R.INGURAIDOO HEALTH CENTER

SERVICES *DRAWINGS*

Client: Ministry of Health

RIYAN PRIVATE LIMITED

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TABLE OF CONTENTS

R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

Rev no	By	Date
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3rd floor, H. Azum, Ameeneemagu, Male'

Title: AC LAYOUT
GROUND FLOOR PLAN

Page: AC-01 /03

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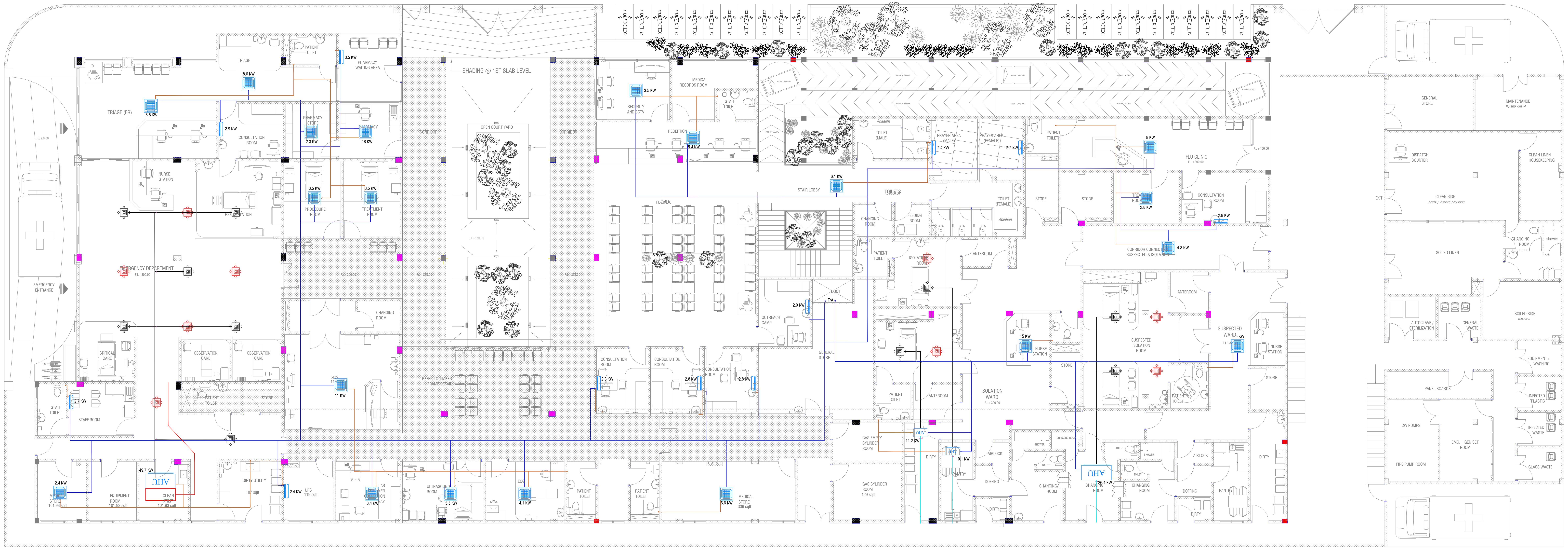

GROUND FLOOR AC LAYOUT

SCALE 1:100

ACV LEGEND & ABBREVIATION

- AIR HANDLING UNIT
- WALL MOUNTED UNIT
- CASSETTE UNIT
- OUTDOOR UNIT [TOP DISCHARGE]
- OUTDOOR UNIT [SIDE DISCHARGE]
- CEILING MOUNTED EXHAUST FAN
- FRESH AIR/EXHAUST AIR FAN [DUCT IN LINE]
- WALL MOUNTED FAN
- REFRIGERANT PIPES WITH INSULATION
- AC DRAIN PIPES WITH INSULATION
- SUPPLY AIR DUCT WITH THERMAL INSULATION
- RETURN AIR DUCT WITH THERMAL INSULATION
- EXHAUST AIR DUCT
- FRESH AIR DUCT
- VOLUME CONTROL DAMPER
- SUPPLY AIR DIFFUSER WITH DAMPER
- RETURN AIR DIFFUSER WITH DAMPER
- EXHAUST AIR GRILL
- 150MM WIDTH SUPPLY AND RETURN AIR GRILL

T/B	TO BELOW
T/A	TO ABOVE
F/A	FROM ABOVE
F/B	FROM BELOW
AHU	AIR HANDLING UNIT
TFA	TREATED FRESH AIR HANDLING UNIT
ODU	OUT DOOR UNIT

SPECIFICATION FOR VRF/VRV

Outdoor Unit
Air cooled VRF / VRV system working in R410A / R -407C or equivalent refrigerant. The system shall be suitable to operate on 3 phase, 380-415 V, 50Hz AC power supply & shall comprises with multiple no's of inverter, digital scroll/screw compressors, air cooled condenser fan with motor, microprocessor control panel, starter controls for all scroll compressors and condenser fan motors along with internal control and power wiring, cooling coil with internally interconnected refrigerant pipes, charging port and all other required accessories, & hardware's. The entire unit shall be with weather resistant powder coating paint for withstanding all ambient conditions for continuous outdoor operation

Indoor unit
Air Conditioning Units suitable for mounting inside false ceiling/wall hang, each comprising of cooling coil, blower with motor, electronic expansion valve,, filter, insulated connection of refrigerant circuit, provision for fresh air intake ducting, condensate water drain pump with electronic level sensor, including wireless remote controller etc

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Title: AC LAYOUT
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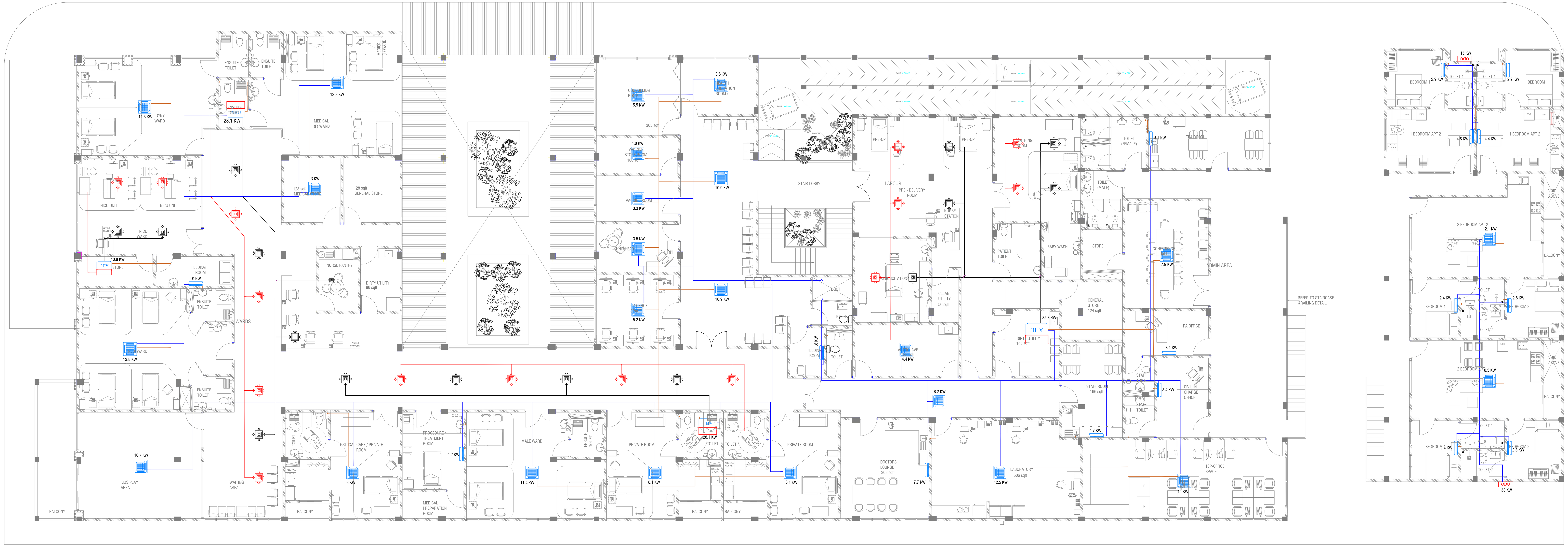

FIRST FLOOR AC LAYOUT

SCALE 1:100

ACV LEGEND & ABBREVIATION

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- CASSETTE UNIT
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Title: AC LAYOUT
FIRST FLOOR PLAN

Page: AC-02 /03

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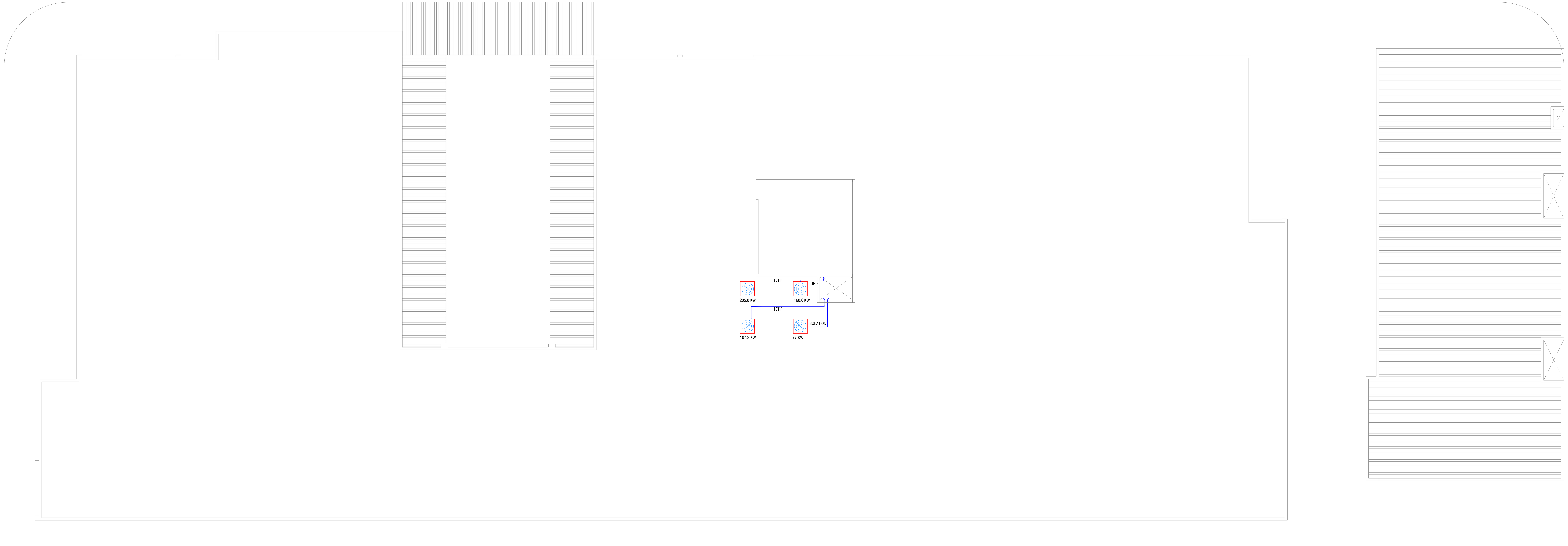

TERRACE FLOOR AC LAYOUT

SCALE 1:100

0 0.5 1 2 3 4 5

ACV LEGEND & ABBREVIATION

- AHU — AIR HANDLING UNIT
- WALL MOUNTED UNIT
- CASSETTE UNIT
- OUTDOOR UNIT [TOP DISCHARGE]
- ODU — OUTDOOR UNIT [SIDE DISCHARGE]
- CEILING MOUNTED EXHAUST FAN
- FRESH AIR/EXHAUST AIR FAN [DUCT IN LINE]
- WALL MOUNTED FAN
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Title: AC LAYOUT
TERRACE FLOOR PLAN

Page: AC-03 /03

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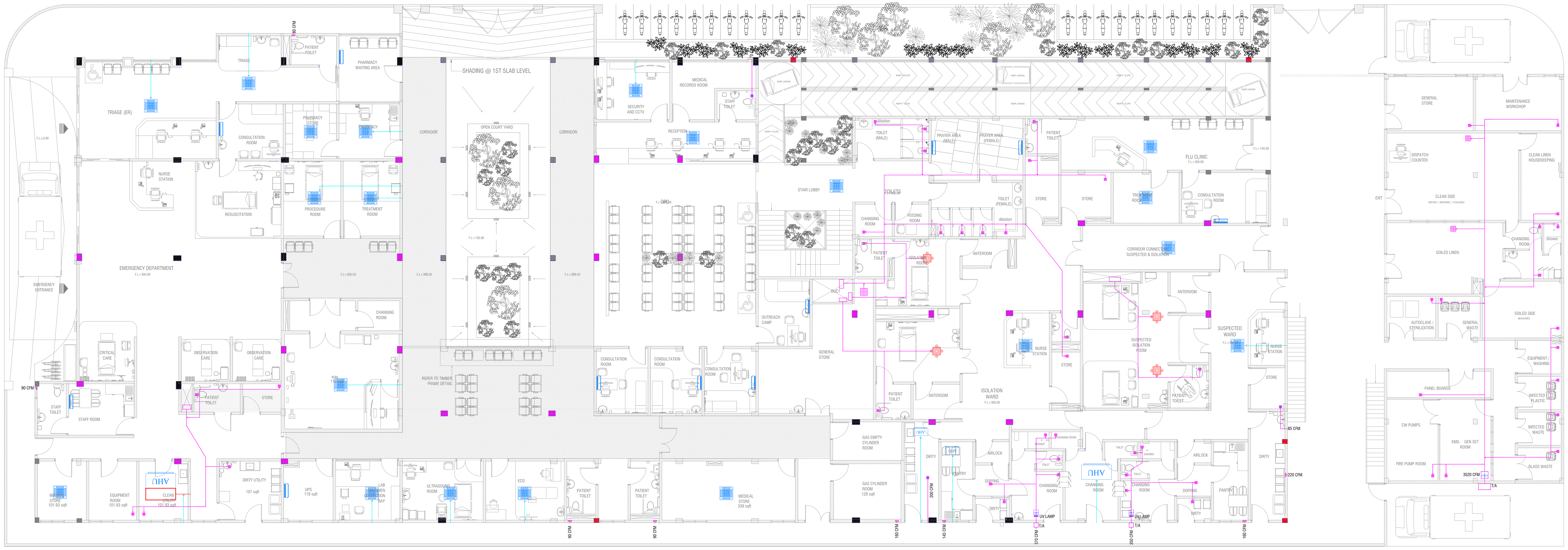

GROUND FLOOR VENTILATION LAYOUT

SCALE 1:100

ACV LEGEND & ABBREVIATION

AHU	AIR HANDLING UNIT
	WALL MOUNTED UNIT
	CASSETTE UNIT
	OUTDOOR UNIT [TOP DISCHARGE]
ODU	OUTDOOR UNIT [SIDE DISCHARGE]
	CEILING MOUNTED EXHAUST FAN
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Title: VENTILATION LAYOUT GROUND FLOOR PLAN

Page: V-01 /03

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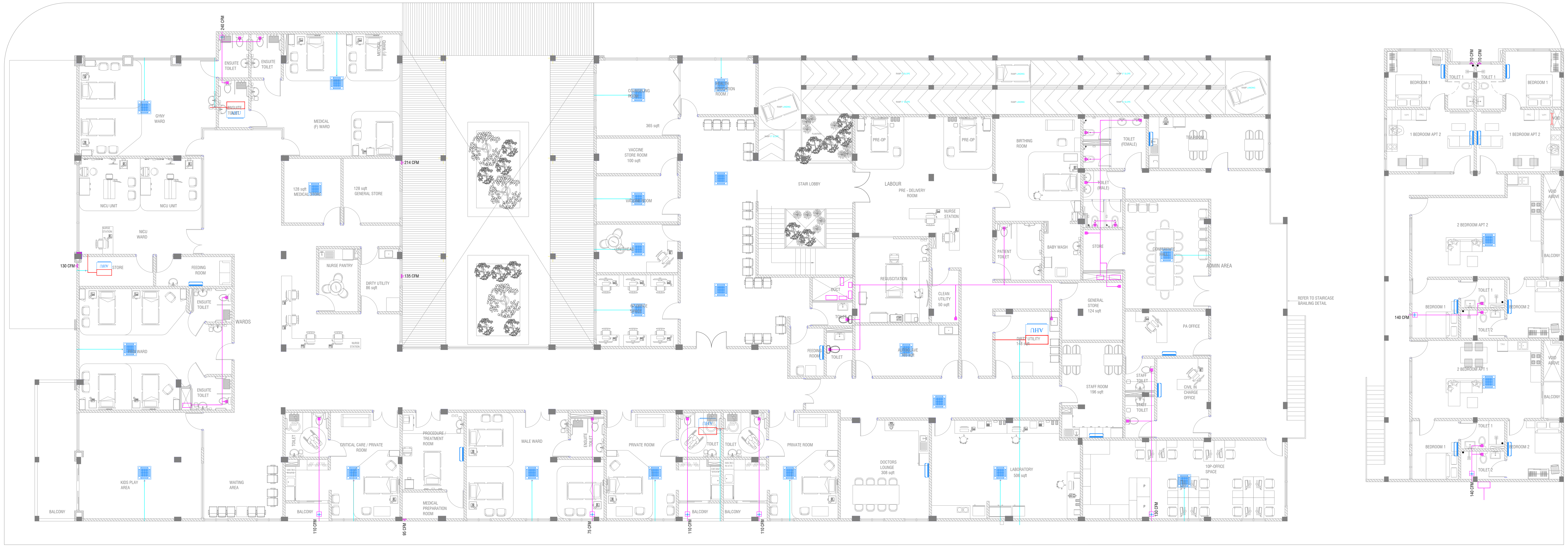

FIRST FLOOR VENTILATION LAYOUT

SCALE 1:100

0 0.5 1 2 3 4 5

ACV LEGEND & ABBREVIATION

Symbol	Description
AHU	AIR HANDLING UNIT
	WALL MOUNTED UNIT
	CASSETTE UNIT
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Title: VENTILATION LAYOUT FIRST FLOOR PLAN

Page: V-02 /03

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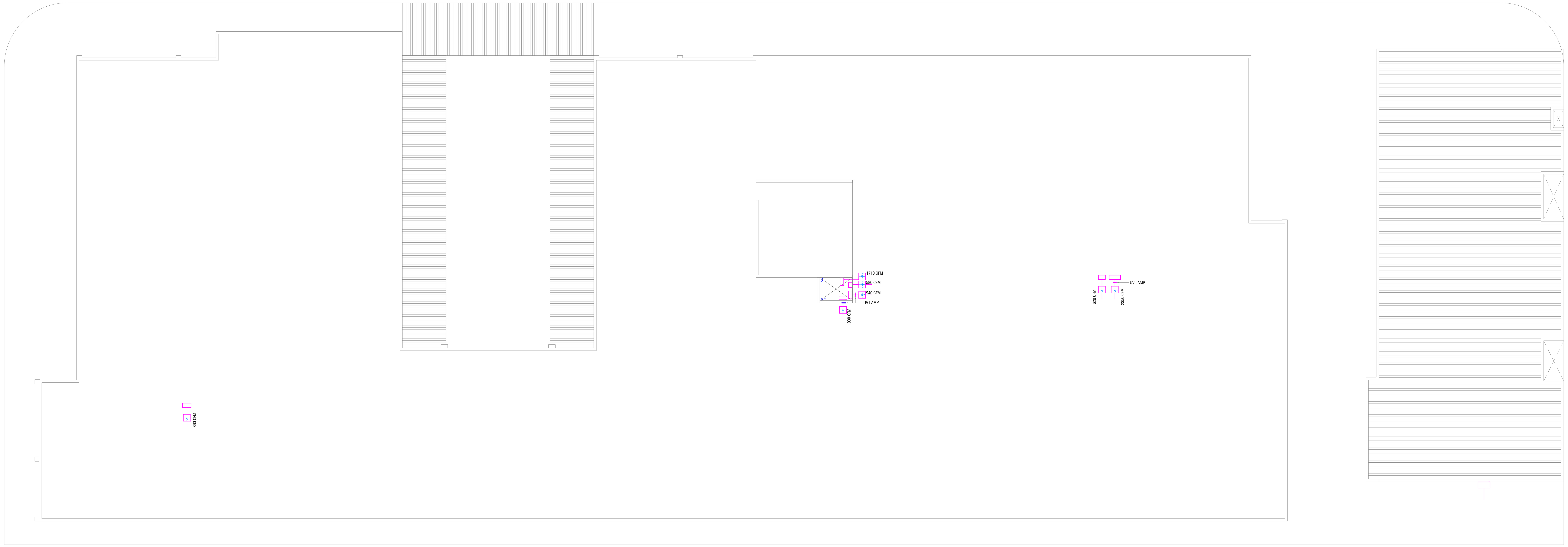

TERRACE FLOOR VENTILATION LAYOUT

SCALE 1:100

0 0.5 1 2 3 4 5

ACV LEGEND & ABBREVIATION	
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ODU	OUTDOOR UNIT [SIDE DISCHARGE]
	CEILING MOUNTED EXHAUST FAN
	FRESH AIR/EXHAUST AIR FAN [DUCT IN LINE]
	WALL MOUNTED FAN
	REFRIGERANT PIPES WITH INSULATION
	AC DRAIN PIPES WITH INSULATION
	SUPPLY AIR DUCT WITH THERMAL INSULATION
	RETURN AIR DUCT WITH THERMAL INSULATION
	EXHAUST AIR DUCT
	FRESH AIR DUCT
	VOLUME CONTROL DAMPER
	SUPPLY AIR DIFFUSER WITH DAMPER
	RETURN AIR DIFFUSER WITH DAMPER
	EXHAUST AIR GRILL
	150MM WIDTH SUPPLY AND RETURN AIR GRILL
T/B	TO BELOW
T/A	TO ABOVE
F/A	FROM ABOVE
F/B	FROM BELOW
AHU	AIR HANDLING UNIT
TFA	TREATED FRESH AIR HANDLING UNIT
ODU	OUT DOOR UNIT

SPECIFICATION FOR VRF/VRV

Outdoor Unit
Air cooled VRF / VRV system working in R410A / R -407C or equivalent refrigerant. The system shall be suitable to operate on 3 phase, 380-415 V, 50Hz AC power supply & shall comprises with multiple no's of inverter, digital scroll/screw compressors, air cooled condenser fan with motor, microprocessor control panel, starter controls for all scroll compressors and condenser fan motors along with internal control and power wiring, cooling coil with internally interconnected refrigerant pipes, charging port and all other required accessories, & hardware's. The entire unit shall be with weather resistant powder coating paint for withstanding all ambient conditions for continuous outdoor operation

Indoor unit
Air Conditioning Units suitable for mounting inside false ceiling/wall hang, each comprising of cooling coil, blower with motor, electronic expansion valve,, filter, insulated connection of refrigerant circuit, provision for fresh air intake ducting, condensate water drain pump with electronic level sensor, including wireless remote controller etc

Air Handling Unit (DX type)
AHU having GI double skin (0.6/0.8 mm thick) sandwich panel (PU injected foam with 45 mm thick, minimum density 40-50 kg/cu.m) with thermal break aluminium profile and heavy duty unit base. Air Handling Units complete with, dx coil (copper), motor, SISW/DIDW fan, pre filter (MERV 7/8) and fine filters (MERV 13).

Air Handling Unit (DX type) for OT,NICU, Labour room,Sterile Areas and Accidents and Emergencies-
AHU having GI double skin (0.6/0.8 mm thick) sandwich panel (PU injected foam with 45 mm thick, minimum density 40-50 kg/cu.m) with thermal break aluminium profile and heavy duty unit base. Air Handling Units complete with, dx coil (copper), motor, SISW/DIDW fan, pre filter (MERV 7/8) , fine filters (MERV 13) and HEPA Filter[H14]

NOTE

-The AC unit shall be suitable for operation under tropical condition with ambient temperature and relative humidity

-Proper access for easy maintenance to be provided as recommended by the manufacturer of AC equipment above false ceiling

-All ceiling suspended unit to be provided with anti vibration hangers spring type

-GI Ducting/Pre insulated dcut for common areas and AL Ducting for OTs ,CSSD and sterile areas

-Acoustic insulation to be provided for duct with minimum 3Sqm from each AHU unit except OT and CSSD areas AHUs

-Canvas connection to be provided between indoor unit and duct

-Aluminium cladding to be provided over the insulation for the exposed duct and pipe works

-Air outlet shall be completely factory aluminium extruded with powder coated and the colour shall be the approval of the interior design

-Air outlet location and size shall be adjusted to suit reflected ceiling drawing,or site condition

-Louver with bird screen to be provided for all the fresh air and exhaust air duct

-Kitchen hood exhaust should be provided in the kitchen areas

-Contractor shall be responsible to provide electrical power requirements to electrical contractor

-Contractor shall be responsible for coordination of all other services

-Contractor shall be responsible to calculating the static pressure for AHU/Exhaust air fan

-Contractor shall be responsible to modify,change,reroute,re locate as per the site condition and submit shop drawing for approval

-Contractor to be provided detailed shop drawings before starting works

-The minimum Energy efficient value for AC [EER] Should be 3.5 [KW/KW]

-All the ACV equipment should be Anti corrosive

Rev no	By	Date
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R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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Title: VENTILATION LAYOUT TERRACE FLOOR PLAN

Page: V-03 /03

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GROUND FLOOR ICT LAYOUT
SCALE 1:100

LEGEND : AUXILIARY SYSTEM

1	CLOSE-CIRCUIT TELEVISION	
2	CLOSE-CIRCUIT TELEVISION PULLBOX	CCTVPB
3	CENTRALIZATION MODULE	CM
4	NURSE CALL	NC
5	PILOT LIGHT	
6	TEL/DATA TERMINAL CABINET	TTC
7	MAIN DISTRIBUTION FRAME - TTC	MDF-TTC
8	TEL/DATA OUTLET	
9	TEL/DATA CIRCUIT RUN	t
10	PRIVATE AUTOMATED BRANCH EXCHANGE	PABX

R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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Title: ICT LAYOUT
GROUND FLOOR PLAN

Page: ICT-01

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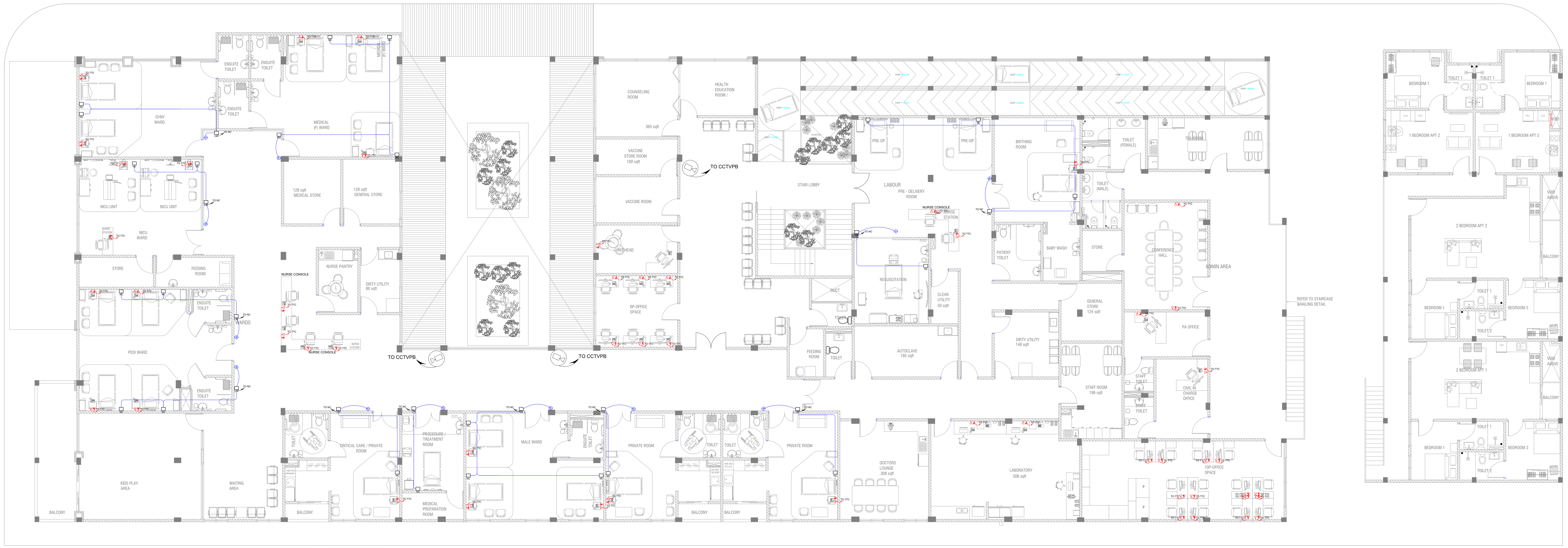

FIRST FLOOR ICT LAYOUT

SCALE 1:100

	LEGEND : AUXILIARY SYSTEM	
1	CLOSE-CIRCUIT TELEVISION	
2	CLOSE-CIRCUIT TELEVISION PULLBOX	CCTVPB
3	CENTRALIZATION MODULE	CM
4	NURSE CALL	NC
5	PILOT LIGHT	
6	TEL/DATA TERMINAL CABINET	TTC
7	MAIN DISTRIBUTION FRAME - TTC	MDF-TTC
8	TEL/DATA OUTLET	
9	TEL/DATA CIRCUIT RUN	t
10	PRIVATE AUTOMATED BRANCH EXCHANGE	PABX

R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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Title: ICT LAYOUT
FIRST FLOOR PLAN

Page: ICT-02

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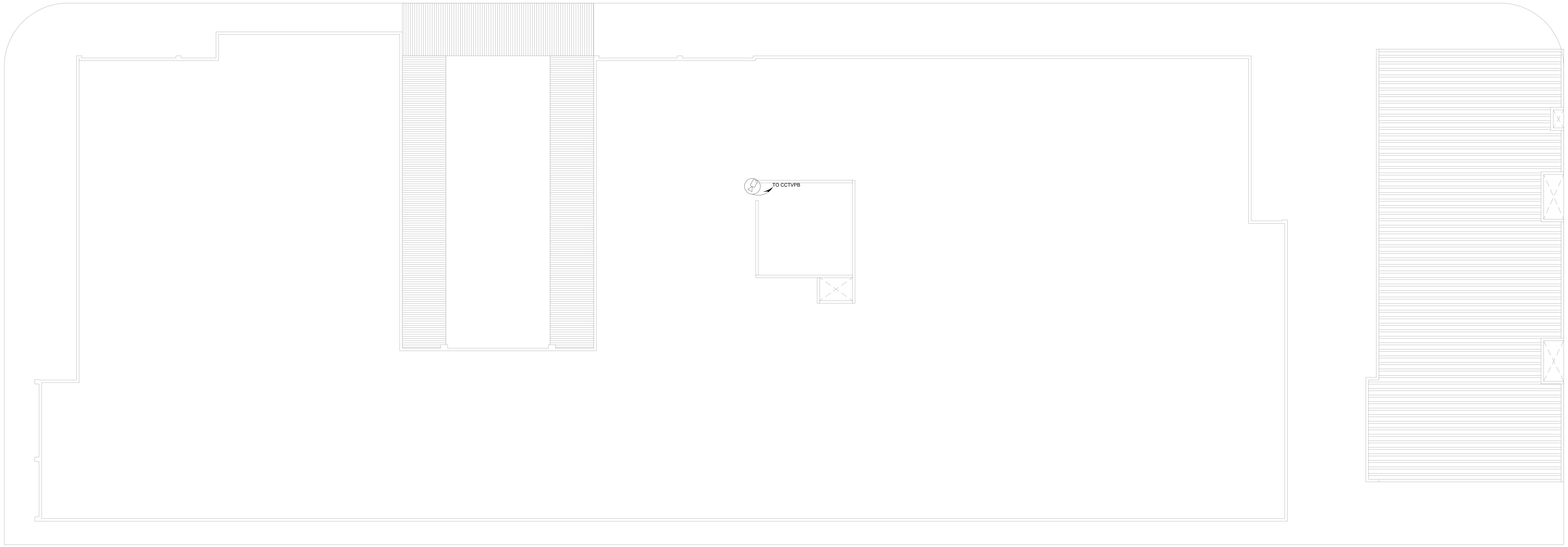

LEGEND : AUXILIARY SYSTEM

1	CLOSE-CIRCUIT TELEVISION	
2	CLOSE-CIRCUIT TELEVISION PULLBOX	CCTVPB
3	CENTRALIZATION MODULE	CM
4	NURSE CALL	NC
5	PILOT LIGHT	
6	TEL/DATA TERMINAL CABINET	TTC
7	MAIN DISTRIBUTION FRAME - TTC	MDF-TTC
8	TEL/DATA OUTLET	
9	TEL/DATA CIRCUIT RUN	t
10	PRIVATE AUTOMATED BRANCH EXCHANGE	PABX

TERRACE FLOOR ICT LAYOUT

SCALE 1:100

0 0.5 1 2 3 4 5

R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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Title: ICT LAYOUT
TERRACE FLOOR PLAN

Page: ICT-03

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GROUND FLOOR LIGHTING LAYOUT

SCALE 1:100

LIGHTING LEGEND

- LED RECESSED LIGHT TYPE 1 (18W)
- LED STRIP COVER LIGHT IP65 (8W)
- LED RECESSED LIGHT TYPE 2 (12W)
- 600 X 600 LED SQUARE DIFFUSER WITH T5 FITTINGS (12W)
- LED RECESSED LIGHT TYPE 3 (12W)
- LED DOWN LIGHT (18W) - WEATHER PROOF
- FLEX. POWER OUTLET W/ COVER PLATE (EXHAUST FAN)
- CEILING FAN (52" - 54")
- LED OUTDOOR WALL LIGHT UP/DWN (8W) - WEATHER PROOF
- LED SPKE LIGHT (3W)
- LED BOLLARD LIGHTS (6W)
- OUTDOOR WALL LIGHT (12W) - WEATHER PROOF (350MMF.F.L)
- LIGHTING SWITCH
- FAN SWITCH
- LIGHTING CABLE
- TROFFER DIFFUSER WITH T5 FITTING (28W)
- LED INDOOR WALL LIGHT UP/DWN (8W)

LIGHTING NOTES

-ALL LIGHTS TO BE CONNECTED TO THEIR RESPECTIVE DB
-ALL CORRIDOR LIGHTS AND OUTDOOR LIGHTS ARE TIMMERD
-CONTRACTOR TO PREPARE SHOP DRAWINGS AND GET APPROVAL FROM CONSULTANT/PROJECT MANAGER FOR ALL LIGHTS, SWITCHES, DB, PANEL BOARD AND OTHER RELEVANT LIGHTING AND POWER POINT LOCATIONS INCLUDING CONDUITING AND WIRING AND TO BE VERIFIED AT SITE PRIOR TO CONSTRUCTION

R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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Title: LIGHTING LAYOUT GROUND FLOOR PLAN

Page: EL-01 /02

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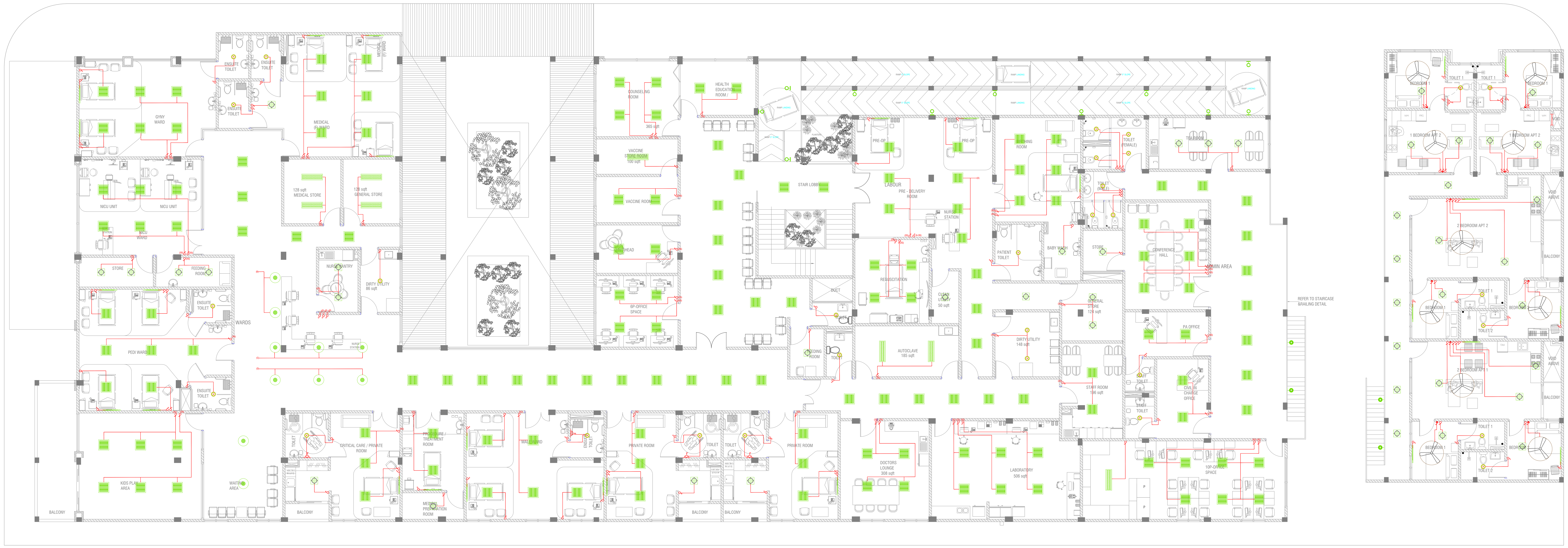

FIRST FLOOR LIGHTING LAYOUT

SCALE 1:100

LIGHTING LEGEND

- LED RECESSED LIGHT TYPE 1 (18W)
- LED STRIP COVER LIGHT IP65 (8W)
- LED RECESSED LIGHT TYPE 2 (12W)
- 600 X 600 LED SQUARE DIFFUSER WITH T5 FITTINGS (12W)
- LED RECESSED LIGHT TYPE 3 (12W)
- LED DOWN LIGHT (18W) - WEATHER PROOF
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- CEILING FAN (52" - 54")
- LED OUTDOOR WALL LIGHT UP/DWN (8W) - WEATHER PROOF
- LED SPKE LIGHT (3W)
- LED BOLLARD LIGHTS (6W)
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- LIGHTING SWITCH
- FAN SWITCH
- LIGHTING CABLE
- TROFFER DIFFUSER WITH T5 FITTING (28W)
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R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
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Title: LIGHTING LAYOUT FIRST FLOOR PLAN

Page: EL-02 /02

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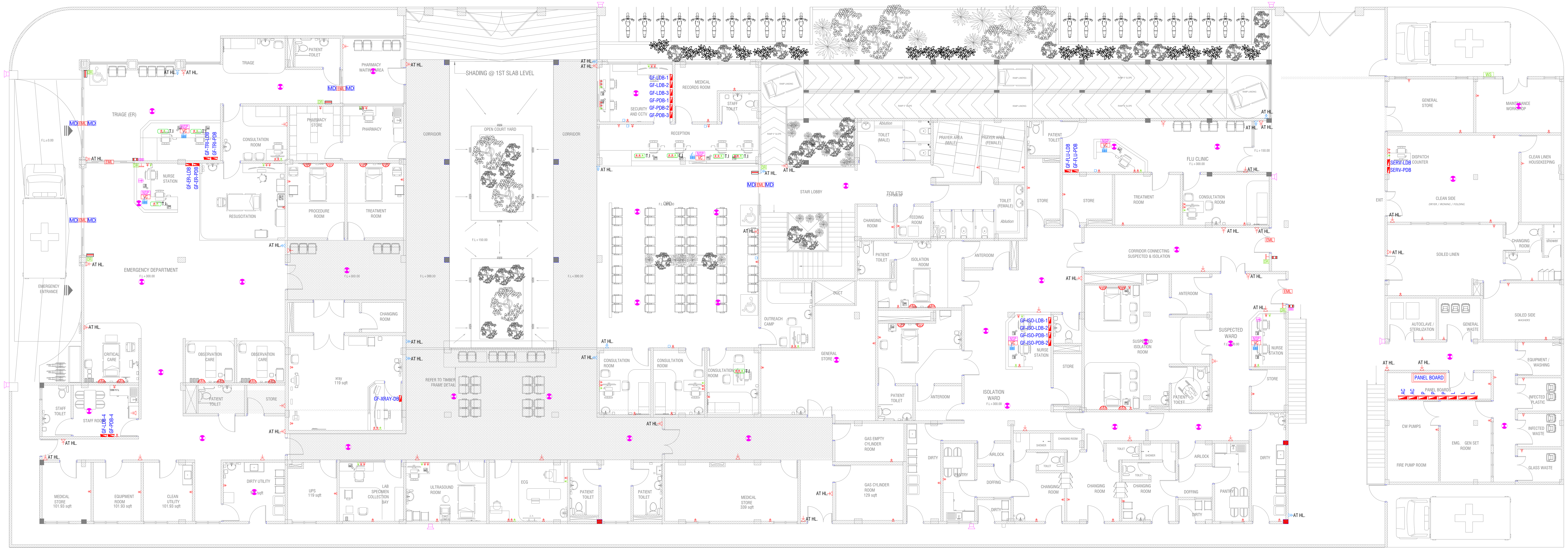

GROUND FLOOR POWER LAYOUT

SCALE 1:100

LIGHTING LEGEND

	TWO GANG TV SOCKET OUTLET
	13A POWER OUTLET (300MM FROM F.F.L) (ABOVE FALSE CEILING FOR TOKEN MONITORS)
	13A TWIN SOCKET OUTLET (300MM FROM F.F.L)
	13A UPS SOCKET OUTLET (300MM FROM F.F.L)
	POWER OVER ETHERNET OUTLET
	15A POWER OUTLET
	VGA CABLE FOR PROJECTOR
	PROXIMITY CARD READER
MD	AUTOMATIC DOOR MOTION DETECTOR SENSOR
	ACCESS CONTROLLER
	EXIT SWITCH
	DISTRIBUTION BOX
	13A SOCKETS FOR TOILETS (1500 F.F.L)
	WEATHER PROOF POLYCARBONATE ENCLOSURE
	PAGING MIC
VC	VOLUME CONTROLLER
WS	WALL SPEAKERS AT CEILING LEVEL
DR	EMERGENCY DOOR RELEASE
NSP	NURSE STATION PANEL ROOM INDICATOR
EML	ELECTROMAGNETIC LOCK
DBB	DOOR BELL BUTTON
DBR	DOOR BELL RECEIVER
	HONE SPEAKER
	CEILING SPEAKER
	8 POWER POINTS ON ENVIROM VERTICAL HEADWALLS CALL POINT TO NURSES STATION: INTEGRATED IN ENVIROM BEDHEAD TRUNK
T.I	TABLE INTEGRATED OR F.F.L OUTLETS
C.L	CEILING LEVEL OUTLETS
H.L	HIGH LEVEL OUTLETS ON WALL

POWER NOTES

- ALL POWER POINTS CONNECTED TO THE RESPECTIVE DB
- CONTRACTOR TO PREPARE SHOP DRAWINGS AND GET APPROVAL FROM CONSULTANT/PROJECT MANAGER FOR ALL LIGHTS, SWITCHES, DB, PANEL BOARD, EAC, REQUIRED ISOLATORS, ACV SERVICES AND OTHER RELEVANT LIGHTING AND POWER POINT LOCATIONS INCLUDING CONDUITING AND WIRING AND TO BE VERIFIED AT SITE PRIOR TO CONSTRUCTION
- CONTRACTOR SHALL BE RESPONSIBLE TO MODIFY, CHANGE, REROUTE, RELOCATE THE LIGHTING AND POWER POINTS AS PER THE SITE CONDITIONS AND SUBMIT SHOP DRAWING FOR APPROVAL PRIOR TO CONSTRUCTION
- CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ELECTRICAL POWER REQUIREMENTS AND POWER POINTS FOR MECHANICAL VENTILATION DEVICES TO ELECTRICAL CONTRACTOR
- RADIOLOGY, ECG AND SCAN ROOMS' POWER CONSUMPTION IS IN GENERAL. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH RELEVANT EQUIPMENT MANUFACTURERS REGARDING EQUIPMENT POWER CONSUMPTION.

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R.Inguraidhoo Health Center
Client: Ministry of Health

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Title: POWER LAYOUT GROUND FLOOR PLAN

Page: EP-01 /02

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FIRST FLOOR POWER LAYOUT

SCALE 1:100

LIGHTING LEGEND

	TWO GANG TV SOCKET OUTLET
	13A POWER OUTLET (300MM FROM F.F.L) (ABOVE FALSE CEILING FOR TOKEN MONITORS)
	13A TWIN SOCKET OUTLET (300MM FROM F.F.L)
	13A UPS SOCKET OUTLET (300MM FROM F.F.L)
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	15A POWER OUTLET
	VGA CABLE FOR PROJECTOR
	PROXIMITY CARD READER
MD	AUTOMATIC DOOR MOTION DETECTOR SENSOR
	ACCESS CONTROLLER
	EXIT SWITCH
	DISTRIBUTION BOX
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	WEATHER PROOF POLYCARBONATE ENCLOSURE
	PAGING MIC
VC	VOLUME CONTROLLER
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R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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Title: POWER LAYOUT FIRST FLOOR PLAN

Page: EP-02 /02

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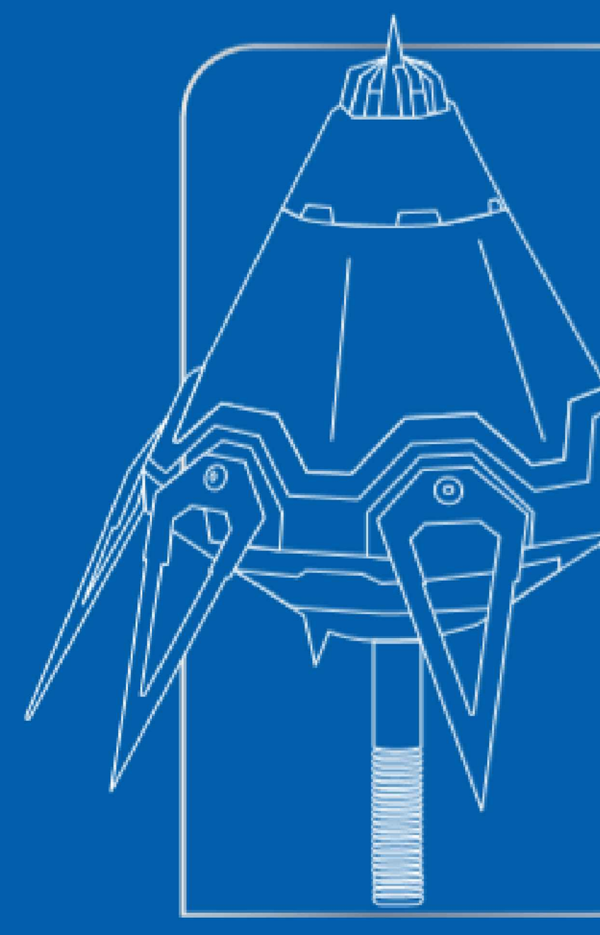
Ground Floor Plan-Lightning Proection Layout



PROTECTION AREA

THE PROTECTION AREA (RP) OF A PREVECTRON 3* LIGHTNING CONDUCTOR IS CALCULATED ACCORDING TO FRENCH STANDARD NF C 17-102 : 2011, THUS :

$$Rp(h) = \sqrt{(2rh - h^2 + \Delta(2r + \Delta))} \text{ if } h \geq 5m$$

and

$$Rp = h \times Rp(5)/5 \text{ if } 2m \leq h \leq 5m$$

The protection area depends on a number of factors :

- h(m) : is the height of the ESEAT tip over the horizontal plane through the furthest point of the object/area to be protected.
- r(m) : 20 m, 30m, 45m or 60m according to the Protection Level I, II, III or IV assessed for the site using the Risk Analysis calculation (NF C 17-102 : 2011 Annex A).
- Δ (m) : $\Delta = \Delta T \times 10^6$. Field experience has proved that is equal to the efficiency obtained during the ESEAT evaluation tests.

PROTECTION RADIUS

PROTECTION LEVEL I : r = 20M

H (M)	2	3	4	5	10
S 60	31	47	63	79	79
S 50	27	41	55	68	69
S 40	23	35	46	58	59
TS 25	17	24	34	42	44
TS 10	10	15	21	26	28

PROTECTION LEVEL II : r = 30 M

H (M)	2	3	4	5	10
S 60	34	52	68	86	88
S 50	30	45	60	76	77
S 40	26	39	52	65	67
TS 25	19	29	39	49	51
TS 10	12	19	25	31	34

PROTECTION LEVEL III : r = 45 M

H (M)	2	3	4	5	10
S 60	39	58	78	97	99
S 50	34	52	69	86	88
S 40	30	45	60	75	77
TS 25	23	34	46	57	61
TS 10	15	22	30	38	42

PROTECTION LEVEL IV : r = 60 M

H (M)	2	3	4	5	10
S 60	43	64	85	107	109
S 50	38	57	76	95	98
S 40	33	50	67	84	87
TS 25	26	39	52	65	69
TS 10	17	26	34	43	49

		S range	TS range
ADVANCED TRIGGERING	▶ ΔT	60µs 50µs 40µs	25µs 10µs
DIMENSIONS	▶ Height	365 mm	320 mm
	▶ Diameter (body)	200 mm	140 mm
	▶ Diameter (Maxi)	317 mm	261 mm
	▶ Diameter (rod)	20 mm	20 mm
WEIGHT	▶ Kg	3.9 kg 3.3 kg 3.0 kg	2.0 kg 1.8 kg
CONNECTION	▶	M 20	M 20

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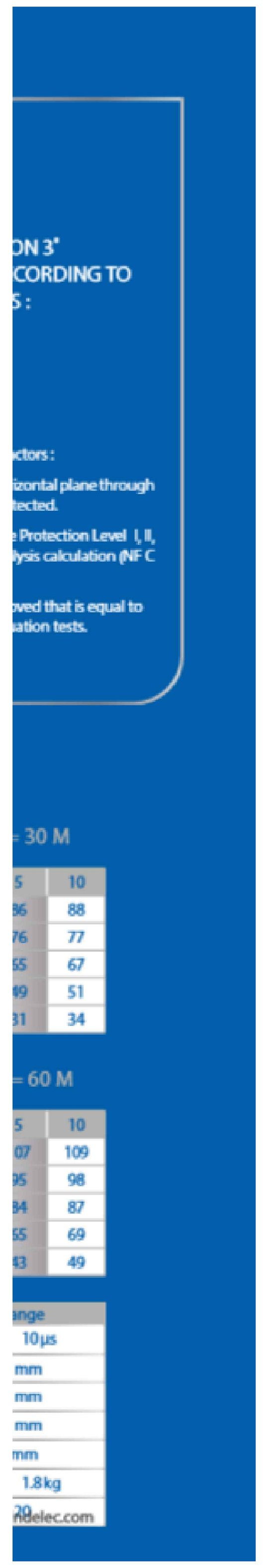
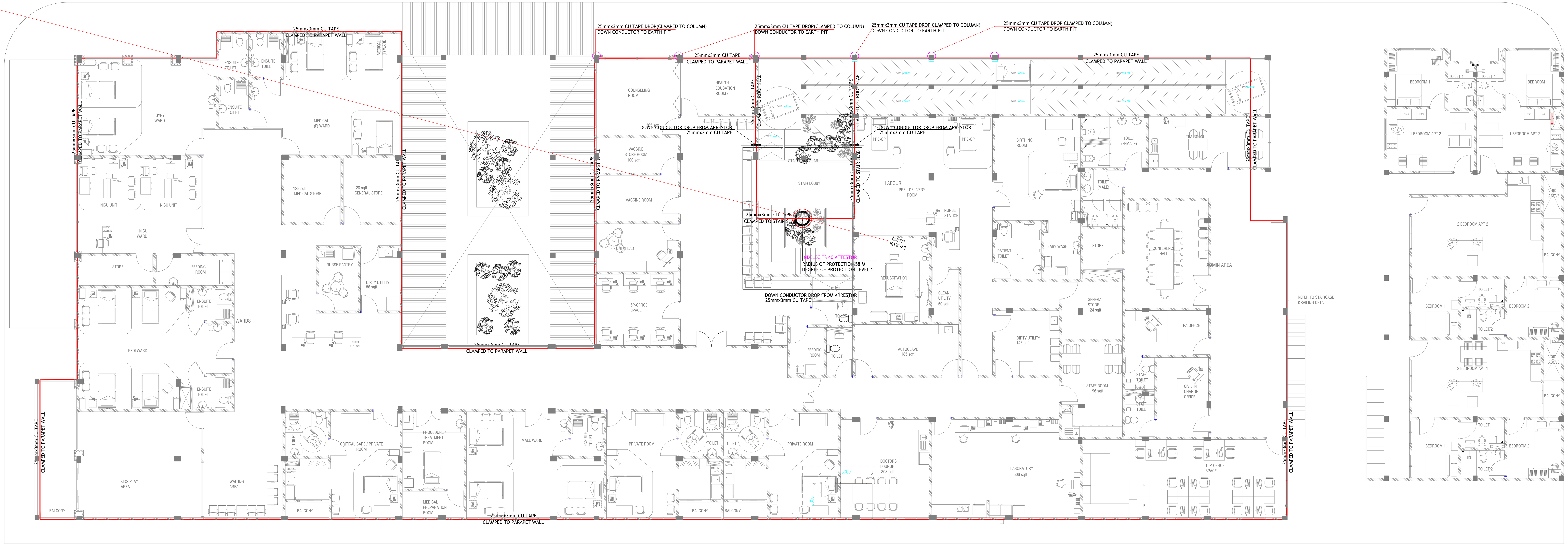
Title: LP LAYOUT
Page: LP-01 /02





Roof Plan-Lightning Proection Layout

R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

Rev no	By	Date
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Title: LP LAYOUT

Page: LP-02 /02

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GROUND FLOOR FDP LAYOUT

SCALE 1:100

LEGEND : FDP SYSTEM

1	SMOKE DETECTOR - ADDRESSABLE/ANALOG	SD
2	HEAT DETECTOR - ADRRESSABLE/ANALOG	HD
3	FIRE ALARM CONTROL PANEL	FACP
4	FIRE MANUAL CALL POINT	MCP
5	FIRE ALARM SOUNDER WITH STROBE LIGHT 95DB	FH/SL
6	FIRE RESISTANT CABLE 1.5MM² X 2 CORE	
7	FIRE BLANKET	FB
8	FIRE EXTINGUISHERS - 9 LTRS H2O & 2KG Co2 FIRE EXTINGUISHERS - 50KG TROLLEY DCP & 2KG DCP	
9	FIRE HOSE REEL W/ 25mmø HOSE & 30 METERS	FHR
10	EMERGENCY LIGHT	EM
11	EXIT SIGNS LIGHT W/ BACK UP BATTERIES	EXIT
12	MWSC WATER METER	M
13	25 MMø AIR RELEASE VALVE	
14	PVC PIPE - 40MMø CONNECTION TO FILL FIRE TANK	
15	PIPE RISER - GI PIPE 100MMø, SCHEDULE 40	
16	PIPE RISER - GI PIPE 25MMø, SCHEDULE 40	
17	PIPE RISER - GI PIPE 50MMø, SCHEDULE 40	
18	PIPE RISER - GI PIPE 25MMø, SCHEDULE 40	
19	PIPE HDPE 100MMø, PE100, PN16,SDR11	
20	FIRE PUMP SYSTEM CONSIST OF ELECTRICAL DUTY PUMP & DIESEL STAND BY PUMP - PUMPS CAPACITY IS 100 GPM @ 40M HEAD - JOCKEY PUMPS IS 3 GPM @ 40m HEAD	
21	FIRE RATED DOOR - 90 MINS.	

R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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w : www.riyan.com.mv
3rd floor, H. Azum, Ameeneemagu, Male'

Title: FDP LAYOUT
GROUND FLOOR PLAN

Page: FDP-01 /03

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FIRST FLOOR FDP LAYOUT

SCALE 1:100

	LEGEND : FDP SYSTEM	
1	SMOKE DETECTOR - ADDRESSABLE/ANALOG	SD
2	HEAT DETECTOR - ADRRESSABLE/ANALOG	HD
3	FIRE ALARM CONTROL PANEL	FACP
4	FIRE MANUAL CALL POINT	MCP
5	FIRE ALARM SOUNDER WITH STROBE LIGHT 95DB	FH/SL
6	FIRE RESISTANT CABLE 1.5MM² X 2 CORE	
7	FIRE BLANKET	FB
8	FIRE EXTINGUISHERS - 9 LTRS H2O & 2KG Co2 FIRE EXTINGUISHERS - 50KG TROLLEY DCP & 2KG DCP	
9	FIRE HOSE REEL W/ 25mmø HOSE & 30 METERS	FHR
10	EMERGENCY LIGHT	EM
11	EXIT SIGNS LIGHT W/ BACK UP BATTERIES	EXIT
12	MWSC WATER METER	M
13	25 MMø AIR RELEASE VALVE	
14	PVC PIPE - 40MMø CONNECTION TO FILL FIRE TANK	
15	PIPE RISER - GI PIPE 100MMø, SCHEDULE 40	
16	PIPE RISER - GI PIPE 25MMø, SCHEDULE 40	
17	PIPE RISER - GI PIPE 50MMø, SCHEDULE 40	
18	PIPE RISER - GI PIPE 25MMø, SCHEDULE 40	
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21	FIRE RATED DOOR - 90 MINS.	

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Title: FDP LAYOUT
FIRST FLOOR PLAN

Page: FDP-02 /03

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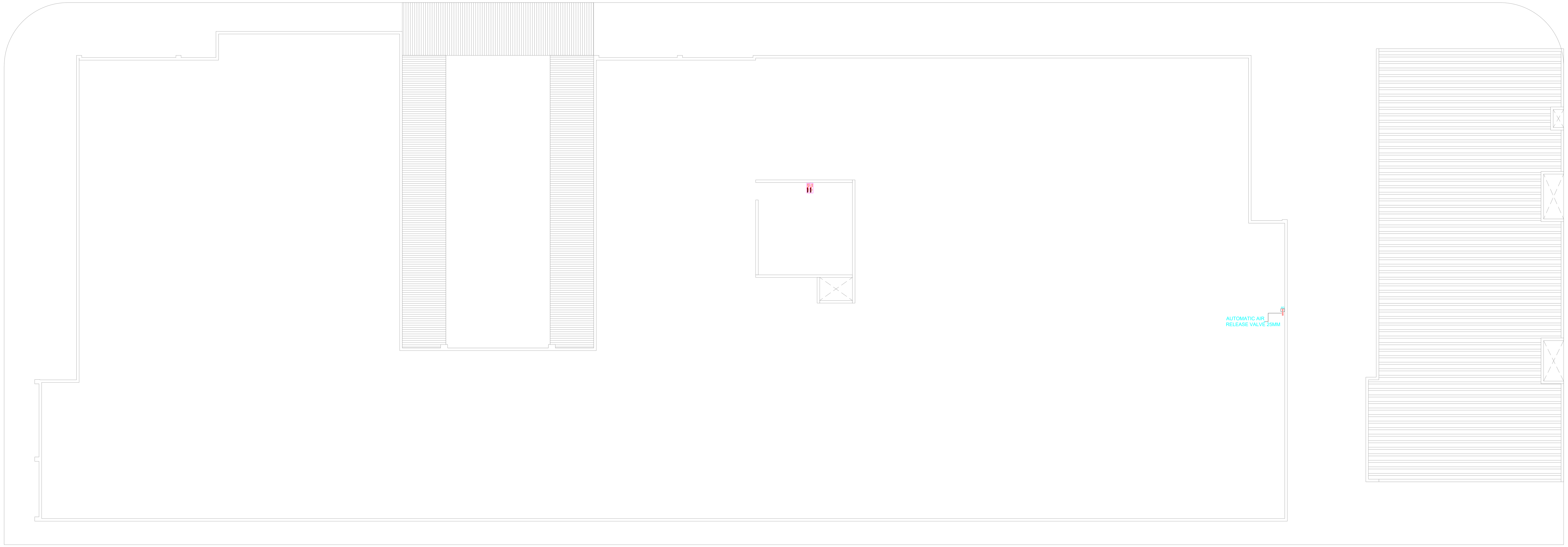

LEGEND : FDP SYSTEM		
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2	HEAT DETECTOR - ADRRESSABLE/ANALOG	HD
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9	FIRE HOSE REEL W/ 25mmø HOSE & 30 METERS	FHR
10	EMERGENCY LIGHT	EM
11	EXIT SIGNS LIGHT W/ BACK UP BATTERIES	EXIT
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14	PVC PIPE - 40MMø CONNECTION TO FILL FIRE TANK	
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TERRACE FLOOR FDP LAYOUT

SCALE 1:100

0 0.5 1 2 3 4 5

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TERRACE FLOOR PLAN

Page: FDP-03 /03

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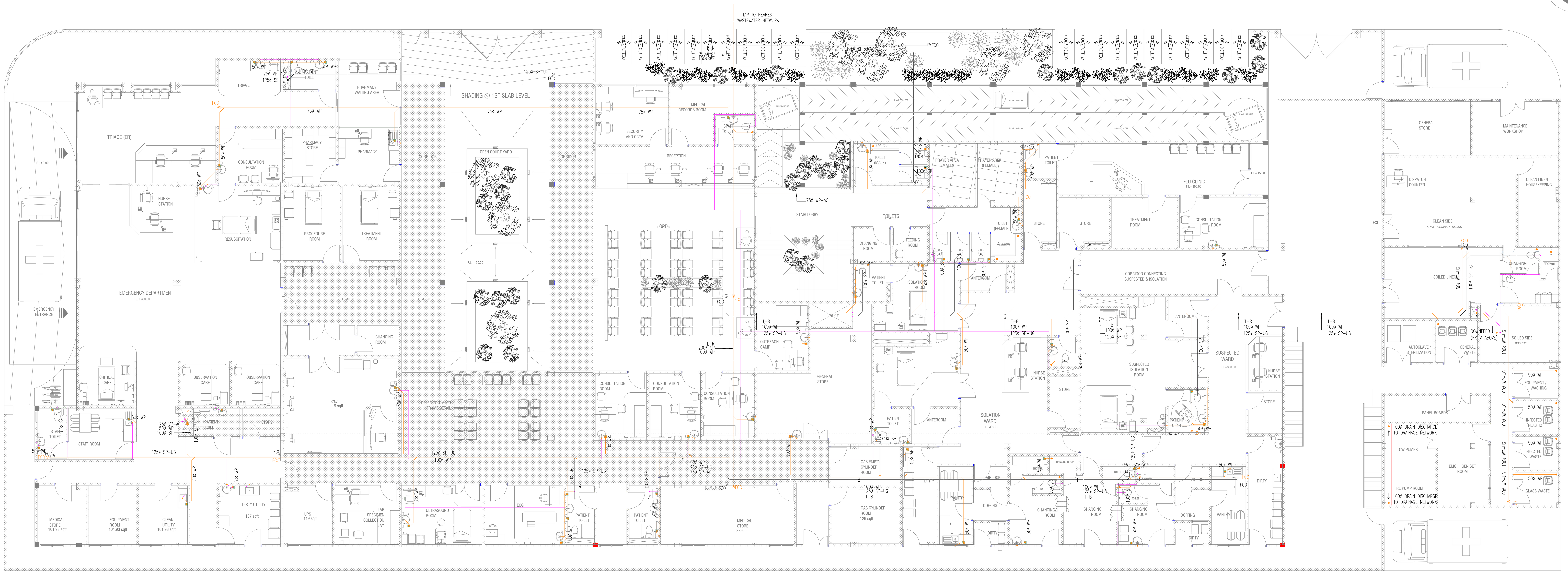
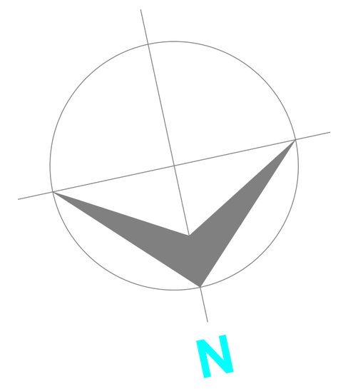


GROUND FLOOR DR PLAN

SCALE 1:100



LEGEND:

WATER DISTRIBUTION SYSTEM

	CWL	COLD WATER LINE
	HWL	HOT WATER LINE
	CWR/CWDF	COLD WATER RISER/DOWNFEED
	GV/DV	GATE VALVE / DRAIN VALVE / ISOLATION VALVE
	CV	CHECK VALVE
	HB	HOSE BIBB
	WM	WATER METER

WASTE, DRAINAGE, SEWER & VENT SYSTEM

	SP	SEWER PIPE
	WP	WASTE PIPE
	VP	VENT PIPE
	RWP	RAINWATER PIPE
	SS/VS/WS	SOIL/VENT /WASTE STACK
	VSTR	VENT STACK THRU ROOF
	FCO/GCO	FLOOR/GROUND CLEANOUT
CCO WCO	CCO/WCO	CEILING/WALL CLEANOUT
	FD	FLOOR DRAIN GULLY TRAP
	FG	FLOOR DRAIN GULLY TRAP
	SD 90°	SCUPPER DRAIN 90 DEGREE OUTLET
	AD	AREA DRAIN (MIN. 300x300MM)
	L-R	LEFT TO RIGHT
	T-B	TOP TO BOTTOM
	UG/S	UNDERGROUND / UNDERSLAB
	AC	ABOVE CEILING
	RWCP	RAINWATER COLLECTOR PIPE
	OFP / OF	OVERFLOW PIPE / OVERFLOW

GENERAL NOTES:

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5. ALL SLOPES FOR HORIZONTAL DRAINAGE SHALL MAINTAIN 1% UNLESS OTHERWISE SPECIFIED.
6. SIZE OF WATER SUPPLY PIPES TO FIXTURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES AT SITE, COORDINATE THE WORKS WITH THE SEWER LINE EFFLUENT DISPOSAL POINT AND WATER LINE SERVICE CONNECTING POINT.
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R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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Title: DR LAYOUT
GROUND FLOOR PLAN

Page: DR-01 /02

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LEGEND:

WATER DISTRIBUTION SYSTEM

Symbol	Code	Description
	CWL	COLD WATER LINE
	HWL	HOT WATER LINE
	CWR/CWDF	COLD WATER RISER/DOWNFEED
	GV/DV	GATE VALVE / DRAIN VALVE / ISOLATION VALVE
	CV	CHECK VALVE
	HB	HOSE BIBB
	WM	WATER METER

WASTE, DRAINAGE, SEWER & VENT SYSTEM

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	SP	SEWER PIPE
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	SS/VS/WS	SOIL/VENT /WASTE STACK
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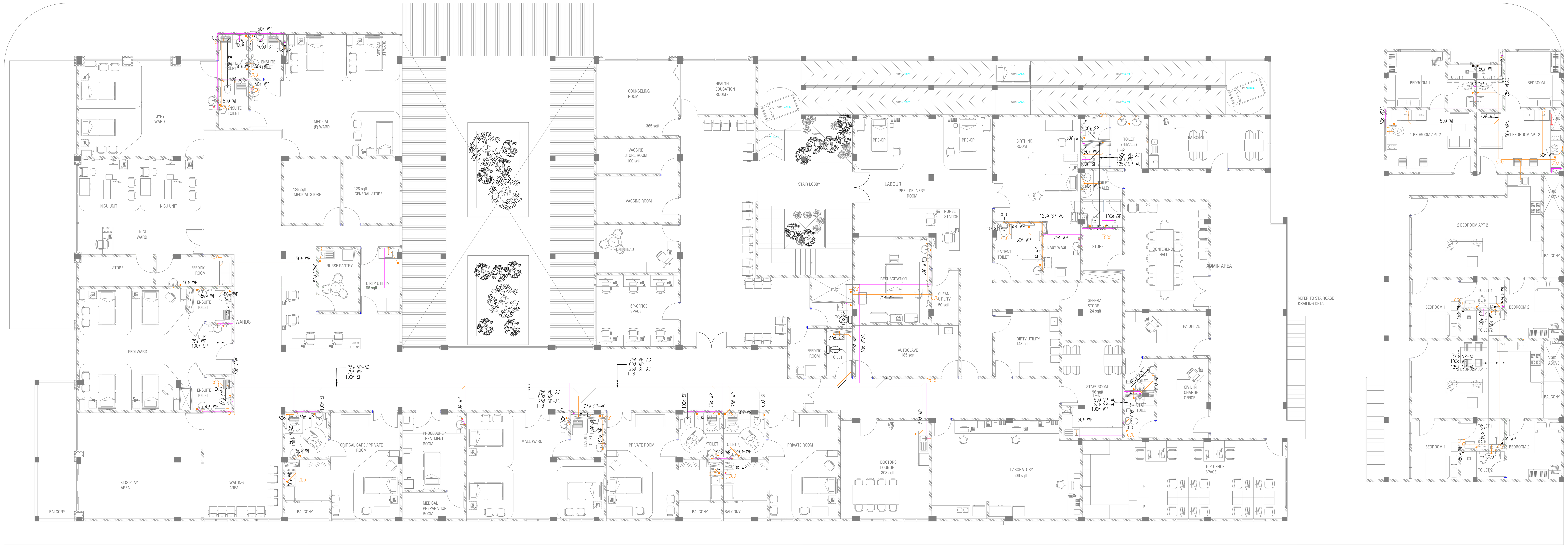
	RWCP	RAINWATER COLLECTOR PIPE
	OFP / OF	OVERFLOW PIPE / OVERFLOW



FIRST FLOOR DR PLAN

SCALE 1:100

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R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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Title: DR LAYOUT FIRST FLOOR PLAN

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GROUND FLOOR PL PLAN

SCALE 1:100

LEGEND:

WATER DISTRIBUTION SYSTEM

CWL	COLD WATER LINE
HWL	HOT WATER LINE
CWR/CWDF	COLD WATER RISER/DOWNFEED
GV/DV	GATE VALVE / DRAIN VALVE / ISOLATION VALVE
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WM	WATER METER

WASTE, DRAINAGE, SEWER & VENT SYSTEM

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L–R	LEFT TO RIGHT
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OFP / OF	OVERFLOW PIPE / OVERFLOW

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R.Inguraidhoo Health Center
Client: Ministry of Health

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Title: PL LAYOUT
GROUND FLOOR PLAN

Page: PL-01 /02

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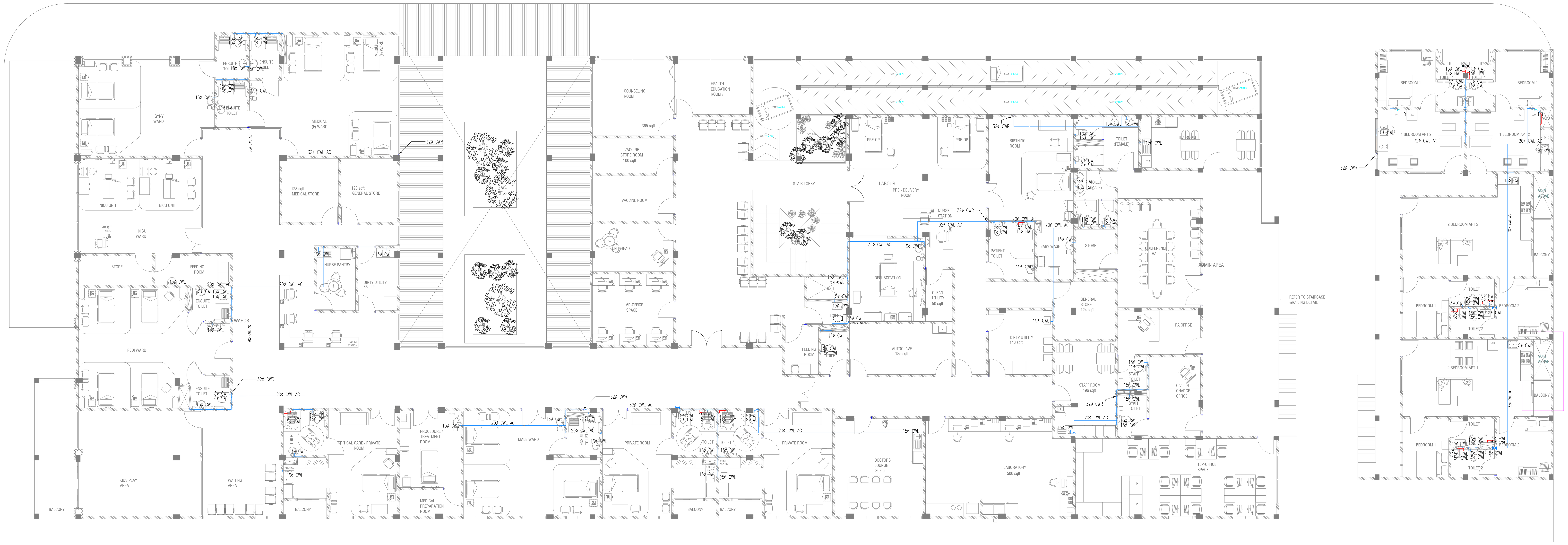

FIRST FLOOR PL PLAN

SCALE 1:100

LEGEND:

WATER DISTRIBUTION SYSTEM

Symbol	Abbreviation	Description
	CWL	COLD WATER LINE
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Title: PL LAYOUT
FIRST FLOOR PLAN

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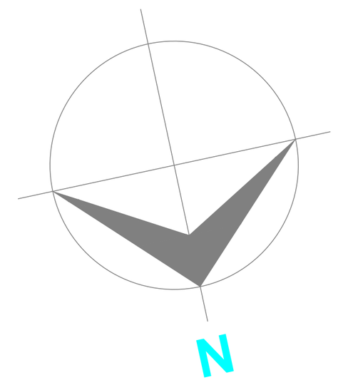
GROUND FLOOR ST PLAN

SCALE 1:100



LEGEND:

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RIYAN PRIVATE LIMITED
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w : www.riyan.com.mv
3rd floor, H. Azum, Ameeneemagu, Male'

Title: ST LAYOUT
GROUND FLOOR PLAN

Page: ST-01 /03

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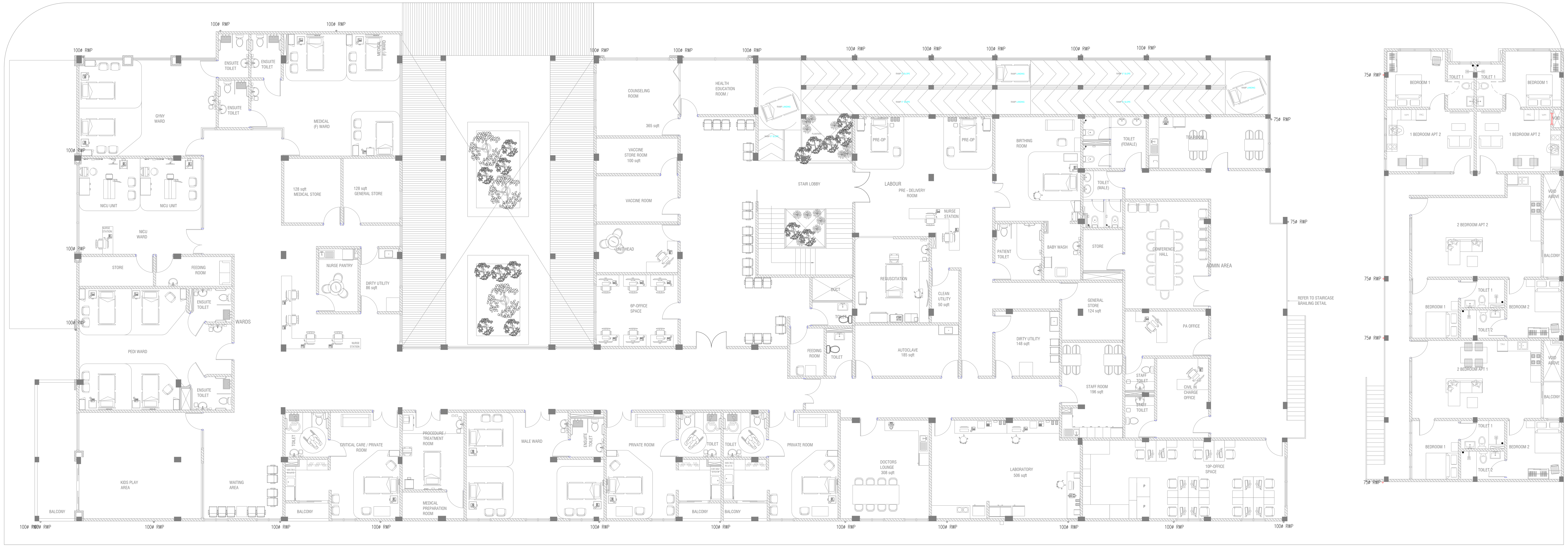

FIRST FLOOR ST PLAN

SCALE 1:100

LEGEND:

WATER DISTRIBUTION SYSTEM

	CWL	COLD WATER LINE
	HWL	HOT WATER LINE
	CWR/CWDF	COLD WATER RISER/DOWNFEED
	GV/DV	GATE VALVE / DRAIN VALVE / ISOLATION VALVE
	CV	CHECK VALVE
	HB	HOSE BIBB
	WM	WATER METER

WASTE, DRAINAGE, SEWER & VENT SYSTEM

	SP	SEWER PIPE
	WP	WASTE PIPE
	VP	VENT PIPE
	RWP	RAINWATER PIPE
	SS/VS/WS	SOIL/VENT /WASTE STACK
	VSTR	VENT STACK THRU ROOF
	FCO/GCO	FLOOR/GROUND CLEANOUT
CCO WCO	CCO/WCO	CEILING/WALL CLEANOUT
	FD	FLOOR DRAIN GULLY TRAP
	FG	FLOOR DRAIN GULLY TRAP
	SD 90˚	SCUPPER DRAIN 90 DEGREE OUTLET
	AD	AREA DRAIN (MIN. 300x300MM)
	L-R	LEFT TO RIGHT
	T-B	TOP TO BOTTOM
	UG/S	UNDERGROUND / UNDERSLAB
	AC	ABOVE CEILING
	RWCP	RAINWATER COLLECTOR PIPE
	OFP / OF	OVERFLOW PIPE / OVERFLOW

GENERAL NOTES:

1. ALL PLUMBING WORKS INCLUDED HEREIN SHALL BE EXECUTED ACCORDING TO THE PROVISIONS OF THE PLUMBING CODE OF THE MALDIVES. IN THE ABSENCE THEREOF, SHALL BE IN ACCORDANCE WITH ACCEPTABLE INTERNATIONAL CODE AND STANDARDS.
2. COORDINATE THE DRAWING WITH OTHER RELATED DRAWINGS AND SPECIFICATION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY FOUND THEREIN.
3. ALL PIPES SHALL BE INSTALLED AS INDICATED ON PLANS. ANY RELOCATIONS REQUIRED FOR PROPER EXECUTION OF OTHER TRADE SHALL BE WITH PRIOR APPROVAL OF THE ARCHITECT OR ENGINEER.
4. PROPOSED SANITARY UTILITIES SHALL CONFORM TO THE ACTUAL LOCATION, DEPTH AND INVERT ELEVATION OF ALL EXISTING PIPES AND STRUCTURES AS VERIFIED BY THE CONTRACTOR.
5. ALL SLOPES FOR HORIZONTAL DRAINAGE SHALL MAINTAIN 1% UNLESS OTHERWISE SPECIFIED.
6. SIZE OF WATER SUPPLY PIPES TO FIXTURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES AT SITE, COORDINATE THE WORKS WITH THE SEWER LINE EFFLUENT DISPOSAL POINT AND WATER LINE SERVICE CONNECTING POINT.
8. ALL PIPE SIZES ARE IN MILLIMETERS AND ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
9. THE PROPOSED UTILITIES SHALL BE MADE TO CONFORM TO THE ACTUAL LOCATION, TAPPING POINT, DEPTH AND INVERT LEVELS OF ALL EXISTING PIPES AND STRUCTURES AS VERIFIED BY THE CONTRACTOR.
10. ALL PIPE DIAMETER INDICATED ON PLANS ARE NOMINAL PIPE SIZES.
11. VENT AND WASTE STACK TO CONNECT TO SOIL PIPE. SOIL PIPE STACK AS MAIN SOIL AND WASTE VENT THRU ROOF

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R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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FIRST FLOOR PLAN

Page: ST-02 /03

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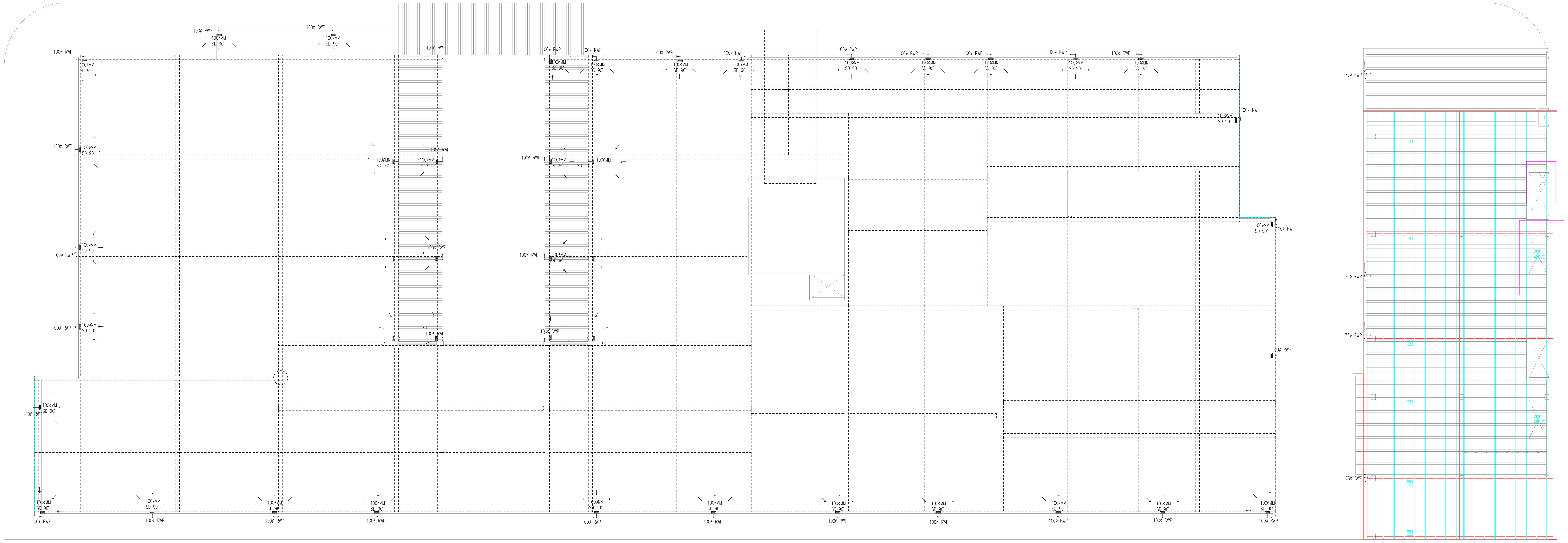

TERRACE FLOOR ST PLAN

SCALE 1:100

0 0.5 1 2 3 4 5

LEGEND:

WATER DISTRIBUTION SYSTEM

	CWL	COLD WATER LINE
	HWL	HOT WATER LINE
	CWR/CWDF	COLD WATER RISER/DOWNFEED
	GV/DV	GATE VALVE / DRAIN VALVE / ISOLATION VALVE
	CV	CHECK VALVE
	HB	HOSE BIBB
	WM	WATER METER

WASTE, DRAINAGE, SEWER & VENT SYSTEM

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	SS/VS/WS	SOIL/VENT /WASTE STACK
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	FCO/GCO	FLOOR/GROUND CLEANOUT
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	FD	FLOOR DRAIN GULLY TRAP
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	AD	AREA DRAIN (MIN. 300x300MM)
	L-R	LEFT TO RIGHT
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R.Inguraidhoo Health Center
Client: Ministry of Health

Project Number: -
Date: September 2021
Architect : Mariyam Irasha Shareef
Engineer : -
Drawn by : Mariyam Irasha Shareef
Services : -
Interior : -

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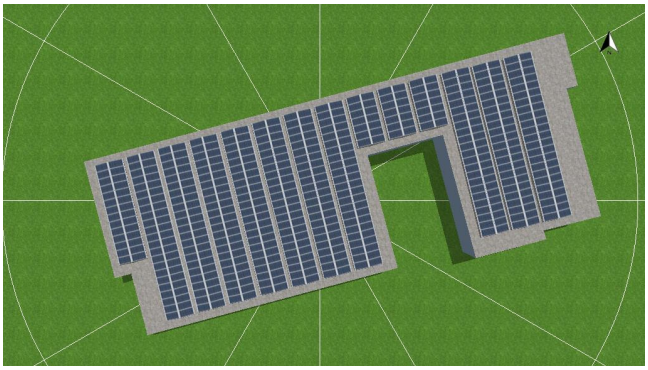
04.02.2022

Your PV system

Address of Installation



Project Overview

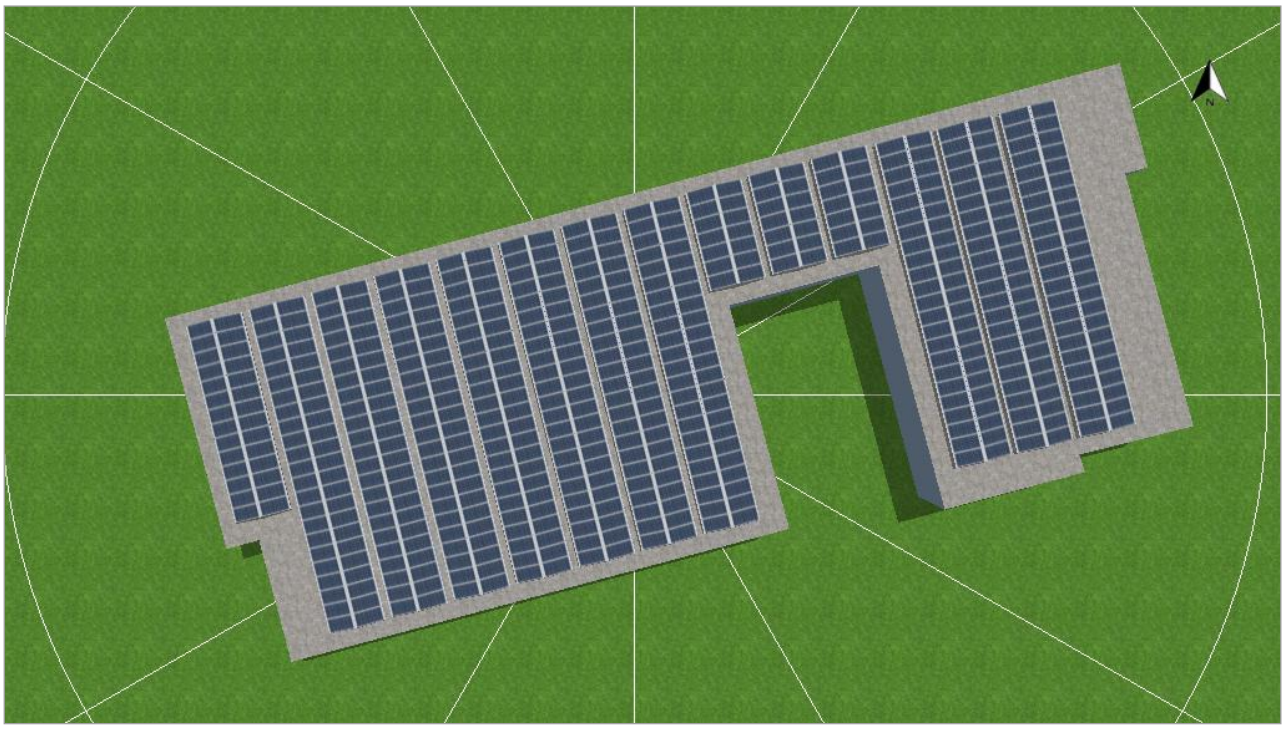


Figure: Overview Image, 3D Design

PV System

3D, Grid-connected PV System

Climate Data	Inguraidhoo, MDV (1996 - 2015)	
Values source	Meteonorm 8.1(i)	
PV Generator Output	241,15	kWp
PV Generator Surface	1 158,6	m²
Number of PV Modules	530	
Number of Inverters	5	

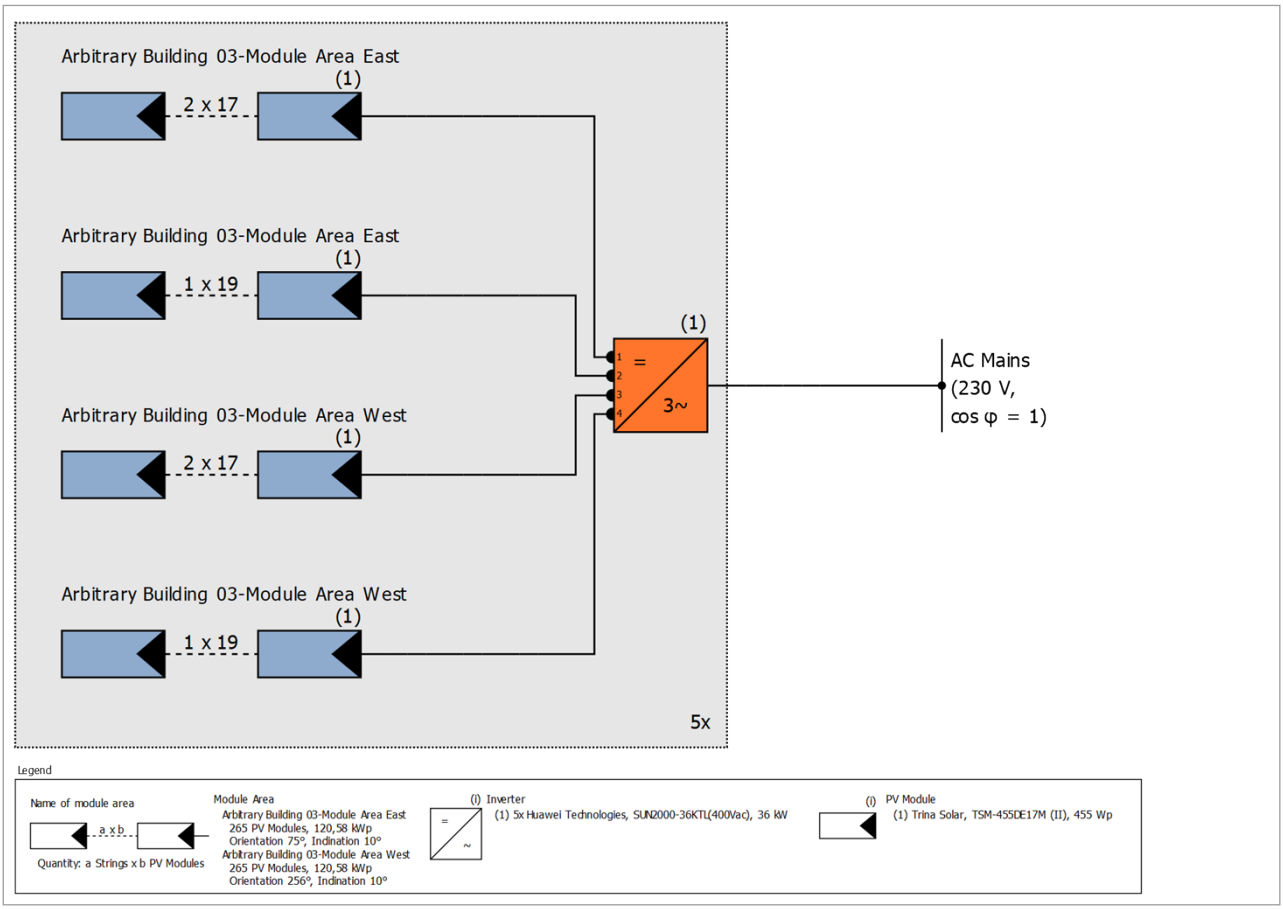


Figure: Schematic diagram

Production Forecast

Production Forecast

PV Generator Output	241,15	kWp
Spec. Annual Yield	1 559,81	kWh/kWp
Performance Ratio (PR)	78,77	%
Yield Reduction due to Shading	0,5	%/Year
Grid Feed-in	376 198	kWh/Year
Grid Feed-in in the first year (incl. module degradation)	371 017	kWh/Year
Standby Consumption (Inverter)	50	kWh/Year
CO_2 Emissions avoided	176 790	kg / year

The results have been calculated with a mathematical model calculation from Valentin Software GmbH (PV*SOL algorithms). The actual yields from the solar power system may differ as a result of weather variations, the efficiency of the modules and inverter, and other factors.

Set-up of the System

Overview

System Data

Type of System	3D, Grid-connected PV System

Climate Data

Location	Inguraidhoo, MDV (1996 - 2015)
Values source	Meteonorm 8.1(i)
Resolution of the data	1 h
Simulation models used:	
- Diffuse Irradiation onto Horizontal Plane	Hofmann
- Irradiance onto tilted surface	Hay & Davies

Module Areas

1. Module Area - Arbitrary Building 03-Module Area East

PV Generator, 1. Module Area - Arbitrary Building 03-Module Area East

Name	Arbitrary Building 03-Module Area East	
PV Modules	265 x TSM-455DE17M (II) (v1)	
Manufacturer	Trina Solar	
Inclination	10	°
Orientation	East 75	°
Installation Type	Mounted - Roof	
PV Generator Surface	579,3	m²

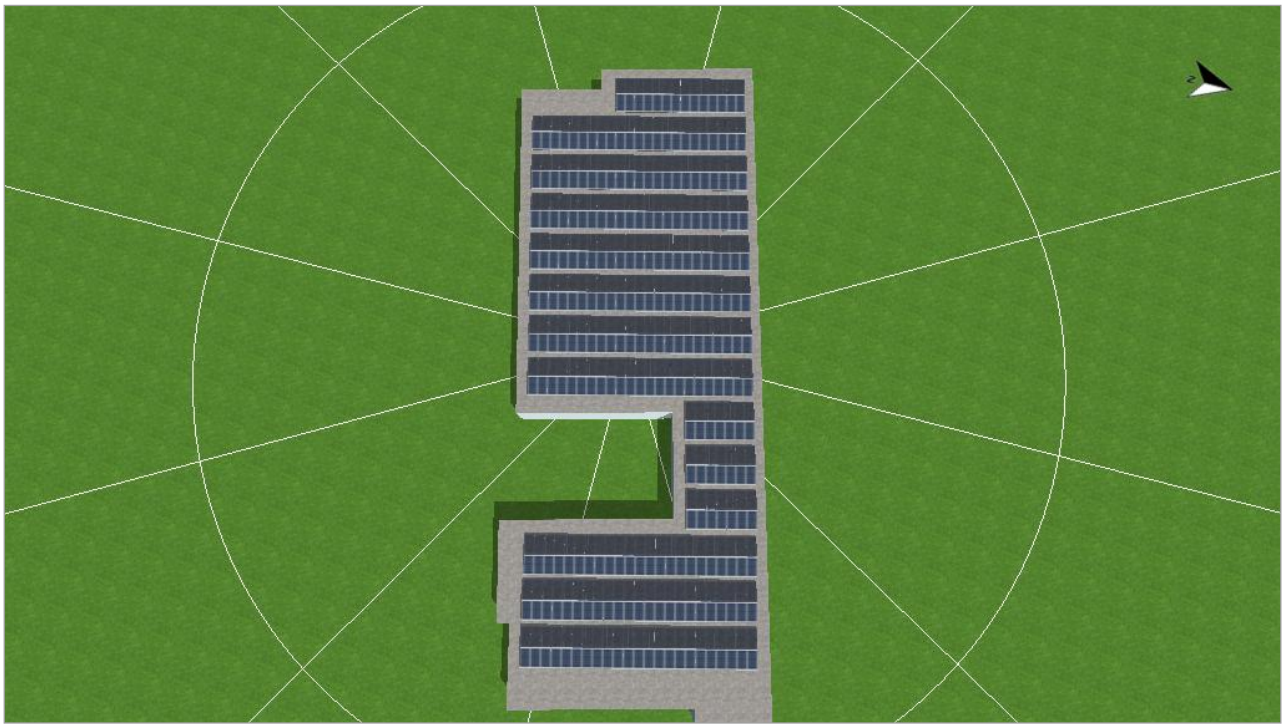


Figure: 1. Module Area - Arbitrary Building 03-Module Area East

2. Module Area - Arbitrary Building 03-Module Area West

PV Generator, 2. Module Area - Arbitrary Building 03-Module Area West

Name	Arbitrary Building 03-Module Area West	
PV Modules	265 x TSM-455DE17M (II) (v1)	
Manufacturer	Trina Solar	
Inclination	10	°
Orientation	West 256	°
Installation Type	Mounted - Roof	
PV Generator Surface	579,3	m²

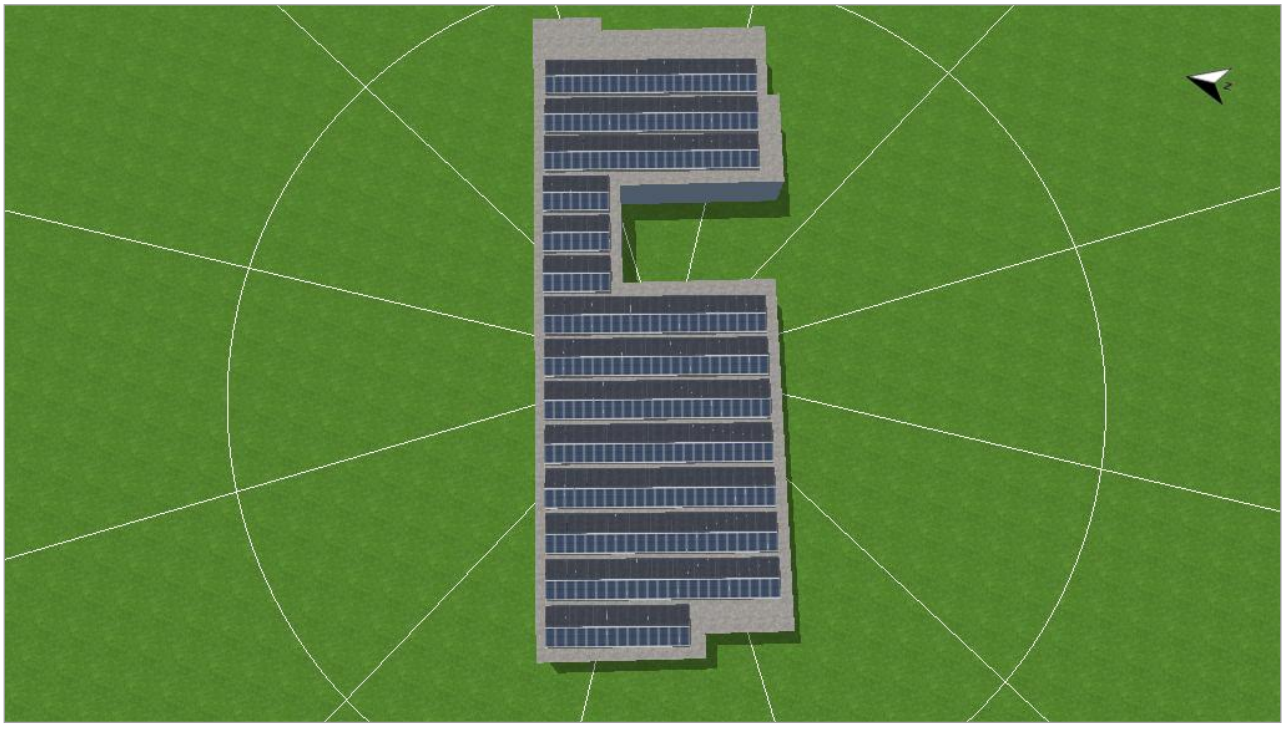


Figure: 2. Module Area - Arbitrary Building 03-Module Area West

Horizon Line, 3D Design

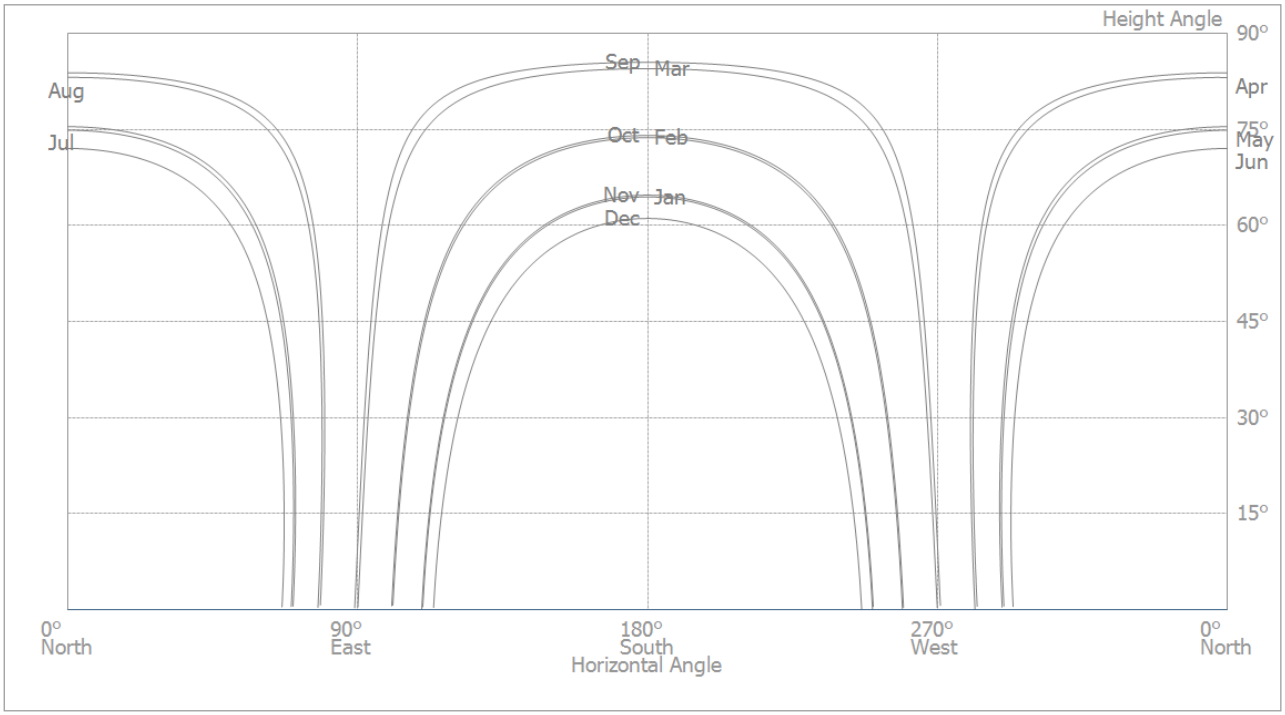


Figure: Horizon (3D Design)

Inverter configuration

Configuration 1

Module Areas	Arbitrary Building 03-Module Area East + Arbitrary Building 03-Module Area West
Inverter 1	
Model	SUN2000-36KTL(400Vac) (v1)
Manufacturer	Huawei Technologies
Quantity	5
Sizing Factor	134 %
Configuration	MPP 1: 2 x 17
	MPP 2: 1 x 19
	MPP 3: 2 x 17
	MPP 4: 1 x 19

AC Mains

AC Mains

Number of Phases	3
Mains voltage between phase and neutral	230 V
Displacement Power Factor (cos phi)	+/- 1

Simulation Results

Results Total System

PV System		
PV Generator Output	241,15	kWp
Spec. Annual Yield	1 559,81	kWh/kWp
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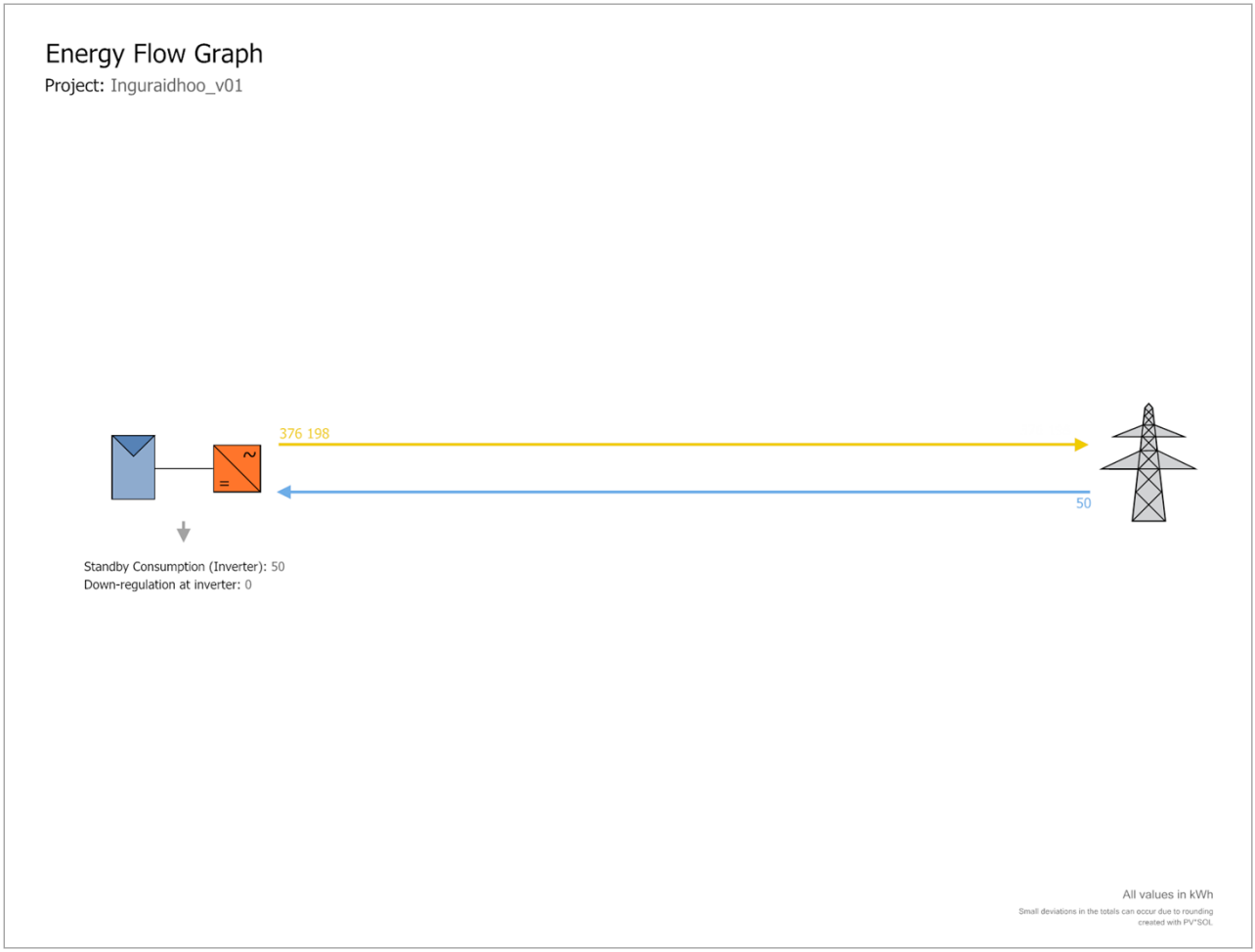

Figure: Energy flow

PV System Energy Balance

PV System Energy Balance

Global radiation - horizontal	**2 020,02**	**kWh/m²**	
Deviation from standard spectrum	-20,20	kWh/m²	-1,00 %
Ground Reflection (Albedo)	3,04	kWh/m²	0,15 %
Orientation and inclination of the module surface	-25,61	kWh/m²	-1,28 %
Module-independent shading	0,00	kWh/m²	0,00 %
Reflection on the Module Interface	-166,26	kWh/m²	-8,41 %
Global Radiation at the Module	**1 810,99**	**kWh/m²**	
	1 810,99	kWh/m²	
	x 1158,622	m²	
	= 2 098 255,84	kWh	
Global PV Radiation	**2 098 255,84**	**kWh**	
Soiling	0,00	kWh	0,00 %
STC Conversion (Rated Efficiency of Module 20,84 %)	-1 660 890,12	kWh	-79,16 %
Rated PV Energy	**437 365,71**	**kWh**	
Module-specific Partial Shading	-2 034,84	kWh	-0,47 %
Low-light performance	-6 422,54	kWh	-1,48 %
Deviation from the nominal module temperature	-32 902,44	kWh	-7,67 %
Diodes	-74,85	kWh	-0,02 %
Mismatch (Manufacturer Information)	-7 918,62	kWh	-2,00 %
Mismatch (Configuration/Shading)	-137,60	kWh	-0,04 %
PV Energy (DC) without inverter down-regulation	**387 874,83**	**kWh**	
Failing to reach the DC start output	-11,71	kWh	0,00 %
Down-regulation on account of the MPP Voltage Range	0,00	kWh	0,00 %
Down-regulation on account of the max. DC Current	0,00	kWh	0,00 %
Down-regulation on account of the max. DC Power	0,00	kWh	0,00 %
Down-regulation on account of the max. AC Power/cos phi	-3 690,01	kWh	-0,95 %
MPP Matching	-215,77	kWh	-0,06 %
PV energy (DC)	**383 957,34**	**kWh**	
Energy at the Inverter Input	**383 957,34**	**kWh**	
Input voltage deviates from rated voltage	-926,30	kWh	-0,24 %
DC/AC Conversion	-6 832,64	kWh	-1,78 %
Standby Consumption (Inverter)	-49,72	kWh	-0,01 %
Total Cable Losses	0,00	kWh	0,00 %
PV energy (AC) minus standby use	**376 148,68**	**kWh**	
PV Generator Energy (AC grid)	**376 198,40**	**kWh**	