.
IS- 3486	Cast iron spigot and socket drain pipes.
IS- 782	Caulking lead.
IS- 651	Salt glazed stoneware pipes and fittings.
Is 14333-1996	HIGH DENSITY POLYETHYLENE PIPES FOR SEWERAGE
IS- 5961	C.I. grating for drainage purposes.
IS- 1230	C.I. rain water pipes and fittings.
IS- 554	Dimensions for pipe threads where pressure tight joints are made on threads.
IS- 781	Cast copper alloy screw-down bid taps and stop valves for water services.
IS- 774	Flushing cisterns for water closets and urinals.
IS- 2470	Code of practice for installation of septic tanks.

IS- 2065	Code of practice for Water supply in buildings.
IS- 1172	Basic requirements of water supply, drainage and sanitation.
IS- 771	Glazed earthen ware sanitary appliance.
IS- 1742	Code of practice for Building drainage.
IS- 1519	P & 'S' traps. (part I).

GENERAL

IS- 1200	Method of measurement of building and civil engineering works.
IS- 4326	Code of practice for earthquake resistant design and construction of buildings.
IS- 1893 Part I 1016	Criteria for earthquake resistant design of special structures (large & tall).

ELEVATORS / LIFTS

IS 14665: Part 1: outline dimensions of *lift* cars for passenger, goods, service and hospital *lifts*. The corresponding well sizes, pit depth, headroom,.

IS 14665 Part 2: CODE OF PRACTICE FOR INSTALLATION, OPERATION AND MAINTENANCE

FIRE FIGHTING EQUIPMENTS:

IS 11346:2000: CODE OF ACCEPTANCE FOR WATER SUPPLY PUMPS:

Applications of Codes, Standards & Specifications which are not included in the above but are

Requirement for completion of the Project activities shall be always be complied with.

OTHER;

IS 13182: Waterproofing and Damp-Proofing of Wet Areas in Building

ISO 8528: Certification of Diesel Generators: Noise, Vibration, and Temperature Measurements

IS 10001: Diesel engine for AC generator.

IS 13364 (Part 1): 1992 (Reaffirm to 2003) - AC GENERATORS DRIVEN BY RECIPROCATING INTERNAL COMBUSTION ENGINES

VOLUME - II

SECTION – 19
LIST OF APPROVED MATERIAL

VOLUME - II	**LIST OF APPROVED MATERIAL**	SECTION -

a) **STEEL**

Sr. No.	**MATERIAL**	**MAKE**
1.	Mild & TMT Steel	SAIL, TISCO
2.	Construction chemicals or Plasticizers	Globus, Dr. Fixit, Fosroc
3.	Waterproof Cement Paint	Super Snowcem., Nitcocem
4.	Hardware	Shalimar, Navbharat, Amarbhoy, Dossaj
5.	Glazing	Hindustan Pilkiriton, Triveni, Float Glass of Asahi`
6.	Metal Primer	Shalimar, Asian, Garware Paints
7.	Paints	Berger, Asian, ICI, Nerolac (Water based)
8.	Hardener	Irnonite, Fosroc,
9.	Aluminum doors, windows, Partitions	Jindal, Indian Aluminum Sections of HINDAL Co
10.	Rolling Shutters & Grills	Standard ,Swastik
11.	G.I. Pipe	Tata, Zenith with ISI mark
12.	Paver blocks	Conwood, Unifab, Nitco
13.	Chequered Tiles	NITCO
14.	Block Masonry	Factory made
15.	Polycarbonate Sheet	G.E. Plastic or equivalent
16.	Fly Ash	Dirk make
17.	Non Shrinkage Grout	ACC, Fosroc, MC – Bauchemie

18.	Flush & Panel Doors – ISI mark	Kutty flush door, Green Ply, Wood crafts, Shree's
19.	F.R.P. Doors	Advance Marketing, Mosonite (DuPont)
20.	Chamber cover	DI/ET-NECO

B. CIVIL WORK

Sr. No.	MATERIAL	MAKE
1.	RMC	RMC India, ACC, Ambuja,
2.	Cement (43/53 Grades)	Gujarat Ambuja, ACC, L& T, Birla Super
3.	Structural steel	SAIL, TISCO, JINDAL, Zenith
4.	Waterproofing compound	MC- Bauchemi, Perma, Par speciality,
5.	Waterproofing polymer	
6.	PVC Pipes LEAD Free UPVC Sch.40/80	
7.	SW pipes	
8.	Ceramic Tiles	
9.	White / Colored Vitrified tiles	
10.	LA Class pipes with rubber gasket (tylon joints)	
11.	Sanitary fittings	Jaguar
12.	Glass mosaic tiles	Bissazza, Palladio.
13.	Water meter	Captain or equivalent
14.	Sanitary wares	Jaguar
15.	GI Fittings	TATA, Zenith, R. Brand. C Class

16.	GM valve ball (Float valves)	Leader, G G Hawa.
17.	Water, sewage & fire pump	Kirloskar, Grunfors, DP, ITT
18.	CINR Valves	Kirloskar , IVC, AUDCO
19.	Bricks	Ordinary clay bricks of any brand
20.	White Cement	ACC, JK WHITE, BIRLA OR Equivalent
21.	Waterproof cement paint	Centex matt Acrylic or equivalent
22.	Sand	River sand [screened]
23.	Water	Potable water free from organic or any
24.	Granite	
25.	Sink [Stainless steel]	

C. ELECRICAL WORKS

SR. NO.	**MATERIAL**	**MAKE**
1.	Pumps	BEST & Crompton, Kirloskar, KSB, Jyoti, Wortigton,
2.	Motor	KEC, Bharat Bijlee, Jyoti, Crompton, BHEL, GEC,
3.	Ring main unit / HT switches &	MEI, Andrew Yule Southern, CG, Lucy.
4.	Auto transformer starter	MEI, Kilburn, JMP, Siemens, Andrew Yule, GE, KEC.
5.	Trivector Meter	IMP, AE, Havells, Jaipur, ME
6.	Measuring instrument	AMP, AE, UE. MECO, RISHLINE (L&T).
7.	Current Transformer	AE, Gibert & Maxwell, IMP, Seimens, SEGC(C.S.)
8.	PVC Conduits, PVC pipes	Garware, Shakti, popular, Prince, Shaktiman,
9.	HDPE pipes	Finolex, Prince

10.	Ceiling/ Table fans / Air Circulators	Usha, Crompton, Orient, Polar
11.	G.O.D. Switches & Dropout Fuse outfit	Kiran, Pactil, Atlas.
12.	Sluice Valve	Kirloskar, IVC.
13.	Butterfly Valve	Forbes, Kirloskar, IVC.
14.	Lugs	Dowels, Lotus.
15.	Chlorinator	Penwalt, Shree Mitra Purification
16.	Motor Protection Relay	Universal, L& T, Siemens,
17.	11 KV Cable/ 22 KV Cable	ICL, Torrent, Polycab with nitrogen curing facility
18.	Feeder Pillar / Mini Piller	Popular Brass Metal Works, Anil Elect. Ind.,
19.	Transformer	Kirloskar, Crompton, Bharat Bijlee,
20.	L.T. Cable	Closter, Asian (S+M), NICCO, ICL, Polycab, INCAB.
21.	MCB & MCB DB	MDS, Schindler
22.	ELCB	MDS, Havells, Siemens, Schindlers.
23.	PVC wires, Copper Aluminium Conductor, Flexible Cables.	Finolex/ PR/ Havells, Pagoda.
24.	HRC Fuse	L&T, Siemens, Indo Asian, Havell, EE.
25.	Fuse Switches	L&T , Siemens, Crompton, Havell, KEW
26.	Switches / Sockets	Clipsal / MDS
27.	Cable Glands	HME, EEW
28.	HC Fuse Distribution board	CPL, EE, Essen, Stanley, KEW
29.	Air / Oil Circuit Breaker (HT /LT)	Jyoti, Siemens, L & T, GEC, BHEL, Telemechnique,
30.	Energy Meter	Havells, ME
31.	Capacitor	Crompton, L & T, Siemens
32.	Steel Tubular Poles	Indian Electric Poles, Bombay Tubes,

33.	Terminal Box, Bracket, Junction, Box, Control Pillar	ELM United, DVK, MEW.
34.	Street Light Luminaries	Bajaj, Crompton, Phillips, Wipro, GE- Apar.
35.	Chokes, Igniters	Bajaj, Crompton, Phillips, Wipro Glolite.
36.	Power contractor	L & T, Siemens, Hammer, Schindler.
37.	Lamps	Bajaj, Crompton, Phillips, Surya, Mysore.
38.	Rotary / Select or Switches	L & T, Siemens, Katcee, EE.
39.	Post top lantern	Bajaj, Crompton, Phillips, Wipro.
40.	Street light controller / timer	L & T, ELM, Indo Asian.
41.	Alternators	Kirloskar, Crompton, Cummins, Cater Pillar.
42.	Diesel Engines	Kirloskar, Crompton, Cummins, Cater Pillar.
43.	Flow Meter	Signet, monetec, Voryex.
44.	Cable joint kit	Raychem, Xicon, Benson, Mahindra (push on), M seal.
45.	Lifts	Schindler/ Otis / Mitsubishi
46.	Ceiling Fan	Crompton, Havells, Bajaj, Orient.
47.	Exhaust Fan	Crompton, Havells, Bajaj, Orient.
48	CT / PT	Pactil, Crompton

D. APPROVED LIST OF MATERIALS & EQUIPMENTS- FIRE FIGHTING WORKS.

All materials & equipment shall be of the best type available & shall be to the approval of Fire Bridges & shall be ISI certified / marked wherever applicable. The following makes of materials & equipment are approved.

Sr. No.	MATRIAL	MAKE
1.	G.I. Conduits	BEC, VIMCO.
2.	Booster pumps at terrace	Kirloskar, HBD, Voltas.
3.	PVC conduits	Precision, Garware.
4.	Moulded cover circuit (MCCB)	L & T (LT/LK), Crompton Greaves, Siemens/ ABB.
5.	Earth leakage Circuit	Siemens, Group Schindlers, MDS, L&T, Hager.
6.	Flow switches	Porcicon.
7.	Steiner	Jaypee/ Grandprix.
8.	Butterfly Valve	Audco/ C & R.
9.	Control Valve	Mather & Platt / HD/ De's Technico.
10.	Sprinkler head	HD/ Mather & Platt / New age.
11.	Sluice & non return valve	Kirloskar, L & T, Sarkar, Kartar.
12.	Pressure switch	Indfoss.
13.	Pressure gauge	H- Guru.
14.	Hydrant Valve	Minimax, New age.
15.	Cable trays	MEK / Profab / Sadhana.

E. LIST OF APPROVED MAKES FOR PLUMBING WORK:

To comply with the Bureau of Standard Act enacted by the Parliament the fixtures selected should have ISI Marking along with brand name of manufacturer. Fittings without ISI mark if selected as a functional / aesthetic requirement should be got tested in approved test house prior to installation.

The society will have the discretion to select the material from the following list, in construction with PMC. Before accepting all chromium plated fixtures the developer will submit for all items the test result of the chrome plating to ensure the thickness of plating.

Sr. No.	MATERIAL	MAKE
1.	Cast iron pipes & fittings (soil pipes)	BIC, HEP, NECO, AJMERA
2.	R.C.NP2 pipes	Indian Huge pipes
3.	Stoneware pipes & fittings	Trimurti, Perfect.
4.	Cast iron LA Class pressure pipes & fittings	TISCO, Electrical Steel Casting, NECO.
5.	G.I. Pipes- Heavy Grade (C class) as per IS	ITC, Tata.
6.	Metal Valves & fittings	Premier, Leader New.
7.	G.I. Fittings	Ring and Cross brand, Kirti, BM, Gujrat steel.
8.	C.I. Sluice valves, Check valves etc.	IVC (Kolkata), Kirloskar.
9.	Butterfly valves	C & R, Audco, Leader
10.	Chromium plated brass fittings with fancy knobs,	JAGUAR
11.	Bathroom fittings	L& K Techno, Malco GMT.
12.	Bottle traps & waste fittings	JAGUAR
13.	Vitreous China Pottery ware	Hindustan, EID Parry CERA, NEYCER.
14.	Fire clay sinks	SUNDER, KCP, PARASURAM.
15.	W.C. seats & cover ‘A’	Commander deluxe type.
16.	Stainless steel sinks	Nirali.

17.	Full Stall Urinals	Khodiyar or Parasuram.
18.	Polysterine & FRP low level cistern	Challenger, Champion Commander Marvel.
19.	C.P. Spreader	(Full bore made to measurement).
20.	C.I./ ceramic flushing Cistern	AI, IF, NOMOS. NOMOTO, Shutter stock, Ruhe, Parryware, Hardstone
21.	Flush valves	Jaguar / Kohler
22.	Water meter	Leeds, capstan, Atlas, Kaycee, Kent.
23.	Water Storage heaters (electric)	Venus, Spherehot, Bajaj, Recold.
24.	Pressure Reducing valve	HAWA, FAN.
25.	Electric pumps, cold water supply	Best & Crompton, Kirloskar, HBD, WASP.
26.	Sump pumps	Kirloskar, HBD, Darling.
27.	Motors	Crompton, Kirloskar
28.	Starters	Crompton, LT- LK, Siemens, Cilter hammer.
29.	Fibre reinforced	Pratibha industries
30.	RCC Manhole cover and frame and greetings.	Approved by BMC and CIDCO or local authorities.
31.	C.I. Manhole covers, and Grating	Ashok Foundry, IF, NECO.
32.	Stainless steel fixtures	Steelmac or equivalent.
33.	Float / Equilibrium valves.	L&K, Techno.
34.	Leads pipes.	Standard Metal, HMS Metal.
35.	Ball Valves with copper Floats.	L&K, Techno.
36.	Powder coated Bath fittings.	Jaguar
37.	Pressure Gauges.	Figi, H. Guru, Pricol.
38.	Electronic Sensor Urinals	Bell Ceramic, Perryware or equivalent.
39.	Lead pipes.	Std. Metal., H.M.S Metal.

GENERAL:

1. Prior approval for all the above materials shall be obtained from Society / PMC before procurement / installation.

Use of equivalent materials is subject to approval by Society / PMC. The bidder shall bear all additional cost if the same rejected after the same are used without written approval from PMC.

VOLUME - II

SECTION – 20

LIST OF DRAWINGS/DOCUMENTS TO BE HANDING OVER BY THE BIDDER / DEVELOPER TO THE SOCIETY

List of drawings/documents to be Handing over by the bidder / developer to the society;

1. The bidder to Hand over the following drawing / documents/material / spares etc, as listed below on the day or before receipt of Occupancy Certificate (OC). The quantity of the spares mentioned below is tentative and final quantity arrived during the finalization of contract with the builder will be handed over to the Society.

   i. Three sets of all approved building plans including approved original drawings (as approved by NMMC)

   ii. All the approvals / permission letters / constructional certificates / for Intimation of Disapproval (IOD), in originals issued by the M/s CIDCO, NMMC, Airport Authority, Environmental clearance or any other clearance, certificates from any other competent authorities

   iii. Two sets of Raft / mat foundation detail drawings , raft foundation detail plan area and section view in detail information, concrete cement ratio and portion in foundation , reinforcement concrete detail etc to be submitted to the society.

   iv. Two sets of building constructional drawings (RCC drawings)

   v. Layout drawing of the drainage / sewerage system

   vi. All the Inspection & Test reports of the building construction materials

   vii. All the guarantee cards / insurances of the equipment's installed in the premises (like Electric motors, Pumps, fans etc)

   viii. All the contract details of the passenger/fire Lifts and warrantee/guarantee certificates and free maintenance & mandatory spares for first two years or as per contract with the Original Equipment manufacturer (OEM) /vendor

   ix. All the contract details of CCTV, warrantees / guarantees of all the monitors & CCTV camera's and mandatory spares (including monitors, 10% cctv cameras, cables etc.) and AMC contract

   x. All the original documents for approval of residential & commercial load (load assessment order) / security deposits / all test certificates issued by the M/s Maharashtra

State Electricity Distribution Company Ltd. (MSEDCL), for provision of electronic meters etc.. The test certificates of the transformer/s.

xi. All the contract details of the bathroom fittings with warrantees / guarantees

xii. 20% spare premises LED lighting fixtures

xiii. The mandatory spares as mentioned in the various sections

xiv. All the drawings, documents of the fire fighting equipment's, mandatory spares and guarantee /warrantee certificates. Three sets of the Fire system equipment & piping layout drawings, mandatory spares of 10% quantity of the valves of each types including NRV's & control valves (if any), sprinklers, extinguishers, Fire detection system and warrantee / guarantee documents

xv. List of all equipment's and 10% spares for the security gadgets provided for the flats / buildings.

VOLUME - II

SECTION – 21
ENCLOSURE'S

VOLUME - II	ENCLOSURE'S	SECTION - 21

ENCLOSURE'S

1. NO OBJECTION FOR HEIGHT CLEARANCE FROM AIRPORT AUTHORITY OF INDIA.

2. DRAFT QUALITY ASSURANCE PLAN

ASSOCIATE
It's different in survey

CERTIFICATE OF SITE ELEVATIONS AND SITE COORDINATES

Reference No.: SKA/NOCCERT01/2023-24/0805 Date: 16th August 2024

Name Of The Licensed Surveyor:- Mr. Vivek Dattaram Sawant

Address:-Aakash Sagar Apt., B-302,Santosh Nagar, Pune Link Road, Kalyan East, Thane:- 421306

Email Id:- sada.kandalgaonkar@gmail.com Mobile No.:- +91-9773327773 / +91-9619666047

License No.:- LS : 840002991 License Validity:- 01.04.2024 to 31.03.2025

Scope of License:- Surveying & certifying the site coordinates of the plot in WGS-84 system by using standard DGPS Instrument to facilitate the applicants to seek NOC through NOCAS of AAI

License Issuing Authority:- **MUNICIPAL CORPORATION OF GREATER MUMBAI**

I/we hereby certify that I/we have carried out survey as per the following details and the results are shown in (A) and (B) below :-

Site / Plot No.: Punit Park, Plot No. 182-C, Sector - 17, Nerul, Navi Mumbai - 400706.

Site Address.: Punit Park, Plot No. 182-C, Sector - 17, Nerul, Navi Mumbai - 400706.

Owned /Lessee of the Plot/Site: **Cosmopolitan - II Co-op. Hsg Society Ltd.**

(A) Site Coordinates:

Corner No.	Latitude	Longitude	Site Elevation (AMSL) in Meters.
North-West	19°02'09.87" N	73°01'26.02" E	7.60
North-West	19°02'10.81" N	73°01'26.94" E	7.65
North-West	19°02'07.68" N	73°01'31.12" E	7.61
North-East	19°02'06.42" N	73°01'29.88" E	7.60

(B) Highest Site Elevation of the plot: 7.65 Mtr. A.M.S.L.

ASSOCIATES SK KALYAN

VIVEK DATTARAM SAWANT

Digitally signed by VIVEK DATTARAM SAWANT
Date: 2024.08.17 15:01:15 +05'30'

Cell: +91 9773 327 773 / 9619 666 047
Mail: info@skassociate.co.in
Address: Aakash Sagar Apt., Santosh Nagar, Pune Link Road, Kalyan (E).

ASSOCIATE

It's different in survey

(C) Further it is certified that:

1. I we am / are trained and equipped to issue this certificate for site elevation and site coordinates.
2. The site elevation and site coordinates data are correct to best of my knowledge and belief and are within permissible limits of accuracy of 50 cm in vertical and 03 meters in horizontal.
3. I have used the following equipment for survey
   a) DGPS confirming to accuracy levels defined in 2 above. Along with validity of calibration certificate.
   b) Total station confirming to accuracy levels defined in 2 above. Along with validity of calibration certificate.

(D) Undertaking

1. I indemnify Airports Authority of India and the concerned airport operator against all damages arising out of errors in data furnished above bye me on addition to the owner's responsibility in this regards. I may further be blacklisted by AAI in case of wrong data.
2. Within a period of three months from the date of filling of NOC application, I shall submit the following documents to the Airport Director of the concerned Airport, if so required by AAI.

a. License certificate of surveyor.
b. Calibration certificate of the survey equipment.
c. Photograph of the Surveyor at site and showing the neighboring land area
d. Site plotted on google Earth map.

ASSOCIATES SK KALYAN

VIVEK DATTAR AM SAWANT

Digitally signed by VIVEK DATTARAM SAWANT
Date: 2024.08.17 15:01:36 +05'30'

Mr. Vivek Dattaram Sawant
(License Number: LS: 840002991)
License Validity: 01.04.2024 to 31.03.2025

(Mr - Liladhar Parab)

Cell: +91 9773 327 773 / 9619 666 047
Mail: info@skassociate.co.in
Address: Aakash Sagar Apt., Santosh Nagar, Pune Link Road, Kalyan (E).