ELECTRICAL NETWORK DESIGN- RESIDENTIAL DEVELOPMENTS

1. Objective

The following policy is formulated to provide a guide line for the following:

1.1 Design of Electrical infrastructure in Residential apartment considering Maximum Demand as per development viz. Casa, Aspirational, and High End/Luxury.

1.2 Design of Electrical Infrastructure for Residential tower considering Overall Diversified Maximum Demand.

1.3 Common area (internal & external) load diversity.

1.4 Point Load/Power/Light/T.V/Data/Telephone/Intercom/VDP/Bell/Motion Sensor allocation apartment type wise.

1.5 Do's & Don'ts for Electrical Network Design

2. Residential Development Classification

Residential developments are classified as follows:

2.1 High End/Luxury

2.2 Aspirational

2.3 Casa

3. Diversity Classification

Listed below are diversity factor to be considered for Maximum Demand (@each apartment) and Overall Maximum Demand (for each Tower Load)

3.1 Residential Apartments

Sl No	Development Type	Number of Apartments on a Floor	Diversity @ Each Apartment Maximum Demand	Diversity @ Each Floor Level Overall Maximum Demand	Diversity of Load for Cable as Riser	Diversity of Load for Bus Bar as Riser
1	High End/ Luxury	≥ 4	0.8	0.4	0.8	0.4
		< 4	0.8	0.5	0.8	0.5
2	Aspirational	≥ 4	0.8	0.3	0.8	0.3
		< 4	0.8	0.4	0.8	0.4

3	**Casa**	**≥** 3	0.8	0.25	0.8	0.25
		< 3	0.8	0.3	0.8	0.3

3.2 Common Area Loads

Sl No	Development Type	Diversity On Common Area Lighting/Pumps/etc	Diversity on Elevator Load	Diversity on Life Safety Equipments For Backup supply
1	**High End/Luxury**	0.6	0.8	1
2	**Aspirational**	0.6	0.8	1
3	**Casa**	0.5	0.8	1

4. Electrical, ICT, AV, VDP Points Schedule

4.1 High End/Luxury Development

FACILITY TABLE FOR 2 BHK FLAT (HIGH END + LUXURY BRAND)																						
S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point													
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total
																						Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	600	2500	1000	1500	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	4	2	3	0	4	0	0	0	0	0	0	0	0	2	1	1	0	1	0	0	
2	Deck	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Passage	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Kitchen	1	0	1	1	1	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	
6	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
7	Store	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	Bed Room 1	2	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
9	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
10	Master Bed	3	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
11	Master Toilet	2	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
	Total number of fixtures	19	8	6	3	16	1	1	0	1	1	2	1	1	4	3	3	1	1	1	2	
	Connected Load(W)	1140	480	360	180	1600	100	300	0	1500	600	5000	1000	1500	6000	0	0	0	0	0	0	**19760**
	Total Connected Load (Watts)	19760.00																				
	Maximum Demand Load (Watts) (at 0.8 div) (DB level)	15808.00																				
	Infrastructure Demand Load (Watts) (at 0.4 div)	6323.20																				

FACILITY TABLE FOR 3 BHK FLAT (HIGH END + LUXURY BRAND)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point													
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	600	2500	1000	1500	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	6	3	3	0	5	0	0	0	0	0	0	0	0	2	1	1	0	1	0	0	
2	Deck 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Deck 2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	Passage	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
5	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	Kitchen	2	0	1	1	2	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	
7	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
8	Store	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	Bed Room 1	3	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
10	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
11	Bed Room 2	2	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
12	Bed Room 2 Toilet	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
13	Master Bed	3	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
14	Master Toilet	2	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
15	Walkin Wardrobe	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	Powder Toilet	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
17	Servant Room	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	Servant Toilet	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total number of fixtures	33	13	8	5	25	1	1	0	1	1	3	1	1	5	4	4	1	1	1	4	
	Connected Load(W)	1980	780	480	300	2500	100	300	0	1500	600	7500	1000	1500	7500	0	0	0	0	0	0	**26040**
	Total Connected Load (Watts)	26040.00																				
	Maximum Demand Load (Watts) (at 0.8 div) (DB level)	20832.00																				
	Infrastructure Demand Load (Watts) (at 0.4 div)	8332.80																				

FACILITY TABLE FOR 4 BHK FLAT (HIGH END + LUXURY BRAND)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point													
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	600	2500	1000	1500	1500/hr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	7	3	3	0	5	0	0	0	0	0	0	0	0	2	1	1	0	1	0	0	
2	Deck 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Deck 2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	Deck 3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Passage	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
6	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Kitchen	2	0	1	1	2	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	
8	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
9	Store	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	Bed Room 1	4	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
11	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
12	Bed Room 2	3	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
13	Bed Room 2 Toilet	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
14	Bed Room 3	3	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
15	Bed Room 3 Toilet	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
16	Master Bed	4	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
17	Master Toilet	2	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
18	Walkin Wardrobe	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	Powder Toilet	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
20	Servant Room	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	Servant Toilet	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total number of fixtures	42	16	9	6	30	1	1	0	1	1	4	1	1	6	5	5	1	1	1	5	
	Connected Load(W)	2520	960	540	360	3000	100	300	0	1500	600	10000	1000	1500	9000	0	0	0	0	0	0	**31380**
	Total Connected Load (Watts)	31380.00																				
	Maximum Demand Load (Watts) (at 0.8 div) (DB level)	25104.00																				
	Infrastructure Demand Load (Watts) (at 0.4 div)	10041.60																				

Aspirational Development

FACILITY TABLE FOR 1.5BHK FLAT (ASPIRATIONAL)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point													
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total
																						Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	400	2000	1000	1000	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	3	2	2	0	3	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	
2	Passage	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
3	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	Study	1	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Kitchen	2	0	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
6	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
7	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
8	Master Bed	2	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
9	Master Toilet	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
	Total number of fixtures	14	7	5	3	12	1	0	0	0	1	2	1	1	2	2	2	0	1	1	2	
	Connected Load(W)	840	420	300	180	1200	100	0	0	0	400	4000	1000	1000	3000	0	0	0	0	0	0	**12440**
	Total Connected Load (Watts)	12440.00																				
	Maximum Demand Load (Watts) (at 0.8 div) (DB level)	9952.00																				
	Infrastructure Demand Load (Watts) (at 0.3 div)	2985.60																				

FACILITY TABLE FOR 2BHK FLAT (ASPIRATIONAL)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point													
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total
																						Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	400	2000	1000	1000	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	3	2	2	0	3	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	
2	Desk	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
3	Passage	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Bed room-1	2	1	1	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
6	Kitchen	2	0	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
7	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
8	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
9	Master Bed	2	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
10	Master Toilet	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
	Total number of fixtures	16	7	5	3	13	1	0	0	0	1	2	1	1	3	2	3	0	1	1	2	
	Connected Load(W)	960	420	300	180	1300	100	0	0	0	400	4000	1000	1000	4500	0	0	0	0	0	0	**14160**
	Total Connected Load (Watts)	14160.00																				
	Maximum Demand Load (Watts) (at 0.8 div) (DB level)	11328.00																				
	Infrastructure Demand Load (Watts) (at 0.3 div)	3398.40																				

FACILITY TABLE FOR 2.5BHK FLAT (ASPIRATIONAL)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point												
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total
																						Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	400	2000	1000	1000	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	3	2	2	0	3	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	
2	Desk	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Passage	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Study	1	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	Bed room-1	2	1	1	0	3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	
7	Bed room-1 Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
8	Kitchen	2	0	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
9	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
10	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
11	Master Bed	2	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
12	Master Toilet	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
	Total number of fixtures	18	9	6	4	15	1	0	0	0	1	3	1	1	3	2	3	0	1	1	3	
	Connected Load(W)	1080	540	360	240	1500	100	0	0	0	400	6000	1000	1000	4500	0	0	0	0	0	0	**16720**
	Total Connected Load (Watts)	16720.00																				
	Maximum Demand Load (Watts) (at 0.8 div) (DB level)	13376.00																				
	Infrastructure Demand Load (Watts) (at 0.3 div)	4012.80																				

FACILITY TABLE FOR 3BHK FLAT (ASPIRATIONAL)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point												
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total
																						Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	400	2000	1000	1000	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	3	2	2	0	4	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	
2	Desk	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Passage	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Bed room-1	2	1	1	0	3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	
6	Kitchen	2	0	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
7	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
8	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
9	Bed room-2	2	1	1	0	3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	
10	Bed room-2 Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
11	Master Bed	2	2	1	0	4	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
12	Master Toilet	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
	Total number of fixtures	19	9	6	4	17	1	0	0	0	1	3	1	1	4	2	4	0	1	1	3	
	Connected Load(W)	1140	540	360	240	1700	100	0	0	0	400	6000	1000	1000	6000	0	0	0	0	0	0	**18480**
	Total Connected Load (Watts)	18480.00																				
	Maximum Demand Load (Watts) (at 0.8 div) (DB level)	14784.00																				
	Infrastructure Demand Load (Watts) (at 0.3 div)	4435.20																				

Casa Development

FACILITY TABLE FOR 1BHK FLAT (CASA)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point													
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total
																						Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	400	2000	1000	600	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	3	1	2	0	3	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
2	Passage	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
3	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	Kitchen	1	0	1	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
5	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
6	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
7	Master Bed	1	1	1	0	3	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
	Total number of fixtures	9	3	4	2	7	1	0	0	0	1	1	1	1	2	2	2	0	0	1	0	
	Connected Load(W)	540	180	240	120	700	100	0	0	0	400	2000	1000	600	3000	0	0	0	0	0	0	**8880**
	Total Connected Load (Watt)	8880.00																				
	Maximum Demand Load (Watt) (at 0.8 div) (DB level)	7104.00																				
	Infrastructure Demand Load (Watt) (at 0.25 div)	1776.00																				

FACILITY TABLE FOR 1.5BHK FLAT (CASA)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point													
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE	20 Amp Power point A.C.	Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total
																						Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	400	2000	1000	600	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	3	1	2	0	3	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
2	Passage	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
3	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	Study	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Kitchen	1	0	1	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
6	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
7	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
8	Master Bed	1	1	1	0	3	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
9	Master Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
10	Deck	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Total number of fixtures	12	4	5	3	9	1	0	0	0	1	2	1	1	2	2	2	0	0	1	0	
	Connected Load(W)	720	240	300	180	900	100	0	0	0	400	4000	1000	600	3000	0	0	0	0	0	0	**11440**
	Total Connected Load (Watt)	11440.00																				
	Maximum Demand Load (Watt) (at 0.8 div) (DB level)	9152.00																				
	Infrastructure Demand Load (Watt) (at 0.25 div)	2288.00																				

FACILITY TABLE FOR 2BHK FLAT (CASA)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point						20 Amp Power point A.C.							
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE		Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	400	2000	1000	600	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	2	2	2	0	3	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	
2	Deck	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Passage	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Bed Room 1	1	1	1	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
6	Kitchen	2	0	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
7	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
8	Common Toilet	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
9	Master Bed	2	1	1	0	3	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
10	Master Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
	Total number of fixtures	14	5	5	3	10	1	0	0	0	1	2	1	1	3	2	2	0	1	1	2	
	Connected Load(W)	840	300	300	180	1000	100	0	0	0	400	4000	1000	600	4500	0	0	0	0	0	0	13220
	Total Connected Load (Watt)	13220.00																				
	Maximum Demand Load (Watt) (at 0.8 div) (DB level)	10576.00																				
	Infrastructure Demand Load (Watt) (at 0.25 div)	2644.00																				

FACILITY TABLE FOR 2.5BHK FLAT (CASA)

S.No.	Name of location			Fan Point		6 Amp Power point			15 Amp Power point						20 Amp Power point A.C.							
		Light Point	Wall Bracket light	Ceiling	Exhaust	General	Water Purify	Food Processor	General	Dish Washer	Fridge	Gyser	MICROWAVE/OVEN	WASHING MACHINE		Tel	TV	Intercom	VDP	Bell	Motion Sensor	Total Wattage
	Typical Wattage	60	60	60	60	100	100	300	500	1500	400	2000	1000	600	1500/tr	0	0	0	0	0	0	(Watts)
1	Living room/Dinning	2	2	2	0	3	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	
2	Deck	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Passage	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4	Puja	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Study	1	0	1	0	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	
6	Bed Room 1	2	1	1	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
7	Kitchen	2	0	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	
8	Utility	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
9	Common Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
10	Master Bed	2	1	1	0	3	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	
11	Master Toilet	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	
	Total number of fixtures	16	6	6	3	13	1	0	0	0	1	2	1	1	3	3	3	0	1	1	2	
	Connected Load(W)	960	360	360	180	1300	100	0	0	0	400	4000	1000	600	4500	0	0	0	0	0	0	13760
	Total Connected Load (Watt)	13760.00																				
	Maximum Demand Load (Watt) (at 0.8 div) (DB level)	11008.00																				
	Infrastructure Demand Load (Watt) (at 0.25 div)	2752.00																				

All of the aforesaid calculations should be multiplied by 1.1 (10%) to take into account use of higher consuming devices in the future.

Comment [Y1]: Revision 4

5. Do's for Residential Electrical Network Design

5.1 For Level of Electrical Switches and Sockets for Residential Apartments refer to the latest Architectural Policy No 67.

5.2 16A sockets(for 2000W Geyser)/20A Sockets(for 3000W Geyser) to be provided adjacent to the Geyser location as power outlet, Geyser switch of similar rating shall be installed together with toilet lights switches.

5.3 For Split Air Conditioner Power outlet (16A for 1Ton M/C & 20A for 1.5Ton M/C) to be provided @ the indoor unit, switch to be installed @ the nearest Switch board in the room. Embedded PVC Conduiting to be done from indoor to outdoor unit for power supply.

5.4 Apartment DB's should be located at a centralized location (preferably passage wall to Kitchen) to optimize radial wiring length. Bottom of the Distribution boards should be +1800mm above finished floor level. Distribution system inside apartment to be protected by 30mA rating ELCB/RCBO. All lighting circuit to be protected by 6/10A Type C outgoing MCB as per circuit load and power circuit be protected by 16/20/25A Type C outgoing MCB as per circuit load.

5.5 Casa Development DB to have Single Door and all other Development DB to be Double Door.

5.6 Where Bus Bar Rising mains are used rating of the Bus Bar to be based on Overall Diversified load demand of the tower and additional 30% load for CAGR. However the Bus Bar size shall be cross checked for the allowable voltage drop.

5.7 Power outlet for all exhaust fans (in toilets & Kitchen) shall be from Ceiling rose adjacent to fan controlled by switch combined together with lighting switch board in respective area.

5.8 2nos 2.5sqmm+1nos 1.5sqmm FRLS wires to be used for lighting and small power circuits. Loading of 2.5sqmm radial circuit with multiple equipments/light should be in the range of 800 to 1000W. Load above 1000W should not be shared with other equipments and shall be fed from individual circuit of 2.5sqmm wire rating.

5.9 Load ≥1500W shall be fed from individual circuit of 2nos 4sqmm + 1nos 2.5sqmm wire which shall be verified for voltage drop calculations.

5.10 Voltage drop shall be restricted to 5% from LT side of Transformer to the final outlet.

5.11 All the floor lamps shall be IP 67 Rated.

5.12 For all projects except Casa, Sockets should be provided with 'universal shutter' and no switches to be provided for on/off of sockets. Switches should be provided with sockets only in case of Microwave, Oven, Refrigerator and Washing machine points. In case of Casa projects, regular switch should be provided with all sockets.

5.13 In case FTH is planned for a project two data points should be provided, one each in Living room and MBR. Cat 6/equivalent cable from the LVDB to the data points should be provided. The Cat6/equivalent cable should use the conduit for Cable TV as much as possible. Wi-fi in individual residences will be done by 3rd party broadband provider and resident will enter into their own arrangement with them.

5.14 Need for Multi-room connections, DVR connections and future changes in signal polarities planned by Satellite TV operators will likely increase the number of RG-6 (co-axial) cables that will need to go into a flat from the shaft and distributed to the end points. Therefore, size of LV conduits should be designed to handle three RG-6 cables at a time so that if required the customer can pull the required number of cables.

5.15 Bus duct for electrical distribution should be used for building having height > 125 mtrs for residential building/ 100 mtrs for commercial buildings (distance between transformer and last floor):

a. Bus duct actual capacity can be taken @ 85% of its rated capacity.
b. Bus ducts should be designed in such a way that the ones with high/highest amperage have the lowest length and vice-versa. The approx. cost is Rs. 10 per ampere meter (2012 costs) for aluminium bus bar and the goal should be to reduce this cost by maximizing the current in the bus ducts of shorter length and vice versa. Currently the maximum capacity of aluminium bus bars is about 4500 amp. and one should try to use it to its maximum capacity.
c. Within a given bus duct, use of reducers should also be considered at the upper levels to reduce the current and consequently cost.
d. In buildings which have transformers placed on upper floors, the electrical distribution maybe planned in both directions - up and down – from the transformer so that the bus duct lengths are moderated. In case of "down" bus ducts, special care should be taken about the bus duct connections which may be affected by gravitational pull.
e. The maximum length of the bus duct shall be limited by the maximum voltage drop (max. 4%) between transformer and the last distribution board (this is to achieve overall max voltage drop of 8% in entire network from HT tapping

onwards). This can also be limited by the maximum capacity of the transformers supplying it, though in such case, technical solutions to couple two transformers should be considered. The no. of floors served should NOT be a limit to the bus duct length.

f. The top 5-7 floors can be serviced by cable, instead of bus duct to further reduce costs. In such case, the tapping shall be done from the bus duct at 5-7 levels below the top floors and then individual cables shall be used to supply the untis above.

g. For each project (multiple buildings) using bus ducts, following spares are required to be handed over to HFM and should be appropriately included in the scope of the electrical contractor:

   i. Two Bus Lengths of same size or amperage capacity of a model/make
   ii. Two numbers of the Bus couplers
   iii. One number Tap off units
   iv. Torque Wrench

Comment [Y2]: Revision 4

6. Don'ts for Residential Electrical Network Design

6.1 No Electrical switch or socket shall be installed under the taps and horizontally a minimum distance of 1.5 meter shall be maintained.

6.2 If possible we should avoid the floor boxes.

6.3 Normal lights shall not be installed in the external areas. These lights shall be minimum IP65 Rated.

6.4 Normal Sockets shall not be installed in the external areas. These shall be minimum IP66 rated.

6.5 Normal wires shall not be used for the landscape lighting and wiring joining using tapes shall be avoided. We should use flexible (non armoured) cables for the distribution and all the joints shall be done inside water proof junction boxes. The cables shall be fixed with the PVC glands to these boxes.