



केंद्रीय लोक निर्माण विभाग
Central public Works Department

कुर्सी क्षेत्र दरें
PLINTH AREA RATES (PAR)
2023





भारत सरकार
GOVERNMENT OF INDIA

कुर्सी क्षेत्र दरें
PLINTH AREA RATES
2023

(w.e.f. 01-08-2023)



महानिदेशक, के.लो.नि.वि., नई दिल्ली के प्राधिकार के अधीन प्रकाशित
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Rajesh Kumar Kaushal
Director General



भारत सरकार
Government of India



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FOREWORD

Plinth Area Rates published by CPWD is a useful technical document for preparation of preliminary cost estimates of projects and development works by engineers in construction industry. This publication is not only being used by CPWD but also by other Organizations, PSUs, State Governments, architects and valuation experts.

Plinth Area Rates was first published in year 1955 there after its 10th edition was published in 2021. These days works costing more than 100 crore, are executed through EPC method and no guidelines, specifications is available. Therefore, the guideline specifications of Civil and Electrical works, in respect of EPC contract for residential buildings/non-residential buildings is included. Considering above this updated version of Plinth Area Rates is published as Plinth Area Rates 2023.

I wish to place on record the commendable work done by Shri. Dharmesh Chandra Goel, Addl. Director General (Technical), Shri Prem Mohan, Chief Engineer, CSQ (Civil), Shri Vinayak Rai, Chief Engineer, CSQ (Civil), Shri Vimal Kumar, Chief Engineer, CSQ (Elect.), Dr. P.K. Tripathi, DDG (Hort.), Shri Dinesh Kumar Ujjainia, SE (TAS), Shri Seetarama Rao Mantrala, SE (TAS), Shri Ramayan Prasad Gupta, SE TAS (Elect.), and entire team of CSQ (Civil & Electrical) in bringing out the Plinth Area Rates 2023.

(Rajesh Kumar Kaushal)
Director General



Dharmesh Chandra Goel
Addl. Director General (Tech)



भारत सरकार
Government of India



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PREFACE

1. Plinth Area Rates published by Central Public Works Department is one of the most comprehensive and useful technical document for preparation of Preliminary Estimate and Rough Cost Estimates for Offices / Colleges / School / Hostels / Hospitals and Residential Buildings etc. This is 11th edition of PAR to be published as PAR 2023.
2. The guidelines, as issued in PAR 2021, with respect to specifications for GPRA and as approved by MoHUA in March 2018 as well as Plinth Area calculation as per the provisions of IS: 3681-2002 are continued to be a part of PAR 2023.
3. The per unit area rates for all categories of buildings and development works have been revised considering prevailing cost index of Delhi as 107 (as on 01.04.2023) and effect of increase in GST rate from 12% to 18%. The rate of E&M Services sub heads have been revised as per prevailing market rates as on 01.04.2023.
4. The provision of guideline specifications for Residential Buildings and Non Residential Building in EPC Mode have been made.
5. The provision of consultancy services for designing and planning has been introduced @ 1% of the total cost of the project.
6. All efforts have been made to update Plinth Area Rates-2023 to make it user friendly by incorporating the views and feedback from various stakeholders, the field units and making necessary simplifications.
7. I would like to acknowledge the lead taken by Shri Prem Mohan, Chief Engineer, CSQ (Civil), Shri Vinayak Rai, Chief Engineer, CSQ (Civil), Shri Vimal Kumar, Chief Engineer, CSQ (Elect.), Dr. P.K. Tripathi, DDG(Hort.), and dedicated efforts of Shri Dinesh Kumar Ujjainia, Superintending Engineer (TAS), Shri Seetarama Rao Mantrala, Superintending Engineer, TAS (Civil), Shri Ramayan Prasad Gupta, Superintending Engineer, TAS(Electrical), Shri S.N. Jaiswal, Executive Engineer (TAS), Shri A. K. Meena, Executive Engineer, TAS(Electrical), and Shri Durga Ram Chowdhary, Assistant Engineer (TAS), Shri Sandeep Kumar DAS, Assistant Engineer, TAS(Electrical), Sh. Kamal Passi, Assistant Architect and entire team of CSQ (Civil) & CSQ (Electrical) who have provided their valuable inputs/data in finalizing of Plinth Area Rates-2023.

Dharmesh

Dharmesh Chandra Goel
ADG (Technical) CPWD

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INTRODUCTION

1. Plinth Area Rates published by Central Public Works Department is one of the most comprehensive and useful technical document for CPWD, PWD Delhi, Other Govt. Department, PSUs, Engineers and Valuation officers for preparation of Preliminary Estimate and Rough Cost Estimates for Offices / Colleges / School / Hostels / Hospitals and Residential Buildings etc. This latest version of Plinth Area Rates-2023 is 11th edition since 1955.
2. The guidelines issued in PAR 2021 with regard to specifications for GPRA, as approved by MoHUA in March 2018, and Plinth Area calculation as per the provisions of IS: 3681-2002 are continued to be a part of PAR 2023.
3. The per unit area rates for all categories of buildings and development works have been revised as per prevailing Cost Index of Delhi, which is 107 as on 01.04.2023 over PAR 2021 with base 100 (as on 01.04.2021), and GST factor 1.0633 due to increase of GST rate from 12% to 18%. The rates of E&M Services sub heads have been revised as per prevailing Market Rates as on 01.04.2023.
4. The Architectural units shall work out floor wise Plinth Area of a building and compile the area of all floors to obtain total Plinth Area of Building. The guidelines are explained in Annexure-II and proforma are provided as Annexure-III (a), III (b) and III (c) which are self-explanatory for minimizing the discrepancies.
5. The provision of guideline specifications for Residential Buildings and Non Residential Buildings in EPC Mode have been made as Annexure-1(f) (for Civil) & Annexure-1(g) (for E&M) respectively.
6. The provision of consultancy services for designing and planning has been introduced @ 1% of the total cost of the project. This provision has to be taken only if desired by the client.
7. The Plinth Area Rates-2023 (with base 01.04.2023 as 100) comprises of following Annexures:
 - Annexure-I: Specifications for Residential Buildings, Scale of Amenities (Civil), Scale of amenities for Sanitary & Water Supply fittings and Electrical installations in GPRA and General Specifications for Non-Residential Buildings. Generalized guideline/ specifications of Civil and E&M services for EPC contract documents for residential buildings/ non-residential buildings.
 - Annexure-II: Guidelines for calculating Plinth Area.
 - Annexure-III: Proforma for Plinth Area calculation by Architectural unit.
 - Annexure-IV: Proforma for calculation of Building cost index for future Cost indices with base 100 as on 01.04.2023
 - Annexure-V: Statement of Cost Indices of Delhi/NCR
8. All efforts have been made to update Plinth Area Rates-2023 to make it user friendly by incorporating the views and feedback from various stakeholders, the field units and making necessary simplifications. All users may share their feedback on email: **cecsq.cpwd@nic.in & delsetascsq.cpwd@nic.in**

PLINTH AREA RATES

as on 01.04.2023

Rate in ₹ per sqm

S. No.	Description	Non-Residential Buildings			Residential Buildings	
		Offices/Colleges	Hospitals	Schools	Hostels	Quarters
1.0	BUILDING COST (Specifications as per Annexure-I)					
1.1	RCC FRAMED STRUCTURE (Upto six storeys)					
1.1.1	Floor height 3.60 metre	30,820	32,370	24,730	-	
1.1.2	Floor height 3.00 metre	-	-	-	23,530	
1.2	COMPOSITE (PARTIALLY LOAD BEARING AND PARTIALLY RCC FRAMED) STRUCTURE (Upto six storeys)					
1.2.1	Floor height 3.60 metre	26,160	27,480	21,260		
1.2.2	Floor height 3.00 metre	-	-		20,070	
1.3	EXTRA FOR					
1.3.1	Set of six additional storey (i.e. from 7 th to 12 th storey)	120				
	Similarly, extra for next set of six storeys may be increased by Rs. 120/- per sqm (viz Rs. 240/- per sqm for 13 th to 18 th storey, Rs. 360/- per sqm for 19 th to 24 th storey, Rs 480/- per sqm for 25 th to 30 th storey and so on). The applicable plinth area shall be the sum of plinth area of all the storeys within the set of six storeys. If the next set of storeys is having fewer than six storeys, the same procedure shall be followed. For example, if building is having 15 storeys, the additional rate applicable shall be (i) Rs 120/- per sqm for sum of plinth area between 7 th to 12 th storey and (ii) Rs. 240/- per sqm for sum of plinth area of 13 th to 15 th floor.					
1.3.2	Every 0.3 metre or part thereof, additional / less height of floor above normal floor height of 3.60 metre / 3.00 metre (on areas having additional / less height)	421				
1.3.3	Every 0.3 metre or part thereof, higher plinth height over normal plinth height of 0.60 metre (on ground floor area only).	421				
1.3.4	Every 0.30 metre or part thereof, deeper foundations over normal depth of 1.20 metre (on ground floor area only).	230				
1.3.5	Making stronger foundations to take load of one additional floor at a later date (on ground floor area only).	For RCC framed structures			For Composite structure	
		1820			710	
1.3.6	RCC raft foundation (on ground floor area only)	12,170				
1.3.7	Pile foundation upto a depth of 15 metre (on ground floor area only)	19,460				
1.3.8	Every 1.0 m deeper pile foundation over normal depth of 15 metre (on ground floor area only)	2,200				
1.3.9	Stronger structural members to take heavy load above 500 kg per sqm upto 1000 kg per sqm.	2,050				
1.4	BASEMENT FLOOR					
1.4.1	Floor height upto 3.35 metre including water proofing (excluding raft base)	23,610				
1.4.2	Add or deduct for every 0.30 metre, or part thereof, height against normal height of 3.35 metre.	1,140				

Plinth Area Rates 2023

S. No.	Description	Non-Residential Buildings			Residential Buildings	
		Offices/Colleges	Hospitals	Schools	Hostels	Quarters
1.5	FIRE FIGHTING					
1.5.1	Downcomer System			460		
1.5.2	With wet riser system			890		
1.5.3	With wet riser and sprinkler system			1,200		
1.6	FIRE ALARM SYSTEM					
1.6.1	Manual fire alarm system			280		
1.6.2	Automatic fire alarm system			600		
1.7	Pressurized mechanical ventilation system in the basements with supply duct of exhaust blowers (on areas where mechanical ventilation is required)			1,050		
1.8	STILT PORTION					
1.8.1	Stilt portion of multi-storey buildings upto floor height of 3.60 metre (on stilt area only)			9,560		
1.8.2	Every 0.30 metre additional height above 3.60 metre			230		
2.0	SERVICES (Percentage below refers to the percentage of building cost as per 1.0 above excluding sub head 1.3.4, 1.3.5, 1.3.6, 1.3.7, 1.3.8, 1.3.9, 1.5 & 1.6)					
2.1	Internal water supply & sanitary installations	4%	10%	5%	12% with attached toilets, 8% with common toilets.	9%
2.2	External service connections and local body approval charges shall be as hereunder or as per estimates given by the local body whichever is higher					
2.2.1	Electrical external service connections	3.75%	3.75%	3.75%	3.75%	3.75%
2.2.2	Civil external service connections	1.25%	1.25%	1.25%	1.25%	1.25%
2.2.3	Local body approvals including tree cutting etc.	1.25%	1.25%	1.25%	1.25%	1.25%
2.3	Internal electric installations	12.5%	12.5%	12.5%	12.5%	12.5%
2.4	EXTRA FOR					
2.4.1	Power wiring and plugs	4%	4%	4%	4%	4%
2.4.2	Lightning conductors	0.25%	0.25%	0.25%	0.25%	-
2.4.3	Telephone conduits	0.25%	0.25%	0.25%	0.25%	-
2.4.4	Third Party Quality Assurance	1%	1%	1%	1%	1%
2.4.5	Consultancy services for designing and planning of project, if out sourced	1%	1%	1%	1%	1%

S.No.	Capacity/ Persons	Speed in m/sec	Travel height	Price (in lac)	Extra for each additional floor (in ₹)
1	2	3	4	5	6
3.0	LIFTS with power operated centre opening doors and AC variable voltage & variable frequency controls				
3.1	Passenger lifts				
3.1.1	8	1.0	G+4	17.24	99,860
3.1.2	8	1.5	G+5	19.39	99,860
3.1.3	13	1.0	G+4	19.39	99,860
3.1.4	13	1.5	G+5	21.55	1,22,050
3.1.5	16	1.0	G+4	25.85	1,22,050

S.No.	Capacity/ Persons	Speed in m/sec	Travel height	Price (in lac)	Extra for each additional floor (in ₹)
3.1.6	16	1.5	G+5	28.01	1,22,050
3.1.7	16	2.5	G+12	75.41	1,22,050
3.2	Bed Lifts				
3.2.1	20	0.75	G+4	25.85	1,22,050
3.2.2	20	1.5	G+5	29.09	1,22,050
3.2.3	20	2.5	G+12	80.79	1,22,050
3.3	Goods lifts (2 speed)				
3.2.1	1 Ton	0.5	G+4	28.01	94,310
3.2.2	2 Ton	0.5	G+4	35.55	94,310
3.2.3	3 Ton	0.25	G+4	44.17	1,10,950

S. No.	Description	Rates in ₹
4.0	RCC WATER TANK	
4.1	Overhead tank without independent staging	23 per litre
4.2	Overhead tank with staging height upto 20 metre	34 per litre
4.3	Overhead tank with staging height above 20 metre upto 30 metre	40 per litre
4.4	Overhead tank with staging height above 30 metre upto 40 metre	46 per litre
4.5	Underground sump	23 per litre
5.0	DEVELOPMENT OF SITE	
5.1	Levelling	340 per sqm
5.2	Internal roads & paths	
5.2.1	Internal road with WBM and bituminous top	1,930 per sqm
5.2.2	Internal road with WMM and bituminous top	2,100 per sqm
5.2.3	Cement concrete pavement with vacuum dewatered concrete	2,320 per sqm
5.2.4	Footpath with PCC base, 60 mm thick paver blocks and kerb stone edging	2,960 per sqm
5.3	External sewerage	3,810 per metre
5.4	Filtered water supply	
5.4.1	Distribution lines upto 100 mm dia	1,930 per metre
5.4.2	Peripheral grid 150 mm to 300 mm dia pipes	4,100 per metre
5.4.3	Unfiltered water supply distribution lines	1,510 per metre
5.5	Storm water drains	10,150 per metre
5.6	Rain water harvesting (RWH)	3,810 per metre
5.7	Trenches for services	7,280 per metre
5.8	Boundary wall with 1500 mm high wall and 600 mm high MS grill including 2100 mm high steel gates at every 100 metres	
5.8.1	With brickwork structure with RCC column of size 300X300 mm @ 3.00 metre centre to centre and RCC plinth beam of size 300X300 mm at ground level and coping	10,870 per metre
5.8.2	Precast RCC wall in M40 grade concrete comprising I shaped 250 x 230 mm RCC posts fixed in ground and 70 mm thick RCC wall panel inserts.	9,160 per metre
5.9	Horticulture Works	
5.9.1	Horticulture operations including 300 mm earth filling, grassing, tree plantations/ shrubs and potted plants etc.	312 per sqm
5.9.2	Vertical plantations (Excluding the cost of frame work for vertical gardening) (Note: Rate are applicable on vertical gardening area)	7,302 per sqm

Plinth Area Rates 2023

S. No.	Description	Rates in ₹
6.0	SPECIALISED E&M WORKS	
6.1	33 kV RECEIVING SUBSTATION AND 33 kV/11 kV HT CABLING	
6.1.1	Supplying, installation, testing and commissioning of 33 kV substation comprising 33 kV HT panel, transformers 33kV/11 kV, 11 kV HT panel, inter connections, 11 kV HT underground cabling to the distribution substations on ring main system, substation earthing, substation safety equipment.	3,800 per kVA
6.2	SUB-STATION EQUIPMENT	
6.2.1	Supplying, installation, testing and commissioning of 33 kV/0.433 kV or 11 kV/0.433 kV substation equipment comprising HT panel, transformers, HT cable, bus trunking from transformer to LT panel, LT panels, automatic power factor correction panel, active harmonic filters, TVSS (transient voltage suppression system), SPD (surge protection system), essential panel, earthing, required inter-connections, substation safety equipments including LT cabling from substation to the buildings fed by the substation. Note: For assessment of kVA estimation of a building, para 4.4, 13 and other relevant paras of "Guidelines for Substation & Power Distribution Systems of Buildings-2019" which is available on CPWD website may be referred to.	9,000 per kVA
6.3	DIESEL GENERATING SETS	
6.3.1	Supplying, installation, testing and commissioning of silent type DG sets, AMF panel, bus ducting/ cables from DG sets to essential panel, synchronizing panel where required, DG set enclosure room sound insulation/ventilation/smoke exhaust as required, earthing of DG set system, control cabling, fuel tank/piping, DG set exhaust piping/ exhaust chimney as per CPCB norms, civil works connected with DG sets including foundation as required.	11,560 per kVA
6.3.2	Extra for synchronizing panels wherever required	1,070 per kVA
6.4	UNINTERRUPTED POWER SUPPLY	
6.4.1	Supplying, installation, testing and commissioning of online 3 phase UPS system with 30 minutes back up including batteries, interconnecting cables, battery racks etc.	21,290 per kVA
6.4.2	Add for every additional 30 minutes backup	9,580 per kVA
6.5	CENTRAL AC PLANT	
6.5.1	Supplying, installation, testing and commissioning of energy efficient central AC plant including low side works	90,380 per TR
6.5.2	Extra for stand-by chilling units high side	40,860 per TR
6.6	VRV/ VRF AC System	
6.6.1	Supplying, installation, testing and commissioning of VRV/VRF system including indoor /outdoor units, piping, electrical power distribution/wiring, electrical panel, treated fresh air system etc.	58,480 per HP
6.7	PRECISION AIRCONDITIONING SYSTEM	
6.7.1	Supplying, installation, testing and commissioning of precision air conditioning system including piping, electrical cabling, controller etc. required for the system	1,10,000 per TR
6.8	SOLAR PHOTO VOLTAIC POWER GENERATION SYSTEM	
6.8.1	Supplying, installation, testing and commissioning of grid interactive roof top solar photo voltaic power generation system including space frame	58,480 per kWp

S. No.	Description	Rates in ₹
6.9	SOLAR WATER HEATING SYSTEM	
6.9.1	Supplying, installation, testing and commissioning of solar water heating system with heat exchanger type including electrical heater backup, make up water tank but without piping.	23,920 per 100 litre
6.10	CCTV SYSTEM	
6.10.1	Supplying, installation, testing and commissioning of IP based CCTV system for building security comprising of PTZ / fixed camera, cabling, recording, display system and hard ware software support – for indoors only {Rate applicable on total plinth area}.	210 per sqm
6.10.2	For external surveillance (Rate applicable on total plot area minus plinth area at ground floor)	210 per sqm
	Note: Rate includes peripheral IP based PTZ camera besides indoor camera at reception, corridors, lift lobby etc., wiring upto CCTV room and setting up monitoring unit/units, as required. It will not cover in sides office room/labs, special video walls etc.	
6.11	ACCESS CONTROL SYSTEM	
6.11.1	Supplying, installation, testing and commissioning of access control system for building security comprising of controller, E&M locks, reader, smart cards, cabling, recording, display system, hardware and software support as required (Rate applicable only on plinth area of high security area in the building)	220 per sqm
6.12.1	Supplying, installation, testing and commissioning of integrated building management system for digital/electronic display and monitoring of all E&M systems like substation, DG sets, UPS, solar power, lifts, AC plants, ventilation systems, fire protection systems, pumps etc. to include cabling, monitors, recording, display system, hardware, software support (upto 10,000 sqm) (Rate applicable on total plinth area)	430 per sqm
6.12.2	Add extra for built up area above 10,000 sqm (Rate applicable on total plinth area)	130 per sqm
6.13	HYDROPNEUMATIC WATER SUPPLY SYSTEM	
6.13.1	Supplying, installation, testing and commissioning of hydro pneumatic water supply system consisting of pumps, pneumatic tank, microprocessor based control panel, VFD, inter connecting pipes, valves, cabling, switchgear etc. as required	1,640 per LPM
6.14	LIGHTING AUTOMATION INCLUDING OCCUPANCY SENSORS	
6.14.1	Supplying, installation, testing and commissioning of lighting automation including occupancy sensors (Rate applicable on area to be specified by client)	220 per sqm
6.15	BASIC HOME SECURITY FOR RESIDENTIAL COLONY	
6.15	Supplying, installation, testing and commissioning of basic security system in the residential colony to include control room at the gate and intercom connection to each dwelling unit, and basic IP based CCTV system to be installed at the entry and exit points, parking areas, entry point of each dwelling unit and other common areas as required including CCTV control room, required under ground cabling, digital recording system and monitor/monitors in the control room:	
6.15.1	Intercom system (Rate applicable on plinth area excluding service/common areas).	320 per sqm
6.15.2	CCTV system (Rate applicable on plinth area excluding service/common areas).	320 per sqm

Plinth Area Rates 2023

S. No.	Description	Rates in ₹
6.16	LAN SYSTEM	
6.16.1	Supplying, installation, testing and commissioning of LAN system comprising of core switches & L2 switches with 10 G, 10 giga SFP modules, WIFI access points, WIFI controller, network management software, racks, CAT 6A cable, patch panels, OFC etc. (Rate applicable on plinth area excluding service/common areas).	560 per sqm
6.17	IP BASED EPABX SYSTEM	
6.17.1	Supplying, installation, testing and commissioning of IP based EPABX system comprising of core switches & L2 switches with 10 G, 10 giga SFP modules, industry standard appliance server, cloud-based, enterprise-grade UC solution, MID/ENTRY level IP/SIP phone with, dual 1 gig ports, racks, CAT 6A cable, patch panels, OFC etc. (Rate applicable on plinth area excluding service/common areas).	580 per sqm
	NOTE: It will be economical to use common infrastructure of switches, OFC, CAT 6A cable for both voice and networking.	
6.18	Conference hall: supplying, installation, testing and commissioning of audio visual/conference system (Rate applicable on carpet area of Hall only)	11,890 per sqm
6.19	STREET LIGHTING WITH LED	
6.19.1	Supplying, installation, testing and commissioning of LED street/ compound/ high mast/ pathway/ landscape lighting for the entire campus (Rate applicable on total plot area).	160 per sqm
	Note: This is applicable for plot sizes more than 1 acre. For smaller plot sizes actual requirements may be worked out	
	Note:- Cost for general façade lighting, if required, with IP 66/67 LED fixtures (RGB/Tunable/Mono) along with controls (hardware and software) and cabling may be assessed on case to case basis.	
6.20	STP/ETP PLANT	
	Supplying, installation, testing and commissioning of STP/ETP of appropriate technology including civil works (except plant room), tertiary treatment etc. for the building/ campus	
6.20.1	Plant size upto 50KLD	75,000 per KLD
6.20.2	Add extra for every KLD for plant size above 50 KLD and upto 100 KLD	60,000 per KLD
6.20.3	Add extra for every KLD for plant size above 100 KLD	50,000 per KLD
6.21	DRIVER FACE AND AUTOMATIC NUMBER PLATE RECORDING SYSTEM/ RECOGNITION SYSTEM	
6.21.1	Supplying, installation, testing and commissioning of driver face and automatic number plate recording system/ recognition system including high resolution camera and software set for the driver face capture and automatic number plate recording.	7,70,890 per set
6.22	BAGGAGE SCANNERS	
6.22.1	Baggage scanner small: computer based multi energy X-Ray baggage inspection system mounted on castor wheels capable of passing through bags of dimensions 540 mm (W) x 350 mm (H), belt height 750 mm to 850 mm, 22"/24" LCD Monitor, Input / Output rollers with frames etc. as required.	22,59,510 per unit
6.22.2	Baggage scanner big: computer based multi energy X-Ray baggage inspection system capable of passing through bags/parcels of dimension 940mm (W) x 640mm (H) with Belt Height- 750mm-850mm with 22"/24" LCD Monitor, Input/ Output rollers with frames etc. as required.	37,21,550 per unit

S. No.	Description	Rates in ₹
6.23	DOOR FRAME METAL DETECTOR	
6.23.1	20 zone or above door frame metal detector nominal size: 760 mm (W) x 2050 mm (H) x 700 mm (D) loaded with necessary software	3,72,160 per set
6.25	MODULAR OPERATION THEATER	
6.25	MOT comprising of walls & ceiling system for operating area, steel framework, static dissipative flooring, laminar flow, double dome OT light, touch screen surgeon's control panel, scrub station, X-Ray viewing screen, hatch box, automatic sliding doors, anesthesia pendent, surgeon pendent etc.	
6.25.1	With stainless steel technology	72,00,000 per OT
6.25.2	With SMS technology	105,00,000 per OT
	Note: The above rates are based on OT size of 50 sqm	
6.26	BOOM BARRIER	
6.26.1	Electromechanical boom barrier with all accessories upto 6 metre length.	1,25,000 each
6.27	CAR PARKING SYSTEM	
6.27.1	Sensor based car parking system with controller, display etc. as required. (cost based on minimum car capacity of 250)	10,000 per car
6.28	EMERGENCY LIGHT & ILLUMINATED SIGNAGES	
6.28.1	Illuminated signages (Rate applicable on total plinth area)	22 per sqm
6.29	Motorized steel gates upto 6.00 metre width	5,00,000 per gate

Notes:

- The rates are inclusive of CP & OH, GST and Labour Welfare Cess (any other cess/levy imposed by local Government shall be added separately).
- The Third Party Quality Assurance (Item 2.4.4) and Consultancy Services for designing and planning of the project (Item 2.4.5), shall only be considered if so desired by the clients.
- If it is not feasible to compute the area or length of development components from item no. 5.1 to 5.7, the cost of these components may be worked out as below on the basis of percentage of building cost as per serial number 1.0.

2.1	Compact site, comprising of a single huge area building with a few ancillary buildings around or few blocks of high rise (higher than 12 storeys) building blocks in close cluster.	=	4.5% of building cost
2.2	Semi compact/semi scattered site comprising of few blocks of midrise (between 6 to 12 storeys) buildings in a gated compound.	=	6.0% of building cost
2.3	Large site comprising of various scattered low rise (upto 4 storey) buildings with exception of a block or two upto 6 storeys.	=	7.5% of building cost

- Cost of the following development works are not included in these rates.
 - Tube wells, pumps, open wells, treatment plant, extension of lines from source of local bodies, head works at water source etc.
 - Sewage pumps, sewage treatment plants, septic tanks, extension of outfall sewer upto point of disposal etc.
- Provision for Specialized E&M services if required may be made as per 6.0 above.
- Concealed wiring shall be used in all electrical works
- The rates for the following green measures are already included for civil & electrical works -
 - Over deck insulation and application of high SRI reflective paint on the roof.
 - Masonry work in super structure with autoclave aerated concrete (AAC) blocks/ fly ash bricks.
 - Window with reflective glass coating / high performance coatings / double glazed unit.
 - Paints with low VOC options.
 - Provision of pillar cock having infrared sensor and foam flow technology along with provisions of online water filter for sediment free water from terrace tank outlet or the distribution line.
 - Dual plumbing system.
 - LED light fixtures.
 - BEE certified 5 star rated fixtures.

GENERAL SPECIFICATIONS FOR RESIDENTIAL BUILDINGS

Sl. No.	Description	Latest Applicable Specifications				Remarks
		Type-II & III	Type-IV, IV (Special)	Type-V & VI	Type-VII & VIII / Bungalows	
1	FOUNDATION					
	Foundation & structure	As per structural requirements	Same as Type II & III	Same as Type-II & III	Same as Type-II & III	The design shall vary as per soil conditions
2	SUPERSTRUCTURE					
	2.1 For multi-storey RCC framed structure	RCC frame & filler walls of autoclaved aerated cement concrete (ACC) block / brunt clay FPS/ fly ash bricks. Internal partition – Half brick thick masonry in autoclaved aerated cement concrete (ACC) blocks/brunt clay FPS/fly ash bricks. Or As per specifications of New and Emerging Technology issued vide circular No. 17/SE(TAS)/BMTPC/2022/105-H dated 24.03.2022 as amended time to time for Project work				Suitable energy efficient and locally available material shall be used in consultation with architect and structural engineer.
	2.2 For composite structure (partially load bearing & partially RCC framed structure)	Autoclaved aerated cement concrete (ACC) blocks/brunt clay FPS/fly ash bricks. Internal partition – Half brick thick masonry in autoclaved aerated cement concrete (ACC) blocks/brunt clay FPS/fly ash bricks.				
	Toilet floor slab	No Sunken floor slab except floor depression for maintaining slopes. However, camouflaging of water supply and sanitary line of upper floor to be done by false ceiling as per the architectural drawings				
3	DOORS AND WINDOWS					
	a) Frames(except of toilet/bath& WC)					
	i) Door	Chemically Treated Hard wood/ seamless mild steel tubular frame(with Hot Dip GI Coating) with minimum wall thickness of 2.0 mm. The external entrance door frame will have double rebate or sub frame for double doors i.e., main door and safety grill door with SS 304 wire(Powder Coated) mesh. For internal doors single rebate frames.	Same as type-II & III	Same as type-II & III	2 nd class teak wood frame work for external entrance having double rebate for double doors i.e. main door and safety grill stainless steel door with stainless steel wire mesh. For internal doors 2 nd class teak wood/ uPVC extruded frame sections with minimum wall thickness of 1.7 mm in single rebate.	

S.No.	Description	Latest Applicable Specifications				Remarks
		Type-II & III	Type-IV, IV (Special)	Type-V & VI	Type-VII & VIII / Bungalows	
	ii) Window	Chemically Treated Hard wood/ uPVC extruded frame sections with minimum wall thickness of 1.7 mm/ powder coated or colour anodized aluminum extruded tubular sections/ engineered wood sections along with the provision of sub frame of suitable material.	Same as type-II & III	Same as type-II & III	2nd class teak wood / uPVC extruded frame sections of minimum wall thickness of 1.7 mm/ powder coated or colour anodized aluminum extruded tubular section having double rebate/ three tracks sliding system for glazed shutters and wire mesh shutters	
	iii) Doors & windows of toilet/bath / WC	Chemically Treated Hard wood/ uPVC extruded frame sections with wall thickness minimum 1.7 mm/ FRP/ PVC, compatible to doors shutters	Same as Type-II & III	Same as Type-II & III	2nd class teak wood/uPVC/ extruded frame sections with wall thickness minimum 1.7 mm/ WPC of density 750 to 1000 kg per cum, compatible to doors shutters	
	iv) Door / window frames in domestic help's area	Not admissible to Type-II and III	For domestic help's quarters same as Type-II to III	For domestic help's quarters same as Type-II to III	For domestic help's quarters same as Type-II to III	
	b) Shutters					
	i) Main door/ external door shutters	Double shutters, one mild steel(Hot Dip Galvanized) grill door with mosquito proof stainless steel wire mesh of SS-304 grade (Powder Coated), painted and other 35 mm thick factory made flush door shutter both side commercial veneered and painted. (including necessary lipping)	Same as Type-II to III except the flush door having decorative veneering on both side with melamine polish.	Double shutters one safety grill single/ double leaf door in SS-304 L grade frame with mosquito proof stainless steel wire-mesh of stainless steel -304 grade(Powder Coated) and stainless steel fittings and other with 35mm thick factory made exterior grade both side decorative veneered type flush door shutter with melamine polish. (including necessary lipping)	Same as Type-V & VI	

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S.No.	Description	Latest Applicable Specifications				Remarks
		Type-II & III	Type-IV, IV (Special)	Type-V & VI	Type-VII & VIII / Bungalows	
	ii) Domestic help's area	Not admissible to Type-II and III	For domestic help's quarters same as Type-II to III.	For domestic help's quarters same as Type-II to III.	For domestic help's quarters same as Type-II to III.	
	Bath, WC & toilet door	25 to 30 mm thick, FRP / PVC panelled doors	Same as Type- II & III	25 to 30 mm thick WPC of density 650 kg per cum paneled / 30 to 35 mm thick flush doors.	Some as Type-V & VI	
	Other doors	35 mm thick, Chemically Treated Hard wood styles and rails with 12 mm thick commercial ply/ wood paneling or factory made flush door shutters both side commercial ply veneering and finished with wooden Putty and painted.	Same as Type II & III	35 mm thick, Chemically Treated Hard wood styles & rails with paneling of 12 mm thick teak ply/ teak wood/ 5 mm thick toughened glass glazing or 35 mm thick factory made exterior grade both side decorative veneered type flush door shutter with melamine polish.	Same as Type-V & VI	
	c) Window shutters All windows shutters	Double shutter one glazed shutters with frames of powder coated or colour anodized aluminum extruded tubular sections/ uPVC extruded profiles of minimum wall thickness of 1.7 mm/ 30 mm thick Chemically Treated Hard wood with glazing of float/ toughened glass and with/ without reflective coating/ high performance coatings or double glazed unit as per design & requirement and other shutter with stainless steel SS-304 grade wire-mesh in place of glazing.	Same as Type II & III	Double shutter one glazed shutters with frames of powder coated or colour anodized aluminum extruded tubular sections/ uPVC extruded profiles of minimum wall thickness of 1.7 mm/ 30 mm thick 2nd class teak wood with glazing of float/ toughened glass and with/ without reflective coating/ high performance coatings or double glazed unit as per design & requirement and other with stainless steel SS-304 grade wire-mesh in place of glazing.	Same as Type-V & VI	

S.No.	Description	Latest Applicable Specifications				Remarks
		Type-II & III	Type-IV, IV (Special)	Type-V & VI	Type-VII & VIII / Bungalows	
	Domestic help's area (doors & windows)	Not admissible to Type-II and III	For domestic help's quarters same as Type II to III	For domestic help's quarters same as Type II to III	For domestic help's quarters same as Type II to III	Shutters in all respective rooms shall be as per the finishes of Type-1 to III in those rooms
	d) Hardware & Fittings Main units	Powder coated or colour anodized aluminum stainless steel fittings SS-304 grade.	Same as Type II & III	Same as Type-II & III	Stainless steel fittings SS-304 grade or chromium/ nickel/ chromium & nickel plated brass fittings.	Rubberized door flashing at the bottom rails of all external doors shall be provided for protection from insects and rainwater etc.
4	FLOORING, SKIRTING & DADO					
	a) Flooring Living/ drawing room, dining & family lounge	Vitrified tile flooring of size not more than 600 x 600 mm	Vitrified tile flooring of size not more than 600 x 600 mm	18 mm thick pre-polished granite stone of approved shade/ vitrified tile (in all designs and shades) of any size. Flooring of living/ drawing room can also have scratch resistant engineered wood or laminated wooden flooring.	Same as Type V & VI	
	Office area	Not admissible	Not admissible	Not admissible	18 mm thick pre-polished granite stone of approved shade/ vitrified tile (in all designs and shades) of any size/ scratch resistant engineered wood or laminated wooden flooring.	
	Bed rooms	Vitrified tile flooring of size not more than 600 x 600 mm with joints finished with matching grout	Vitrified tile flooring of size not more than 600 x 600 mm with joints finished with matching grout	18 mm thick pre-polished granite stone of approved shade/ vitrified tile (in all designs and shades) of any size/ scratch resistant engineered wood or laminated wooden flooring.	Same as Type-V & VI	

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S.No.	Description	Latest Applicable Specifications				Remarks
		Type-II & III	Type-IV, IV (Special)	Type-V & VI	Type-VII & VIII / Bungalows	
	Kitchen	Anti-skid vitrified tiles of size not more than 600 x 600 mm with water absorption less than 0.08% laid with joints finished with matching grout	Same as Type-II & III	Anti-skid vitrified tiles of size not more than 600 x 600 mm with water absorption less than 0.08% with joints finished with matching grout.	Anti-skid vitrified tiles of size not less than 600 x 600 mm with water absorption less than 0.08% with joints finished with matching grout.	
	Kitchen counter	18mm thick pre-polished granite with nosing as per design				
	Common circulation area	18 mm thick pre-polished granite / vitrified tiles in all designs and shades (with water absorption less than 0.08%) of any size.				
	Domestic help's area (flooring)	Not admissible to Type-II and III	For domestic help's quarters flooring shall be as per flooring of Type II & III			Finishes in all rooms shall be as per the finishes of Type-1 to III in respective rooms
	Common circulation area in domestic help's quarters	Not admissible to Type-II and III	18 mm thick granite stone / locally available stone			Use of locally available stone shall be as per approval of higher of Senior Architect/ Chief Architect provided in the Region.
	Main Staircase	18 mm thick honed / flamed finish granite in single length of treads & risers				Nosing design in treads shall be as per architectural design
	Fire escape staircase					
	Toilets / bathroom/ WC	Glazed ceramic anti-skid of size not more than 300 x 300 mm including grouting the joints.	Same as Type-II & III	Rectified ceramic anti-skid tiles of size not more than 300 x 300 mm	Anti-skid vitrified/ ceramic tiles (with water absorption less than 0.08% not more than 600 x 600 mm or 18 mm thick gang-saw cut pre-polished granite stone.	

S.No.	Description	Latest Applicable Specifications				Remarks
		Type-II & III	Type-IV, IV (Special)	Type-V & VI	Type-VII & VIII / Bungalows	
	Skirting in rooms and other areas	100 to 150 mm high skirting matching the floor material.				
	Kitchen dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm as per design from floor upto full height.	Same as Type-II & III	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm as per design from floor to full height	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm as per design from floor to full ht.	Must be read with scale of amenities in the respective categories
	Toilets/ bathrooms/ WC dado	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm upto full height with decorative bands at certain intervals.	Same as Type- II & III	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm upto full height with decorative bands at certain intervals	Ceramic glazed/ vitrified tiles of size not more than 300 x 450 mm upto full height with decorative bands at certain intervals.	
5	RAILINGS /PARAPETS IN BALCONIES/ TERRACE					
	(a) Railings in balconies	Clear 1.00 m high MS railing made out of MS flats and square bars with 40 mm dia. MS pipe hand rail on top (as per approved design)	Clear 1.00 m high stainless steel railing made out of tubular balustrades with horizontal tubular SS tubes as rails and hand rail on top (as per approved design); all stainless steel tubular members to be of SS-316 L grade.			
	Note: Hand rail of the balcony railings in multi storey flats may be so designed that clothes drying lines in sufficient numbers are provided along with					
	(b) Parapet on terrace	200 / 230 mm thick masonry in autoclaved aerated cement concrete (AAC) blocks / RCC / burnt clay FPS bricks duly plastered on both sides and top upto 1.0 metre clear height				
6	FINISHES					
	(a) Internal finishes	All walls & ceiling to be treated with 2 mm thick POP (one time only) and painted with low VOC acrylic washable distemper. Synthetic enamel paint on all wood works and steel works	All walls & ceiling to be treated with 2 mm thick POP (one time only) & painted with low VOC acrylic washable distemper. Synthetic enamel paint on all wood works & steel works	All walls & ceiling to be treated with 6 mm thick POP punning (one time only) and painted with low VOC plastic emulsion paint. Synthetic enamel paint on all wood works and steel works	Premium acrylic emulsion paint with low VOC of approved shade in roller finish over 6 mm thick POP wall punning Synthetic enamel paint on all wood works and steel works	

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S.No.	Description	Latest Applicable Specifications				Remarks
		Type-II & III	Type-IV, IV (Special)	Type-V & VI	Type-VII & VIII / Bungalows	
	(b) External finishes	Quartz reinforced texture acrylic paint finish/ Premium acrylic smooth water proof exterior finish over cement-based putty/ washed mosaic plaster in premium cement. Synthetic enamel paint on all wood work & steel work	Same as Type-II & III.	Quartz reinforced texture acrylic paint finish of approved shade/premium acrylic smooth water proof exterior finish / washed mosaic plaster in premium cement-based putty/ exposed brick / stone work/GRC / designer cement concrete tile cladding/ ACP cladding in combination with structural glazing	Same as Type-V & VI	In case of large campus etc., the external finishes of the residences shall match the overall colour & texture finishes within the campus

Note: For hostels, same specifications as for Type-IV & Type-IV (Special) quarters shall be followed.

ANNEXURE-I (b)

SCALE OF AMENITIES (CIVIL) FOR GENERAL POOL RESIDENTIAL ACCOMODATION (GPRA)

Item No.	Item	Type-II & III	Type-IV & IV (Special)	Type-V & VI	Type-VII & VIII	Domestic help's Qtrs.
1	Kitchen cabinets					
i)	Cooking platform	Yes	Yes			Yes
ii)	Stainless steel AISI 304(18/8) kitchen sink as per IS 13983 with drain board	Yes	Yes			Yes
iii)	Built in cupboard made up of box and shelves with both side balancing laminated and shutters with one side decorative and other side balancing laminated 18 mm thick high moisture resistant HDF board or Same shelves with box and shutter of 18 mm thick EPC boards, with stainless steel hardware, as per architectural design and specifications.	Yes, (with shelves)	Yes, (drawers with telescopic channels)			
iv)	25 mm thick and not more than 400 mm wide both side balancing laminated high moisture resistant HDF board shelves, in tiers upto 2100 mm height in niche and covered with 18 mm thick one side decorative and other side balancing laminated high density high moisture resistant HDF board, with stainless steel hardware as per architectural design and specifications.	Yes	Yes			Yes
v)	Factory made modular kitchen having sink with double bowl & double drain-board, cooking platform and electric chimney of reputed company.			Yes	Yes	
2	Wardrobes					
i)	Built in cupboard of minimum depth 650 mm made up of 18 mm thick one side decorative and other side balancing laminated high moisture resistant HDF board in box, sides, top and bottom and 18 mm thick both side balancing laminated high moisture resistant HDF board in shelves, with stainless steel hardware as per architectural design and specifications.	One in each bed room upto ceiling height	One in each bed room upto ceiling height (steel shutters with frame not to be used)			One upto ceiling height

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Item No.	Item	Type-II & III	Type-IV & IV (Special)	Type-V & VI	Type-VII & VIII	Domestic help's Qtrs.
ii)	Factory made wardrobe carcass, shelves, drawers etc. manufactured in 19 mm thick block board / ply wood painted with synthetic enamel paint or primer on all the inner surfaces and sides top and shutter faces finished with post formed lamination / natural veneer with melamine polish and using stainless steel hardware as per the approved sample.			One in each bed room upto ceiling height	One in each bed room upto ceiling height	
3	Magic eye in front entry door.	One	One	One	One	One
4	Curtain rod with required accessories.	On all windows and doors in all rooms except kitchen, toilets/baths/WC's	Drapery rods on all windows and doors in all rooms except kitchen, toilets/baths/WC's	Same as Type IV & IV (Special)	Same as Type IV & IV (Special)	Same as Type -II & III
5	Set of pegs.	In all toilets/ baths /WC's	In all toilets/ baths/ WC's and wardrobes	In all toilets/ baths/ WC's and wardrobes	In all toilets/ baths/ WC's & wardrobes	
6	18 mm thick projected window sill lining, window jambs.	Granite stone	Granite stone	Granite stone	Granite stone	Granite stone

ANNEXURE-I (c)

**SCALE OF AMENITIES FOR SANITARY AND WATER SUPPLY FITTING FOR GENERAL POOL
RESIDENTIAL ACCOMMODATION (GPRA)**

Sl. No.	Item	Type-II&III	Type-IV& IV (Special)	Type-V &VI	Type-VII & VIII	Domestic help's Qtrs.
1	EWC / IWC with trap (EWC with seat rim and cover) and low level dual flushing cistern.	One in each toilet				
2	Water jet and / or health faucet with WC.	Water jet and Health faucet with each EWC				Not applicable
3	Wash basin with CP brass basin mixture for hot & cold water, single lever quarter turns type with ceramic cartridges.	One in each toilet & one in dining area as per design.				One in each toilet
4	Tap (In kitchen, toilet, bath & WC) CP brass bib cock provided quarter turn type with ceramic cartridges.	Three in kitchen, one in each toilet for WC.				
5	Shower with CP brass diverter /mixture single liver type for hot & cold water with ceramic cartridges	One in each toilet/bath				-
6	CP brass towel rail and towel ring	One towel ring with each wash basin and towel rail in each bath				
7	Mirror with frame and glass shelf having stainless steel frame/ guard bar/brackets.	600 x 450 mm with each wash basin	As per design with each wash basin			600 x 450 mm with each wash basin
8	CP brass/ceramic toilet paper holder.	With each EWC				
9	Soap rack/ niche as per architectural design and specification.	One with each wash basin and in each bath				
10	Plumbing for water purifier and geyser.	Yes for both in kitchen and for geyser in each bath				
11	Storage tank of capacity as per NBC 2016 provision of separate tank for WC & drinking water.	Separate tanks for kitchen and toilets for dual flushing system as per requirements with provision of online filter.				
13	Water meter of appropriate bore size, as per approval of the local municipal body.	Yes, inside the flat at direct supply point to dwelling unit or at first inlet point if supply is through bulk storage at terrace; separately for each piping system.				

SCALE OF AMENITIES FOR ELECTRICAL INSTALLATION IN GENERAL POOL RESIDENTIAL ACCOMMODATION

Sl. No.	Description	Type-II	Type-III	Type-IV & IV (Special)	Type-V	Type-VI	Type-VII& VIII	Domestic helps Qtrs.
1	Power plug points (16 A 6 pins)	2 in each room 1 in kitchen 1 in utility area	2 in each room 1 in kitchen 1 in utility area	2 in each room 1 in kitchen 1 in utility area	3 in drawing room 3 in Dining Room 2 in each Bedroom 2 in Kitchen 1 in Utility Area	3 in drawing room 3 in dining room 2 in each bedroom 2 in kitchen 1 in utility area	2 in office 4 in drawing room 3 in dining room 2 in family lounge 2 in each bedroom 2 in kitchen 1 in utility area	Total 2
		Total 8	Total 8	Total 12	Total 15	Total 17	Total 22	
2	Light plug points (6 A)	2 in each room 1 in kitchen 1 in balcony area	2 in each room 1 in kitchen 1 in balcony area	2 in each room 1 in kitchen 1 in balcony area	2 in each room 1 in kitchen 1 in store 1 in main balcony	2 in each room 1 in kitchen 1 in store 1 in each balcony	1 in office 2 in each room 1 in kitchen 1 in store 1 in each balcony	Total 2
		Total 8	Total 8	Total 12	Total 13	Total 15	Total 20	
3	Bracket lights (with normal fittings excluding lamp/bulb)	1 in each room 1 in kitchen 1 in each toilet 1 in utility	1 in each room 1 in kitchen 1 in each toilet 1 in utility	1 in each room 1 in kitchen 1 in each toilet 1 in utility	1 in store 1 in each toilet 1 in utility	1 in store 1 in each toilet 1 in utility	1 in store 1 in each toilet 1 in utility	Total 3
		Total 4	Total 4	Total 11	Total 10	Total 12	Total 12	
4	Ceiling fans	1 in living room 1 in each bedroom	2 in living room 1 in each bedroom	2 in living room 1 in dining room 1 in each bedroom	2 in drawing room 1 in dining room 1 in each bedroom 1 in each balcony	2 in drawing room 1 in dining room 1 in family lounge 1 in each bedroom 1 in each balcony	2 in drawing room 1 in dining room 1 in family lounge 1 in each bedroom 1 in each balcony	Total 1
		Total 3	Total 4	Total 6	Total 6	Total 12	Total 14	
5	Call bell points	1	1	2	3	3 (One with image display system)	4 (One with image display system)	
6	Exhaust fans	1 each in kitchen, bath & WC	1 each in kitchen, bath & WC	1 each in kitchen, bath & WC	1 each in kitchen & toilets	1 each in kitchen & toilets	1 each in kitchen & toilets	Total 2

Sl. No.	Description	Type-II	Type-III	Type-IV & IV (Special)	Type-V	Type-VI	Type-VII& VIII	Domestic helps Qtrs.
7	AC points (with MCB connected socket outlet with wiring)	1 in each room except kitchen & toilet	1 in each room except kitchen & toilets	1 in each room except kitchen & toilets	1 in each room except kitchen & toilets	1 in each room except kitchen & toilets	1 in each room except kitchen & toilets	
8	Geyser point (with MCB connected socket outlet with wiring)	1 in bathroom	1 in bathroom/toilet	1 in kitchen 1 in each toilet	1 in kitchen 1 in each toilet	1 in kitchen 1 in each toilet	1 in kitchen 1 in each toilet	1 in toilet
9.	EDB/MCB point (single phase)	1	1					1
10.	EDB/MCB (3 phase)			1	1	1	1	
11	Cable TV point	1 in living room 1 in each bedroom	1 in living room 1 in each bedroom	1 in drawing room 1 in each bedroom	1 in drawing room 1 in each bedroom	1 in drawing room 1 in dining room 1 in each bedroom	1 in office 1 in drawing room 1 in dining room 1 in family lounge 1 in each bedroom	1
12	Telephone point As per the approval of competent authority	1 in living room 1 in each bedroom	1 in living room 1 in each bedroom	1 in drawing room 1 in each bedroom	1 in drawing room 1 in each bedroom	1 in drawing room 1 in dining room 1 in each bedroom	1 in office 1 in drawing room 1 in dining room 1 in family lounge 1 in each bedroom	1

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Sl. No.	Description	Type-II	Type-III	Type-IV & IV (Special)	Type-V	Type-VI	Type-VII& VIII	Domestic helps Qtrs.
13	Decorative light fittings for LED bulbs (without bulbs)				3 in drawing room 3 in dining room 2 in each bedroom 1 in kitchen	3 in drawing room 3 in dining room 2 in each bedroom 2 in kitchen	3 in office 3 in drawing room 3 in dining room 3 in family lounge 2 in each bedroom 2 in kitchen	
					Total 13	Total 16	Total 22	
14	LED tube light fittings (excluding tubes)	1 in each room 1 in kitchen	1 in each room 1 in kitchen	1 in each room 1 in kitchen	1 in drawing room 1 in dining room 1 in each bedroom 1 in kitchen	1 in drawing room 1 in dining room 1 in each bedroom 1 in kitchen	1 in office 1 in drawing room 1 in dining room 1 in family lounge 1 in each bedroom	
		Total 4	Total 4	Total 6	Total 6	Total 7	Total 9	
15	Modular switches	---	---	---	Yes	Yes	Yes	---

Note: All the common areas e.g. lifts & staircases, lobbies, connecting corridors etc. shall have lighting arrangement along with LED light fixtures as per actual design.

ANNEXURE-I (e)

GENERAL SPECIFICATIONS FOR NON – RESIDENTIAL BUILDINGS

Item No.	Description	Specifications
1.0	FOUNDATION	
1.1	For RCC framed structure	As per structural design based on soil investigation. (Primarily with RCC footings, columns, raft etc.).
1.2	For composite (partially load bearing and partially RCC framed structure)	As per structural design based on soil investigation. (brick/stone work spread footings on cement concrete base upto 1500 mm depth below ground level with or without RCC isolated combined footings with plinth beams/bands).
2.0	SUPER STRUCTURE	
2.1	As per specifications of New and Emerging Technology issued vide circular No. 17/SE(TAS)/BMTPC/2022/105-H dated 24.03.2022 as amended time to time	
2.2	Internal partitions (wherever applicable) :- Office/college/hospital	Aerated cement concrete (ACC) blocks / Light weight autoclaved aerated concrete (AAC) blocks/ Gypsum blocks/ Non asbestos double skin cement boards/ Fly ash bricks/ dry wall partitioning/ glass partitioning
	Schools	Light weight autoclaved aerated concrete(AAC) blocks/ burnt clay FPS brick masonry work / aerated cement concrete (ACC) blocks / fly ash bricks.
2.3	Sunken Floor in Lavatory Blocks for Floor Traps / W.C. with four course waterproofing treatment	No Sunken floor slab except floor depression for maintaining slopes. However, camouflaging of water supply and sanitary line of upper floor to be done by false ceiling as per the architectural drawings.
3.0	DOORS & WINDOWS	
3.1	Frames	
3.1.1	Door frames:- Office/college/hospital	Door frames of 2nd class Indian teakwood or equivalent in officer's room. anodized / powder coated/ polyester powder coated aluminum extruded tubular sections/extruded hollow mild steel pipes (minimum 2 mm thickness)/uPVC extruded frame sections / WPC of density between 750 to 1000 kg per cum.
	Schools	Locally available chemically treated hardwood/ seamless mild steel tubular frame (with Hot Dip GI coating) of minimum 2 mm thickness.
3.1.2	Window frame:- Office/college/hospital	uPVC extruded sections of window frame/ Aluminum extruded tubular sections / WPC of density between 750 to 1000 kg per cum.
	Schools	uPVC extruded sections of window frame/ standard mild steel Z-section steel frame members.
3.2	Door & window shutters	
3.2.1	Door Shutter:- Office/college/hospital	Paneled type in 2nd class Teak wood or flush door with teak veneered ply/ commercial ply or anodized/powder coated/ polyester powder coated aluminum shutters with toughened glass glazing/paneling wherever required as per CPWD specifications/as per design & drawing.
	Schools	Flush door shutters with Teak ply veneering/commercial ply veneering (including necessary lipping).
3.2.3	Frame and shutters in wet area	PVC/FRP/WPC door frames & shutters in wet areas.

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Item No.	Description	Specifications
3.3	Window shutters:- Office/college/hospital	Factory made colour anodized/ powder coated/ polyester powder coated Z-section aluminum shutters/ standard uPVC/WPC section for windows glazed with glazing of float / toughened glass and with / without reflective coating / high performance coatings or double-glazed unit as per design & requirement.
	Schools	Standard powder coated aluminum tubular profiles windows / mild steel Z-section steel windows with glazing of float / toughened glass and with / without reflective coating / high performance coatings or double-glazed unit as per design & requirement.
3.4	Fittings	Anodized aluminum / stainless steel SS-304 grade.
3.5	Fire check door	As per fire safety specifications.
4.0	FLOORING	
4.1	Main entrance hall:- Office/college/hospital	18mm thick Pre polished granite flooring.
	Schools	18mm thick Pre polished granite flooring in entrance lobby.
4.2	Corridors:- Office/college/hospital	Matt finished vitrified tiles/granite flooring
	Schools	Kota stone flooring and corresponding skirting.
4.3	Rooms:- Office/college/hospital	Granite tiles/vitrified tiles/engineered wood flooring (in officers chambers)
	Schools	Kota stone flooring and corresponding skirting. In principal room and office area vitrified tiles of size 600 x 600 mm and matching skirting/ dado.
4.4	Lavatory Blocks:- Office/college/hospital	Granite flooring.
	Schools	Rectified antiskid tiles (of any size).
4.5	Laboratories in schools	Rectified antiskid tiles (of any size) and chemical resistance tiles in floor/ counters/shelves of chemistry labs.
4.6	Flooring in basement	Vacuum dewatered concrete.
4.7	Rest of the area	Vitrified ceramic floor tiles
5.0	STAIRCASE	
5.1	Internal staircases:- Office/college/hospital	18 mm thick single piece granite stone in flooring in treads & risers with dado of matching permanent finish specifications.
	Schools	20 mm thick single piece kota stone flooring in treads & risers with 1200 mm high dado of ceramic glazed tiles of size 300 x 450 mm.
5.2	Fire escape staircase	18 mm thick flamed granite in single piece in treads & risers with dado of matching permanent finish specifications.
6.0	RAILING:- Office/college/hospital	Stainless steel balustrades with 12mm thick toughened glass railing or stainless-steel tubular horizontal guard rails /hand rails in SS-304 grade.

Item No.	Description	Specifications
	Schools	1200 mm high parapets minimum 100 mm thick or mild steel railing with GI pipe hand rail.
7.0	TOILETS:- Office/college/hospital	Granite flooring / glazed tiles of size not less than 300 x 450 mm / 400 x 600 mm in dado upto ceiling height, granite counters, rimless counter sunk basins/stainless steel sinks, mirrors with moulded PVC frame, FRP/PVC doors with frames.
	Schools	Rectified antiskid tiles of size not less than 400 x 400 mm and dado upto door height with ceramic glazed wall tiles of size not less 300 x 450 mm.
8.0	ROOFING	
8.1	Roof treatment	Coba treatment/over deck insulation with puff slab.
8.2	False ceiling:- Office/college/hospital	False ceiling in office area & toilets to cover the services as per design requirements.
	Schools	False ceiling in office area, principal room and in toilets (If needed to hide sanitary pipes)
9.	FINISHING	
9.1	External:- Office/college/hospital	Dry stone cladding/washed stone grit plaster/water proof weather coat paints/ structural glazing/ ACP cladding conforming to Energy Conservation Building Code.
	Schools	Dry stone cladding/washed stone grit plaster upto certain specified heights rest cement plastered surface with white cement based putty and acrylic smooth exterior paints.
9.2	Internal:- Office / college / hospital	Cement plaster in wet areas / Dry acrylic paint / distemper in service area & basement / Acrylic emulsion paint/ textured paint (low V.O.C) over POP / Wall paneling as per approved architectural design upto sill level / 1200 mm height or ceiling height
	Schools	Cement plastered wall surfaces with POP (one time) and acrylic smooth interior paints in classrooms, corridors and labs etc. In principal room and office texture paint over POP surface.
9.3	Painting:- Office/College/Hospital	Doors & windows – painting/polishing on wood work as per design requirement.
	Schools	Doors and windows to be painted with synthetic enamel paint and in corridors upto 1500 mm height on the exterior of classroom walls and upto parapet height on the other side to be painted with synthetic enamel paint.
10.0	Provision for barrier free building	Ramps, toilets for physically challenged, chequered tiles, use of Braillesignage & lifts etc.GRC (glass reinforced concrete) tiles in ramp area.

**Generalized Guidelines/ specifications for Civil for works executed through EPC mode
(for Residential & Non-Residential Buildings)**

General Notes

- (a) Below mentioned are brief general specifications for guidance purpose only. Detailed specifications have to be drafted as per the intended purpose of the building conforming to applicable local bye-laws, regulations, norms, codal provisions, work wise, building wise, room wise depending upon the functional, architectural, structural requirements of the client specific to the project and may be incorporated in the tender document as schedules 1 to 10 by the NIT approving authority in the tender document as per the pro-forma appended at Appendix-I.
- (b) For any such material for which specifications are not available in CPWD specifications or item is not contained in DSR, NIT approving authority should provide per unit rate as applicable and also specifications in the tender document.
- (c) Guidelines of Ministry of Housing and Urban Affairs (MoHUA) in respect of General Pool Residential Accommodation (GPRA) & General Pool Office Accommodation (GPOA) shall be followed.

Item No.	Description	Brief Specification/Guide lines
1.0	General Specifications/ Guidelines	- All the items of Delhi Schedule of Rates are in the scope of work against the tender, as may be applicable, according to the design developed by the contractor and discharged by the Engineer-in-Charge by way of Good for Construction drawings. - CPWD Specifications Vol-I and Vol-II as amended from time to time shall be applicable for all the items to be executed as per Good for construction drawings. - Provisions contained in Harmonized Guidelines & Standards for Universal Accessibility in India 2021 (available on CPWD Website) of Ministry of Housing and Urban Affairs, Government of India shall be complied with while preparing drawings. - Contractor shall submit detailed Architectural working drawings to Engineer-in-Charge. The Engineer-in-Charge shall get it examined from the designated Architect of the project and issue NOC for taking up work. - Contractor shall submit Good for construction drawings (structural, services, MEP etc.) to the Engineer-in-Charge. Work shall be executed only as per NOC issued for Good for construction drawings (structural, services, MEP etc.) by the Engineer-in-Charge, for which he shall take prior internal approval from the authority competent to accord technical sanction. - Contractor shall carry out his own soil investigation from a soil investigating agency approved by the Engineer-in-Charge for the purpose of design of foundation and superstructure. In case of any contradiction between Geo technical report appended with tender documents and that undertaken by contractor, the report suggesting of weaker technical conditions shall prevail. - Type of cement to be used in the work shall be as per provisions of IS: 456 with regard to exposure conditions including Sulphate attack. - C&D waste products and recycled aggregates to the extent provided in IS codes shall be used as per extant provisions of Green building measures. - Only potable water shall be used in the work.
2.0	Earthwork, Foundation and Plinth	- Scope of work includes all items of DSR as contemplated in the Sub Head Earthwork of DSR (including bailing and pumping out water, strutting etc.) as may be applicable to the work as per design and drawings submitted by the contractor and as confirmed by the Engineer-in-Charge and are to be executed as per CPWD specifications. - Surplus excavated earth shall be disposed of by the contractor after remittance of due royalty to concerned authority, as applicable, by the contractor. - Filling available earth or earth brought from outside shall be done as per requirement to level the ground as per approved drawings.

Item No.	Description	Brief Specification/Guide lines
		4. Plinth filling shall be done as per the recommendation of the soil investigation report or with earth suitable for plinth filling including filling of sand of grading zone IV or V as per CPWD specifications and thickness as per drawing. 5. Appropriate ground improvement or soil stabilization measures as per the soil investigation report and structural design, if any recommended shall be carried out. 6. Appropriate foundation system Including isolated footing/combined footing/ Raft/ pile and possible combination of these as per the recommendations of the soil investigation report containing borehole data, seasonal variation of subsoil water table, and as per structural design conforming to relevant Indian Standard Codes shall be provided. 7. Anti-termite treatment as per the necessity of ground shall be carried out as per relevant Indian standard codes/ CPWD specifications. 8. Structural/Non- Structural Grade slab as per the necessity at site/design requirement and as per the functional requirement of supported flooring shall be designed & provided accordingly. 9. Damp proof course shall be provided wherever required as per CPWD specification. 10. Basement if provided shall be designed as an integral part of superstructure and integrated with foundation system with suitable water proofing system and measures for collection, pumping and disposal of any water. 11. Any extended basement beyond footprint of the Superstructure shall be designed and integrated with foundation system and its roof slab designed to carry all loads including fire tender load as required. 12. Drainage and Plinth protection along the perimeter of the buildings shall be provided as per CPWD specifications or as per specific functional requirement.
3.0	Superstructure	1. Structural system for the superstructure shall be adopted as per the technology mentioned in the tender document and in line with the list of structural system technologies circulated vide OM No. 17/SE(TAS)/BMTPC/2022/105-H dated 24.03.2022 as amended from time to time. The latest guidelines should be made part of tender document. Structural design shall be carried out conforming to relevant Indian Standard codes. Building shall be designed based on latest IS codes and should have seismic resistant provisions as per IS codes. The materials like concrete, steel, centering and shuttering shall be as per the approved technology and as per CPWD specifications/ IS codes. Minimum M-30 grade design mix concrete shall be used for RCC work. Minimum Fe-500 D grade low alloy steel as per provisions contained in Note-3 of Para 4.2 of amendment number 3 to IS 1786 shall be used in the work. All the horizontal, vertical, inclined projections of the structure like porticos, slab projections, staircases, mummy, machine rooms, water tanks, any other architectural features shall be designed as integral part of the structure and provided. 2. Expansion joints / seismic separation joints shall be provided as per the approved structural drawing and treated and covered as per CPWD specifications / manufacturer specifications. 3. The Structural Steel shall be made at least 2 hrs fire resistant by using Intumescent Fire Paint / Vermiculite coating as per manufacturer's specifications and by applicators approved by them in case measures stipulated in NBC 2016 are not possible to adopt. 4. External walls and internal partitions / walls if not designed as integral part of the super structure shall be provided as per Schedule (Civil) No. 1

Item No.	Description	Brief Specification/Guide lines
4.0	Flooring	1. Flooring shall be provided as per Schedule(Civil) No. 2. 2. Skirting minimum 75mm/100 mm high to be provided as per functional and architectural requirement. 3. Leveling course to be provided on the top of RCC slab before laying flooring as per site requirement, if required
5.0	Doors, windows ventilators, fittings & fixtures,	1. Doors, windows, ventilators including fittings fixtures and glazing shall be provided as per Schedule(Civil) No 3. 2. Provision of viewing glass shall be made as per functional requirement. Provision for SS 304 mosquito proof shutters shall be made as per requirement for external doors. 3. Windows along with glazing shall be designed for wind loads applicable to the area/location as per relevant IS codes. 4. Wherever required for security concerns, MS/ aluminium/SS 304 grills in windows as per approved design shall be provided as per Schedule (Civil) No. 9 5. Curtain rods of Stainless steel/brass/PVC/Oxidized Mild steel shall be provided as per requirement at as per Schedule(Civil) No 3. 6. Blinds vertical/ horizontal / roller of approved make and opacity shall be provided at windows at as per Schedule(Civil) No 3.
6.0	Internal finishing Painting, wall paneling, dado, false ceiling	Internal finishing like painting, wall paneling, dado, false ceiling shall be provided as per Schedule (Civil) No. 4
7.0	Cupboards, wardrobe & kitchen cabinets /Modular kitchen	Cupboards, wardrobe & kitchen cabinets/modular kitchen in kitchen shall be provided as per Schedule (Civil) No. 5
8.0	External finishing Painting, Cladding, Structural glazing	1. External finishing including painting, cladding, structural glazing shall be provided as per Schedule (Civil) No. 6 2. Structural glazing/cladding system shall be designed for applicable wind loads, thermal expansions and seismic movements.
9.0	Internal Water Supply, Sanitary lines and fittings fixtures	1. Dual piping system shall be provided as per Schedule (Civil) No. 7 wherever recycled water is used for flushing. Separate pipe lines for hot and cold water supply shall be provided. Pipe lines and their accessories shall be of approved make. 2. Plumbing shall have provision for Geysers, water purifier, washing machines, Dish washers, cage washers or any other equipment as per functional requirement as per Schedule (Civil) No. 7 3. Piping has to be done such that every house shall be provided with individual water meter at a designated location. 4. In toilets and other waste water disposal areas sanitary pipe lines shall be suspended from the floor slabs i.e. the floor slabs should not be depressed on account of accommodating sanitary lines. These overhanging sanitary lines shall be camouflaged by moisture resistant false ceiling. 5. Plumbing system shall be designed and provided as per the functional requirements of the buildings. 6. Double stack system shall be followed. All sewerage to be connected to one stack and all drainage to be connected to other stack.

Item No.	Description	Brief Specification/Guide lines
		- Water supply and sanitary fittings shall be provided as per the functional and architectural requirements. - Exposed pipes shall be placed over saddle duly fixed to the wall by bracket. - All drainage in balconies shall have their inlets in plan. All drainage through balconies shall be connected to Rain Water Harvesting. - Utility balcony drainage shall be suitably treated and shall be not connected to Rain Water Harvesting System. - For high rise buildings (Buildings whose height is more than 15m) - the stacks shall be provided in shafts and the shafts shall be opening in balconies, shafts shall be covered with weather proof doors and accessible from balconies for maintenance.
10.0	External Water supply pipelines & sewage lines. Fittings & fixtures/ chambers Sewage pipeline Fitting & fixtures/ chamber	- External water supply & sanitary installation fittings and fixture shall be provided as per Schedule (Civil) No. 8 - Dual piping system shall be provided, as required, where recycled water is used for flushing, Horticulture, firefighting purposes and for cooling towers for chiller units. - Inspection chambers/manholes/ gullies chambers/ valves and other accessories of approved specifications and make shall be provided considering all the site conditions and reduced level as per design parameters. As far as possible green and recyclable materials shall be preferred, as per approved drawings.
11.0	STP/ETP	- The input and output parameters of sewage and treated sewage like BOD, COD, Turbidity, TDS including quantity of incoming sewage, requirement of primary / secondary / tertiary system shall be specified in the NIT as per Schedule(electrical) No 11 - Appropriate capacity STP/ ETP using appropriate technology as per approved makes shall be designed and provided depending on quality and quantity of output. - Provision shall be kept as required, for the use of recycled water for toilet flushing, horticulture/irrigation, firefighting purposes if permitted by fire department and for use in cooling towers of chiller plants with appropriate treatment. - Provisions for running and maintenance of STP/ETP post construction, to be made.
12.0	Water treatment plant & storage tanks	- Water treatment plant of appropriate capacity using appropriate technology shall be designed and provided depending on quality and quantity of incoming water and quality of treated water required. The quality parameters of input and output water shall be specified in the NIT. - Bulk storage tanks including fire tank of required capacity either underground/ overhead/ground shall be provided. If required hydro pneumatic system of pumping shall be designed and adopted.
13.0	Service buildings	Transformer yard, DG set yard, Substation building, pump house, fire pump room shall be provided as per drawings and design approved by Engineer-in-Charge.
14.0	Roads/ footpaths/ kerbstones Parking, Signages	Cement Concrete /Bituminous concrete – wearing course. Minimum 200mm thick Wet mix macadam/150 mm thick dry lean concrete – base course Minimum 250 mm thick Granular sub base. More thickness to be provided as per design considering actual ground conditions and traffic load.

Item No.	Description	Brief Specification/Guide lines
	Compound wall & gate Horticulture & landscaping. Rain water harvesting	- Footpaths shall be provided as per requirement and design with 60mm thick factory made interlocking paver blocks of M-35 grade / 16 mm thick factory made chequered cc tiles/vitrified tiles. Factory made Kerb stones of required sizes along the sides of roads and footpaths shall be provided. - Covered/open parking areas shall be provided as per requirement with CC/BT/80 mm thick Paver blocks of grade M-40. Roofing if required shall be RCC/Galvalume/ CGI/Bamboo sheets supported on RCC /Steel structure. - Retro-reflective sign boards shall be made of aluminium/Stainless steel sheet supported on epoxy painted MS/SS frame work. Road markings shall be with thermoplastic reflective paint. - MS/SS-304 entrance gates with RCC/Steel support structure with provision for security guard rooms, toilet etc. - Compound wall of required height shall be provided wherever required with RR masonry/Brick masonry/RCC/Precast with RCC and MS grills as per the approved architectural drawing and structural design. - Horticulture and landscaping shall be carried out as per approved horticulture plan and specifications. - Rainwater harvesting system shall be designed and provided as appropriate to the site and as per Municipal byelaws and Central Ground Water Board norms. - Roof top rain water has to be harvested. - Storm water drains shall be provided wherever required with RR masonry/Brick masonry/RCC/Precast RCC/non-pressure RCC pipes/HDPE pipes as per approved development plan and site conditions. - NP3 / HDPE pipe of required diameter including testing of joints as per specification shall be provided at road crossings. - Manholes of required dia and depth shall be provided with brick wall (with Sewer Bricks/CD-100 bricks) as per CPWD specifications or IS codes. In adverse sub soil conditions, manholes and sewer lines pipes shall be appropriately designed and provided.
15.0	Waterproofing treatment	Waterproofing treatment shall be done as applicable and as required on terraces, sunken slabs, toilet slabs, lift pits, basement rafts & walls, water tanks, UG sumps, OHTs and any other liquid retaining structures as per Schedule (Civil) No. 9 Water stops shall be provided in construction joints of liquid retaining structures.
16.0	Railings & grills	Stainless steel of grade SS 304 grade/ Aluminium/Mild steel /GI railings and grills shall be provided as per architectural design in Balconies, staircases, steps, Ramps corridors and in other common circulation areas as indicated in drawings and in accordance with provisions of NBC 2016 as per Schedule (Civil) No. 10
17.0	Facade/Jalis of shafts	Aluminium louvers, GFRG(Glass fibre reinforced concrete)/WPC (Wood Polymer Composite) CNC curtain jalis to cover exposed Rain water pipe shafts, Toilet shafts and other areas shall be provided as per requirement. The sections for fixing of such jalis shall be designed as per codal provisions to withstand wind loads, seismic movements etc. as per Schedule (Civil) No. 10
18.0	Miscellaneous	- All shafts (Civil and E&M) shall be appropriately closed horizontally and covered with appropriate door system vertically. This arrangement may be augmented as per fire requirements. - Kitchen should be so designed so as to ensure that various gadgets ducts are conveyed to service ducts for example ducting for electric chimney. - Accessible roofs shall have parapets. - NIT approving authority has to make a clear mention regarding providing eaves board/curtain below the slab in balconies/verandah/court yards.

SCHEDULE TO BE ATTACHED IN NIT(To be filled in by the NIT approving authority)

1. Schedule of walls including external, internal (dry area), internal (wet area) **(SCHEDULE (CIVIL) No.1)**
2. Schedule of flooring **(SCHEDULE (CIVIL) No.2)**
3. Schedule of doors, windows, ventilators including fittings, fixtures and glazing details **(SCHEDULE (CIVIL) No.3)**
4. Schedule of internal finishing including painting, wall paneling, dado & false ceiling **(SCHEDULE (CIVIL) No.4)**
5. Schedule of cup boards, wardrobe, kitchen cabinets, modular laboratory tables / platforms etc. **(SCHEDULE (CIVIL) No.5)**
6. Schedule of External finishing including painting, cladding, structural glazing **(SCHEDULE (CIVIL) No.6)**
7. Schedule of internal water supply & sanitary installation including fittings, fixtures **(SCHEDULE (CIVIL) No.7)**
8. Schedule of External water supply & sanitary fittings, fixtures including all sewer appurtenances **(SCHEDULE (CIVIL) No.8)**
9. Schedule of Waterproofing **(SCHEDULE (CIVIL) No. 9)**
10. Schedule of Railings, Grills and Jali **(SCHEDULE (CIVIL) No.10)**

NOTE: Above schedule shall indicate complete description of item and dimensions like size, thickness etc. to the required accuracy as appropriate. Additional schedules may be added as per the requirement of work. Entire scope of the work shall be covered in the above schedules.

Schedule of Walls

(A) External Walls

S. No.	Location	Description of item / Brief Specifications
		1. In case of structural walls, specifications of walls shall be as per structural drawings approved by Engineer-in-Charge.
		2. In case of non-structural walls, NIT approving authority shall choose and specify any of the items/specifications from the following: (a) Item No 2.1 to 2.3 of Annexure I (e) of PAR in case of non-residential buildings (b) S.No 2 of Annexure I (a) of PAR in case of residential buildings.
		3. If any other item other than above mentioned at 1&2 is chosen, cost shall be compensated for in the estimate appropriately.

(B) Internal Walls (Dry Area)

S. No.	Location	Description of item / Brief Specifications
		1. In case of structural walls, specifications of walls shall be as per structural drawings approved by Engineer-in-Charge.
		2. In case of non-structural walls, NIT approving authority shall choose and specify any of the items/specifications from the following: (a) Item No 2.1 to 2.3 of Annexure I (e) of PAR in case of non-residential buildings (b) S.No 2 of Annexure I (a) of PAR in case residential buildings.
		3. If any other item other than above mentioned at 1 & 2 is chosen, cost shall be compensated for in the estimate appropriately.

(C) Internal Walls (Wet Area)

S. No.	Location	Description of item / Brief Specifications
		1. In case of structural walls, specifications of walls shall be as per structural drawings approved by Engineer-in-Charge.
		2. In case of non-structural walls, NIT approving authority shall choose and specify any of the items/specifications from the following: (a) Item No 2.1 to 2.3 of Annexure I (e) of PAR in case of non-residential buildings (b) S.No 2 of Annexure I (a) of PAR in case residential buildings.
		3. However non water absorbing material shall be chosen.
		4. If any other item other than above mentioned at 1 & 2 is chosen, cost shall be compensated for in the estimate appropriately.

Note:

- To be filled by NIT approving authority.
- Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Schedule (Civil) No. 2

Schedule of Flooring

S. No.	Room / Space / Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items/specifications from the following: (a) Item No 4.1 to 5.2 of Annexure I (e) of PAR in case of non-residential buildings (b) S.No 4 of Annexure I (a) of PAR in case residential buildings.
		2. If any other item other than above mentioned at 1 is chosen, cost shall be compensated for in the estimate appropriately.

Note:

- To be filled by NIT approving authority.
- Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Schedule (Civil) No. 3

Schedule of doors windows, ventilators including fittings, fixtures and glazing details

(A) Doors

S. No.	Room / Space / Location	Size	Description of item / Brief Specifications
			1. NIT approving authority shall choose and specify any of the items/specifications from the following: (a) Item No 3.1,3.2 & 3.5 of Annexure I (e) of PAR in case of non-residential buildings (b) S.No 3 of Annexure I (a) of PAR in case residential buildings.
			2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(B) Windows/ Ventilators

S. No.	Room / Space / Location	Size	Sill level	Description of item / Brief Specifications
				1. NIT approving authority shall choose and specify any of the items/specifications from the following: (a) Item No 3.1,3.2 & 3.3 of Annexure I (e) of PAR in case of non - residential buildings. (b) S.No 3 of Annexure I (a) of PAR in case residential buildings.
				2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(C) Fittings and Fixtures

S. No.	Room / Space / Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items/specifications from the following as per architectural requirement and design.
		(a) Item No 3.4 of Annexure I (e) of PAR in case of non- residential buildings
		(b) S.No 3 of Annexure I (a) of PAR in case residential buildings
		2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(D) Details of Glazing

S. No.	Room / Space / Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items from the following as per architectural requirement and design
		(a) Float glass
		(b) Toughened glass with/without reflective coating/high performance coatings
		(c) Double glazed unit
		2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

Note:

1. To be filled by NIT approving authority.
2. Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Schedule (Civil) No. 4**Schedule of internal finishing including painting, wall paneling, dado & false ceiling****(A) Plastering**

S. No.	Room / Space / Location	Description of item / Brief Specifications
		1. NIT approving authority to clearly mention the specifications of plastering in case it is different from conventional cement plaster.
		2. If any other item other than conventional plaster is chosen, cost shall be compensated for in the estimate appropriately.
		3. If plaster is not technically required, cost compensation in the estimate may be done appropriately.

(B) Painting

S. No.	Room / Space / Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items/specifications from the following:
		(a) Item No 9.2 & 9.3 of Annexure I (e) of PAR in case of non- residential buildings
		(b) S.No 6 of Annexure I (a) of PAR in case residential buildings.
		2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.
		3. If painting is not technically required, cost compensation in the estimate may be done appropriately.

(C) Wall paneling

S. No.	Room / Space / Location	Height	Description of item / Brief Specifications
			1. NIT approving authority shall specify as per architectural requirement/design. 2. Appropriate cost compensation may be considered in the estimate depending upon the specifications adopted.

(D) Dado/Sill linings/jambs

S. No.	Room / Space / Location	Height	Description of item / Brief Specifications
			1. NIT approving authority shall choose and specify any of the specifications from the following : (a) Item No 4.0,5.0 & 7.0 of Annexure I (e) of PAR in case of non -residential buildings (b) S.No 4 of Annexure I (a) of PAR in case of residential buildings. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(E) False Ceiling

S. No.	Room / Space / Location	Description of item / Brief Specifications
		1. NIT approving authority shall specify specifications as per architectural requirement/design. 2. Appropriate cost compensation shall be considered in the estimate depending upon the specifications adopted.

Note: 1.

1. To be filled by NIT approving authority.
2. Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Schedule (Civil) No. 5

Schedule of cup-boards, wardrobe, kitchen cabinets/ modular kitchen/modular laboratory tables / platforms etc.

S. No.	Room / Space / Location	Description of item / Brief Specifications
		1. NIT approving authority shall provide and specify as per scale of amenities Annexure I (b) of PAR for residential buildings and as per architectural requirements for non-residential buildings. 2. Appropriate cost compensation may be considered in the estimate depending upon the specifications adopted.

Note:

1. To be filled by NIT approving authority.
2. Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Schedule of External finishing including painting, cladding, structural glazing**(A) Finishing / Facade**

S. No.	Location	Height	Description of item / Brief Specifications
			1. NIT approving authority shall choose and specify any of the items/specifications from the following: (a) item No 9.1 of Annexure I (e) of PAR in case of non- residential buildings (b) S.No 6 of Annexure I (a) of PAR in case residential buildings. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately

(B) Exposed brick work

S. No.	Location	Description of item / Brief Specifications
		1. NIT approving authority shall specify as per architectural requirement and design. 2. Appropriate cost compensation may be considered in the estimate depending upon the specifications adopted.

Note:

1. To be filled by NIT approving authority.
2. Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Schedule of internal water supply & sanitary installation including fittings, fixtures**(A) Water supply line**

S. No.	Toilet / Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items/specifications from CPVC /GI/SS/PPR/PE-AL-PE pipes. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(B) Sanitary line

S. No.	Toilet / Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items/specifications from CI/Hub less CI/UPVC/HDPE. 2. If any other item other than above mentioned at 1 is chosen, cost shall be compensated for in the estimate appropriately.

(C) Wash basin / Kitchen sink/Toilet fittings and fixtures

S. No.	Toilet / Kitchen / Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items/specifications from the scale of amenities given at Annexure I (c) & (b) of PAR in case of residential buildings and as per architectural requirements in case of non-residential buildings. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(D) Dado/Sill linings/Jambs

S. No.	Toilet / Location	Height	Description of item / Brief Specifications
			1. NIT approving authority shall choose and specify any of the specifications from the following: (a) Item No 4.0,5.0 &7.0 of Annexure I (e) of PAR in case of non-residential buildings (b) S.No 4 of Annexure I (a) of PAR in case of residential buildings. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

Note:

1. To be filled by NIT approving authority.
2. Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Schedule of External water supply & sanitary lines**(A) Water supply line**

S. No.	Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items from DI/GI pipes. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(B) Sanitary lines

S. No.	Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items from RCC (minimum NP-2 grade) / HDPE pipes. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

Note:

1. To be filled by NIT approving authority.
2. Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Schedule of Waterproofing on terraces, toilet slabs, lift pits, basement rafts & walls, water tanks, UG sumps, OHTs and any other liquid retaining structures.

S. No.	Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items from Integral cement (coba)/bitumen felt / crystalline admixture/ fibre reinforcement elastomeric based waterproofing. 2. If any other item other than mentioned at 1 above is chosen cost shall be compensated for in the estimate appropriately.

Schedule of Railings and Grills

(A) Railings

S. No.	Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items from SS/Aluminium/Mild steel/GI in combination with or without toughened glass as per architectural requirement / design 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(B) Grills

S. No.	Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items from SS/Aluminium/Mild steel as per architectural requirement / design. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(C) Façade/ Jali of shafts

S. No.	Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items from Aluminium /GFRC/WPC/CC as per architectural requirement / design. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

(D) Parapet wall on terrace

S. No.	Location	Description of item / Brief Specifications
		1. NIT approving authority shall choose and specify any of the items from RCC/AAC Block/Clay bricks/Flyash bricks/CC blocks as per architectural requirement / design. 2. If any other item other than above mentioned at 1 is chosen cost shall be compensated for in the estimate appropriately.

Note:

1. To be filled by NIT approving authority.
2. Items / specifications to be provided at any location even though left out in the above provisions but is required as per functional requirements and as per approved drawings shall be provided as per direction of Engineer-in-Charge and the rates for same shall be deemed to be inclusive in quoted rates of contractor. Nothing extra on this account shall be payable.

Generalized Guidelines/Specifications for E&M services for EPC mode NITs (for Residential & Non-Residential Buildings)

GENERAL NOTES

1. All Electrical & Mechanical works shall be as per the guidelines/ specifications mentioned herein, which shall represent the minimum requirement compliant to the related CPWD specifications and relevant Indian standards/ International standards as applicable including installation, testing and commissioning.
2. The requirement of the energy efficiency measures shall be complied as per the provisions of the local body and provisions as per minimum "Green rating" as per Green Rating Manual 2021 and ECBC 2017 [minimum ECBC building] (as applicable for individual service/ item).
3. The scale of amenities and the provisions for different services shall be as per the client's requirement/ approved yardstick if any/ local body /statutory requirements as applicable.
4. Equipment's capacity/selection and design shall also be made as per good engineering practices, based on design/ site / client requirements, CPWD Specifications, Relevant BIS standards, NBC -2016, Local by-laws, Local Fire authority Rules as modified up to date.
5. Clearances from local authorities as per norms shall be with the scope of work.
6. For the purpose of the interpretation of the specifications, the order of preference shall be:
 - a. Preliminary Estimate items description & Additional conditions as per site requirements.
 - b. CPWD specifications
 - c. Bureau of Indian Standards (BIS)
 - d. Manufacturer's standard practice/ specifications
 - e. International Standards
7. Detailed specifications have to be drafted as per the intended purpose of the building conforming to applicable local bylaws, regulations, norms, codal provisions, workwise, building wise, room wise depending upon the functional, architectural, electrical and mechanical works requirements of the client specific to the project and incorporated in the tender document. For E&M services, schedules 1 to 23 to be incorporated by the NIT approving authority in the tender document as per the proforma appended, as per the sanction provisions. Schedules 1 to 23 to include items from DSR as may be applicable to them as per requirement/ as per design and drawings confirmed by the department and are to be executed as per CPWD specifications/ NIT.
8. For any such work/ materials, specifications of which are not available in CPWD specifications or item is not contained in DSR, NIT approving authority should provide per unit rate and specifications in the tender document.
9. Provisions contained in Handbook on barrier free built environment and corresponding provision of NBC 2016 shall be made.
10. Guidelines of MOHUA in respect of GPRA & GPOA shall be followed.

Item No.	Description	Brief Specifications																				
1	Internal Electrical Installations	As per CPWD General Specification for Electrical Works Part I (Internal) – 2023 amended upto date.																				
1.1	Conduits & Cable Trays	The work will be carried out in recessed/surface PVC/ MS conduit wiring system with modular socket in accordance of CPWD General Specifications for Electrical Works Part-I (Internal)-2023 amended upto date; Hot Dip Galvanized GI Cable trays (perforated or ladder type) for cable laying. Data and communication cables shall be laid in the recessed/surface PVC/ MS conduit or laid in the metallic raceways/ channels with cover and matching junction boxes.																				
1.2	Wires & Cables	FRLS PVC insulated Copper conductor cables will be used for points, circuit & sub-main wiring; Power & light point wiring shall be with copper conductor of size as per CPWD specifications & relevant BIS standards; RG-6 Cable TV wiring; Cat-6/ 6A Cabling / telephone wiring as required for EPABX / Data networking requirements.																				
1.3	Switches & Sockets	All switches, sockets, stepped type electronic fan regulators, bell push and accessories along with matching mounting boxes shall be of modular type.																				
1.4	MCB DBs & LT Panels	Meter Boards & Main Distribution Boards as per CPWD specification / requirement; Size of distribution board shall be as per number of light / power circuits. All distribution boards shall be MS powder coated MCB based, Single phase/ 3 phase and suitable in-comer as per individual DB requirement, double door type with RCCB of required capacity and MCCB/MCB of suitable rating. LT panels shall be as per CPWD specifications & IS/IEC 61439 with MCB/MCCB/ACB as required.																				
1.5	Fittings	Lighting fixtures, LED type, in all spaces, common areas on all floors, staircases, corridors, lobbies, services rooms, basement, terrace etc. shall be provided. For basement and wet areas, the degree of protection for the fittings shall be minimum IP 65. The minimum illumination requirement and other parameters shall be as per the NBC 2016 amended upto date. All LED Indoor lighting fixtures should be following parameters <table><tr><th>Description</th><th>Parameters</th></tr><tr><td>CRI</td><td>> 80</td></tr><tr><td>THD</td><td>≤ 10%</td></tr><tr><td>System efficacy</td><td>minimum 100 lm/W at temp 0 to +45deg. C and humidity 10% to 90%</td></tr><tr><td>System life time (Burning Hour with driver)</td><td>50000 hours @ L70 as per LM 70 and testing as per LM 80</td></tr><tr><td>Driver voltage</td><td>220-240V</td></tr><tr><td>power factor</td><td>>0.9</td></tr><tr><td>efficiency</td><td>> 85%</td></tr><tr><td>Surge protection</td><td>(L-N) 1KV, (E-L/N) 2 KV</td></tr><tr><td>Color Temperature</td><td>As per site requirement</td></tr></table>	Description	Parameters	CRI	> 80	THD	≤ 10%	System efficacy	minimum 100 lm/W at temp 0 to +45deg. C and humidity 10% to 90%	System life time (Burning Hour with driver)	50000 hours @ L70 as per LM 70 and testing as per LM 80	Driver voltage	220-240V	power factor	>0.9	efficiency	> 85%	Surge protection	(L-N) 1KV, (E-L/N) 2 KV	Color Temperature	As per site requirement
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Surge protection	(L-N) 1KV, (E-L/N) 2 KV																					
Color Temperature	As per site requirement																					
1.6	Fans/ Exhaust fans	Ceiling fans [BLDC] (min 3-star rating as per Bureau of Energy Efficiency) & exhaust fans/ fresh air fans in all residential units, services rooms, bathrooms/ toilets and in common areas shall be provided as per CPWD specifications and related BIS.																				
1.7	Earthing	Copper/GI plate earth pits and complete earthing system as required as per CPWD specifications.																				
1.8	Lightening Arrestor	Lightning Protection System as per IS/IEC 62305 standard & National Building Code (NBC 2016).																				

Item No.	Description	Brief Specifications																				
2	External Lighting & Power distribution	As per CPWD General Specification for Electrical Works Part II (External) – 2023 and relevant BIS, amended upto date																				
2.1	Cables	XLPE armoured cable copper/ aluminium between outdoor feeder pillar to termination box of pole etc. and wiring of suitable size between termination box to fitting i/c their termination. The power cabling should be sized to ensure that the distribution losses do not exceed 3% of total power usage.																				
2.2	Feeder Pillars	Outdoor type Feeder Pillars shall be suitable for 3 phase, 50Hz, 415 volts, A.C. system. Rating and size of Feeder pillar shall be as per designed load and requirement; The feeder pillars shall be as per CPWD specifications with MCB/MCCB/ACB as required. To be provided with astronomical timer/ photo sensor based switching for outdoor and street lighting, to save energy.																				
2.3	Fittings	LED outdoor light fixtures (IP-66) of suitable lumen output / wattage for compound lighting; street lighting, Security light fittings at perimeter on boundary wall as required. The minimum illumination requirement shall be as per the NBC 2016 amended upto date. All LED outdoor lighting fixtures should be following parameters <table><tr><th>Description</th><th>Parameters</th></tr><tr><td>CRI</td><td>> 80</td></tr><tr><td>THD</td><td><10%</td></tr><tr><td>System efficacy</td><td>minimum 100 lm/W at temp 0 to +45 deg. C and humidity 10% to 90%</td></tr><tr><td>System life time (Burning Hour with driver)</td><td>50000 hours @ L70 as per LM 70 and testing as per LM 80</td></tr><tr><td>Driver voltage</td><td>220-240V</td></tr><tr><td>power factor</td><td>>0.9</td></tr><tr><td>efficiency</td><td>> 85%</td></tr><tr><td>Surge protection</td><td>(L-N) 1KV, (E-L/N) 2 KV</td></tr><tr><td>Color Temperature</td><td>As per site requirement</td></tr></table>	Description	Parameters	CRI	> 80	THD	<10%	System efficacy	minimum 100 lm/W at temp 0 to +45 deg. C and humidity 10% to 90%	System life time (Burning Hour with driver)	50000 hours @ L70 as per LM 70 and testing as per LM 80	Driver voltage	220-240V	power factor	>0.9	efficiency	> 85%	Surge protection	(L-N) 1KV, (E-L/N) 2 KV	Color Temperature	As per site requirement
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Color Temperature	As per site requirement																					
2.4	Street Light Poles	Octagonal GI poles with sliding door, single / double bracketed arm along the road as per IS standards. Ornamental/ Decorative poles and bollards with LED fittings may also be provided as per the site/client requirements.																				
2.5	Earthing	Copper/GI plate earth pits and complete earthing system as required as per CPWD specifications.																				
3	Electrical Sub-station	As per CPWD General Specification for Electrical Works Part IV Substation – 2013 and relevant BIS amended upto date covering 33kV/0.433 kV or 11 kV/0.433 kV substation equipment comprising HT panel, dry type/ Oil type transformers (Indoor/ outdoor type, as required), HT cables, bus trunking / suitable cabling from transformer to LT panel, LT panels (as per IS/IEC 61439), automatic power factor correction panel, active harmonic filters, TVSS (transient voltage suppression system), SPD (Surge protection system), essential panel, earthing, required inter-connections, substation safety equipment including LT cabling from substation to the buildings fed by the substation																				
3.1	HT Panel	33KV or 11KV HT panel board; With required nos. of incomer (preferable to have atleast 2 incomers to have standby), bus coupler/s and required no of outgoing HT outgoing with VCBs, metering (in all panels and suitable for net metering) and protection equipment/ accessories and compatible for SCADA/ BMS as required.																				
3.2	Transformer	Dry type/ oil type Transformer, complete with online tap changer and other accessories and safeties, cable end box etc. as per IS and having maximum losses as per table of ECBC 2017 code (as per ECBC building or better) with amendments, if any. The entire work shall comply with the latest CPWD specifications for substation and electrical works.																				

Item No.	Description	Brief Specifications
3.3	LT Panel	Main LT panel (normal supply) for receiving supply from Transformers and having ACB's/ MCCBs as outgoing; Main LT panel (Essential supply) for receiving supply from Transformers and DG sets and ACB's /MCCBs as outgoing; Main Sub LT Panel for supplying power to smaller loads having MCCB's as outgoing; The incomers rating of LT breakers of Main Panel shall match with transformer rating or next available standard ratings of ACB with requisite breaking capacity of for all the incoming and outgoing switchgears as per applicable fault level.
3.4	APFC Panels	APFC panel shall be provided on separate sections of main LT panel and having switching off arrangement in case of DG supply in the main panel; Designed capacity to maintain overall P.F. as applicable for ECBC building category or better (presently 0.97 or better)
3.5	Bus trunking	All Bus trunking and rising mains shall be compact air insulated/ Sandwich type, of required breaking capacity, complete with joints, fire barriers, tap off boxes, mounting arrangement etc. and of required degree of protection. Shall be used for the connections between the Transformer and main LT panel, LT panel to the rising mains, or as per specific site requirements.
3.6	Cables	HT Panel and transformers will be connected through three core 11/33 KV HT XLPE(E) of requisite capacity based on the current carrying and breaking (fault level) capacity; HT cable end terminations shall be Cold shrink/ Heat shrinkable type; These cables shall have individually screened cores and be manufactured and tested according to IS: 7098 (Part II) - 1973 amended up to date; The power cabling should be sized to ensure that the distribution losses do not exceed 3% of total power usage.
3.7	Earthing	Earthing sets, connections etc. shall be as per CPWD Specifications and relevant BIS
4	Diesel Generating Set	As per CPWD General Specification for Electrical Works Part VII DG Sets – 2013, relevant code, CPCB norms and local body norms covering DG sets, AMF panel, bus ducting/ cables from DG sets to essential panel, DG set enclosure room sound insulation/ ventilation/ smoke exhaust as required, earthing of DG set system, control cabling, fuel tank/ piping, DG set exhaust piping/ exhaust chimney as per CPCB norms, civil works connected with DG sets including foundation as required. DG sets shall be silent type, minimum rating/ capacity specified is nominal capacity at standard test conditions; The DG set capacity shall be suitable for the load covering common area lighting, outdoor lighting, lifts, water supply pumps, sewerage and drainage pumps, firefighting essentials and other essential power supply requirements as per site requirements.
4.1	Engine	The engine shall be capable of driving the alternator continuously at its rated full load and rated speed without getting over loaded under the prevailing operating conditions
4.2	Alternator	Generator Sets shall be 415V, 3 Phase, 4 wire, 50Hz, 0.8 PF with acoustic enclosure
4.3	AMF Panel	Generator sets shall start automatically in the event of a power failure and shall transfer power to emergency / critical loads automatically and shall switch off after some time delay in case of restoration of power supply. Synchronisation arrangement to be provided in case of parallel operations, where more than 1 DG set is installed and such arrangement is required as per site requirement.
4.4	Exhaust Pipe	As per CPWD General Specification for Electrical Works Part VII DG Sets – 2013, relevant codes and CPCB/ local body norms
4.5	Cables	Complete Electrical and control wiring for various accessories etc.
4.6	Earthing	Earthing sets as per CPWD Specification and relevant BIS
4.7	Fuel tank	As per OEM standard/ site requirement.
5	Fire Fighting and Wet Riser System	Fire Protection System including Sprinkler System, wet-risers, down comer, Yard-hydrants, internal-hydrants, first aid hose reels, electrical and diesel engine driven pumps etc. designed and provided as per provision given in NBC 2016, relevant BIS Codes, local Fire Bye Laws & CPWD Specification Part V-2020, all with up-to-date amendments; Pipe materials and other fixtures for Fire Fighting, plumbing work shall be as per CPWD specifications.

Item No.	Description	Brief Specifications
6	Fire Alarm System	As per CPWD's General specification for Electrical Works, Part -VI Fire detection and Alarm system-2018, NBC 2016, local Fire Bye Laws, IE Rules, BIS/IEC, Indian Standards amended upto date; covering Manual/ Automatic Fire Alarm System complete with items like detectors, manual call boxes, cabling/ wiring, fire panels, etc. including Integration of FAS panel with Smoke Ventilation & pressurization fans, AHUs, Lifts, sprinkler monitoring panel, water curtain system, water levels of Fire water tanks and as required for any other service.
6.1	Cables	Either copper conductor Armoured Fire survival cables of suitable size or copper wire in heavy duty MS conduit of suitable size shall be used compliant to the relevant IS.
6.2	PA System	Public Address System with Audio Amplifiers, speakers & required wiring shall be provided to cover all the areas as per the requirement of CPWD specifications, NBC 2016 and local bye laws.
7	IP BASED EPABX System	IP based EPBAX System comprising of core switches & L2 switches with 10 G, 10 giga SFP modules, industry standard appliance server, cloud-based, enterprise-grade UC solution, MID/Entry level IP/SIP phone with, dual 1 gig ports, racks, CAT-6/ 6A cable, patch panels, OFC etc.
8	CCTV Surveillance System	As per good Engineering practice or as required under the codes or by local/statutory authorities compliant to relevant Indian standard 13252; IP based CCTV system for building security comprising of PTZ/ fixed camera, cabling, digital recording, HD display system with minimum display of 5" x 8" per camera and hardware & software support both for indoor and external surveillance IP based Closed Circuit Surveillance system is proposed to monitor the activities at critical/ desired areas. The video shall be continuously transported to existing server, using IP cameras; The items supplied by the contractor should have specifications compatible with each other required for satisfactory operation of the system. CCTV cameras and storage server/ NVR shall have ONVIF Profile-S compliance for interoperability.
9	Mechanical Ventilation System	The system shall be provided as per National Building Code of India- 2016 and requirement of the local body, CPWD General Specifications for Heating, Ventilation and air conditioning work-2017 and relevant I.S Codes; The system shall be designed and provided to achieve rate of air change in various ventilated areas as prescribed in NBC-2016 and local building bye-laws/ site requirements.
9.1	Fans	All the fan motors which will operate in normal mode shall have IE-3 efficiency. The fan motors required to be operated during fire mode shall be minimum IE-2 efficiency
9.2	Ducting	The Staircase, Lift Lobby & Lift Well pressurization shall be designed and provided as per provisions given in NBC 2016 and Local by laws. Scope of works include GSS ducting, grills, louvers and all associated works and shall be executed as per CPWD specifications; The pressurization system shall be integrated with fire alarm system for automatic operation on command from fire detection system.
10	Lifts	The lifts shall be with power operated centre opening/side opening doors and AC variable voltage & variable frequency controls, Car safety & Governor, Guides, guide rails, ropes, car platform, cabin finishes (stainless steel), car & landing doors (stainless steel), hoist motors, braking system, Automatic Rescue Device (ARD) etc. complete as per the CPWD Specifications and related IS standards upto date. (Lifts can be with Machine room or Machine room less depending upon site requirement) Provision of lifts will be made as per National Building Code-2016 / relevant BIS amended upto date) considering no of floors, height of the building and speed of elevators; At least one lift in each block be made compliant to barrier free and accessibility requirements as per CPWD specifications & capacity to be minimum 13 passengers for barrier free lift; One lift in each tower should be goods / bed lift, with size and capacity of lift car to be designed accordingly. Provision of fire lifts shall also be ensured as per local fire authorities requirements/ bye laws.

Item No.	Description	Brief Specifications
11	Sewage/Effluent Treatment Plant	STP/ETP shall be based on suitable technology to meet the requisite norms of treatment of sewage to achieve required quality of output water as per local body/ CPCB/ local pollution board, MoE&F, NBC 2016 norms; The work shall be inclusive of interconnecting piping between all units, valves, gates and all other accessories and devices as required, all mechanical equipment duly protected against corrosion, all electric drives, pumps, motors control centers, power and control cables (except main incoming feeder and yard lighting), all instrumentation, control cabling, panels complete in all respects. Water meter on outgoing treated effluent for measuring the outflow should be provided; Dewatering pumps (with automation) as required with 100% standby pumps. All remaining pumps & blowers shall have minimum N+1 redundancy. It shall be complete with required civil works (except plant room), storage chambers, tertiary treatment etc. for the building/ campus.
12	Hydro pneumatic Water Supply System	Hydro pneumatic Water Supply System shall be complete with pumps, pneumatic tank, micro-processor based control panel, VFD, interconnecting pipes, valves, cabling and switchgears. Water supply pumping stations with auto control panels shall be provided for filling terrace tanks of water supply system/ direct pumping for building/s /residential unit/s as required. It shall be designed and provided to meet water demand as per provisions given in NBC-2016. Each pump of pump set shall be with variable frequency drive and each set shall have one standby pump; All pump motors shall be of minimum IE3 efficiency rated (except dewatering pumps, where IE2 is acceptable). Each pump shall have an efficiency of more than 70% at selection point; Type, Pressure, Head and discharge of the pumps, sizes and type of valve shall be designed for proper service.
13	Roof Top Solar PV Power Plant	Roof top grid interactive solar photo voltaic plant system shall be inclusive of the Solar panels of prescribed efficiency, mounting structure, cabling, inverter, panel, metering devices, earthing, lightning protection complete as per state-of-the-art technology as per good engineering practice compliant to relevant Indian standards/ local/statutory authorities/MNRE guidelines.; The capacity of plant shall be derived as per available space on terrace of the buildings; High efficiency PV cells with high efficiency invertors shall be used. Minimum power output guarantee offered for the SPV Module shall not be less than rated for 25 years; Invertors/Power conditioning unit (PCU suitable for mains as well as DG supply) as required. However, capacity of each inverter should not be more than 30 Kw; The inverter output shall always follow the grid in terms of voltage and frequency; AC collection Panel with metering to monitor generation at the terrace and AC cabling from Panel to receiving switch; Measuring devices i/c net metering, indication devices, protection devices, switching devices, all necessary wiring, DC and AC cabling including feeding power to essential supply by providing necessary tap off boxes; Mounting structure of GI on terrace of the building, protection of system for external / internal causes and from all kind of surges etc.; Earthing and Lightning protection of Solar system

Item No.	Description	Brief Specifications
14	Solar Water Heating System	As per good engineering practice; As per capacity requirement of individual house/ building, meeting the minimum local body requirements for each residential unit or building as applicable. Solar water heating system with heat exchanger type including electrical heater backup, make up water tank but without external piping. Solar water heating system shall be compliant to IS:12976:1990 with latest amendment with Solar Flat Plate shall be BIS marked and as per IS :12933/2003 with amendment 1 to 3 and Hot water storage tank shall be of SS 316 grade. Tank shall be insulated with 100 mm thick glass wool insulation not less than 80 kg/m2 density & wrapping by 24g aluminium sheet.
15	Access Control System	As per good engineering practice or as required under the codes or by local/statutory authorities; Access control system with Controller, E&M Locks, Biometric /NFC/Card reader and smart cards, cabling, display system, hardware and software. The system includes cards for required number of persons (as per site requirement) and a visitor management system, attendance monitoring system.
16	Boom Barrier	Electromechanical boom barrier with all accessories upto 6 meter length; consisting of a fixed housing and a movable arm; in two pieces without central support, electrically operated from security/guard- room through push buttons; Barrier Housing Unit: Powder Coated; Boom: Powder Coated White RAL 9010m or approved color with Red reflective strips having IP 44 (Barrier Body) & IP 67 (Control Card Box); All Aluminium Housing with Base frame in SS-304 for high protection against corrosion; Operator console, necessary hardware, software, Power and control cabling etc. as required It should have anti-crush safety mechanism to suspend the motion of barrier when met with any obstruction; Quick opening and closing of barrier with soft landing; Speed of barrier should be programmable while installing as per frequency of traffic; Provision to integrate with other peripheral devices like Access Control System, Beam sensors; It should be activated by a single push button and with an option to operate wirelessly through remote. In addition it must have provision to operate on electronic signals from Access Control System; Safety device like beam sensor should be provided with the barrier; Barrier should have clamping mechanism in open and closed positions; Control system (gear unit, crank drive and control unit etc.) should be housed inside a stainless steel pole stand casing; It should have distinct visible marking/ paint work. The barrier body should be treated with 100 micro epoxy zinc plating anti corrosion paint.
17	Door Frame Metal Detector	20 zone or above door frame metal detector nominal size: 760 mm (W) x 2050 mm (H) x 700 mm (D) along with necessary software, power and control cabling etc. suitable for operation on 230 volts single phase supply $\pm 10\%$ AC, complete as required. The metal detector set should be intelligent, microprocessor controlled & PC compatible. It should have the following features and controls: Latest technology like continuous wave; It should consist of minimum required number of zones, each zones should have facility of auto calibration; The unit should be active continuously; It should be simple to operate; It should have keypad provision for all program settings; Detector should have self test program and system fault indicators; Sensitivity, threshold & volume of each zone should be digitally controlled in steps from 0-99; There must be independent sensitivity setting of each zone; The detector should have battery backup for memory protection;

Item No.	Description	Brief Specifications
		The detector should have zone display on side panel of the frame along the length; The detector should have multimode counter i.e. IN, OUT, total IN & OUT; The detector should display the time, counter, program setting and sensitivity during setting; It should have IR occupancy sensor for traffic counter. Alarm should be active only when occupancy is there; It should be able to detect the objects as small as 15 mm ferrous or non-ferrous metal cubes; The walk-through door frame should be of FRP material and built in control unit to display different alarms and location of the metal; It should meet the test requirement as per relevant ASTM standards (ASTM C1309-97, ASTM C1270-97 etc.) or equivalent Indian standards.
18	Baggage Scanners	X Ray baggage scanner, suitable for operation on 230 V single phase supply, 50 Hz (170 V to 260 V), complete with X-Ray source/ generator, sensors, video display, features of multi energy X Ray image facility, compliant to Radiation safety standards, Lead impregnated safety screen, Threat Image Protection (TIP) system software, required computer with CPU, hard disk, mouse, keyboard, CD -RW Drive: DVD Drive etc. compete as required. The X Ray Baggage Inspection System shall be suitable for indoor use and the radiation level should not exceed accepted health standard (0.1 R/Hr at a distance of 5 cm from external housing). (Relevant certificate from AERB) It shall be as per QR/specification for 'X-RAY BAGGAGE INSPECTION SYSTEM', approved by MHA vide letter No. F/No. W-42011(494)/QRs/CISF/ Tech/2008/MHA - Prov-I-1422 Dated 08th September, 2016
18.1	Small size	Computer based multi energy X-Ray baggage inspection system mounted on castor wheels capable of passing through bags of nominal dimensions 540mm(W) x 350mm(H), belt height 750mm to 850mm, 22"/24" LCD monitor, Input/Output rollers with frames etc. as required.
18.2	Big size	Computer based multi energy X-Ray baggage inspection system mounted on castor wheels capable of passing through bags of nominal dimensions 940mm(W) x 640mm(H) with belt height 750mm to 850mm, 22"/24" LCD monitor, Input/Output rollers with frames etc. as required.
19	Driver face and automatic number plate recording system/ recognition system	Driver face and automatic number plate recording system/ recognition system including high resolution camera and software set for the driver face capture and automatic number plate recording; ANPR system shall be complete with all required hardware, software, license, 2 HD cameras of requisite specifications (Minimum 2 MP, progressive scan with Day/Night function WDR or better, lens, with resolution 1280 X 1024 or better), for capturing number plate and driver's face, minimum 30 days recording capacity in HD, archive of vehicle entry and exit data base, recording of vehicle plate photo, heavy duty central monitoring console (Server) 32" display with required operating system, LAN switches, cabling in surface/ underground, ANPR server, operating system and spare hard disks. The system shall be able to process and read number plates of vehicle with speed upto 80 KM per hour and have feature for alert generation, vehicle log, central management module with system accuracy of minimum 90% + vehicle plate detection.
20	Integrated Building Management System	Integrated Building Management System for digital/ electronic display, monitoring and control of specified E&M systems like substation, DG sets, UPS, Solar PV system, lifts, AC plants, ventilation systems, fire protection systems, water supply pumps etc. to include cabling, monitors, recording, display system, hardware, software support as per good Engineering practice or as required under the related codes; The IBMS would comprise the integration of various independent systems on a common system; The BMS shall use a series of Dedicated Controllers, located in different parts of the building to Control and Monitor following (based on availability of services in the building/project): 1. HVAC and Ventilation equipment 2. Water supply and drainage pumps 3. Façade lighting/ Street lighting/ area lighting

Item No.	Description	Brief Specifications
		Monitoring/ Status only for 1. Lifts 2. UPS 3. Fire Fighting pumps status 4. Fire Alarm System 5. HT Panel & main LT Panel 6. DG Set/s 7. Access Control System 8. STP All required hardware (server, DDC, Network switch, path, panel, IO devices, LAN cabling, wiring, software, field devices, control and sensor cables, integration etc. complete as required for successful commissioning and operation of the system.
21	HVAC System	The work shall be executed as per CPWD General Specifications for Heating, Ventilation & Air Conditioning Works-2017, relevant IE rules, relevant IS amended upto date.
21.1	Central AC Plant	Energy efficient central AC plant including high side and low side works including Compressor units (Reciprocating/ Scroll/ Centrifugal) Condenser, Chillers (Screw/ Centrifugal), Refrigerant Plumbing, Micro Processor controller, AHUs, Fan coil unit, cooling tower, circulating water pumps, Water plumbing works, Ducting, volume dampers, grills, diffusers, thermal insulation for pipes and ducting, Controls, power cables, electrical panels etc. complete as required.
21.2	Chiller, Pumps, Cooling Tower, Boilers	Efficiency should be compliant to minimum "ECBC Building" as per ECBC 2017.
22	VRV/ VRF AC System	Variable Refrigerant Flow (VRF) shall meet or exceed the efficiency requirements specified as per minimum "ECBC Building" as per ECBC 2017 and the work shall be executed as per CPWD General Specifications for Air Conditioning Works-2017, relevant IE rules, relevant IS; It should consist of suitable nos. of outdoor and indoor units refrigeration pipe and drain pipe, all necessary civil work for installation including 1st charging of refrigerant gas for proper and specified functioning of the VRV system, AHUs, Fan coil unit, cassette, split, ductable split etc., plumbing works, ducting, volume dampers, Thermal insulation for pipes and ducting, Controls, power cables, electrical panels complete as required. VRV/VRF system shall be communicable type seamlessly integrated for monitoring and control through BMS
23	Precision AC System	Precision air conditioning system shall be complete with all equipment, all controls, indoor and outside units, monitoring units and complete installation and commissioning, inclusive of all auxiliary works like ducting, inlet and drain piping, piping between indoor and outdoor, cabling, acoustic and thermal insulation (Duct and floor for server room), volume control dampers, supply and returns air grills, stands for indoor and outdoor units with related civil works etc. as per the site requirements. Automatic monitoring and control of cooling, heating, humidification, dehumidification, air-filtration, etc. shall be installed to achieve the required temperature and humidity conditions.

Item No.	Description	Brief Specifications
24	UPS System	The UPS system shall be online 3 phase with 30 min backup or more including batteries, inter connecting cable, battery racks. Each UPS module must have the following built in parts/features: IGBT PWM Rectifier based input charger (float cum equalizing) IGBT /technology based Inverter. Automatic Bi-directional Static switch; Inbuilt Manual Bypass Switch; K 13 Copper Wound Galvanic Isolation transformer at UPS Output after the static Galvanic inverter output isolation transformer (inbuilt). switch as per IEEE 1100-2005 in a separate cabinet (inbuilt); Fully Microprocessor Controlled Circuitry; Inverter with stipulated Switching Frequency with PWM controlled using DSP logic. Analog control shall not be acceptable; A UPS shall be tested against EMC (Electromagnetic compatibility) category C2; Inbuilt/External Back Feed protection shall be provided. Input phase reversal protection & Correction (The system should run in mains operation in spite of phase sequence reversal) & same should be shown is SLD. Provision for separate Input for rectifier and for Bypass. Event Monitoring & Diagnostics Last 100 events with exact date & time should be monitored from the front LCD panel of the UPS & upto 900 events from UPS system memory using Laptop. The input voltage window must be from 340 V to 460 V at full load. The UPS system shall be continuous duty, highly reliable and solid state. The system shall be modular in design so that any individual unit can be easily isolated/taken out for repair or any additional added in future for increasing the capacity; The UPS shall be fully microprocessor controlled till the level of rectifier/inverter; UPS system output must be independently brought out to the UPS and synchronized (voltage, phase angle and frequency must be equal). The provision of parallel operation and automatic bypass shall be provided as per the site specific requirements. The design manufacture, inspection, testing and installation of the UPS System covered under this specification shall conform to the latest international standards such as: EN 62040-1 - General Safety Regulations. EN 62040-2 - EMC Regulations
24.1	Battery	Battery should be designed to provide 30 minutes back up or more as required. Battery should be 12V lead acid sealed maintenance free type. The UPS module shall have the Battery Circuit breaker mounted in the battery Rack. When this breaker is opened no battery voltage should be present in the UPS enclosure. The UPS module should be disconnected automatically when the battery reaches to the minimum discharge voltage level or when signalled by other control functions.
25	LAN System	High speed Data Networking system is to be provided. Work shall include all passive and active components excluding server; LAN System shall comprise of core switches & L2 switches with 10G, 10 giga SFP modules, Wi-Fi access points, Wi-Fi controller, network management software, racks, CAT-6A cable, patch panels, OFC etc. complete as required.
26	Emergency Light & Illuminated Signage	Exit signs shall not exceed 5 W per phase as per ECBC-2017; Self contained rechargeable emergency exit light with minimum 6 hours battery backup; IP 20 rated; Confirms to IS : 10322 (part-5 / sec1) : 2012, Single side / Double side facia as per requirement of location installed.

PROFORMA FOR SCHEDULES 1 TO 23

SCHEDULE TO BE ATTACHED IN NIT as per following (as per AA & ES):

1. Schedule of Internal Electrical Installations (Schedule-1)
2. Schedule of External Electrical Installations (Schedule-2)
3. Schedule of Electrical Sub-station including HT Panel, Transformer, LT Panel, APFC Panels, Bus trunking, Cables and Earthing (Schedule-3)
4. Schedule of Diesel Generating Set including Engine, Alternator, AMF Panel, Exhaust Pipe, Cables, Earthing and Fuel tank (Schedule-4)
5. Schedule of firefighting and Wet Riser System (Schedule-5)
6. Schedule of Fire Alarm System including Cables and PA (Schedule-6)
7. Schedule of IP BASED EPABX System (Schedule-7)
8. Schedule of CCTV Surveillance System (Schedule-8)
9. Schedule for HVAC (Central AC plant)/ Precision AC/ VRF AC system, Ventilation and Smoke Extraction requirements (Schedule-9)
10. Schedule of Lifts (Schedule-10)
11. Schedule of Sewage/Effluent Treatment Plant (Schedule-11)
12. Schedule of Hydro pneumatic Water Supply System (Schedule-12)
13. Schedule of Roof Top Solar PV Power Plant (Schedule-13)
14. Schedule of Solar Water Heating System (Schedule-14)
15. Schedule of Access Control System (Schedule-15)
16. Schedule of Boom Barrier (Schedule-16)
17. Schedule of Door Frame Metal Detector (Schedule-17)
18. Schedule of Baggage Scanners (Schedule-18)
19. Schedule of Driver face and automatic number plate recording system/ recognition system (Schedule-19)
20. Schedule of Integrated Building Management System (Schedule-20)
21. Schedule of UPS System including Battery (Schedule-21)
22. Schedule of LAN System (Schedule-22)
23. Schedule of Emergency Light & Illuminated Signage (Schedule-23)

SCHEDULE OF INTERNAL ELECTRICAL INSTALLATION**(a) For Lighting**

S. No.	Room/ Space/ Location	Type of switch/ socket	Lux level regd.	Fittings parameters	Type of control			Control linked with		
				Glare/ CRI/THD/ Efficacy (Lum/watt), PF, Colour temp. or any other parameter as required by NIT authority						
					Single	Group	Dimmer based/ Keypad/ remote/ DALI	Occupancy sensor	Photo sensor	Time based sensor
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

(b) For Ventilation/Air circulation in room/halls

S.No.	Room/ Space/ Location	Whether fans required	Type of fan (Ceiling/ Wall/ Exhaust fan)	Fan parameters	Type of control			Control linked with		
				BEE Energy Efficiency/ Star rating						
					Single	Group	Regulator based/ Keypad/ remote	Occupancy sensor	Timer based	Any other as applicable
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

(c) Other Services

S.No.	Room/ Space/ Location	Cable TV point	Intercom Point (Analogue/ IP based)	LAN point	Any other requirement (related to provisions for Medical services/ office/ data centre/ labs etc. as applicable)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(d) Light plugs/ Power points/ Special power requirements

S.No.	Room/Space/ Location	Light plug point 5/6Amp.	Power plug 15/16 Amp.	Light plug/ power supply arrangement for work station/s	Special power plug/ power requirement	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)

SCHEDULE NO. -2

SCHEDULE OF EXTERNAL ELECTRICAL INSTALLATION**(a) For Outdoor Lighting**

S.No.	Space/ Location/ Area	Type of switch/ socket	Lux level regd.	Fittings parameters	Type of control			Control linked with		
				Glare/CRI/THD/ Efficacy (Lum/ watt), PF, Colour temp. or any other parameter as required by NIT authority						
(1)	(2)	(3)	(4)	(5)	(6)			(7)		
					Single	Group	Dimmer based/ Smart lighting/ Intelligent lighting concept	Occupancy sensor	Photo sensor	Time based sensor

(b) Description for the mounting arrangements/poles power distribution

S.No.	Related to lighting for	Room/ Space/ Location	GI Pipe pole	Swaged type pole	Octagonal pole	Ornamental pole	Cabling in ground/ Trench/ GI/ DWC Pipe/ any other arrangement	Cable Distribution scheme (provision for stand by cables to be indicate)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i.	Road & outdoor Parking Areas							
ii.	Path & Landscape areas							
iii.	Facade							

SCHEDULE OF ELECTRICAL SUB-STATION

- NIT approving authority to describe the sub-station equipment required comprising of requisite transformers, HT panels, LT panels, APFC panels, bus trunking, cabling, earthing, safety requirements etc. as per the site and design requirements as well as AA & ES provisions.
- Load estimation/Load Calculation: The load calculation for sub-station capacity to be done on the basis of inventory of power outlets/points of all types in Internal EI, External EI, HVAC, firefighting equipment, fire alarm system, lifts, pumps for water supply, sewerage, drainage, power requirements, special power requirement etc. and any other proposed connected equipment in the building/ project.

Based on the total requirement for the project/ area coverage, distribution scheme more than one substation may be required, for which the NIT authority has to clearly describe the requirements.

The maximum demand and sub-station capacity may be calculated by considering following factors, besides any other relevant design aspect/ site requirements:

S. No.	Description of type of load/ relevant factors	Diversity Factor (To be described by the NIT Approving Authority) and other factors
(1)	(2)	(3)
(a)	For light load for different area/ buildings/ floors	
(b)	For Power Outlets for Different Area/ Buildings/ Floors	
(c)	For special power outlets/ power requirements	
(d)	For Air Conditioning Load	
(e)	For Pumps (water supply, sewerage, drainage, treatment etc.)	
(f)	For Lift Load	
	Over all diversity	
(g)	Maximum loading on transformer	
(h)	Power factor assumed for KVA calculation of transformer	

The calculation of the overall sub-station capacity, number of sub stations required and selection of individual transformer rating shall be done after taking all above factors and other relevant design requirements into consideration.

The detailing for following shall also be part of the NIT:

S. No.	Description	To be provided by the NIT authority
1.	Sources of HT electric connection/s along with number of HT connections, stand by, bus coupler arrangement etc. and location .	
2.	Location of sub station/s and numbers and requirement of ring main.	
3.	Number of working and number of standby transformers required.	
4.	Level of voltages for HT and MV/ LT required and respective fault levels.	
5.	Whether parallel operation of transformers required	
6.	Requirements of bus ducts and type (sandwich or air insulated)	
7.	For main LT panels requisite incomer and bus coupler arrangements and spare incomers.	
8.	Requirement of load balancing and spares for outgoing feeder in LT panel with rating for other than the required number of outgoing feeders.	
9.	Provision of SCADA/ BMS	

SCHEDULE OF DIESEL GENERATING SET

1. Design basis for DG Sets and related panels

- NIT approving authority to describe the DG set/s required comprising of requisite generators with cooling arrangements, compliance to CPCB/ local pollution board requirements, AMF / synchronization panel, LT panels, bus trunking, cabling, earthing, safety requirements etc. as per the site and design requirements as well as AA & ES provisions.
- Load estimation/Load Calculation: The load calculation for DG set/s capacity to be done on the basis of inventory of power outlets/points of all types in Internal EI, External EI, HVAC, firefighting equipment, fire alarm system, lifts, pumps for water supply, sewerage, drainage, power requirements, special power requirement etc. and any other proposed connected equipment in the building/ project to be fed by DG set/s.

Based on the total requirement for the project/ area coverage, distribution scheme more than one DG set or DG set/s at more than one location may be required, for which the NIT authority has to clearly describe the requirements.

The maximum demand and DG set/s capacity may be calculated by considering following factors, besides any other relevant design aspect/ site requirements:

S.No.	Description of type of load/ relevant factors as applicable for DG set load	Diversity Factor (To be described by the NIT Approving Authority) and other factors
(1)	(2)	(3)
(a)	For light load for different area/ buildings/ floors	
(b)	For Power Outlets for Different Area/ Buildings/ Floors	
(c)	For special power outlets/ power requirements	
(d)	For Air Conditioning Load	
(e)	For Pumps (water supply, sewerage, drainage, treatment etc.)	
(f)	For Lift Load	
	Over all diversity	
(g)	Maximum loading on transformer	
(h)	Power factor assumed for KVA calculation of transformer	

The detailing for following shall also be part of the NIT:

S. No.	Description	To be provided by the NIT authority
(1)	(2)	(3)
1.	Location of DG set/s and numbers	
2.	Number of working and number of standby DG set/s required.	
3.	Level of voltages for DG set/s required and respective fault levels.	
4.	Provision of AMF and/ or synchronization panel as applicable considering requirement of parallel operation of DG set/s.	
5.	Requirements of bus ducts and type (sandwich or air insulated)	
6.	For main LT panels requisite incomer and bus coupler arrangements and spare incomers.	
7.	Requirement of load balancing and spares for outgoing feeder with rating for other than the required number of outgoing feeders for essential panels.	

SCHEDULE NO. -5

SCHEDULE OF FIREFIGHTING AND WET RISER SYSTEM**(A) DESIGN CRITERIA FOR FIREFIGHTING SYSTEM AND SPRINKLER SYSTEM**

The design of firefighting system and sprinkler system shall meet the requirement of NBC 2016 and UBBL code/ local body bye laws and requirement of Delhi/ local fire service as applicable. The details for following to be provided by the NIT authority:

S. No.	Description	To be provided by the NIT authority	Remarks
1.	Requirement of (a) Main Electric Fire Hydrant Pump (b) Diesel Driven Standby Fire Pump (c) Main Electric Fire Sprinkler Pump (d) Electric Jockey Pump for Hydrant System (e) Electric Jockey Pump for Sprinkler System As applicable		
2.	Number of pumps and capacity of the pump/s		Based on requirement of NBC 2016 and UBBL code/ local body bye laws and requirement of Delhi/ local fire service and site details.
3.	Whether Internal and External Hydrants, Fire hose reel, Fire brigade connections, Air vessels required or not to be detailed.		
4.	Zoning requirement of sprinkler system on each floor/ area		-Do -
5.	Details of different types of fire extinguishers required (portable/ trolley mounted)		
6.	Scope of firm for getting approval and NOC from local body and local fire authorities.		

Note: Gas based fire extinguishing systems to be provided in Electrical panel, server rooms, equipment rooms etc. as per the requirement of NBC 2016 or local fire authorities for which the item should also be included separately in the Preliminary Estimate and executed accordingly.

SCHEDULE NO. -6

SCHEDULE OF FIRE ALARM SYSTEM**DESIGN CRITERIA FOR FIRE ALARM SYSTEM**

The design of fire alarm system and sprinkler system shall meet the requirement of NBC 2016 and UBBL code/ local body bye laws and requirement of Delhi/ local fire service as applicable. The details for following to be provided by the NIT authority:

S. No.	Description	To be provided by the NIT authority	Remarks
1.	Requirement of Fire Alarm system (Automatic/ Manual/ Intelligent etc.) Public Address system as applicable		Based on requirement of NBC 2016 and UBBL code/ local body bye laws and requirement of Delhi/ local fire service and site details.

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S. No.	Description	To be provided by the NIT authority	Remarks
2.	Details of required integration with different services like: (a) Ventilation System (b) Smoke extraction system (c) Pressurization system (d) Air conditioning system (e) Lifts (f) Public Address system (g) Sprinkler system and firefighting system etc. as applicable. (h) BMS		-do-
3.	Zoning of Fire Alarm system and public address system on each floor/ area		-do-
4.	Scope of firm for getting approval and NOC from local body and local fire authorities.		-do-

SCHEDULE NO. -7**SCHEDULE OF IP BASED EPABX SYSTEM**

The scope of work shall include planning, designing, supply, installation, testing and commissioning of complete of IP based voice communication system.

Note: The EPABX outlets required are to be described in the Internal EI subhead indicating their required locations and numbers.

The NIT approving authority to provide following details in the NIT:

S. No.	Description	To be provided by the NIT authority	Remarks
1.	Scope and purpose with respect to the internal as well as external voice communication for all the users in entire building/ campus as applicable.		
2.	Details of features required for the EPABX system including voice mail including spare capacity for additional outlets for future.		
3.	Provision for users license and cost applicable		
4.	Type of phones required at different locations in the building/ campus and their features.		
5.	Scope of firm for getting approval and NOC from local service provider and liasoning for connection and fees applicable if any.		

SCHEDULE NO. -8**SCHEDULE OF CCTV SURVEILLANCE SYSTEM**

The Scope and purpose are to monitor & supervise the entire area for security purpose, as well as record and inform officials on unwanted, untoward incidents.

It is also essential to have recorded images to be stored for which requisite storage memory capacity to be indicated (number of days/ months as applicable).

The complete LAN networking, for the CCTV should be separate and exclusive for CCTV system only and not mixed with other LAN system. The NIT to describe accordingly.

The area/ room/space/ locations to be covered by CCTV should be indicated in the NIT as per following schedule in Table- 1:

Table-1

S. No.	Room/ Space/ Location/ Area	Type of CCTV Cameras required (To be indicated by the NIT Approving Authority along with table 2 below)
(1)	(2)	(3)
	Internal areas of building like Halls, Corridors, Lobbies, Rooms, etc. to be indicated floor wise and building wise.	
	External areas of the complex to be indicated like boundary walls/ entry/ exist/ roads/ parking etc.	

Table-2

S. No.	Room/Space/ Location (Internal/ External areas)	Type of Camera			Storage Capacity required for system	Camera parameters	Centralized control
						Lens/Day/ Night Operation/Image Resolution/Zoom/IP Level/IR/ protection	
(1)	(2)	(3)			(4)	(5)	(6)
		Dome	Bullet	PTZ			

SCHEDULE NO. -9

Schedule for HVAC (Central AC plant)/ Precision AC/ VRF AC system, Ventilation and Smoke Extraction requirements

The NIT approving authority to provide following details for the proposed HVAC & VRF AC system, Ventilation and Smoke Extraction as applicable.

For areas to be air conditioned area/s:

S. No.	Description	Parameter	Parameter values (To be filled by NIT Authority)	Remarks
1	Building/ project details indicating: (a) Location, (b) Altitude, (c) Latitude and (d) Longitude coordinates			
2	Outside Conditions applicable for Building/ project			
	i) Summer			
		DBT		
		WBT		
		RH		

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S. No.	Description	Parameter	Parameter values (To be filled by NIT Authority)	Remarks
	ii) Winter			
		DBT		
		WBT		
		RH		
	iii) Monsoon			
		DBT		
		WBT		
		RH		
3	Inside conditions required for the building/ proposed project (area wise/room wise/ building wise)			
	i) Summer			
		DBT		
		WBT		
		RH		
	ii) Winter			
		DBT		
		WBT		
		RH		
	iii) Monsoon			
		DBT		
		WBT		
		RH		
	Air Quality Parameters	Fresh Air requirement/ Air changes (rooms wise/ area wise as required)		
		Acceptable level of CO ₂		
		Acceptable level of CO		
	Any other parameter applicable by NIT Authority			
4.	Design Consideration for Special Purposes to be indicated for e.g.			
	(a) UPS Room			
	(b) Server Room			
	(c) Special equipment rooms			
	(d) Storage Rooms			
	(e) Any other room/ area as per site requirement			
5.	Any Other Design Consideration by NIT Authority			

**Ventilation requirements for Non-air conditioned area
(in Normal and Fire Condition) to be indicated:**

Ventilation & Fresh Air Requirement for

S. No.	Location/rooms/spaces/equipment room (as applicable)	Air changes/ Fresh air requirement (under normal condition) to be filled in by NIT approving authority	Air changes/ Fresh air requirement (under Fire condition) to be filled in by NIT approving authority
a.	Toilets		
b.	Kitchen		
c.	Pantry		
d.	Laundry		
e.	Staircase		
f.	Fire Exit Route		
g.	Basements		
h.	Sub Station Rooms		
i.	ETP/STP Plant Rooms		
j.	HVAC Plant Room,		
k.	Electrical Panel Rooms		
l.	Fire Fight Plant Room		
m.	Water Supply Plant/Pump Room		
n.	Storage Rooms		
o.	Fire Shafts		
p.	Any other room/ area as per site requirement		

Pressurization and smoke extraction requirement to be indicated for

S. No.	Location	Applicable parameters to be filled by NIT Authority for normal condition	Applicable parameters to be filled by NIT Authority for Fire condition
1.	Lift Shaft/s		
2.	Lift Lobby/ies		
3.	Staircase/s		
4.	Staircase Lobby/ies		
5.	Fire Shafts		
6.	Fire Exit Routes		
7.	Any other room/ area as per site requirement		

For the equipment involved NIT authority to indicate applicable Energy Efficiency and Performance Parameters along with stand by/ spare requirements (e.g. CoP, EER, IEER, Efficiency (full load and Part Load), Inlet and outlet water temperatures, Fan Efficiency, Motor efficiency, R-Value of Duct Insulation, R-Value of Pipe Insulation, dB levels, Velocity, requirement of VFD, Fire safety features/requirements or any other parameters as applicable) for:

S. No.	Name Of Equipment/ item (as applicable)	Location	Name of Parameters	Value of Parameters	Details of spare/ standby required
To be Filled by NIT Authority					
1.	Chillers				
2.	Primary chilled water Pumps				

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S. No.	Name Of Equipment/ item (as applicable)	Location	Name of Parameters	Value of Parameters	Details of spare/ standby required
		To be Filled by NIT Authority			
3.	Secondary chilled water pumps				
4.	Hot Water Generator				
5.	Heat Pumps				
6.	Hot Water Circulation Pumps				
7.	Cooling Towers				
8.	Cooling Tower Water Circulation Pumps				
9.	AHUs				
10.	FCUs				
11.	Unitary Window Unit				
12.	Smoke Extraction Fans				
13.	Ventilation Fans				
14.	Pressurization Fans				
15.	Heat Recovery Wheel				
16.	Ducting				
17.	Piping				
18.	Any other equipment/ systems as per site requirement				

Note:

1. Requirement of Control, Operation, Measurement and Monitoring of various equipment / systems covered in the NIT including BMS to be indicated by NIT authority.
2. Clearances from local body and local fire authority as applicable to be indicated, defining the scope and responsibility of the firm.
3. NIT approving authority to describe the applicable thermal transmission co-efficient values for building elements, for the purpose of heat load calculation and capacity of the HVAC equipment:

Description	Parameter	To be indicated by NIT approving authority or linked to the building construction material taken in NIT as applicable
Glazing	a. SHGC b. U value	
External Wall	U value	
Internal Wall partition	U value	
Ceiling	U value	
Floor	U value	
Roof	U value	

SCHEDULE NO. -10
SCHEDULE OF LIFTS

DETAILS OF THE LIFTS required (passenger/ hospital/ goods/ service) to be provided by the NIT approving authority

S. No.	TECHNICAL PARAMETERS/ REQUIREMENTS	DETAILS OF REQUIRED LIFTS			
		Passenger Lift	Passenger cum Bed Lift (Hospital)	Good Lift/ service lift	Remarks
(1)	Type of Lift				
(2)	Numbers of lifts required along with location				

S. No.	TECHNICAL PARAMETERS/ REQUIREMENTS	DETAILS OF REQUIRED LIFTS			
		Passenger Lift	Passenger cum Bed Lift (Hospital)	Good Lift/ service lift	Remarks
(3)	Load: Number of persons				
(4)	Rated Speed				
(5)	Number of floors served				
(6)	Type of control				
(7)	Type of operation				
(8)	Requirement of Potential free Contacts for BMS				
(9)	Construction design and finish of car body work, car door and landing doors				
(10)	Type of signal system				
(11)	Automatic Rescue Device				
(12)	Fireman Lift provision				
(13)	Intercom and Alarm provision indicating locations where facility required				

SCHEDULE NO. -11

SCHEDULE OF SEWAGE/EFFLUENT TREATMENT PLANT

The scope of work includes designing, Planning, supplying, Installation, testing & commissioning of the STP plant for the building and complex based on the norms of the local body, Delhi Jal Board/ Local Water and Sewerage department, NBC- 2016 etc. as applicable.

S. No.	Description	To be provided by the NIT authority	Remarks
1.	Scope and purpose for the proposed STP/ ETP plant with details of sewerage/ effluent to be treated including requisite incomer and outlet pipe connection.		
2.	Details of outlets generating STP/ ETP for the purpose of calculation of capacity of STP/ ETP plant.		
3.	Details of proposed technology if decided already.		
4.	Requirement of standby of different equipment related to STP/ ETP plant		
5.	Details of raw sewerage/ effluent and details of required output parameters for treated raw sewerage/ effluent.		
6.	Scope of firm for getting approval and NOC from local body/ pollution control board as applicable.		

RAW SEWAGE WATER CHARACTERISTICS

S. No.	Parameter	Unit	Sewage/ effluent (to be filled in by the NIT authority)
(1)	pH	-	
(2)	BOD	ppm	
(3)	COD	ppm	
(4)	TSS	ppm	
(5)	O & G	ppm	
(6)	TDS	ppm	
(7)	Any other relevant parameter		

REQUIRED TREATED SEWAGE WATER CHARACTERISTICS

The required characteristics of the treated sewage water as per the local PCB and NIT authority to describe required parameters:

S. No.	Parameter	Unit	Sewage/ effluent (to be filled in by the NIT authority)
(1)	pH	-	
(2)	COD	mg/l	
(3)	BOD3 @ 27 °C	mg/l	
(4)	TSS	mg/l	
(5)	TDS	mg/l	
(6)	O & G	mg/l	
(7)	Any other relevant parameter		

SCHEDULE NO. -12**SCHEDULE OF HYDRO PNEUMATIC WATER SUPPLY SYSTEM**

The scope of work shall include designing, Planning, supplying, Installation, testing & commissioning of the Hydro pneumatic water supply system for the building/ complex based on required water supply pumping arrangement.

The NIT approving authority to provide following details in the NIT:

S. No.	Description	To be provided by the NIT authority	Remarks
1.	Scope and purpose for the proposed Hydro pneumatic water supply system with details of quantity of water to be pumped, duration and timings.		
2.	Requirement of stand by arrangement and desired control, monitoring system, automation and connections to BMS system, efficiency norms for the pumps and motors.		

SCHEDULE NO. -13**SCHEDULE OF SOLAR PV POWER PLANT**

The scope of work shall include designing, Planning, supplying, Installation, testing & commissioning of Solar PV Power Plant for the building/ complex based on required type and capacity of Solar PV Power Plant.

The NIT approving authority to provide following details in the NIT:

S. No.	Description	To be provided by the NIT authority	Remarks
1.	Scope of Solar PV Power Plant describing the inclusion of Solar modules, DC and AC cabling, inverter, mounting arrangement required, earthing, lightning protection, metering arrangement etc. as required.		
2.	Details of available terrace area, location, Geographical coordinates, required efficiency for Solar modules and type, guarantee provisions etc.		
3.	Requirement of clearances from Local supply agency, provision of net metering, applicable fees etc.		

SCHEDULE OF SOLAR WATER HEATING SYSTEM

The scope of work shall include designing, Planning, supplying, Installation, testing & commissioning of Solar Water heating system for the building/ complex based on required type and capacity of proposed Solar Water heating system

The NIT approving authority to provide following details in the NIT:

S.No.	Description	To be provided by the NIT authority	Remarks
1.	Scope of Solar Water heating system describing the inclusion of different components, water tank, piping, back up heater arrangement etc.		
2.	Details of available terrace area, location where units are to mounted and number of units.		
3.	Requirement of clearances from Local body as applicable.		

SCHEDULE OF ACCESS CONTROL SYSTEM

The NIT authority to describe the following requirements in the NIT:

S.No.	Room/Space/Location	No. of Doors where access control in required			No. of Readers.	No. Users	Storage data	Type of access control (Bio-metric / NFC / card reader/ face recognition)
(1)	(2)	(3)			(4)	(5)		
		Main Door	Individual room door	Hall				

SCHEDULE OF BOOM BARRIER

The NIT authority to provide the details of following:

S.No.	Space/Location where to be installed	No. of boom barriers	Remarks
(1)	(2)	(3)	(4)

SCHEDULE OF DOOR FRAME METAL DETECTOR

The NIT authority to provide the details of following:

S.No.	Space/Location where to be installed	No. of Door Frame Metal Detector	Remarks
(1)	(2)	(3)	(4)

SCHEDULE OF BAGGAGE SCANNERS

The NIT authority to provide the details of following:

S.No.	Space/Location where to be installed	No. of Baggage Scanner	Small/ Big	Remarks
(1)	(2)	(3)	(4)	(5)

**SCHEDULE OF DRIVER FACE AND AUTOMATIC NUMBER PLATE RECORDING SYSTEM/
RECOGNITION SYSTEM**

The NIT authority to provide the details of following:

S.No.	Space/Location where to be installed	No. of Driver Face And Automatic Number Plate Recording System/ Recognition System	Remarks
(1)	(2)	(3)	(4)

SCHEDULE OF INTEGRATED BUILDING MANAGEMENT SYSTEM

The NIT approving authority to provide details of required monitoring & control parameters for desired services/ utilities and related details of location/ space.

BMS DELIVERABLES

The deliverables expected from the BMS are to be defined by the NIT authority and provide the requisite I / O summary for the required services to be covered.

S.No.	Details of services to be covered (as applicable)	BMS DELIVERABLES (To be decided by the NIT Approving Authority) to describe required control and monitoring parameters for respective services.
(1)	(2)	(3)
a)	HVAC and Ventilation equipment	
b)	Water supply and drainage pumps	
c)	Façade lighting/ Street lighting/ area lighting/ lighting in the building	
d)	Lifts	
e)	UPS	
f)	Fire Fighting System	
g)	Fire Alarm System	
h)	HT Panel & main LT Panel	
i)	DG Set/s	
j)	Access Control System	
k)	STP/ ETP	
l)	Additional services as required	

SCHEDULE NO. -21

SCHEDULE OF UPS SYSTEM

The NIT approving authority to provide details of load to be fed by UPS system in similar manner as covered in Sub-station schedule and also to provide details of stand by arrangement (Redundancy) and required battery backup (in minutes).

SCHEDULE NO. -22

SCHEDULE OF LAN SYSTEM

The scope of work shall include the Planning, designing, supplying, installation, testing & commissioning of LAN networking with 10G backbone with Wi-fi modem on all floors covering complete floor area. The requirement of LAN outlets as indicated in the Internal EI subhead shall be taken into account for the designing of the complete system.

The NIT authority shall define the required redundancy at the level of core switch as well for the backbone and Network Design Guidelines.

S.No.	Room/Space/Location/ Hall /Workstation where LAN outlets are required	No. of Outlets	Remarks
(1)	(2)	(3)	(4)

Note: The proposed location network switches may also be indicated if feasible.

SCHEDULE NO. -23

SCHEDULE OF EMERGENCY LIGHT & ILLUMINATED SIGNAGE

The NIT authority to indicate requirement of such signages mentioning location and numbers as required covering required areas/ spaces/ location ensuring compliance to the site requirements, provision in NBC-2016 and local fire authority requirements

S.No.	Room/Space/Location/ where Signages are required	No. of signages	Remarks
(1)	(2)	(3)	(4)

GUIDELINES FOR WORKING OUT PLINTH AREA

(As per IS:3861-2002 with upto date amendments as may be issued from time to time)

In order to ensure the adoption of a uniform method of working out Plinth Area from plans, the following guidelines are laid down. These guidelines are general in nature. These are based on the fundamental principle that the plinth area of a building should present a true picture of the covered floor area provided in the plans.

1. Terminology

1.1 Plinth Area :

The plinth area shall mean the built-up covered area measured at the floor level of basement or of any storey.

1.2 Balcony :

A horizontal projection with a hand-rail, balustrade or a parapet.

1.3 Mezzanine Floor:

An intermediate floor in between two main floors having minimum height of 2.2 m from the floor and having a proper and permanent access to it.

Note: Where rules of the local bodies permit intermediate floor of minimum 1.8 m clear height, may also be considered as mezzanine floor for the purpose of measurement.

1.4 Mumty (Stair Cover) :

It is a structure with a roof over a staircase and its landing, built to enclose only the stairs for the purpose of providing protection from weather and not used of human habitation.

1.5 Loft

A structure providing, intermediate storage space in between two main floors without having a permanent access and at a height not less than 2.0 m from the floor below.

1.6 Porch

It is a covered structure supported on pillars or otherwise for the purpose of pedestrian or vehicular approach to a building.

2. General

2.1 Linear measurement shall be measured to nearest 0.01 m and areas shall be worked out to the nearest 0.01m²

2.2 The areas of each of the following categories shall be measured separately and shall not be clubbed together so as to enable the cost computation at different rates per unit area as worked out for varied heights or categories.

- a) Basement
- b) Floor without cladding (stilted floor)
- c) Floors including top floor which may be partly covered;
- d) Mezzanine floor including additional floor for seating in assembly building/theatre, auditorium etc.
- e) Garage
- f) Accommodation for service staff
- g) Mumty (Stair cover)
- h) Machine room
- i) Porch
- j) Towers, turrets, domes projecting above the terrace level at terrace.

3. Method of measurement of Plinth Area

The total Plinth area shall be the sum total of builtup covered areas measured at each floor level of the buildings for the categories mentioned under 3.1 below and excludes the areas given in 3.2

3.1 For the purpose of plinth area, following shall be included:

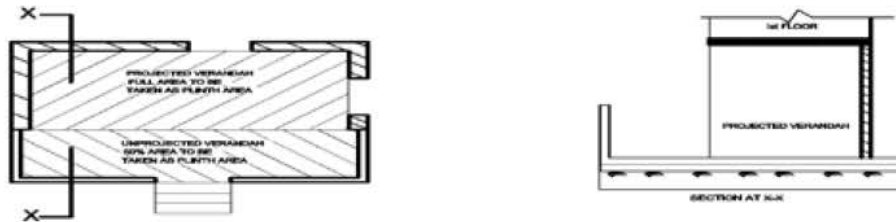
- a) Area of the wall at the floor level excluding plinth offsets, if any; when the building consists of columns projecting beyond cladding, the plinth area shall be taken upto the external face of cladding (in case of corrugated sheet cladding outer edge of corrugation shall be considered)(Refer sketch-1)
 Note: In case, a common wall is owned jointly by two owners, only half the area of such walls shall be included in the plinth area of one owner.
- b) Shafts for sanitary, water supply installations, garbage chute, telecommunication, electrical, fire-fighting, air-conditioning and lifts.
- c) Stair case: Main stair case, open spiral/service stair case/fire escape stair case etc.
 - (i) 100 percent of the plan area of main / service / fire escape stair (enclosed in defined stair hall and mumty at top)
 - (ii) 50 percent of the plan areas of service /fire escape/ open stairs (without any enclosure around and mumty at top).
 Note:- Any type of steps, ladder/cat-ladder, spiral/flat, with or without side guard rails created for the purpose of approaching inaccessible terrace or from terrace to top of bulk water storage tanks or otherwise for maintenance purposes shall not account for plinth area.
- d) In case of open verandah with parapets (Refer sketch-2):
 - (i) 100 percent areas for the portion protected by the projections above and
 - (ii) 50 percent area for the portion unprotected from above.
- e) In case of balcony projections with railing / parapets (Refer sketch-3):
 - (i) 100 percent area of the balcony covered by projection above
 - (ii) 50 percent area of the uncovered balcony
- f) In case of alcove made by cantilevering a slab beyond external wall:
 - (i) 25 percent of the area for the alcove of height upto 1 m.
 - (ii) 50 percent of the area for the alcove of height more than 1 m and upto 2 m, and
 - (iii) 100 percent of the area for the alcove of height more than 2 m.
- g) Area of mumty and machine rooms (Refer sketch-4)
- h) Mezzanine floors shall be measured as different floor levels with deduction for lesser floor heights than the standard heights

3.2 The following shall not be included in the plinth area

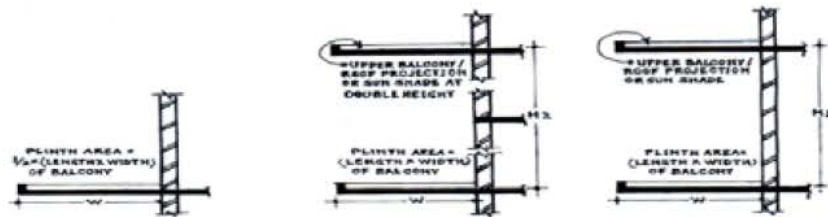
- a) Area of loft
- b) Area of architectural band, cornice, etc.
- c) Area of vertical sun breaker or box louver projecting out and other architectural features, for example slab projection for flower pot, etc.(Refer sketch-5)
- d) Terrace
- e) Open platform on ground
- f) Towers, turrets, domes projecting above terrace level.



Sketch -1



Sketch -2

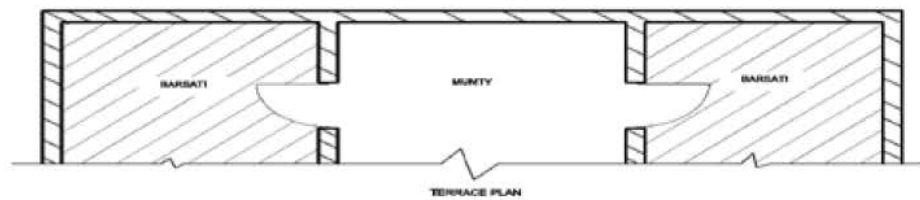


Uncovered balcony

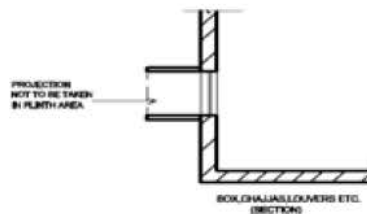
Covered balcony

H-1 refers to floor height & H-2 refers to double the floor height in case of staggered balconies.

Sketch -3



Sketch -4



Sketch- 5

Proforma for Plinth Area calculation (Floor wise) by Architectural unit

Name of Project:

Reference to building/location:

Floor:

S. No.	Room Designation	Area of Room			Area deductions			Net Area (in sqm) $A-A_1$
		Length, L (in metre)	Breadth, B (in metre)	Area, $A=L*B$ (in sqm)	Length, L_1 (in metre)	Breadth, B_1 (in metre)	Area, $A_1 = L_1*B_1$ (in sqm)	
1	Area of the wall at the floor level excluding plinth offsets							
(i)	Basement							
(ii)	Stilted floor							
(iii)	Entrance foyer / Lobby							
(iv)	Room-1/Hall-1							
(v)	Room-2/Hall-2							
(vi)	Room-3							
(vii)	Domestic help's room							
(viii)	Corridors							
(ix)	Kitchen							
(x)	Toilet							
(xi)	Stores							
2	Shafts							
(i)	Sanitary and water supply							
(ii)	Garbage chute							
(iii)	Telecommunication							
(iv)	Electrical							
(v)	Fire Fighting							
3	Stairs							
(i)	Main/Service stairs (enclosed)							
(ii)	Service/Fire escape / Open							
4	Verandah							
(i)	Protected verandah							
(ii)	Un protected verandah							
5	Balconies							
(i)	Covered balconies							
(ii)	Uncovered balconies							
6.	Alcove (Cup-boards / Box storage)							
(i)	Upto 1.00 m							
(ii)	1.00 m to 2.00 m							

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S. No.	Room Designation	Area of Room			Area deductions			Net Area (in sqm) $A-A_1$
		Length, L (in metre)	Breadth, B (in metre)	Area, $A=L*B$ (in sqm)	Length, L_1 (in metre)	Breadth, B_1 (in metre)	Area, $A_1=L_1*B_1$ (in sqm)	
(iii)	Above 2.00 m							
7	Covered area at Terrace							
(i)	Machine Room							
(ii)	Mumty							
8	Mezzanine floor							
9	Poarch							

Note:- In above statement more no. of rooms/designated spaces may be added in serial and more than one toilets, balconies, corridors and other ancillary spaces may be incorporated accordingly. All care should be taken that no space on any floor is left out for calculation of plinth area. The proforma is for cuboidal plans only, architectural unit may modify it for other shapes in such a manner that calculation of plinth area is comprehensible.

Architect

Sr. Architect / Chief Architect

Abstract of Plinth Area building wise

Name of Project:

Reference to building/location:

S. No.	Floor Designation	Floor No.	Plinth Area with;					
			Standard floor height		More than standard floor height		Less than standard floor height	
			Height (in m)	Area (in sqm)	Height (in m)	Area (in sqm)	Height (in m)	Area (in sqm)
1	Basement	(-x)						
2	(i) Ground Floor	0						
	(ii) Stilted floor	0						
	(iii) Porch (at ground floor)							
3	First floor	1						
4	Second floor	2						
5	Typical floor	3						
6								
7								
8								
9	Terrace floor							
	(i) Mumty							
	(ii) Machine rooms							
10	Mezzanine floor (at any floor)							
11	Domestic help's / service staff accommodation (at any floor)							
	Total Plinth Area (in building)							

Architect

Sr. Architect / Chief Architect

Abstract of Plinth Area of the project**Name of Project:****Reference to building/location:**

S. No.	Building Designation (Name/block of building)	No. of blocks	Plinth Area (each block)	Total plinth area in sqm (as per building area details)	Reference to building abstract sheet
1	Residential				
	(i) Type- II				
	(ii) Type- III				
	(iii) Type- IV				
	(iv) Type- V				
	(v) Type- VI				
	(vi) Hostel- 1				
	(vii) Hostel- 2				
2	Office/Admn. Blocks				
	(i) Block- 1				
	(ii) Block- 2				
	(iii) Block- 3				
3	Class room/ Lecture hall Blocks				
	(i) Halls				
	(ii) Blocks				
4	Auditorium/ assembly hall/ workshops				

Architect

Sr. Architect / Chief Architect

S. No. 3.1(a to h) refers to areas to be included for plinth area, 3.2 (a to f) refers to areas not to be included and 2.2 (a to j) refers to areas to be calculated separately on Annexure-II. Plinth area calculation sheets as per proforma (Annexure-III (a), (b) & (c)) above, shall be provided by the Architectural unit.

The concerned Architectural unit would provide building wise Plinth area calculation abstract and a consolidated plinth area abstract for the entire campus based on the parameters explained in Annexure-II, duly approved and signed by stated Architects with the conceptual drawings so as to enable the Project Managers work out Preliminary Estimate based on these Plinth Area Rates.

ANNEXURE –IV

PROFORMA FOR CALCULATION OF BUILDING COST INDEX

S. No	Description	Unit	%age	Rates as on 01.04.2023 (in ₹)	Proportionate value (in ₹)	Weightage rates (in ₹)	Weightage of Component	Rates at the time of revision of Cost Index	Cost Index
1	Bricks (Fly Ash)	1000 nos.	100%	4750.00	4750.00	4750.00	8.00	-	-
2	Cement (OPC)	qtl.	100%	515.60	515.60	515.60	14.50	-	-
3	TMT Steel Reinforcement bar								
a.	8 & 10 mm dia.	qtl.	50%	5550.00	2775.00	5550.00	19.50	-	-
b.	12 & 16 mm dia.		50%	5550.00	2775.00			-	-
4	Aggregates 20 mm a) Natural sources	cum	75%	1425.00	1068.75	1308.00	6.50	-	-
	b) Aggregates 20 mm (RCA)		25%	957.00	239.25			-	-
5 (a)	Sand (coarse sand) Natural sources	cum	75%	1450.00	1087.50	1326.75	3.00	-	-
(b)	Sand (coarse sand) RA		25%	957.00	239.25			-	-
6	Flooring Items								
a.	Vitrified tiles	sqm	50%	550.00	275.00	727.00	5.00	-	-
b.	Ceramic tiles		20%	300.00	60.00			-	-
c.	Kota stone		10%	320.00	32.00			-	-
d.	Granite stone		20%	1800.00	360.00			-	-
7	Paints								
a.	Synthetic enamel paint	litre	33.33%	178.00	59.33	132.00	3.00	-	-
b.	Acrylic washable distemper		33.33%	38.00	12.67			-	-
c.	Premium acrylic paint		33.33%	180.00	60.00			-	-
8	Door/windows-wooden/ uPVC/ aluminum/steel								
a.	35 mm thick flush door shutters both side commercial veneering	sqm	30.00%	1050.00	315.00	2100.00	7.00	-	-
b.	Factory made, standard Z-section steel windows		15.00%	1750.00	262.50				
c.	uPVC windows		20.00%	3500.00	700.00			-	-
d.	Aluminum window		35.00%	2350.00	822.50			-	-

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S. No.	Description	Unit	%age	Rates as on 01.04.2023 (in ₹)	Proportionate value (in ₹)	Weightage rates (in ₹)	Weightage of Component	Rates at the time of revision of Cost Index	Cost Index
9	Pipes								
a.	15 mm GI pipes	metre	10.00%	95.00	9.50	309.50	2.50		
b.	100 mm CI pipes		40.00%	650.00	260.00				
c.	20 mm black conduits		20.00%	80.00	16.00				
d.	20 mm CPVC pipes		30.00%	80.00	24.00				
10	Lamps & Fans								
a.	Ceiling fans 1200 mm	each	50%	1584.00	792.00	987.40	4.50		
b.	1200 mm LED tube lights with fittings		40%	467.00	186.80				
c.	LED bulbs 9/11 W		10%	86.00	8.60				
11	Electrical machinery, Motor 7.5 HP (pump set) 1500 RPM	each	100%	26631.00	26631.00	26631.00	2.50		
12	Wires & cable								
a.	Copper wire 1.5 sqmm	100 metre	70%	1600.00	1120.00	2230.00	4.00		
b.	Copper wire 4.0 sqmm		30%	3700.00	1110.00				
13	Labour								
a.	Skilled	each	50%	897.00	448.50	816.50	20.00		
b.	Unskilled		50%	736.00	368.00				
Total							100.00		

Note:-

- In the above proforma at S. No. 4 & S. No. 5, Aggregates – 20 mm and Sand (coarse sand) are considered in two parts (a) & (b) respectively where (a) represents 75% from natural source and (b) represents 25% RCA/RA. In areas where components of RCA/RA are not available (because of non-setting up of C&D waste conversion units), the components of aggregate 20 mm at 25% RCA and coarse sand at 25% RA can be avoided and 100% of these materials from natural sources only be considered.
- In the above proforma the rates for building materials adopted in column 5 and corresponding computed rates in column 6 & column 7 are bare rates excluding GST or any other levy. Therefore, for working out local cost index prevailing bare rates only at the respective station shall be considered.

STATEMENT OF COST INDICES OF DELHI/NCR SINCE 1955

Year	Effective Date	Cost Index	Base 100 of PAR
1962	18.09.1962	131	1955
1966	19.07.1966	148	1955
1969	15.01.1969	157	1955
1969	17.06.1969	168	1955
1969	15.10.1969	181	1955
1970	01.01.1970	100	1970
1971	05.04.1971	120	1970
1972	03.05.1972	134	1970
1973	24.12.1973	166	1970
1975	26.06.1975	180	1970
1976	01.10.1976	180	1970
1976	01.10.1976	100	1976
1977	30.12.1977	113	1976
1978	31.03.1978	116	1976
1979	31.03.1979	130	1976
1980	10.04.1980	176	1976
1981	23.04.1981	200	1976
1982	29.01.1982	217	1976
1982	30.03.1982	221	1976
1983	16.03.1983	245	1976
1984	13.03.1984	274	1976
1985	27.06.1985	312	1976
1986	09.07.1986	340	1976
1987	16.06.1987	370	1976
1988	31.03.1988	397	1976
1988	01.11.1988	421	1976
1989	31.10.1989	494	1976
1990	31.03.1990	521	1976
1991	11.02.1991	564	1976
1991	31.03.1991	595	1976
1992	31.12.1991	664	1976
1992	01.01.1992	100	1992
1994	01.01.1994	117	1992
1995	01.06.1995	132	1992
1997	01.06.1997	145	1992
1998	01.06.1998	148	1992
1999	01.09.1999	158	1992
2000	01.07.2000	162	1992
2001	01.04.2001	166	1992
2002	01.04.2002	176	1992
2003	01.04.2003	197	1992
2004	01.04.2004	209	1992
2005	01.04.2005	223	1992
2006	01.04.2006	236	1992

Year	Effective Date	Cost Index	Base 100 of PAR
2007	01.04.2007	254	1992
2007	01.10.2007	260	1992
2007	01.10.2007	100	2007
2008	01.04.2008	114	2007
2008	01.10.2008	119	2007
2009	01.04.2009	113	2007
2009	01.10.2009	126	2007
2010	01.04.2010	136	2007
2010	01.10.2010	139	2007
2011	01.04.2011	149	2007
2011	01.10.2011	151	2007
2012	01.04.2012	161	2007
2012	01.10.2012	170	2007
2012	01.10.2012	100	2012
2013	01.04.2013	100	2012
2014	01.04.2014	105	2012
2014	01.10.2014	107	2012
2015	01.04.2015	104	2012
2015	01.10.2015	103	2012
2016	01.04.2016	102	2012
2016	01.10.2016	101	2012
2017	01.04.2017	111	2012
2017	01.10.2017	115	2012
2018	01.04.2018	116	2012
2018	01.10.2018	118	2012
2019	01.04.2019	118	2012
2019	01.04.2019	100	2019
2019	01.10.2019	98	2019
2020	01.04.2020	101	2019
2020	01.10.2020	97	2020
2021	01.04.2021	105	2020
2021	01.04.2021	100	2021
2021	01.10.2021	99	2021
2022	01.04.2022	110	2021
2022	01.10.2022	107	2021
2023	01.04.2023	107	2021
2023	01.04.2023	100	2023

1. PAR 1955 base 100 is effective from 17.05.1955
2. PAR 1970 base 100 is effective from 01.01.1970.
3. PAR 1976 base 100 is effective from 01.10.1976.
4. PAR 1992 base 100 is effective from 01.01.1992.
5. PAR 2007 base 100 is effective from 01.10.2007.
6. PAR 2012 base 100 is effective from 01.10.2012.
7. PAR 2019 base 100 is effective from 01.04.2019.
8. PAR 2020 base 100 is effective from 01.04.2020.
9. PAR 2021 base 100 is effective from 01.04.2021.
10. PAR 2023 base 100 is effective from 01.04.2023.

Plinth Area Rates 2023

CPWD TEAM

1. Sh. Dharmesh Chandra Goel, ADG (Technical)
2. Sh. Prem Mohan, Chief Engineer, CSQ (Civil)
3. Sh. Ashok Kumar Sharma, Chief Architect (RD)
4. Sh. Vimal Kumar, Chief Engineer, (Elect.), CSQ
5. Sh. Dinesh Kumar Ujjainia, SE (TAS)(Civil)
6. Sh. Ramayan Prasad Gupta Superintending Engineer, TAS (Electrical)
7. Sh. S.N. Jaiswal, Executive Engineer (TAS) (Civil),
8. Sh. Ashok Kumar Meena, Executive Engineer (Elect.), CSQ
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