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RESIDENTIAL DEVELOPMENT (TOWERS-04B) AT MANGADU, CHENNAI

TECHNICAL WRITEUP ON MEP SERVICES

**Clients &
Architects**

:



GARDENCITY REALTY PVT LTD

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1 WATER MANAGEMENT

1.1.1 Water Requirement:

- A logical approach is made to assess the quantity of water required for various applications, based on guidelines laid down in National Building Code of India and best industrial practices.
- The overall daily requirement of water for Towers-04B is as tabulated in the table below;

Water Requirement for Residential Apartment Unit: Towers-04B										
Sl No	Description of Module	Total Units	Rate of Occupancy/ Unit	No of Persons	Domestic water demand in lpcd	Flushing water demand in lpcd	Total water demand in lpcd	Domestic water reqt in liters/day	Flushing water reqt in liters/day	Total water reqt in liters/day
1	Towers-04B									
	1 BHK	40	5	200	90	45	135	18,000	9,000	27,000
	2 BHK	232	5	1,160	90	45	135	1,04,400	52,200	1,56,600
	Total	272		1360				1,22,400	61,200	1,83,600

- Total water requirement for Towers-04B is 184 cum, out of which Domestic Water demand is 123 cum & Flushing Water demand is 62 cum.

1.2.2 Storage Requirements:

- Storage is provided for 1.5 days requirement for comprising of raw water sump & treated water sump and 0.5 days storage requirement for OHT storage. The proposed water storage tanks shall be of following capacities:
- For Towers-04B: Parcel-02**

Total Water Requirement in Cum	184
Fire Reserve Sump Capacity in Cum	400
Raw Water Sump Capacity in Cum	300
Treated Water Sump Capacity in Cum	300
Roof Top Water Collection Sump Capacity in Cum	170
STP capacity in KLD	530

1.2.3 Source of Water:

- Municipal water if available/ bought out water supply/Bore wells (if allowed at site) are the only sources for Domestic water supply system.
- Recycled Water from sewage treatment plant of proposed capacities is the source for flushing & irrigation water supply system in the entire site.

1.2.4 Water Distribution System:

1.2.4.1 Domestic water Distribution:

- Water Supply from various sources(i.e. from Tanker / Borewell) is connected to Fire water storage, and then overflow is taken to Raw water storage tank, raw water is treated in a primary water treatment plant & finally collected in the treated water storage tank.
- Distribution of water supply for Towers-04B for various fixtures in all user points is by Gravity system.
- Domestic water is used for all the purposes like toilets, showers, wash hand basins, Kitchens etc.,
- The requirement of distribution system may be classified as functional and hydraulic. The sizing of the entire distribution network is based on the simultaneous use of fixture unit's demand. Individual toilets will be provided with main control valve for isolation and maintenance of the same.

1.2.4.2 Recycled Water Distribution:

- Sewage and sullage is collected from toilets & Kitchens shall be transferred to STP by Gravity system.
- Required treatment shall be given as per PCB or available reuse norms through primary, secondary and tertiary treatment method.
- The source of water supply for flushing of WC's & landscape irrigation purposes shall be through STP treated water by providing Gravity system in Towers-04B.
- Excess unutilized water shall be drained to municipal sewer line as per the location available at site.

2 SOLID WASTE MANAGEMENT SYSTEM

- Segregation at the source house hold level
- Primary (Door to Door) Collection
- Secondary Storage
- Processing
- Disposal

2.1 Segregation

- Segregation of wastes into wet, dry/ recyclables and household hazardous waste.
- Familiarizing users about the solid waste management system adopted.
- Training program for retrievers regarding importance of segregation, proper handling of waste and its hazards due to improper handling.
- Littering of waste to be banned.

2.2 Primary Collection & Secondary Storage

- Door to door waste collection system will be carried out.
- Waste will be collected in two bins, one for Organic biodegradable waste & other for Inorganic one.

2.3 Processing & Disposal

- Biodegradable fed through “Organic Waste Converter”.
- The segregated waste is pulverized and mixed with bacterial seed.
- This homogenized mixture stored in racks for 14 days with moisture controlled environment.
- Ultimately this convert as odor manure, the same may be sold outside.
- Non-biodegradable inorganic waste shall be either disposed to municipal land fill or to recyclers.

<i>SI No.</i>	<i>Description of Module</i>	<i>No. of persons</i>	<i>Organic waste per capita considered(in kg/day)</i>	<i>Inorganic waste per capita considered(in kg/day)</i>	<i>Total Organic Solid Waste(in MT/day)</i>	<i>Total Inorganic Solid Waste(in MT/day)</i>
1	Towers-04B	1360	0.27	0.18	0.37	0.24
		Total			0.37	0.24

<i>SI No.</i>	<i>Description of Waste</i>	<i>Organic Quantity</i>	<i>Inorganic Quantity</i>	<i>Method of Collection</i>	<i>Method of Disposal</i>
1	General Garbage	0.37 MT/Day		Manual	Organic waste converter
			0.24 MT/Day	Manual	sold to recycler
2	STP Sludge	26.5 Kg/Day		Manual	On Own Land for Gardening

2.4 Method of Collection, Segregation & Disposal:

ORGANIC WASTE

Customers are provided with special biodegradable bin liners/bags and an under-sink mini bin for collecting **organic waste**. The bag must be placed in the household bin (or the apartment building's large bin) the evening before collection day. The household bin (or apartment-building bin) should be placed in front of the house (or apartment building).

Organic waste **includes** the following:

- food leftovers
- fruit skins or peel
- tea bags
- coffee grounds
- eggshells
- small bones and fruit stones
- small amounts of garden waste (in accordance with the size of the bin)
- scraps of fish, meat, cheese
- vegetable peelings
- kitchen waste
- food that is past its best-before date (no packaging)
- paper napkins

Large, apartment-building bins, individual household bins and under-sink bins are **brown**, bags are **white**.



MULTI-MATERIAL RECYCLABLE WASTE

All customers are given clear plastic sacks for **multi-material recyclable waste** collection. Big apartment buildings (more than 15 households) are also supplied with a white on-street container. The sack should be placed in front of the house the evening before collection day. Households in apartment buildings should put their sacks in the white on-street container, which must be placed on the street (or other collection point agreed with Iris Isontina) the evening before collection day. Multi-material recyclable waste **includes**:

METAL CANS and OTHER METAL ITEMS

- aluminium kitchen foil/food containers
- drink cans
- oil cans
- small metal items (cutlery, etc.)
- bottle caps
- jars and cans used for jams/pickles etc.

PLASTIC PACKAGING

- egg boxes
- shopping bags
- water/soft drink bottles
- toiletry containers (jars, tubs and tubes)
- food containers
- household detergent bottles
- cellophane wrapping
- yogurt tubs
- plastic packaging in general (plastic strips, fruit nets, polystyrene, etc.)

PAPER & CARDBOARD

- food packaging (including Tetrapaks)
- paper sheets and bags
- exercise books and books
- newspapers and magazines
- boxes (including cardboard boxes)

Bulky paper or cardboard waste must be flattened as much as possible and placed next to the sack (or on-street container). This also applies to wood, plastic or polystyrene crates (which must be clean).



Organic Waste Converter WASTE FLOW CHART



Waste Generator

- Hotels
-
- Temples
-
- Markets
-
- Hospitals
-
- Clubs & Resorts
-
- Slaughter House
-
- Industrial Canteen
-
- Institutional Campus
-
- Building Cluster in lane
-
- Large Housing Complex

3 SEWERAGE SYSTEM

3.1 Sewage Collection & Conveyance

- Sewerage system is designed as per NBC & local by-law. The system is designed as two pipes system (double stack) as per IS specifications.
- Soil & waste internal piping system (Inside the toilets) is laid below the slab either by making core-cut or by placing pipe sleeves & covering with false ceiling.
- Sewage network comprises of horizontal & vertical stacks laid in the toilets and in the shafts. The vertical stacks are terminated into separate Soil & waste lines laid at Basement ceiling level, as per the requirement. The pipes are properly fixed with pipe supports and anchored to the RCC slab. The pipes are provided with proper slope in ceiling level to maintain easy flow of sewage.
- The minimum diameter of the vertical soil & waste stack shall be 110mm. All fixtures and appliances shall be fully trapped to prevent back flow of foul gases and odour into the toilets.

3.2 Sewage Treatment Plant

- Sewage treatment plant design as per CPCB norms.
- The sewage from the building along with waste water from toilets & Kitchens etc... would be treated in Sewage treatment plant.
- The treatment shall be **Sequencing Batch Reactor (SBR)**. The air shall be distributed through diffused aeration system using coarse bubble and fine pore diffusers. After the tertiary treatment, treated effluent is used for flushing & landscaped irrigation purposes.
- The Sewage Treatment Plant of capacity **530KLD** for Towers- 04 to 05 shall be designed to treat the combined sewage (i.e. soil and waste water).
- The treatment plant shall be compact type with minimum 2.4mts headroom above maximum water level (Platform level) for maintenance. The process of treatment shall be divided into three parts:
 - Primary Treatment
 - Secondary Treatment (SBR)
 - Tertiary Treatment

4 Fire Fighting system:

The proposed building Fire Fighting system is designed per NBC (National Building Code) Part IV of Fire & Life Safety, 2016.

Relevant necessary approvals from state body, Tamilnadu State Fire & Emergency department is also obtained.

Following systems is proposed to be adopted as per NBC 2016 & TNSFS requirements:

- Fire Pumps & Equipment's
- Fire Hydrant system
- Automatic Sprinkler system

- Fire water curtain system for basement car parking area
- Portable Fire Extinguishers
- Manual fire alarm system
- Automatic Fire Detection for club house
- Public Address system
- Fire signage's

All equipment's used are minimum BIS (Bureau of Indian Standards) approved. All suppression systems are Water based, designed to discharge water at necessary pressure to suppress fire under emergency. Portable extinguishers are used as early suppression media, which is of ABC Type (powder type), extinguisher equipment is listed under BIS 15683.

No HALON agents are used as suppression media.

The working principal of firefighting system is as follows:

When the sprinkler head, hose reel or hydrant valve opens, the pressure drop in respective piping network which will be sensed by pressure switches installed in delivery header of pumping system. This, in turn switches on the respective jockey pump automatically to meet the water requirement. In case of further pressure drop, the system's main pump will start to meet the water supply requirement. The jockey pumps will start and shut off automatically as per pressure adjustment, whereas the main pumps of both the system and common diesel engine driven pump will have auto start and manual OFF feature.

Automatic fire detection for club house & alarm system is proposed for Buildings which are crossing more than 15 meter in height and for Buildings which coming under category such as Assembly i.e. Club house.

These provisions are intended to provide early notification to building occupants of a fire scenario and inform building occupants to evacuate the area accordingly. The two-way fire department communication system is provided to facilitate fire department personnel communication between the fire control room and common lobby areas of the building.

5. EMERGENCY EVACUTION SERVICES :

The proposed building Emergency Evacuation is designed per NBC (National Building Code) Part IV of Fire & Life Safety, 2016.

Relevant necessary approvals from state body, Tamilnadu State Fire & Emergency department is also obtained.

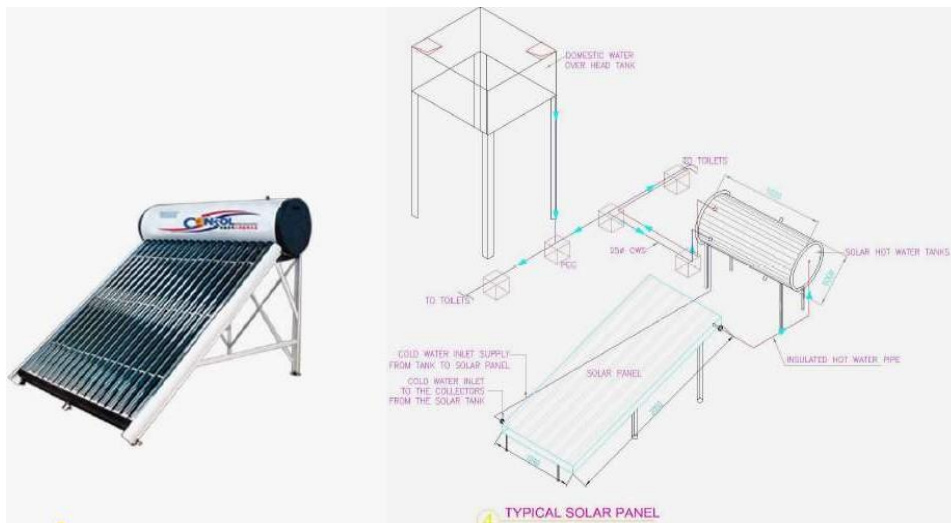
Following paths are created for easy evacuation of occupants:

- Adequate staircases with necessary width as per NBC 2016 and required numbers are proposed for each of buildings to make it safe and easier to escape in case of emergency.
- Refuge area in terms of Balconies for each of the apartment houses is proposed for quick assembly and easy evacuation by Emergency department like Fire service & Disaster management service in case of emergency.
- Emergency communication system like Public Address system with capability to have Mass communication is proposed for reach occupants in case emergency.
- Fire aid fire extinguishers and necessary Firefighting system proposed for occupant utilization and service personnel utilization.

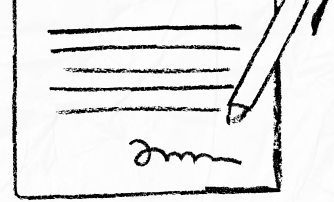
- Necessary Setback as required by NBC & Zonal requirements is left surrounding two buildings for easy assembly in case of emergency.
- Fire tender movement (Fire driveway) of necessary width as required by Chief fire officer is proposed for access of emergency vehicle in case of emergency.
- Fire Order or Display board stating “Procedure and Process” or Standard operating Procedure to be followed in case of emergency is proposed at every escape staircases.
- Emergency contact numbers of Police, Fire department is displayed for utilization along with fire order.
- All evacuation path like Escape staircase, Refuge balconies are proposed to be constructed with Non-combustible materials like Brick, Block, RCC column, Steel & Cement making it 2 hours fire rated.
- All escape staircases are proposed to have ventilation (natural ventilation) enabling fresh air entry and smoke exhaust in case of emergency, thereby occupants can evacuate through staircases.
- Each tower contain fire tower, Fire tower lobby contain one staircase +one fire lift and fire shaft along with all the equipment's as per the NBC 2016.

6. SOLAR WATER HEATER SYSTEM:

- Solar water heater system is provided for upper two floors/as per statutory requirement.
- Hot water line will be provided with necessary insulation, valves & network of terminal mains at terrace level for further distribution.
- Hot water from solar water heating system will acts as the pre heated water for respective geysers.



Note: Towerwise Centralized Solar hot water system have been proposed.



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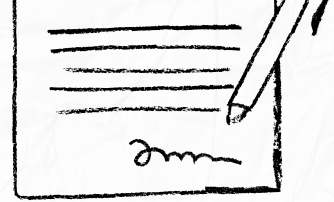
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