I/3092637/2024

भारत सरकार GOVERNMENT OF INDIA
रेल मंत्रालय MINISTRY OF RAILWAYS
(रेलवे बोर्ड RAILWAY BOARD)

No. 2024/LMB-II/2/3 **New Delhi, dated: as signed**

The General Managers,
All Zonal Railways/Production Units,
DG/RDSO,
IRICEN/PUNE.

Sub: Revision of Plinth Area Norms for General Pool Residential Accommodation to be constructed for Indian Railway Employees – Reg.

It has been decided to revise the Plinth Area norms of construction of residential quarters under Railway colonies for Railway employees. The revised plinth area norms as contained in Ministry of Housing & Urban Affairs' O.M No. 28012/08/2023-WI dated 23/01/2024 have been adopted in construction of staff quarters in Railways. To optimize the utilization of limited and valuable land resources with the railways, zonal railways are advised to strictly follow the instruction issued by Board's policy letter No. 2023/LMB-II/2/8 dt. 05.12.2023 regarding construction of multi-storey residential accommodation on IR. The revised Plinth area norms and related details are as under:-

1.1 Revised Plinth Area Norms

Revised Plinth Area Norms for Dwelling Units from Type-I to Type-V and new Plinth Area Norms from Type-VI to Type VIII Quarters applicable for construction on Indian Railways for Railway Employees shall be as per Table Below:

(In Sq. mtr)

Type		2013	2024
I (A)	Main Unit	49.5	No new construction
II (B)	Main Unit	63.00	75.00
III (C)	Main Unit	73.00	85.00
IV (D)	Main Unit	101.50	110.00
	Servant Unit	19.50	25.00
V (E)	Main Unit	161.50	161.50
	Servant Unit	25.00	25.00
VI (F)	Main Unit	229.00	229.00
	Servant Unit	25.00	25.00
VII (G)	Main Unit	331.00	331.00

I/3092637/2024

	Servant Unit	**23.5*2**	**25*2**
VIII (H)	**Main Unit**	**460.00**	**460.00**
	Servant Unit	**23.5*4**	**25*4**

1.2 Scale of Amenities

a. General Design Guidelines for Railway Quarters (Annexure-1).
b. Scale of Amenities for Architectural Services (Annexure-2).
c. Scale of Amenities for Civil Fittings and Fixtures (Annexure-3)
d. Scale of Amenities for Electrical Services (Annexure-4).

1.3 General specifications – General specification of flooring, doors, windows, water supply, sanitary installation and other services (Annexure-5).

1.4 Parking Norms:

The parking norms of the local body shall be followed.

This issues in consultation with Finance Directorate of Railway Board.

DA: Annexure 1 to 5

Signed by Surendra Kumar
Date: 05-04-2024 15:23:27
Reason: Approved

(Surendra Kumar)
Director/ Land & Amenities
Railway Board

No. 2024/LMB-II/2/3 **New Delhi, dated: as signed**

Copy forwarded for information to:

1. The Principal Financial Advisor (PFA), All Indian Railways.
2. The Principal Director of Audit, All Indian Railways.
3. The Deputy Comptroller & Auditor General of India (Railways), Room No. 224, Rail Bhawan, New Delhi.

Signed by
Jagdish Pandey
Date: 08-04-2024 15:46:22

for Member (Finance), Railway Board

Copy to:-

1. Advisor (MR), EDPG(MR), EDPG/MoSR(J), EDPG/MoSR(D), OSD(MR), OSD/Co-ordination (MR).
2. The General Secretary, NFIR
3. The General Secretary, AIRF
4. The Secretary General, FROA
5. The Secretary General, IRPOF

I/3092637/2024

6. The Secretary General, All Indian RPF Association.
7. The GM, NF Railway (Const.),Chief Administrative Officer (Const.), All Indian Railways.
8. The General Manager and the PFA, Metro Railway, Kolkata.
9. The General Manager and the PFA, CORE, Allahabad.
10. The Director General, National Academy of Indian Railways/Vadodara.
11. The Director, IRIEEN/Nasik Road, IRIMEE/Jamalpur, IRISET/Secunderabad.
12. PPSs/PSs to:- All AMs and Advisers, Railway Board.
13. E/G, G/ACC., E/WELFARE, E/LR, F/X-I Branches of Railway Board.

Annexure-1

General Design Guidelines for Railway Quarters

Guidelines given below may be adopted while designing Railway houses.

- Minimum floor to floor height may be kept as 3,000 mm.
- Generally, no room or space of less than 1,800 mm may be designed.
- The size of toilets may be minimum 1,500 mm x 2,100 mm, but it is desirable to design bigger toilets. All water closets must have a wash basin also.
- Generally, duplex units may be avoided. However, if designed, provision of pantry of adequate size may be made at the first-floor level.
- Utility balcony may be avoided on front side of the building. Utility Balcony to be provided in all unit types.
- Balcony must be provided in all the climatic regions of the country. These balconies may be enclosed with glaze windows only in the hilly regions. The area of balconies may vary with the design depending on the architectural & structure considerations. Minimum depth 1,200 mm
- Windows may be designed for window type ACs in all bedrooms, living and drawing rooms. Provision for power points and drainage of split/window type ACs may also be made.
- The layout of electrical points, fittings and fans shall match with furniture layout.
- The staircase and balcony railing may be made of SS 316 or cast iron or timber.
- Large size granite stone slabs may be used in common circulation areas.
- Community facilities like community hall, milk booth, vegetable shop, grocery store, dry-cleaning shop etc. may be provided, if required.
- The main entrance to the building may be designed for barrier free access.
- As far as possible, stilt may be avoided.
- Wherever required, additional area for staircase, circulation, porch and services like electrical sub-station, pump house, meter room, guard room etc. will be allowed over and above the norms. Staircase and circulation to be as per local bye laws/NBC.
- Shafts for services like water supply, drainage and sanitary pipes, electrical and communication lines will be allowed over and above the norms.
- Generally, no deviation from the prescribed norms should be made, but if any deviation becomes essential, proposal for such deviation should be referred to for specific approval of the owner organization on case-to-case basis.

I/3092637/2024

- The proposed plinth area Norms are based on standard single brick wall of 230 mm (9") and shall be applicable to modular masonry of size 200 mm (8"). However where the wall thickness has to be increased for technical reasons like cavity-wall for green building construction or for use of local material like stone etc. the plinth area may be suitably increased.

Annexure-2.

Scale of Amenities: Architectural (Main Unit)

S No	Category	Office	Drawing Room	Dining Room	Bed Rooms	Kitchen	Store	Number of Attendant's Unit	Utility Balcony	Toilets
1	Type-II	--	One	--	Two	One	--	--	One	Two
2	Type-Ill	--	One	--	Two plus study	One	--	--	One	Two
3	Type-IV	--	One	One	Three	One	-	One	One	Three
4	Type-V	--	One	One	Three	One	One	One	Two	Three
5	Type-VI	--	One	One	Four	One	One	One	Two	Three
6	Type-VII	One	One	One	Four	One	One	Two	Two	Four*
7	Type-VIII	One	One	One	Four	One	One	Two	Two	Four*
8	Attendant's unit	--	--	--	One	One	--	--	One	One

*One toilet (without bath) shall be provided attached with office.

Annexure-3

Scale of Civil Fittings and Fixtures

S No	Item	Type- II &Ill		Type-IV		Type-V &VI		Type-VII & VIII		Attendant unit	
1	Kitchen	**Old**	**New**	**Old**	**New**	**Old**	**New**	**Old**	**New**	**Old**	**New**
(i)	Granite cooking platform	Yes	Yes	Yes	Yes	__	Yes	__	Yes	Yes	Yes
(ii)	Stainless steel 316 kitchen sink with drain board	Yes 304 grade	Yes	Yes	Yes	__	Yes	__	Yes	Yes	Yes
(iii)	Modular cupboard	**__**	**Yes**	**___**	**Yes**	Yes	Yes	Yes	Yes	__	Yes

I/3092637/2024

	with shelves and drawers										
2	Built in wardrobe in each bedroom up to ceiling height, minimum about 900 mm wide and 600 mm deep. It may be made up of 18 mm thick blackboard or wood composite plastic or steel. The inner side of one shutter may have mirror of size 600 mm x 1200 mm approx.	Yes	Yes	Yes	Yes	Factory made wardrobe	Yes	Factory made wardrobe	Yes	Yes	Yes
3	Magic eye in front entry door	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Curtain rod with required accessories, except for kitchen and toilet doors and windows	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	18 mm thick granite window sill lining	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Indian or European or wall hung WC pan with flushing cistern	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

I/3092637/2024

Annexure-3 (cont..)

Scale of Civil Fittings and Fixtures

S No	Item	Type- II &Ill		Type-IV		Type-V &VI		Type-VII & VIII		Attendant unit	
		Old	New	Old	New	Old	New	Old	New	Old	New
7	Water jet spray/ Hand faucet with each IWC/EWC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
8	Wash basin with CP brass mixer tap in each toilet	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	Wash basin in balcony. Tap for washing machine	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	No	No
10	Taps in kitchen, toilets and balcony, director supply connection in kitchen	Yes Not in Balcony	Yes	Yes Not in Balcony	Yes	Yes Not in Balcony	Yes	Yes Not in Balcony	Yes	Yes Not in Balcony	Yes
11	Swan neck CP brass mixer tap in kitchen sink	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
12	Shower with CP brass mixer tap	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
13	SS 316 towel rail	Yes CP Brass	Yes	Yes CP Brass	Yes	Yes CP Brass	Yes	Yes CP Brass	Yes	Yes CP Brass	Yes
14	SS 316 toilet paper holder	Yes CP Brass	Yes	Yes CP Brass	Yes	Yes CP Brass	Yes	Yes CP Brass	Yes	No	Yes
15	Mirror of size 450 x 600 mm or of bigger size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	Granite quadrant of 250 mm radius near shower, one at 1200	No	Yes	No	Yes	No				No	Yes

	mm and second at 1500 mm height						Yes	No	Yes		
17	Plumbing for water filter and geyser	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	Terrace water tank of 500 litres capacity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	**Facility for IGL pipeline, where applicable**	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
20	**PVC pipe for drainage of water from ACs**	No	Yes	No	Yes	No	Yes	No	Yes	No	No
21	**Provision for window A/Cs in each room**	No	Yes	No	Yes	No	Yes	No	Yes	No	No
22	**Provision for split A/Cs in each room**	No	Yes	No	Yes	No	Yes	No	Yes	No	No

Annexure-4

Scale of Electrical Fittings and Fixtures

S No	Item	Type- II &Ill	Type-IV	Type-V &VI	Type-VII &VIII	Attendant unit
1	Light fittings, minimum one in each room and kitchen	Yes	Yes	Yes	Yes	Yes
2	Bracket or decorative lights, minimum one in each room balcony, each toilet and mirror light for each bathroom	Yes	Yes	Yes	Yes	Yes
3	Fans(minimum one decorative in each	Yes	Yes	Yes	Yes	Yes

I/3092637/2024

	room)					
4	Modular switches	Yes	Yes	Yes	Yes	Yes
5	5 A sockets (minimum two in each room and kitchen)	Yes	Yes	Yes	Yes	Yes
6	15 A sockets (minimum two in each room and kitchen)	Yes	Yes	Yes	Yes	Yes
7	15 A socket with MCB for geyser in each toilet and kitchen	Yes	Yes	Yes	Yes	Yes
8	15 A socket with MCB for AC in each room	Yes	Yes	Yes	Yes	-
9	5 A and 15 A sockets, one each, in balcony , and utility area , store	Yes	Yes	Yes	Yes	Yes
10	Call bell near main door	Yes	Yes	Yes	Yes	Yes
11	Electric chimney in kitchen	-	-	Yes	Yes	-
12	Fresh air exhaust fan in kitchen and each toilet	Yes	Yes	Yes	Yes	Yes
13	25 liters geyser in each toilet	Yes	Yes	Yes	Yes	-
14	Telephone and cable TV sockets & modular mobile charging socket each room	Yes	Yes	Yes	Yes	Yes
15	Electrical points for water filter and oven	Yes	Yes	Yes	Yes	Yes
16	Electrical point for fridge and washing machine	Yes	Yes	Yes	Yes	Yes
17	Call bell point with image display system			Yes	Yes	
18	Dressing light point	Yes	Yes	Yes	Yes	Yes

I/3092637/2024

ANNEXURE – 5

GENERAL SPECIFICATIONS

The materials, specifications and design values given here are only illustrative. Use of local and renewable materials shall be preferred. The actual design values may vary according to type of building, bye-laws, and special requirements, if any.

Sl . No.	Description	Specifications and design
	Civil	
1	**Foundation**	
i	Bearing capacityqa	60 kN/m^2 at 2500 mm below the ground level
ii	Ground water table	7 meter below ground during rainy season
iii	Type	Bored cast in situ RCC piles of M30 concrete with minimum cement content of 350 kg/m^3
iv	Masonry	Fly ash cement concrete bricks in cement mortar 1:6
2(a)	**Superstructure**	RCC framed structure
i	Concrete mix	M 30
ii	Rebars	Corrosion resistant Fe 550 D
iii	External walls	230 mm thick fly ash cement concrete brick masonry with cement mortar 1:6. OR 200 mm thick autoclaved aerated concrete blocks laid with adhesive.
iv	Internal Walls	115 mm thick fly ash cement concrete brick masonary with cement mortar 1:4. OR 100 mm thick autoclaved aerated concrete blocks laid with adhesive.
2b	**Superstructure**	Load bearing masonry in burnt clay FPS bricks.
i	Load bearing walls	230 mm thick brick masonry in cement mortar 1:6.
ii	Partition walls	115 mm thick brick masonry in cement mortar 1:4.
3	**Doors**	
i	Entrance Door	2^{nd} class teak wood frame and 2- leaf shutters. 35 mm thick decorative flush door shutter. The frames will have double rebate for wire mesh shutters.
ii	Room frames	2^{nd} class teak wood or UPVC.
iii	Room Shutters	35 mm thick decorative or commercial flush door.
iv	External doors	35 mm thick flush door shutters or UPVC. Exposed face of shutters in balcony or mumty will be protected with 1 mm thick PVC rigid foam sheet fixed using rubber based adhesive.
v	Toilets	Frames and 25 mm thick shutters made of wood fibre composite board of density 650 kg/m^3.
vi	Wire gauze shutters (for all external doors)	Wire mesh of SS 304 stainless steel.

vii	Architraves	Teak wood or wood fibre composite or UPVC.
4	**Windows**	
i	Frames	2nd class teak wood or UPVC extruded profiles having 2.3 mm thick wall.
ii	Shutters	2nd class teak wood or UPVC extruded profiles having 2.3 mm thick wall.
iii	Fixed glazing	2nd class teak wood or UPVC extruded profiles having 2.3 mm thick wall.
iv	Toilets	5mm glass louvers in colour anodized aluminium frame
v	Wire gauze shutters (for all external)	Wire mesh of SS 304 stainless steel.
vi	Window sill level	Rooms: 900 mm, Toilets: 1225 mm, Kitchen: 1225 mm
5	**Wardrobes**	Boxes and shelves of 19 mm thick commercial block board, shutters of 19 mm teak veneered or laminated or commercial block board. OR boxes, shelves and shutters of 18 mm thick wood fibre composite board of density 650 kg/m^3 .20 mm diameter aluminium hanger rods with slotted (non screw type) brackets. Clear distance of hanger rod below the board bottom: 40 mm . Or S.S 304
6	**Kitchen cupboards**	Boxes shelves, and shutters of teak veneered or commercial or laminated 19 mm thick block board OR 18 mm thick wood fibre composite board of density 650 kg/m^3. Stainless steel drawers with telescopic channel.
7	**Hardware fittings**	ss 304 stainless steel. OR colour anodized aluminum 125 *64*1.90 mm stainless steel butt hinges
8	**Curtain rods**	Elliptical shaped SS 304 stainless steel with heavy duty non-screw type brackets and finials. Height 100 mm above window top.
9	**Flooring and skirting**	
i	Circulation areas	18 mm thick gang saw cut granite of light shade with contrast border. The skirting will not project beyond wall surface. Staircase skirting will be parallel to waist slab.
ii	Rooms	18 mm thick gang saw cut granite of light shade.
iii	Kitchen	Satin matt vitrified tiles of minimum size 600*600 mm.
iv	Kitchen platform	18 mm thick gang saw cut black granite; edges rounded. Height above finished floor level: 900 mm Granite slab will be supported over19 mm thick block board boxes, no RCC slab is required for modular kitchen platform.
v	Kitchen dado	Above platform: 600 mm high with vitrified tiles of size 600*600 mm OR with ceramic tiles of size 600*300 mm. Elsewhere: full height dado of same tiles.

I/3092637/2024

vi	Toilets and WC	Anti-skid ceramic tiles of size 300*300 mm. Two granite corners of 250 mm radius will be fixed in wall near shower, first at 1200 and second at 1500 mm height.
vii	Toilet dado	Vitrified tiles of size 600*600 mm OR ceramic tiles of size 600*300 mm up to ceiling. One decorative band.
viii	Wash basin counter	Counter and 100 mm high skirting with 18 mm thick gang saw cut black granite. Edges rounded. 1500 mm high dado of vitrified tiles of size 600*600 mm OR 1500 mm dado of ceramic tiles of size 600*300 mm. Only under countertop wash basins will be used.
ix	Window sill	18 mm thick gang saw cut black granite, edges rounded, and projecting 12mm from finished wall surfaces.
10	**Parapet walls**	1200 mm high, 230 mm thick. Top finished with black granite, sloping inwards edges rounded, projecting 12mm from finished wall surfaces.
11	**Balustrade/railing**	1200 mm high powder coated aluminium sections or factory made SS 304 stainless steel. OR cast iron.
12	**Terracing**	Vitrified tile of size 600*600 mm with adhesive or crazy marble flooring. The RCC roof slab will be cast with a slope of 1:100.
13	**Sanitary fittings**	CP brass fittings Sanitaryware of reputed brands. Rigid PVC or GI waste pipe for wash basins and kitchen sinks.
14	**Sanitary ware height**	Wash basin top: 800 mm Urinal lip top: 600 mm Shower: 2100 mm Mirror: 1200 mm Towel rail: 1500 mm WC faucet: 300 mm
15	**Internal services**	
i	Rain water pipes	150 mm diameter UPVC pipes clamped over MS heavy duty brackets 50 mm away from wall surface.
ii	Soil and waste pipes	100 mm diameter centrifugally cast (spun) iron pipes and fittings. OR UPVC pipes and fittings. All pipes shall be 50 mm away from wall surface, clamped over MS heavy duty brackets. No pipe will be < 75 mm diameter.
iii	Floor traps	Long arm P-type floor traps placed at a corner of toilet Each floor trap outlet will be separate and join the vertical stack externally. No *Nahani* traps shall be used.
iv	Spouts	75 mm diameter UPVC OR GI spouts, projecting 150 mm beyond wall surface, sloping outwards, laid 5 mm below floor level. End of pipe shall be cut at 45°.
v	Sewer lines	HOPE pipes. Cushion of 600 mm.
vi	Manholes	At 30 metre centres, and at bends and junctions.
vii	Terrace tanks	4 PVC tanks of 1000 litres capacity each, with screw type

		lid. Tanks will be placed over 1200 mm wide RCC slab cantilevering from a beam spanning over two columns. The top of slab will be 900 mm above the terrace level. OR SS
16	**Finishing**	
i	Cement plaster	1:6 mortar with well graded coarse sand.
ii	Internal walls, ceiling	Low VOC acrylic paint over cement-based putty.
iii	External walls	Low VOC textured or smooth acrylic paint over cement based putty.
iv	Wood and steel	Synthetic enamel paint.
v	Brick-RCC junction	200 mm wide polypropylene wire mesh with U-clip will be used at the junction before plastering.
17	**Modular Kitchen**	The cabinets will be made of 18 mm thick wood fibre composite board of density 650 kg/m^3 OR galvanized steel. No RCC slab Is required for kitchen platform.
18	**Clothes lines**	Three or four rows of PVC coated steel wire 450 mm apart, tied to 75 mm long J hooks fixed with m-seal.
Electrical		
1	**Wiring**	FRLS PVC insulated single core copper wiring of 1.5 mm^2 for light and 4 mm^2 for power points. Concealed wiring in recessed medium class PVC conduits. Separate conduits from mains for wiring of essential, non-essential, and UPS distribution system.
2	**Electrical fittings**	Modular switches and sockets. Energy efficient LED luminaries of minimum 110 lumen per watt. 5-star, brushless direct current motor fans of 1200 mm sweep. Occupancy sensors. Master switch outside hostel and guest house rooms. Fittings will be provided as per furniture lay out. Minimum two 5A and one 15A sockets will be provided in each room. Fans and light shall be fitted symmetrically as per furniture lay out Height of fittings: Switch board centre: 1200 mm Tube light or lamps: 2400 mm, 16A sockets: 300 mm
3	**Exhaust fans**	125 mm inline duct booster exhaust ventilation fan
4	**Escape lighting**	Escape routes to get illuminated from an independent power source within 5 sec of power failure. The luminaries shall be mounted at 2400 mm height.
5	**Exit signage**	Green colour photo luminescent exit signs of size 450*150 mm at 2400 mm height at 30 m intervals and at all changes in direction.
6	**Distribution Boards**	Powder coated, prewired DBs with detachable cassette for safe removal of MCBs, RCCBs and terminal blocks.
7	**Phone and TV**	Only on specific requirement, telephone and coaxial TV

	cables	cables will be provided in recessed PVC conduits.
8	**LAN**	Core switches, L2 switches, gigabit switch, SFP modules, OFC, wi-fi access and controller.
9	**Uninterruptible power systems**	Online (double conversion voltage and frequency independent) UPS shall comply with IEC 62040-3 to provide continuous power to life safety circuits and sensitive equipment. It must have both static bypass switch and manually operated bypass switch for maintenance. Battery banks shall be designed to provide at least 30 minutes back- up at full load.
10	**Lifts**	Two regenerative lifts of 20 persons capacity each, with speed of 1.5 mis, microprocessor-based control, and variable voltage variable frequency drive system for AC motor. It should be equipped with automatic rescue device and maintenance free dry batteries, It should meet accessibility requirements for especially abled persons. like minimum lift size of 1500 mm x 1500 mm, minimum door width of 900 mm, call button, control panel, hand rails, and audio and visual indicators
11	**Air-conditioning**	Two modular air cooled variable refrigerant flow outdoor units of 20 HP capacity each with inverter type scroll compressor and R410 A refrigerant, suitable to deliver coefficient of performance (CoP) of minimum 4.7 at 50% load. High wall type indoor units of 2 TR capacity each.
12	**Fire alarm system**	The intelligent addressable fire alarm system (AFAS) will integrate public address, lifts, fire fighting, pressurization and smoke management systems.
13	**Fire fighting system**	The wet riser system will consist of electric pump, diesel pump, jockey pump, all suitable for automatic operation and control panel for pumps in a pump room near the underground sump, delivery pipe, terrace pump and air vessel. Powder coated MS glazed cabinet will be provided for wet riser shaft on each floor to encase one 150 mm diameter C class MS delivery pipe, fire hose box containing two reinforced rubber lined hose pipes each of 63 mm diameter and 15 m length with 20 mm diameter nozzle, powder coated MS hose reel disc with 30 m long rubber braided hose of 20 mm nominal diameter and 19 m shut off nozzle and hydrant landing valve. Four-way and three-way fire brigade inlet connection valves will also be provided in the sump and riser respectively. The landing valve, hose coupling, fire brigade inlet connection valve etc, will be of stainless steel. The yard hydrant will consist of ring main of 200 mm diameter C class MS pipe, hydrants spaced at 45 metre centres and connected to ring main with 80 mm diameter MS pipe, and fire hose box containing two reinforced rubber lined hose pipes

I/3092637/2024

		each of 63 mm diameter and 15 m length with 20 mm diameter nozzle. The clear size of wet riser shaft will be 1200*800 mm.
14	**Ventilation system**	The basement and corridors will have supply air fans, ducts, grills, and exhaust air fans. The lift shaft, lift lobby and staircase will have pressurization system consisting of axial flow fan. Fan motor and casing shall be suitable for smoke exhaust application having thermal rating of 250^{o} C for 2 hours as per BS EN12101-3: 2015. The ventilation system will be designed for minimum 12 air change per hour and pressure differential of 25 to 30 Pa.
15	**Lightning protection**	Single prong finial with GI tape of 20 mm*3 mm suitably earthed lo the ground.
	Bulk services	
1	**Compound wall**	Low height compound wall is preferable. The maximum height may be 2100 mm, with 1500 mm high masonry and 600 mm high MS grill. The length of each wall panel may be 3600 mm centres. Expansion joint will be provided at 45 metre centres. The entrance gate, wall panels, coping, and grill will be designed aesthetically. About 1200 mm wide strip along the wall will be used for plantation. laying cables and pipes.
2	**Buildings in hills**	Hill slopes of up to 30^{o} are generally stable. Therefore, building sites will be located on hillside with slope is 45^{o}, preferably on south slope for more heat gain. Stepped terrace development and stepped storey construction will be adopted for economy and environment protection.
3	**Levelling**	The entire plot will be levelled to a slope of 300:1 to allow natural drainage of rain water.
4	**Internal roads**	6 meter wide carriage way with 2% camber. 750 mm wide unpaved shoulders on both sides sloping outwards to drain off rain water. Paver finished bituminous road section will consist of 150 mm GSB, 150 mm WMM 50 mm BM and 40 mm thick bituminous concrete OR 150 mm thick vacuum dewatered M 30 concrete laid over 100 mm thick base of M10 concrete, in chequered bays of maximum 3*3 metre size. The grooves will be 5 mm wide, 50 mm deep and filled with suitable sealant
5	**Footpath**	200 mm high and 1200 mm wide footpath finished with 60 mm thick paver blocks of M30 and kerb stone
6	**Tube Well**	One 200 mm diameter, 100 m deep tube well with uPVC pipe. Distribution network of CPVC pipes

I/3092637/2024

7	**Underground Sump**	
		RCC sump of 200 kl capacity, with 10 HP submersible pump. The floor and walls will be finished with vitrified tiles of size 600*600 mm. The first compartment of 100 kl will be used for firefighting.
8	**Filtered water supply**	Tube well water will be chlorinated and fed into the UG sump. Water from the sump will be pumped to terrace tanks through CPVC distribution lines.
9	Sewerage system	HOPE pipes of 300, 200, and 100 mm diameter laid to minimum slope of 300:1. Manholes at 30 m intervals. 100 kl sewage treatment plant on MBBR technology
10	Recycled water	Treated water from STP will be collected into a sump and pumped for horticulture purpose through CPVC distribution lines. The hydrants will be of ball cock type.
11	Rainwater harvesting	2 pits each of size 1.5*2*2 m with borewell of 100 mm diameter and 15 m depth
12	Sub-station	Two 1250 kVA, 5-star, 3 phase dry type 11 kV/433-250 V transformers, HT panel, LT panels, APFC panel, and surge protection device.
13	DG set	Two 250 kVA 3 phase DG set with AMF panel mounted on platform of size 7000*6000 mm. Shed of MS tubular truss and galvalume sheet.
14	Solar power	On grid, roof top solar PV plant of 250 kWp installed capacity with monocrystalline cell panels of minimum 20% efficiency. Power conditioning unit. Net metering and data monitoring system.
15	Street lights	LED fitting over 9 m high ornamental MS/CI poles
16	Horticulture works	Grassing in select areas, tree and shrub plantation
General		
1	Floor height (minimum)	Residential: 3000 mm Non-residential: 3300 mm 3600 mm with sprinklers. False ceiling height 2700 m
2	Pantry	Pantry of minimum 1800 width may be provided on each floor of a non-residential building. It may have 600 mm wide platform and one kitchen sink
3	Toilets	Each water closet will be provided with a wash basin

I/3092637/2024

		Wherever feasible, sanitary ware will be provided on external wall of the building. The clear depth of sunken slab for Indian WC will be 600 mm and that for EWC will be 300 mm to accommodate pipes, traps, and slope
4	Accessible terrace	All the buildings with flat roof will have accessible terrace for ease of maintenance.
5	Retaining walls	Generally, the hill slope will not be cut steeper than 60^{o} from the horizontal for its stability. Where unavoidable, retaining wall will be provided with weep holes of 100 mm diameter PVC pipes at 1500 mm centres in staggered manner embedded at 10^{o} downward slope, projecting by 150 mm beyond the wall on the valley side. Inverted filter will be provided behind the wall. About 300 mm thick silty clay layer of back-fill with grass will be provided flush with the top of retaining wall to prevent seepage of water in the back-fill. The back-fill itself will be of self-draining soil like coarse sand or gravel, free of fines. Grass turfing on toe side to prevent toe erosion

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