

CONSULTANCY SERVICES FOR SURVEY, DESIGN AND EIA WORKS OF WATER SUPPLY AND
SEWERAGE FACILITIES IN 6 ISLANDS, MALDIVES

PACKAGE 5

WATER SUPPLY SYSTEM OF TH.DHIYAMIGILI, MALDIVES

For Ministry of National Planning and Housing Infrastructure, Republic of Maldives

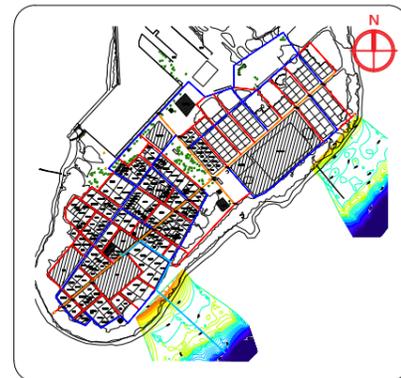
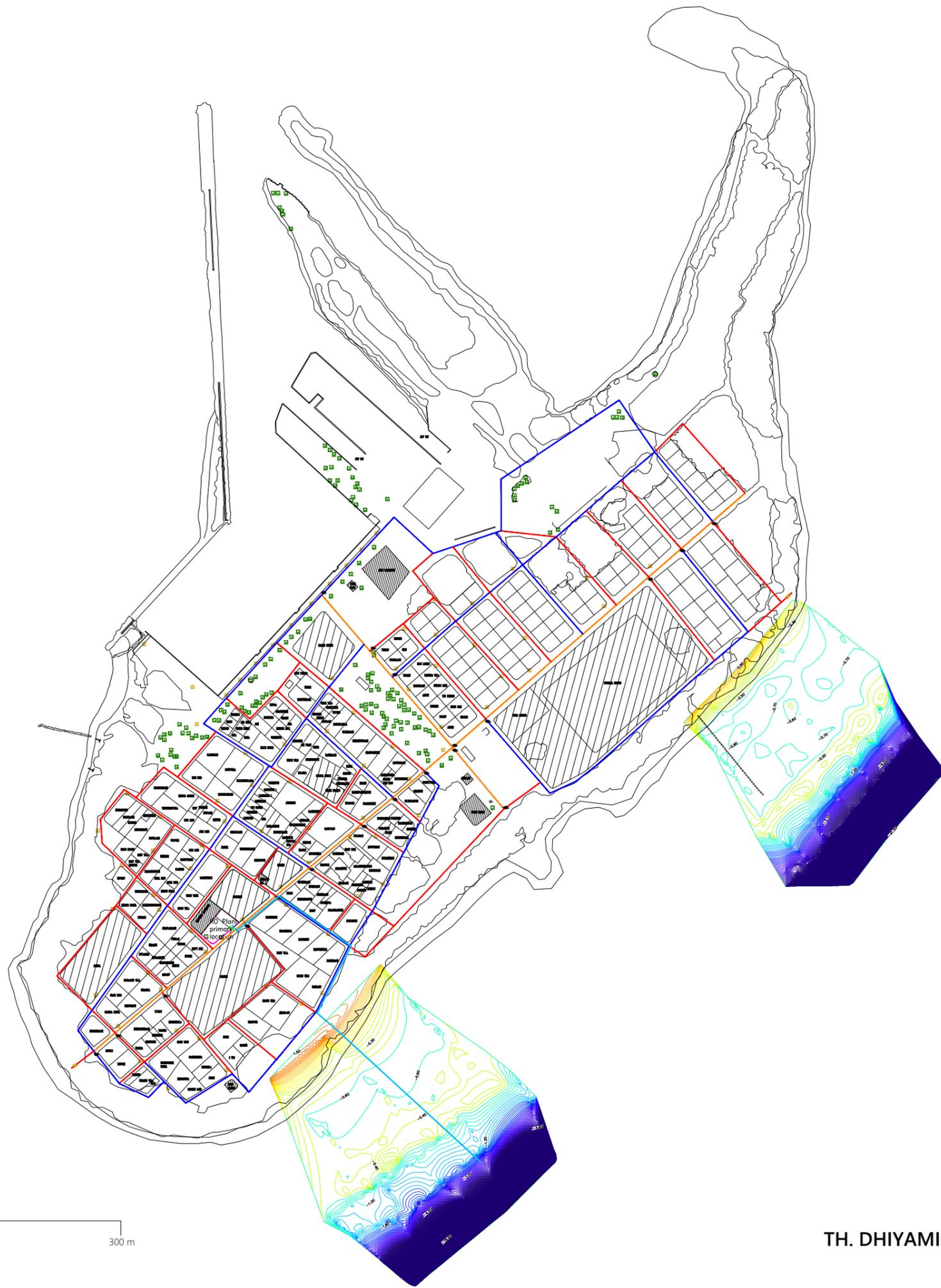


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FEEDBACK INFRA
Making Infrastructure Happen

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Legend

- Ø83 HDPE Water Main Distribution Pipe
- Ø90 HDPE Water Main Distribution Pipe
- Ø110 HDPE Water Main Distribution Pipe
- Ø110 HDPE Brine Outfall Pipe
- Gate Valves
- Junction
- Ø75 HDPE Water Main Distribution Pipe
- Ø110 HDPE Water Main Distribution Pipe
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- Washout Valves

- Notes:
1. All levels are shown in meters.
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 8. Minimum size of the house service line shall be OD 25mm PE100, PN16, SDR11 HDPE pipe.
 9. Minimum size of commercial and other institutional connection service line shall be 50mm, PE100, PN16, SDR11 HDPE pipe.

MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	3497	HDPE (PE100,PN10,SDR17)
75	2825	
110	1506	
160	6	
Total	7334	

Gate Valves	- 19 nos
Washout Valves	- 02 nos

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	- 226m (on land), 168m (offshore)	HDPE (PE100,PN10,SDR11)

ROD	JUNE 2020	STAGE -1	PD	SBC	SD
REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5

Sub Title:
Water Supply System in Th. Dhiyamigili

Client:
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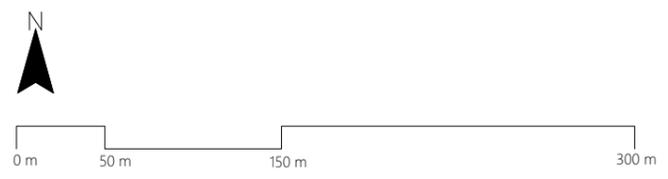
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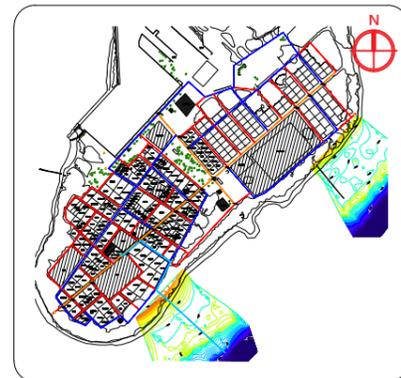
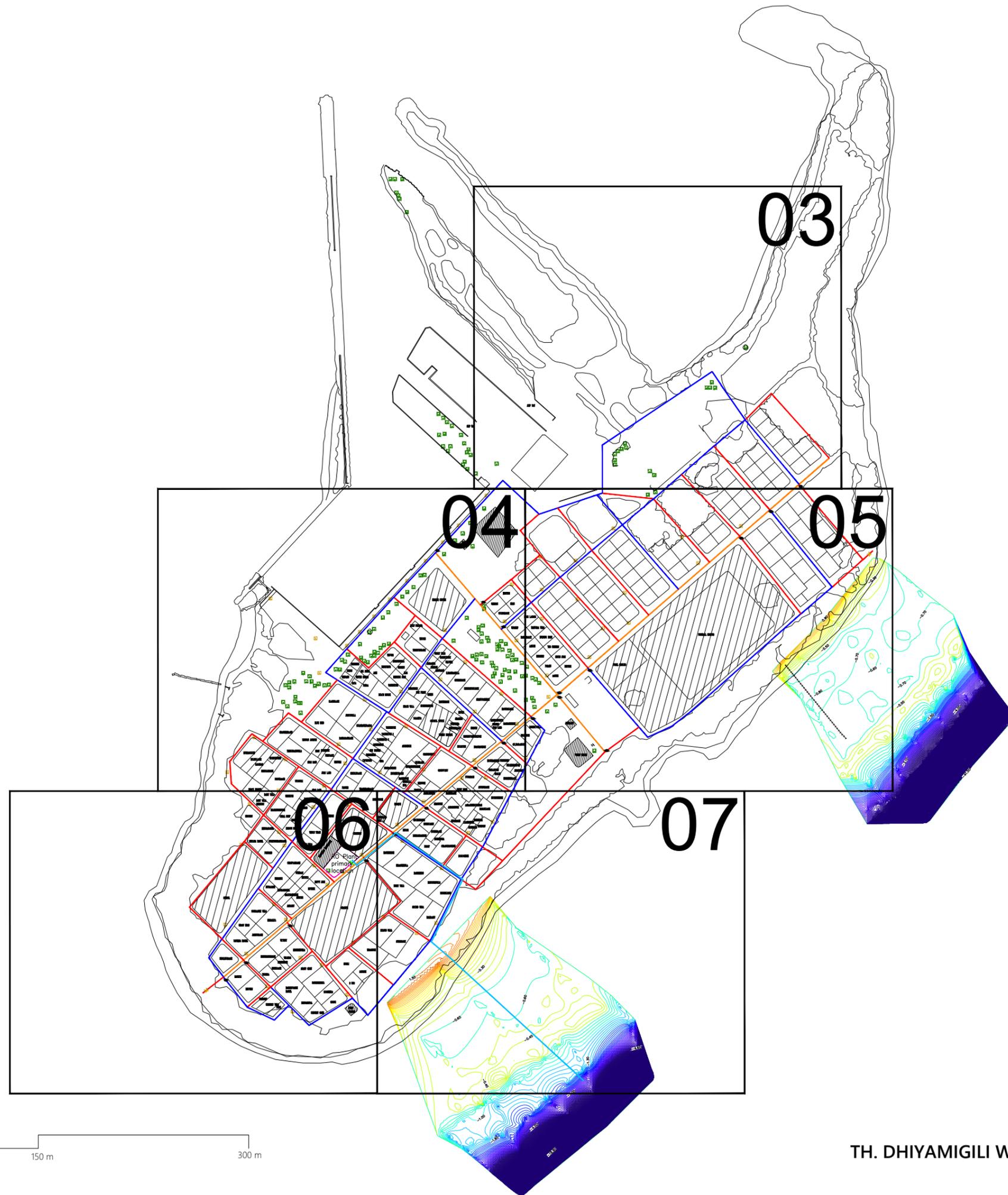
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TH. DHIYAMIGILI WATER NETWORK LAYOUT

1:4000



Legend

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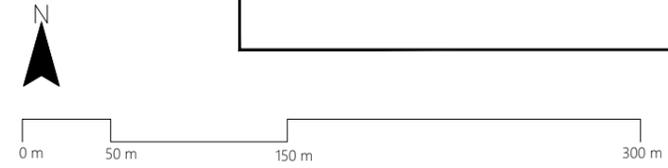
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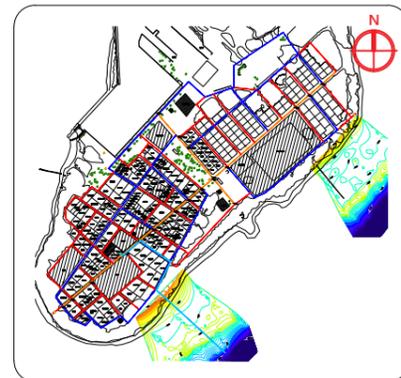
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TH. DHIYAMIGILI WATER NETWORK ZONE LAYOUT

1:4000



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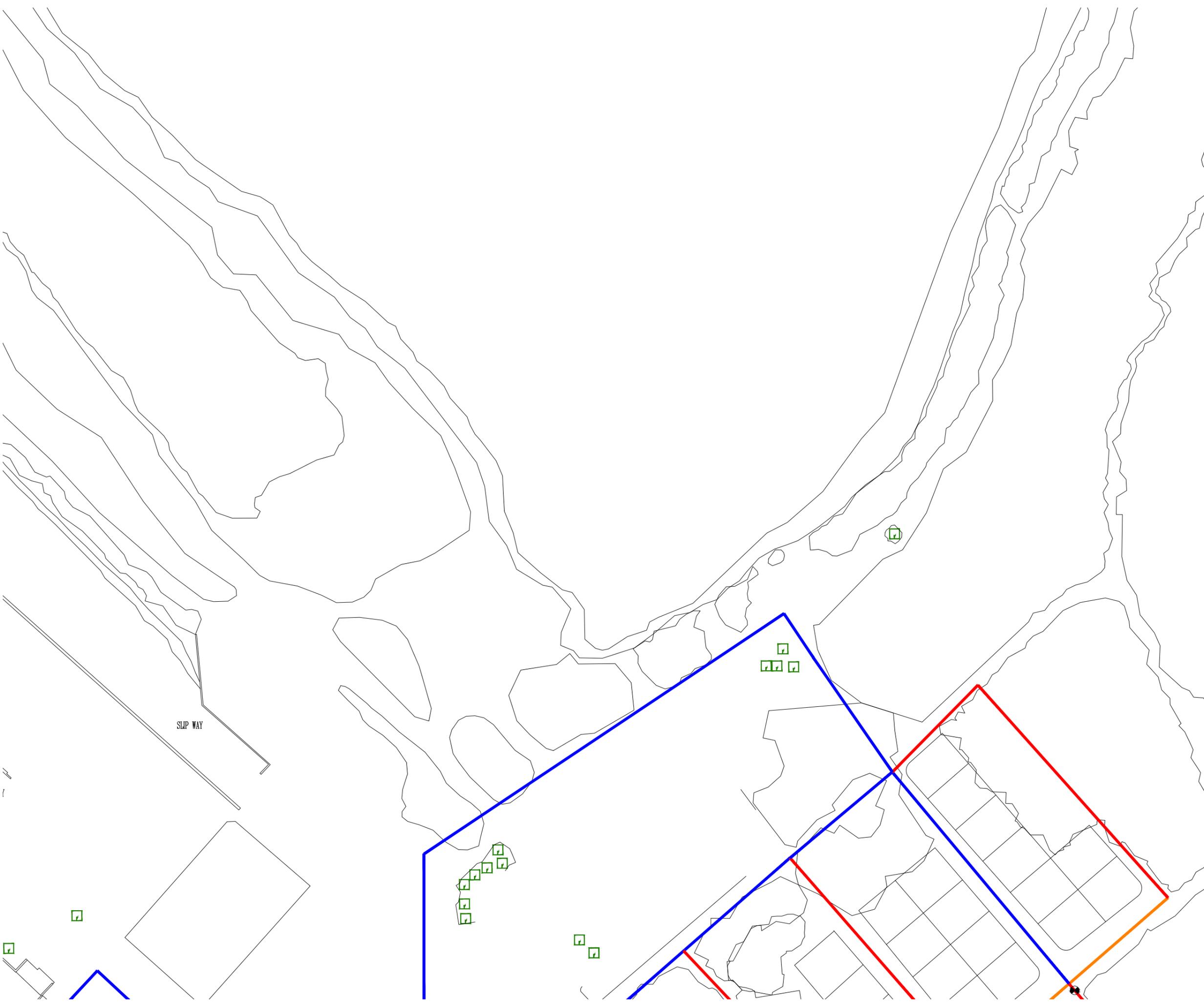


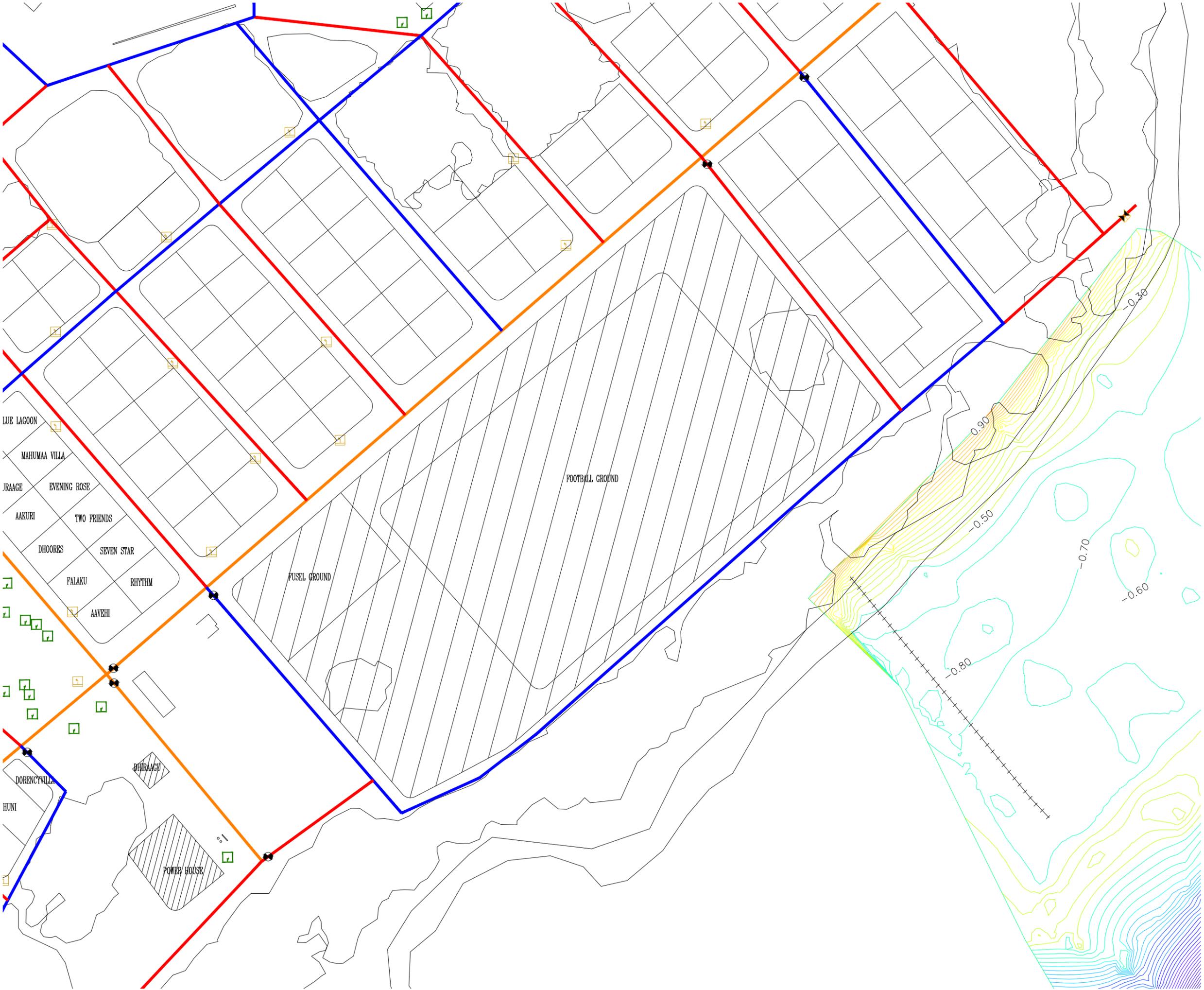
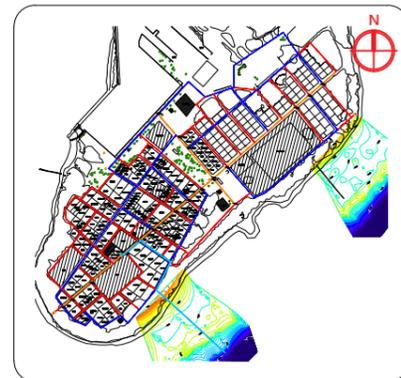
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Project No: EP-WS/2019/05	Page: 03
Rev: R-01	





Legend

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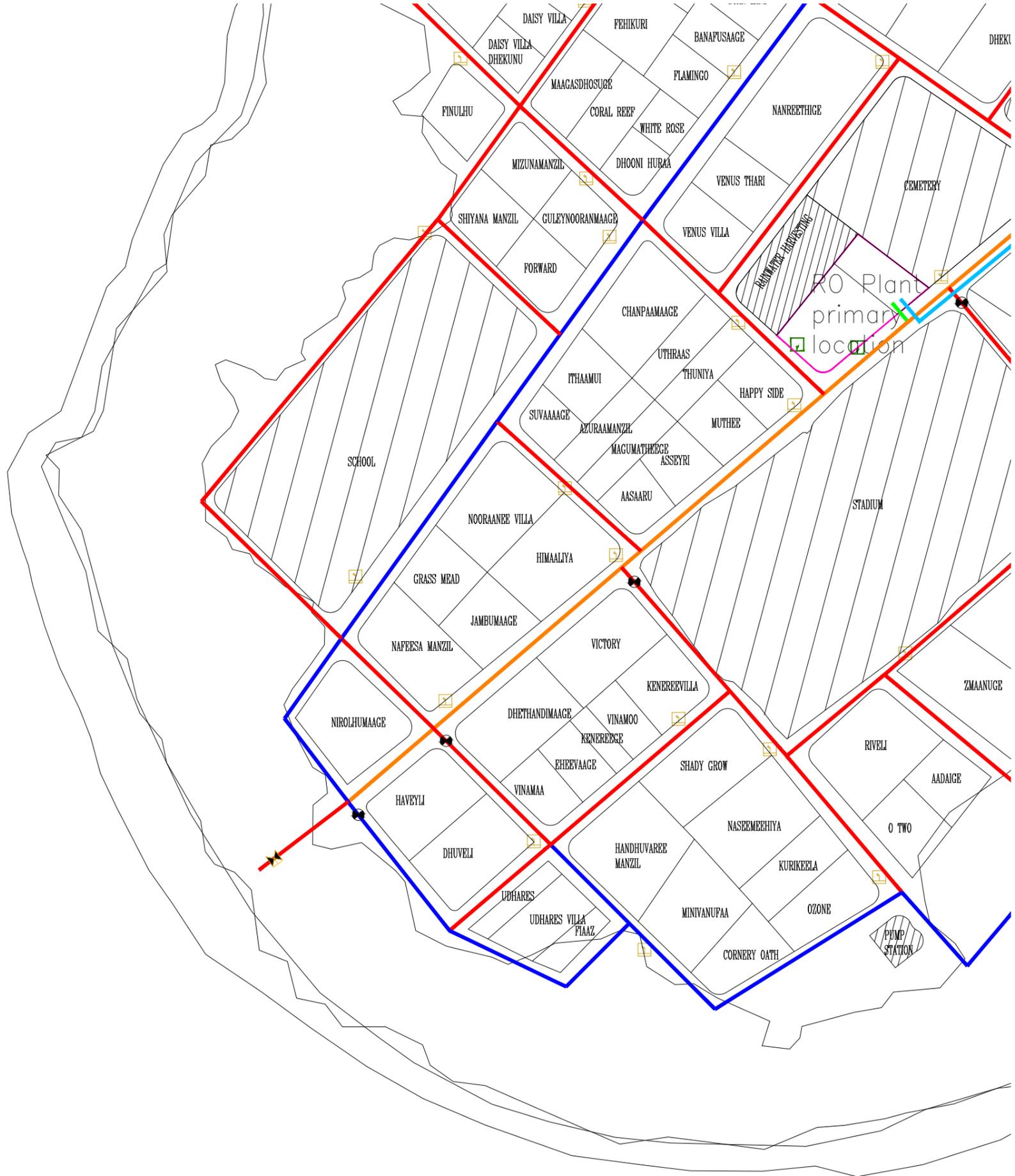
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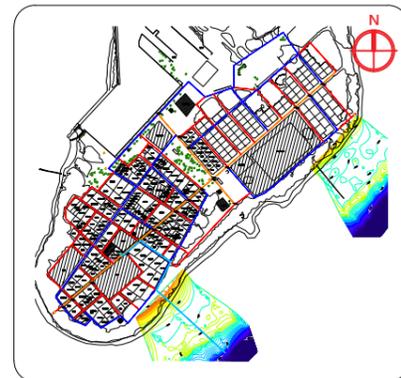
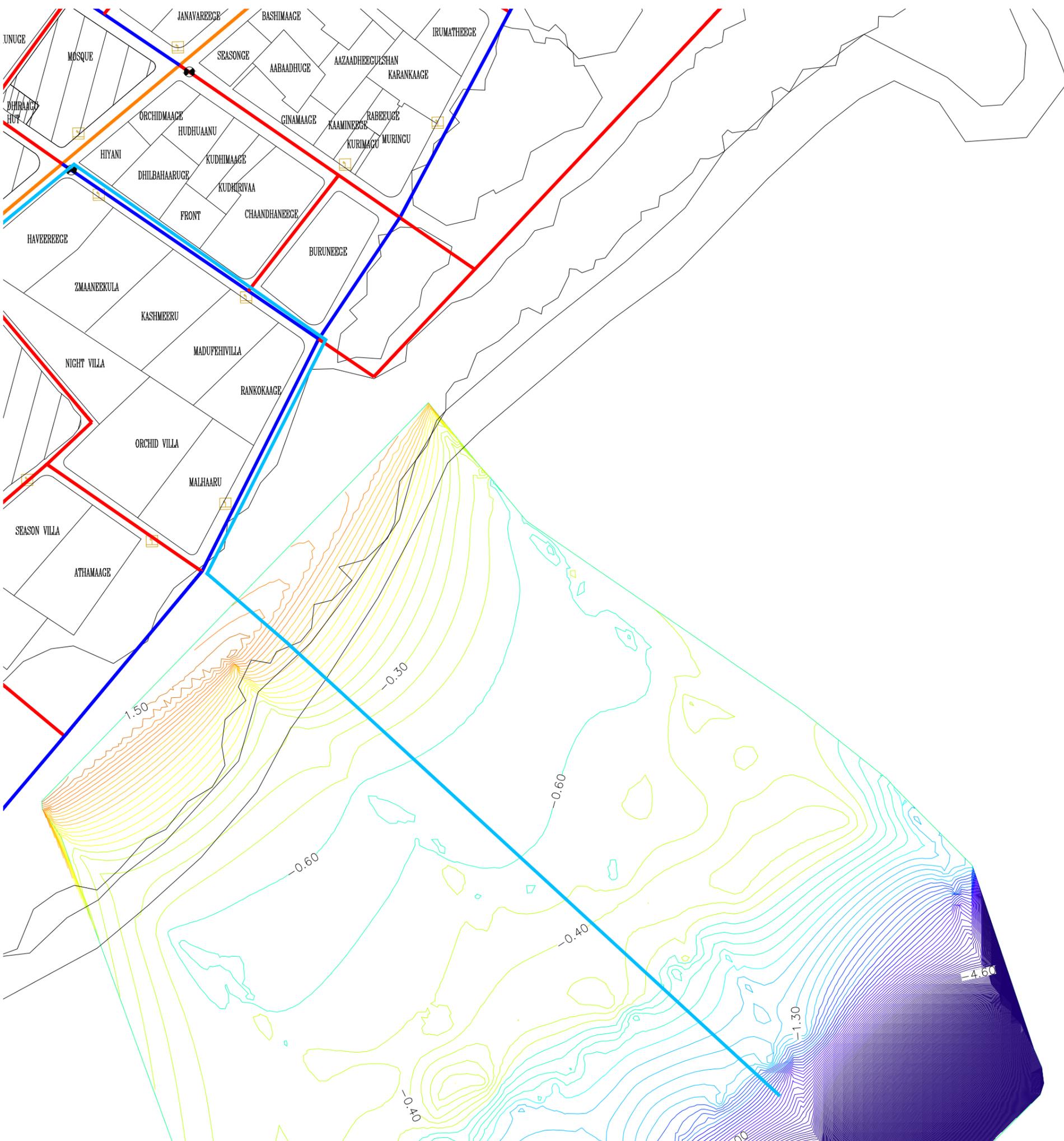
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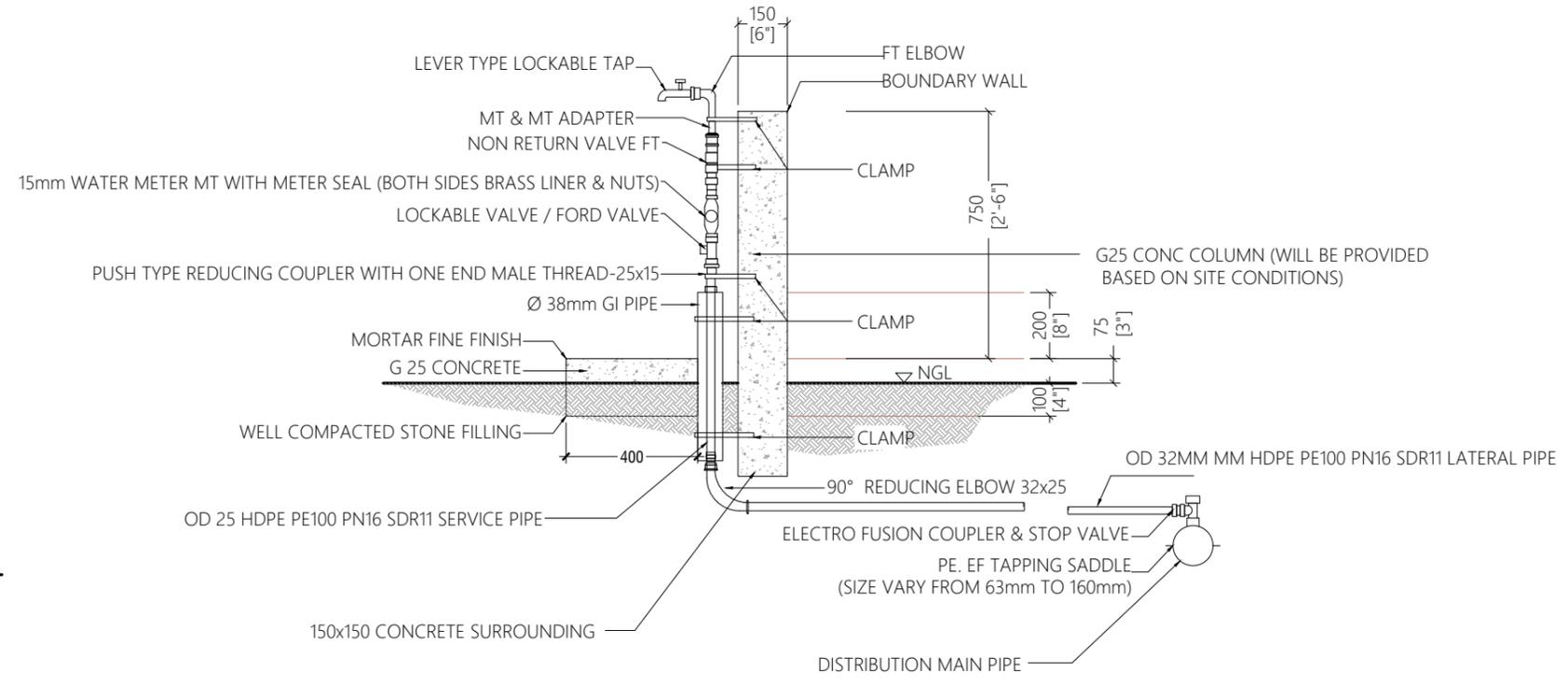
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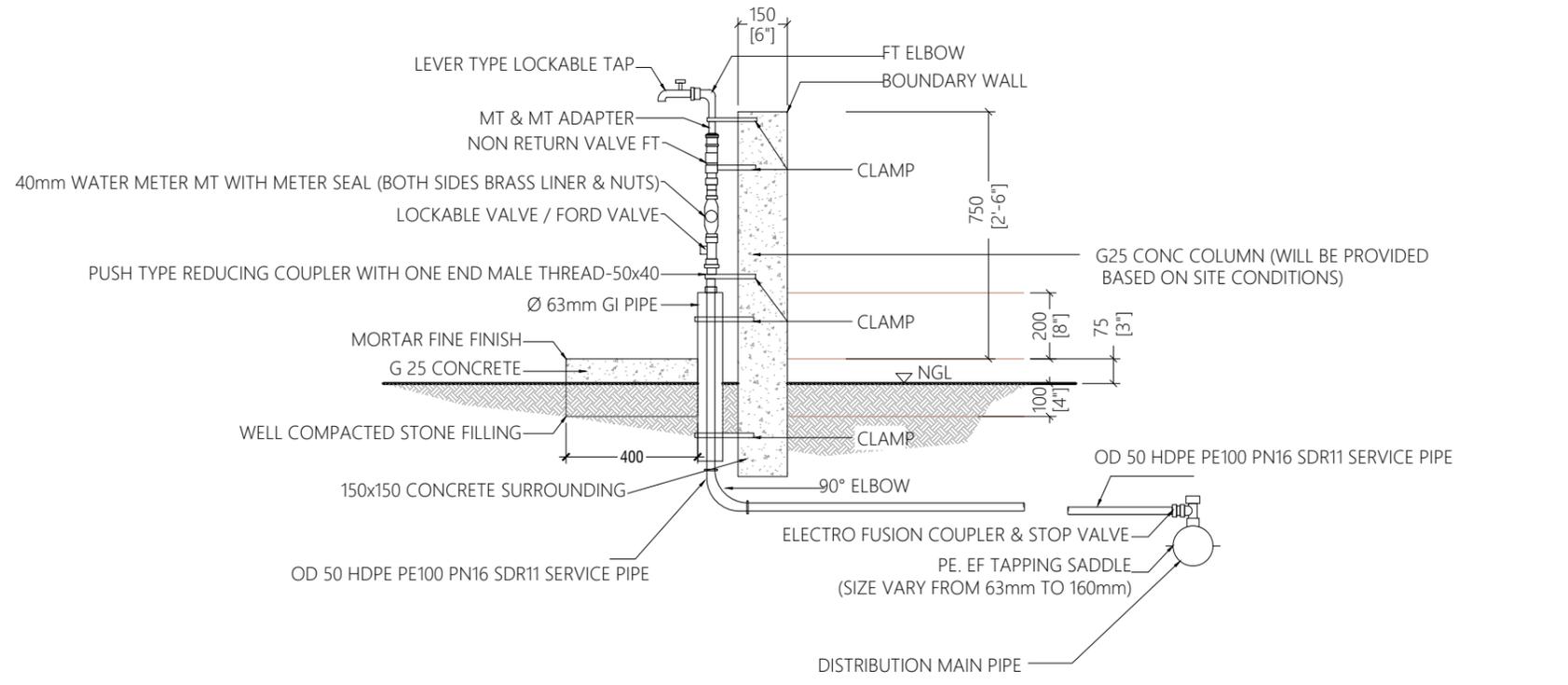
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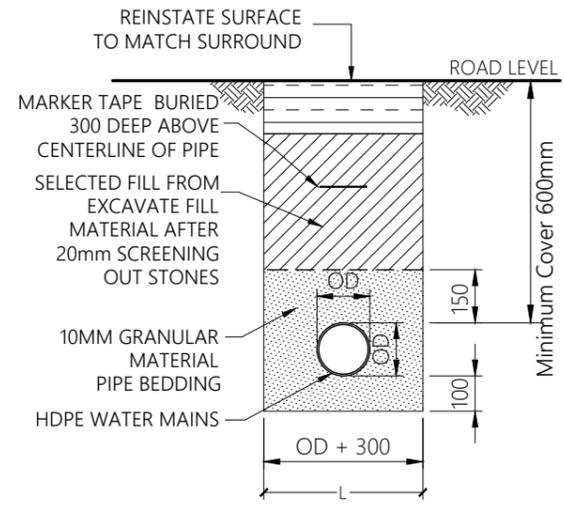
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WATER SUPPLY HOUSE CONNECTION DETAILS



WATER SUPPLY COMMERCIAL/INSTITUTIONAL CONNECTION DETAILS



TRENCH & BEDDING DETAILS

WATER SUPPLY HOUSE AND COMMERCIAL/INSTITUTIONAL CONNECTIONS

1:20

Legend

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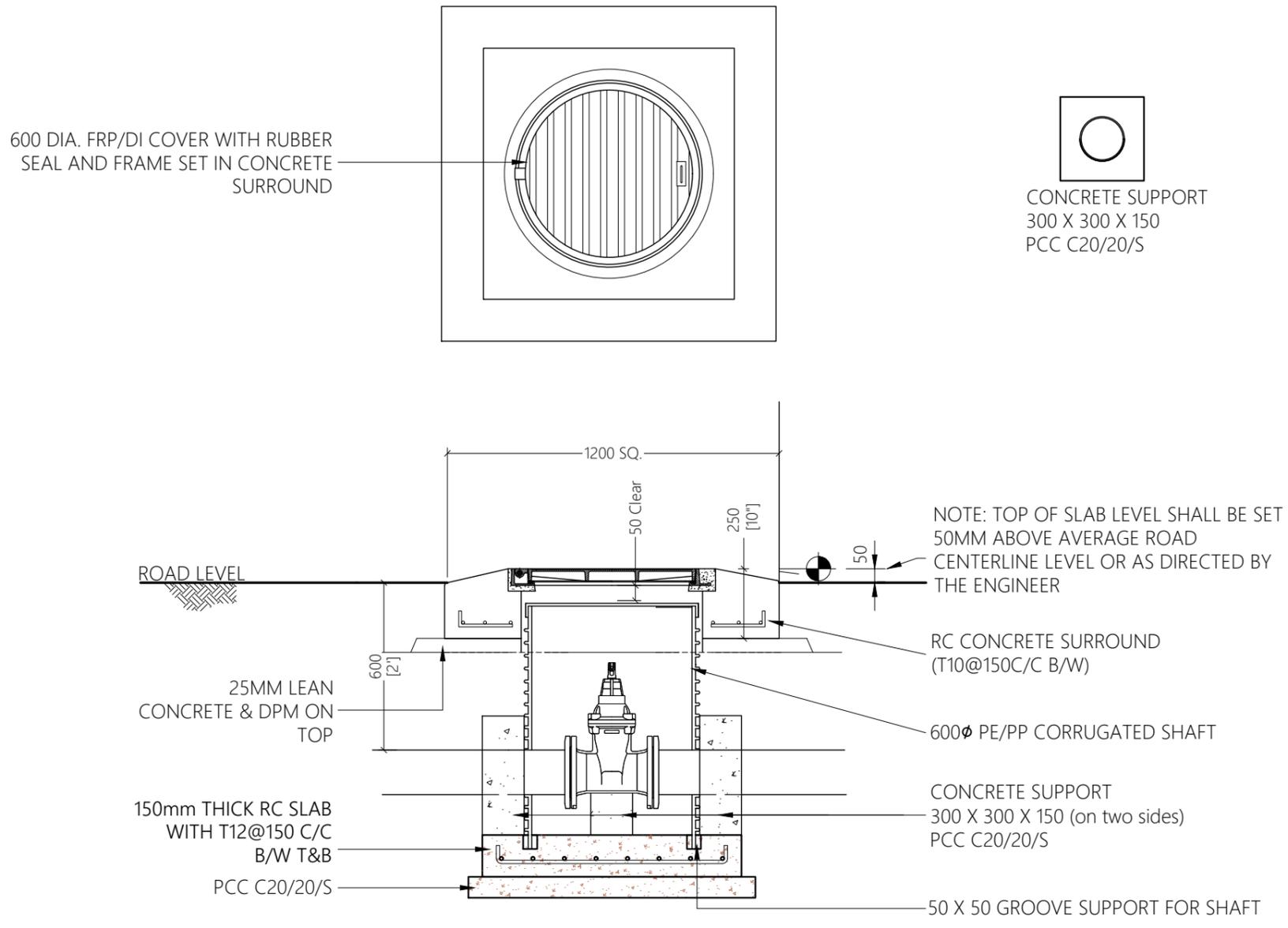
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SECTION - VALVE CHAMBER

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VALVE CHAMBER DETAILS

1:20



PUMP DETAILS

Borehole Pump : 2 Nos
 - Flow (Q) = 16.7 m³/hr
 - Head (h) = 50 m

High Pressure Pump : 2 Nos
 - Flow (Q) = 8.34 m³/hr
 - Pressure Range = 45-65 bar

Transfer Pump : 2 Nos
 - Flow (Q) = 7.5 m³/hr
 - Head (h) = 34 m

Distribution Pump Set : 2 Nos
 - Flow (Q) = 11.6 m³/hr
 - Head (h) = 30 m

Brine Pump : 2 Nos
 - Flow (Q) = 11.67 m³/hr
 - Head (h) = 16 m

- Gate Valve
- Check Valve
- Totalizer
- Pump
- Closed Gate Valve
- Sampling Point
- Butterfly Valve
- Ball Valve

- Legend**
- Ø90 HDPE (PE100, PN10, SDR17)
 - Ø63 HDPE (PE100, PN10, SDR17)
 - Ø110 HDPE (PE100, PN10, SDR17)
 - Ø160 HDPE (PE100, PN10, SDR17)
 - Ø110 HDPE (OUTFALL PE100, PN16, SDR11)

- Notes:**
- All Pump sizes are based on 15 year demands.
 - Rainwater collection Pump sizing is done considering Maximum Rainfall intensity of 50mm/hr.
 - UF feed pump will be subject to Approved UF Plant suppliers approval.
 - Both Feed Pump and High pressure pump capacity will need to be approved by the approved RO plant Supplier. The working pressure range will be established based on the approved suppliers requirements.
 - Distribution Pump set will have Variable Frequency Drive.
 - All pump control float switches and automated valves will be provided.
 - Rainwater transfer pump to be placed in existing RWH UF shed.
 - 63mm pipe from existing rainwater harvesting system is connected to the degassifier.

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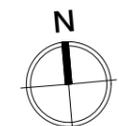
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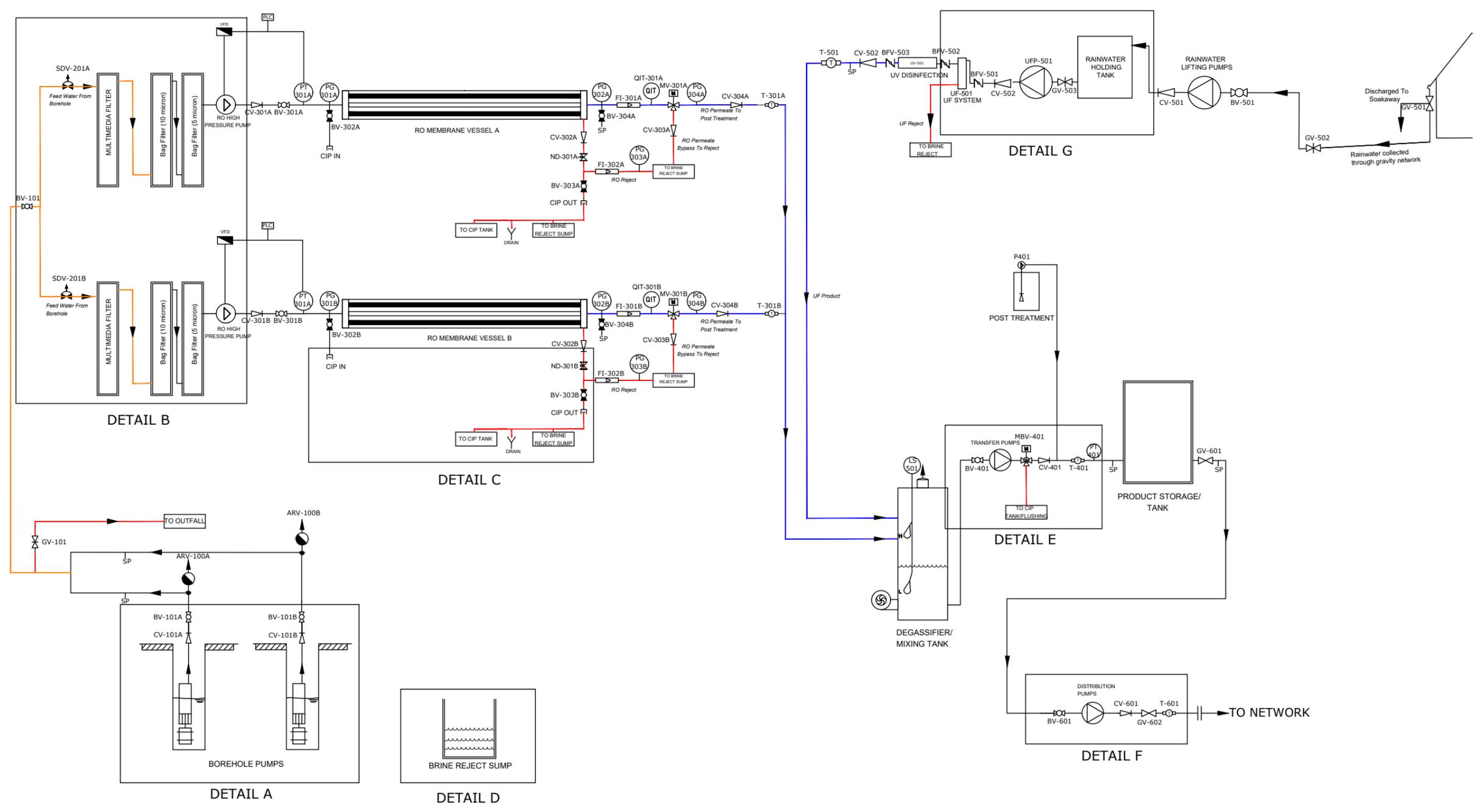
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INTERNAL PIPE LAYOUT
 1:200





Legend

- FEED LINE
- REJECT LINE
- PRODUCT LINE

Note:

- CPVC pipe with PN10 rating to be used for the internal pipeline of the plant except for high pressure area (HPP to MV).
- From HPP to MV SS316 piping to be used.
- CPVC pipe with PN16 rating to be used for pipe fittings.
- CPVC pipe with SDR ratio 17 ratio to be used for network.
- HPP used to have a self cooled radial piston.
- CF filters to have a plastic housing with SS304 bolt fittings at connections.
- MM filters to be sized with 32" height by 7" diameter housing.
- Borehole Pumps set to include Variable Frequency Drive (VFD)

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

LEGEND					
ACTUATION	VALVES		FEATURES	CONDITION	ABBREVIATIONS
T	MANUALLY OPERATED	BUTTERFLY	MOTORIZED BALL	FLANGED CONNECTION	LS - LEVEL SENSOR
PNEUMATIC DIAPHRAGM - SINGLE ACTING	BALL	TORTALIZER	TRAP	VALVE NORMALLY OPEN	FT - FLOW TRANSMITTER
PNEUMATIC DIAPHRAGM - DOUBLE ACTING	DIAPHRAGM	GATE	DISCHARGE TO ATMOSPHERE	VALVE NORMALLY CLOSED	PI - PRESSURE INDICATOR
PNEUMATIC PISTON	3-WAY	CHECK VALVE	SAMPLING POINT		SP - SAMPLING POINT
	SLUICE	MOTORIZED 3 WAY	FLOW INDICATOR		AR - AIR RELEASE

IWRM PLANT P&I OVERVIEW

NTS

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5

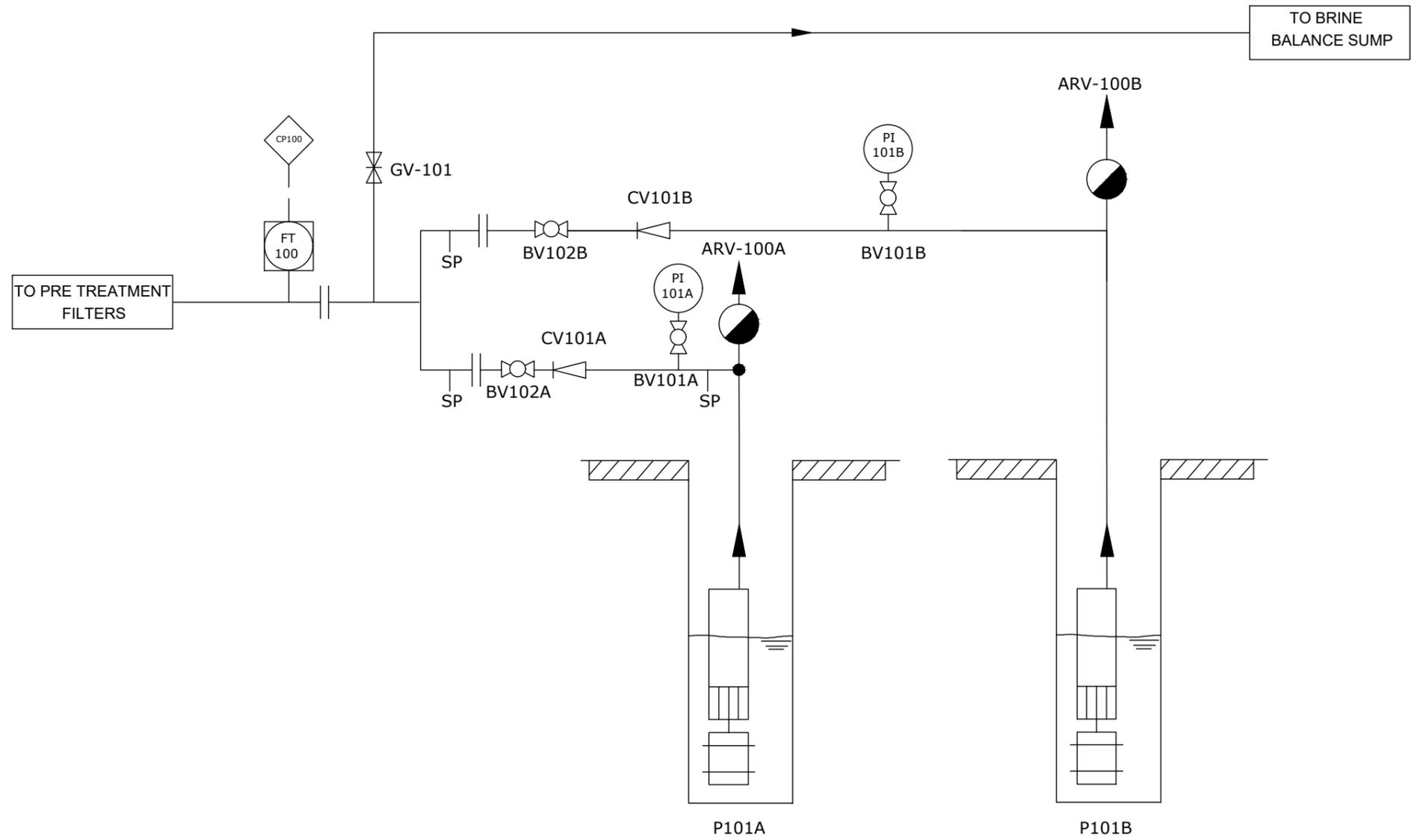
Sub Title:
Water Supply System in Th. Dhiyamigili

Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives

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W: www.epoch.associates
A: G. Rosary West, Husnuheena Magu, Male', Maldives

FEEDBACK INFRA
Making Smart Infrastructure Happen

Drawn: F.I.A. Checked: M.S.S.
Designed: F.I.A. Approved: I.W.
Date: Sep 2020 SCALE (A3): NTS
Project No: EP-WS/2019/05
Rev: R-01 Page: W-05



BOREHOLE PUMPS

DETAIL A

LEGEND					
ACTUATION	VALVES		FEATURES	CONDITION	ABBREVIATIONS
	MANUALLY OPERATED	BUTTERFLY	MOTORIZED BALL	FLANGED CONNECTION	LS - LEVEL SENSOR FT - FLOW TRANSMITTER PI - PRESSURE INDICATOR SP - SAMPLING POINT AR - AIR RELEASE P - PUMP PG - PRESSURE GAUGE PS - PRESSURE SENSOR CP - CONNECTION POINT LT - LEVEL TRANSMITTER QIT - CONDUCTIVITY INDICATOR PLC - PROGRAMMABLE LOGIC CONTROLLER
	PNEUMATIC DIAPHRAGM - SINGLE ACTING	BALL	TORTALIZER	TRAP	
	PNEUMATIC DIAPHRAGM - DOUBLE ACTING	DIAPHRAGM	GATE	DISCHARGE TO ATMOSPHERE	
	PNEUMATIC PISTON	3-WAY	CHECK VALVE	SAMPLING POINT	
		SLUICE	MOTORIZED 3 WAY	FLOW INDICATOR	
				VALVE NORMALLY OPEN	
				VALVE NORMALLY CLOSED	

Legend

Note:
- Borehole pumps to be controlled by Variable Frequency Drive (VFD)

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5

Sub Title:
Water Supply System in Th. Dhiyamigili

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Drawn: F.I.A. Checked: M.S.S.

Designed: F.I.A. Approved: I.W.

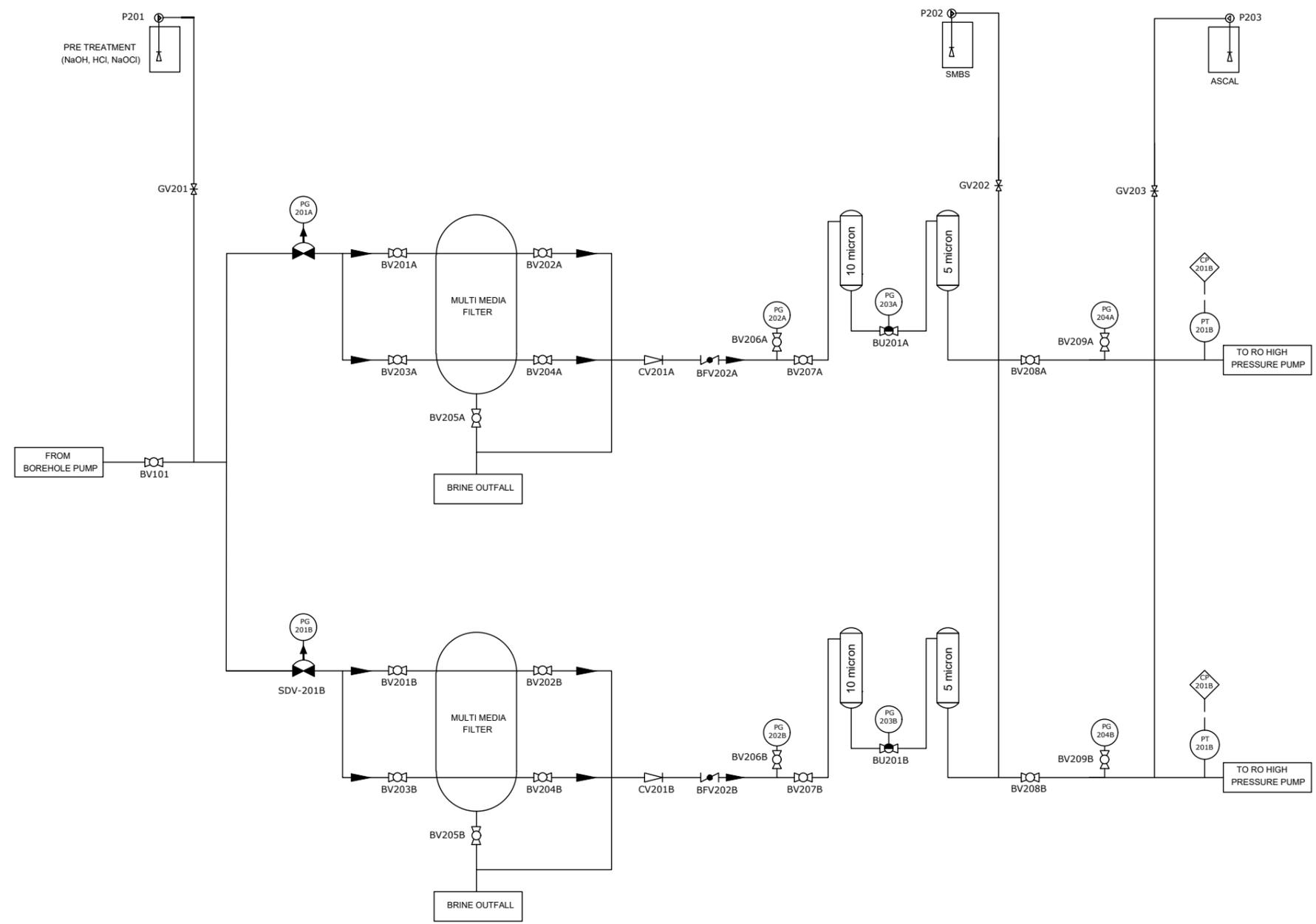
Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

Rev: R-01 Page: W-06

IWRM PLANT P&I DETAIL A

NTS



DETAIL B

LEGEND				
ACTUATION	VALVES	FEATURES	CONDITION	ABBREVIATIONS
	MANUALLY OPERATED	BUTTERFLY	MOTORIZED BALL	LS - LEVEL SENSOR FT - FLOW TRANSMITTER PI - PRESSURE INDICATOR SP - SAMPLING POINT AR - AIR RELEASE P - PUMP PG - PRESSURE GAUGE PS - PRESSURE SENSOR CP - CONNECTION POINT LT - LEVEL TRANSMITTER QIT - CONDUCTIVITY INDICATOR PLC - PROGRAMMABLE LOGIC CONTROLLER
	PNEUMATIC DIAPHRAGM - SINGLE ACTING	BALL	TORTALIZER	
	PNEUMATIC DIAPHRAGM - DOUBLE ACTING	DIAPHRAGM	GATE	
	PNEUMATIC PISTON	3-WAY	CHECK VALVE	
		SLUICE	MOTORIZED 3 WAY	
		FLANGED CONNECTION	VALVE NORMALLY OPEN	
		TRAP	VALVE NORMALLY CLOSED	
		DISCHARGE TO ATMOSPHERE		
		SAMPLING POINT		
		FLOW INDICATOR		

Legend

- Note:**
- SMBS Pre dosing chemical to be used only if Chlorine based dosing chemical is added prior to filtration.
 - Union valve to be connected in between the two cartridge filters.
 - MM filters to be controlled manually.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5

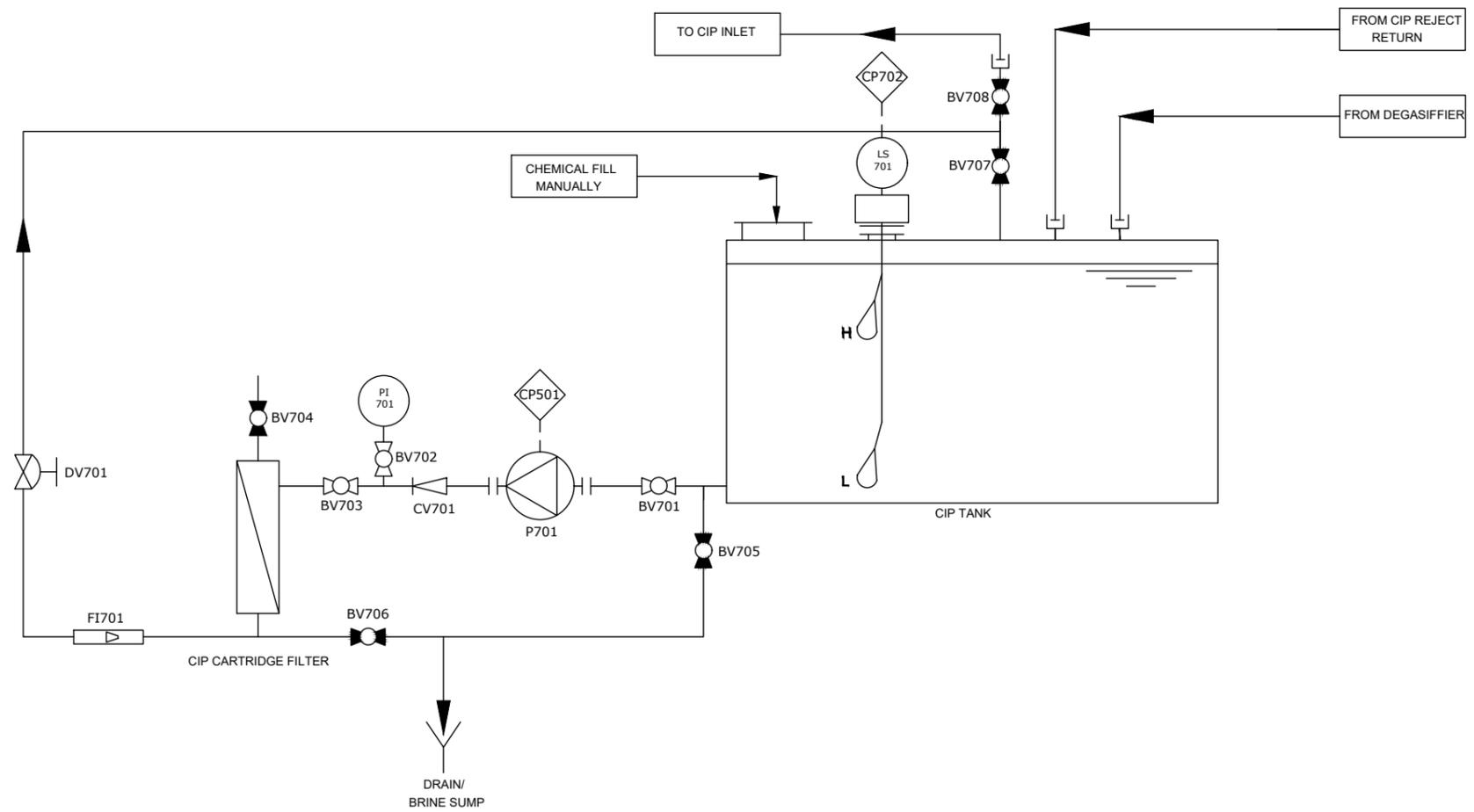
Sub Title:
Water Supply System in Th. Dhiyamigili

Client:
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Designed: F.I.A.	Approved: I.W.
Date: Sep 2020	SCALE (A3): NTS
Project No: EP-WS/2019/05	
Rev: R-01	Page: W-07



DETAIL C

LEGEND					
ACTUATION	VALVES		FEATURES	CONDITION	ABBREVIATIONS
		BUTTERFLY		MOTORIZED BALL	LS - LEVEL SENSOR FT - FLOW TRANSMITTER PI - PRESSURE INDICATOR SP - SAMPLING POINT AR - AIR RELEASE P - PUMP PG - PRESSURE GAUGE PS - PRESSURE SENSOR CP - CONNECTION POINT LT - LEVEL TRANSMITTER QIT - CONDUCTIVITY INDICATOR PLC - PROGRAMMABLE LOGIC CONTROLLER
		BALL		TORTALIZER	
		DIAPHRAGM		GATE	
		3-WAY		CHECK VALVE	
		SLUICE		MOTORIZED 3 WAY	
				FLANGED CONNECTION	
				TRAP	
				DISCHARGE TO ATMOSPHERE	
				SAMPLING POINT	
				FLOW INDICATOR	
				VALVE NORMALLY OPEN	
				VALVE NORMALLY CLOSED	

Legend

Note:
- Flexible hose VIC connection to be used for during CIP use and flushing.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

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Sub Title:
Water Supply System in Th. Dhiyamigili

Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives

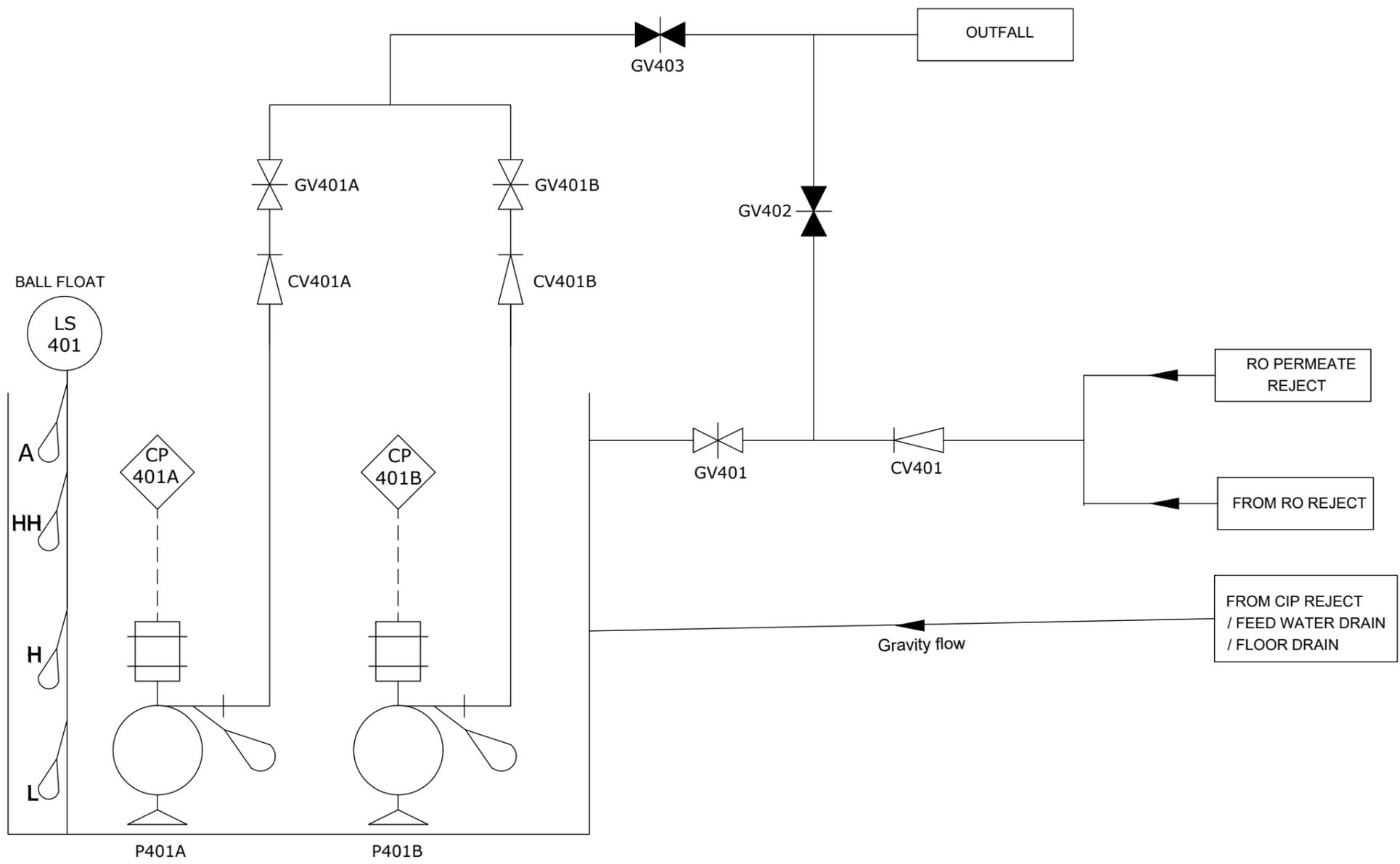
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Date: Sep 2020	SCALE (A3): NTS
Project No: EP-WS/2019/05	
Rev: R-01	Page: W-08

IWRM PLANT P&I DETAIL C

NTS



BRINE BALANCE SUMPS

DETAIL D

Legend

- Note:**
- Separate pipeline to be laid out connecting the drain points around the plant area, CIP reject and feed water drain.
 - Either Dry mount of submersible pumps to be used.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

LEGEND						
ACTUATION		VALVES		FEATURES	CONDITION	ABBREVIATIONS
T	MANUALLY OPERATED		BUTTERFLY		MOTORIZED BALL	LS - LEVEL SENSOR FT - FLOW TRANSMITTER PI - PRESSURE INDICATOR SP - SAMPLING POINT AR - AIR RELEASE P - PUMP PG - PRESSURE GAUGE PS - PRESSURE SENSOR CP - CONNECTION POINT LT - LEVEL TRANSMITTER QIT - CONDUCTIVITY INDICATOR PLC - PROGRAMMABLE LOGIC CONTROLLER
U	PNEUMATIC DIAPHRAGM - SINGLE ACTING		BALL		TORTALIZER	
			DIAPHRAGM		GATE	
			3-WAY		CHECK VALVE	
			SLUICE		MOTORIZED 3 WAY	
					FLANGED CONNECTION	
					TRAP	
					DISCHARGE TO ATMOSPHERE	
					SAMPLING POINT	
					FLOW INDICATOR	
					VALVE NORMALLY OPEN	
					VALVE NORMALLY CLOSED	

IWRM PLANT P&I DETAIL D

NTS

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5

Sub Title:
Water Supply System in Th. Dhiyamigili

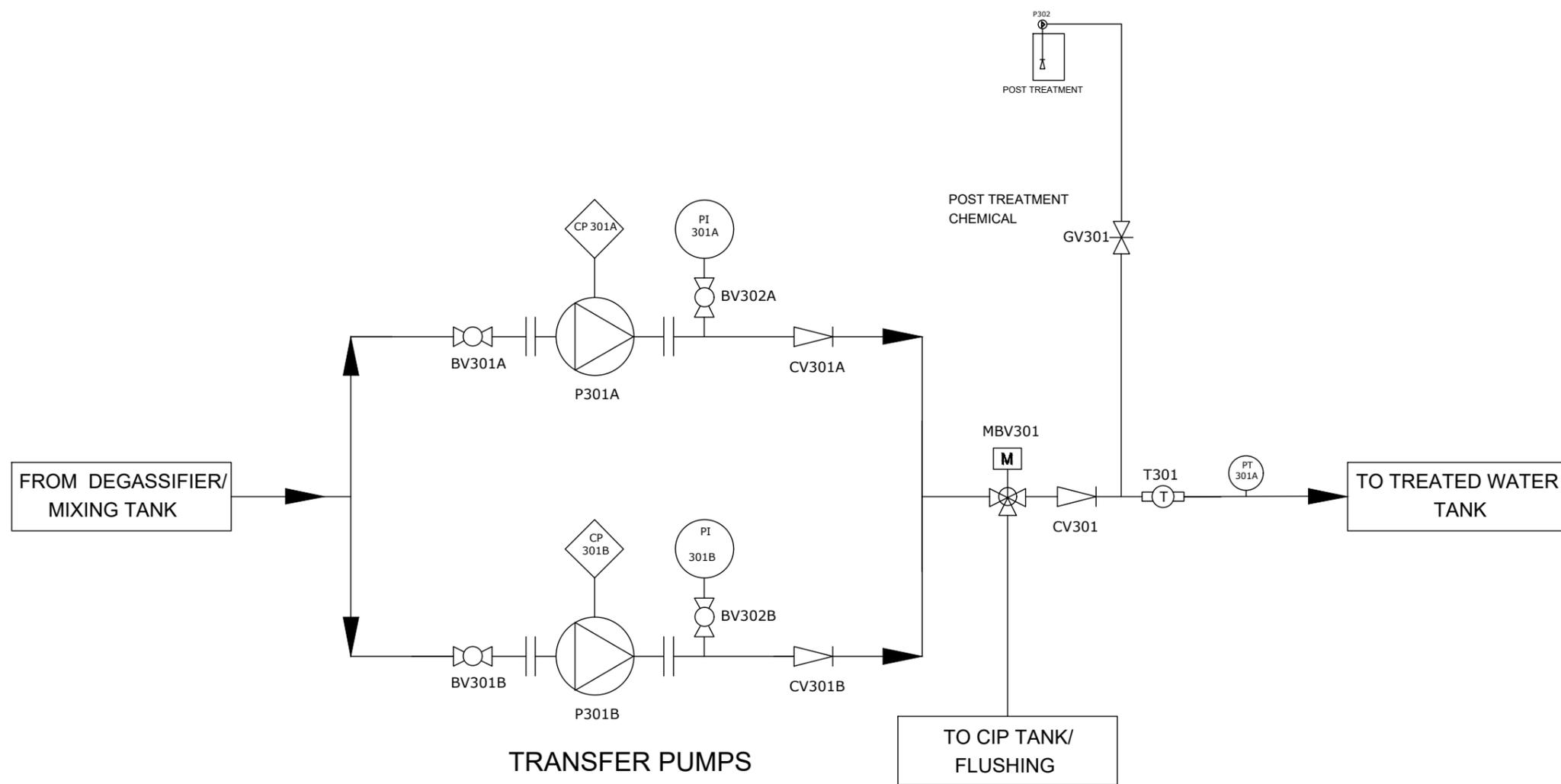
Client:
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Project No: EP-WS/2019/05	Page: R-01

W-09



DETAIL E

ACTUATION		VALVES		FEATURES		CONDITION		ABBREVIATIONS	
	MANUALLY OPERATED		BUTTERFLY		MOTORIZED BALL		FLANGED CONNECTION		VALVE NORMALLY OPEN
	PNEUMATIC DIAPHRAGM - SINGLE ACTING		BALL		TORTALIZER		TRAP		VALVE NORMALLY CLOSED
	PNEUMATIC DIAPHRAGM - DOUBLE ACTING		DIAPHRAGM		GATE		DISCHARGE TO ATMOSPHERE		
	PNEUMATIC PISTON		3-WAY		CHECK VALVE		SAMPLING POINT		
			SLUICE		MOTORIZED 3 WAY		FLOW INDICATOR		

Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5
 Sub Title:
Water Supply System in Th. Dhiyamigili
 Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives

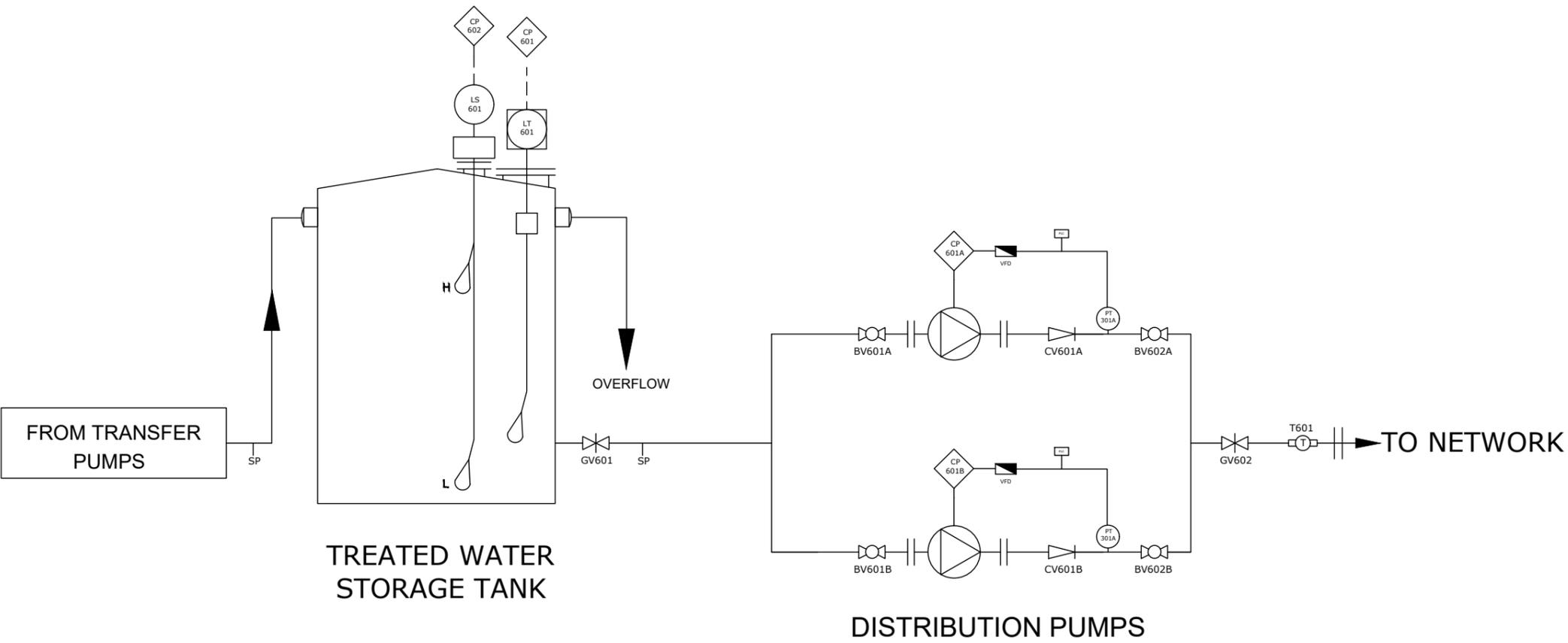
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Rev: R-01	Page: W-10

IWRM PLANT P&I DETAIL E

NTS



DETAIL F

LEGEND					
ACTUATION	VALVES		FEATURES	CONDITION	ABBREVIATIONS
					LS - LEVEL SENSOR FT - FLOW TRANSMITTER PI - PRESSURE INDICATOR SP - SAMPLING POINT AR - AIR RELEASE P - PUMP PG - PRESSURE GAUGE PS - PRESSURE SENSOR CP - CONNECTION POINT LT - LEVEL TRANSMITTER QIT - CONDUCTIVITY INDICATOR PLC - PROGRAMMABLE LOGIC CONTROLLER

IWRM PLANT P&I DETAIL F

NTS



Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5

Sub Title:
Water Supply System in Th. Dhiyamigili

Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives

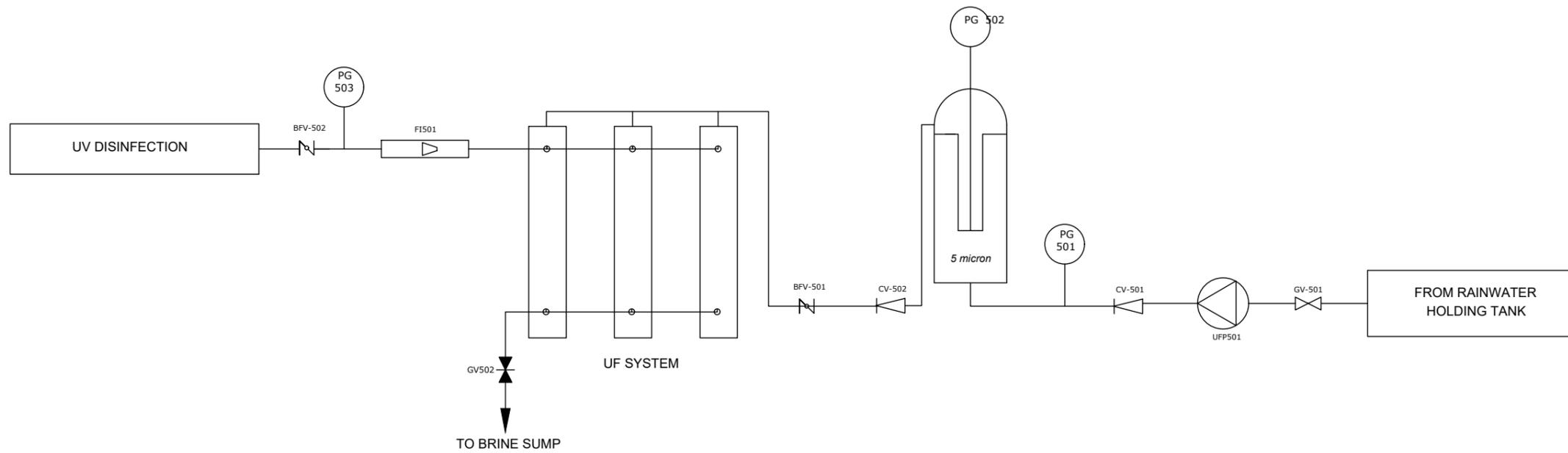
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Project No: EP-WS/2019/05	Page: R-01

W-11

UV DISINFECTION



Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

DETAIL G

LEGEND					
ACTUATION	VALVES		FEATURES	CONDITION	ABBREVIATIONS
	MANUALLY OPERATED		BUTTERFLY		MOTORIZED BALL
	PNEUMATIC DIAPHRAGM - SINGLE ACTING		BALL		TORTALIZER
	PNEUMATIC DIAPHRAGM - DOUBLE ACTING		DIAPHRAGM		GATE
	PNEUMATIC PISTON		3-WAY		CHECK VALVE
			SLUICE		MOTORIZED 3 WAY
					FLANGED CONNECTION
					TRAP
					DISCHARGE TO ATMOSPHERE
					SAMPLING POINT
					FLOW INDICATOR
					VALVE NORMALLY OPEN
					VALVE NORMALLY CLOSED

- LS - LEVEL SENSOR
- FT - FLOW TRANSMITTER
- PI - PRESSURE INDICATOR
- SP - SAMPLING POINT
- AR - AIR RELEASE
- P - PUMP
- PG - PRESSURE GAUGE
- PS - PRESSURE SENSOR
- CP - CONNECTION POINT
- LT - LEVEL TRANSMITTER
- QIT - CONDUCTIVITY INDICATOR
- PLC - PROGRAMMABLE LOGIC CONTROLLER

IWRM PLANT P&I DETAIL G

NTS

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5

Sub Title:
Water Supply System in Th. Dhiyamigili

Client:
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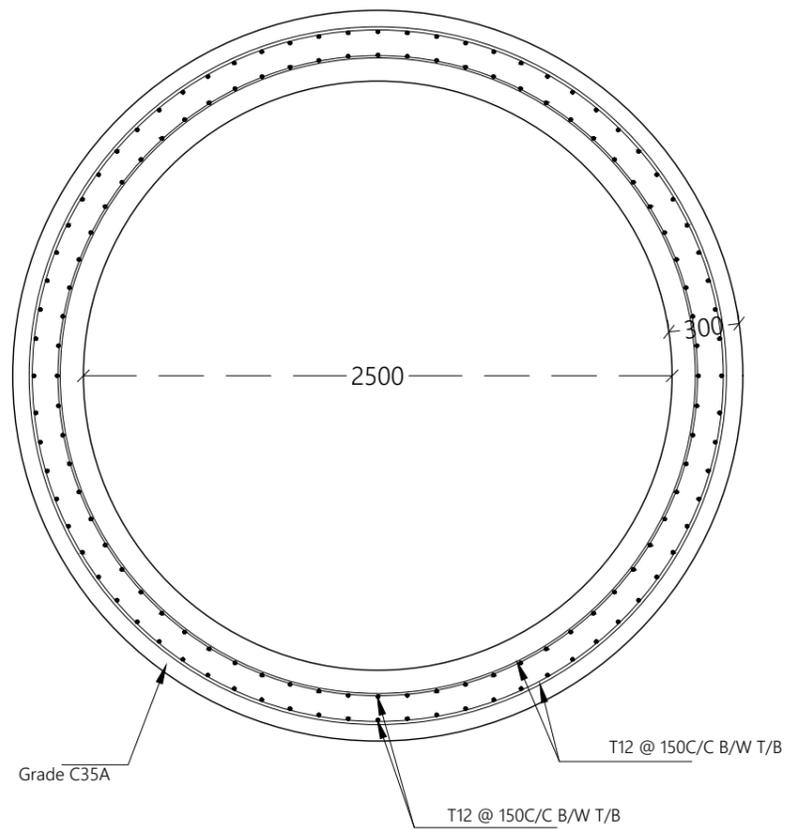
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Designed: F.I.A. Approved: I.W.

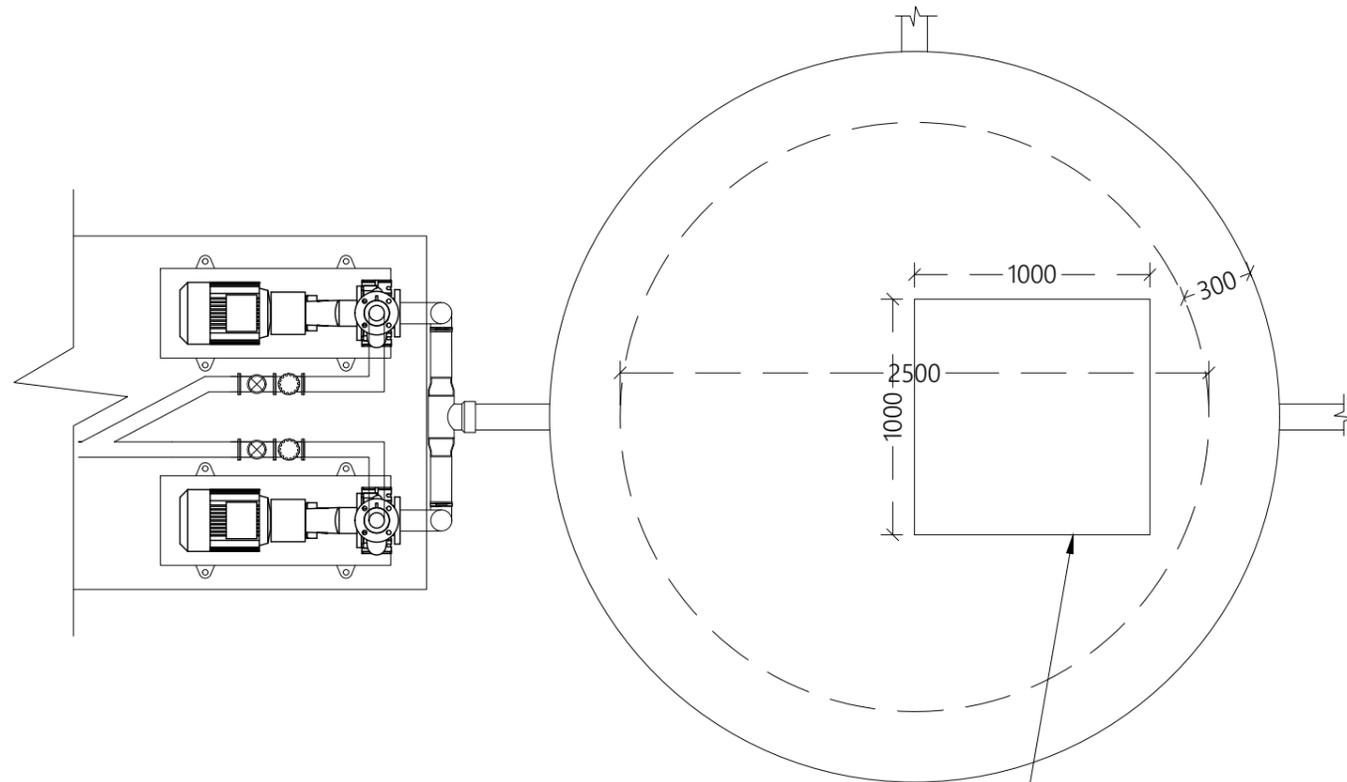
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Project No: EP-WS/2019/05

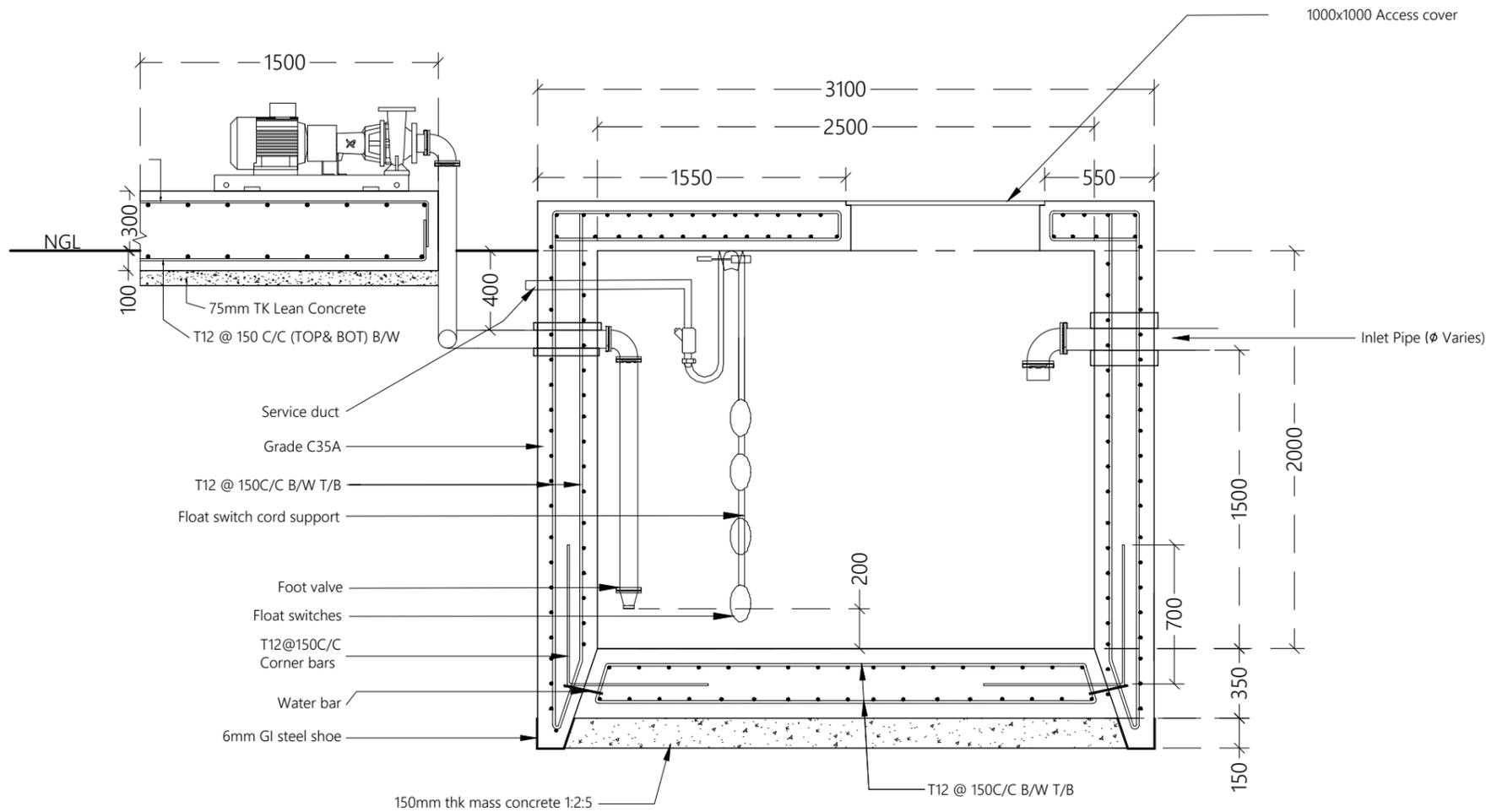
Rev: R-01 Page: W-12



BRINE WATER TANK PLAN - STRUCTURAL



BRINE WATER TANK PLAN



BRINE WATER TANK SECTION X-X

BRINE TANK DETAILS

1:30

Legend

Note:
 - Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
 - Orientation of tanks and pipe work to suit location.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

Title:
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 Sub Title:
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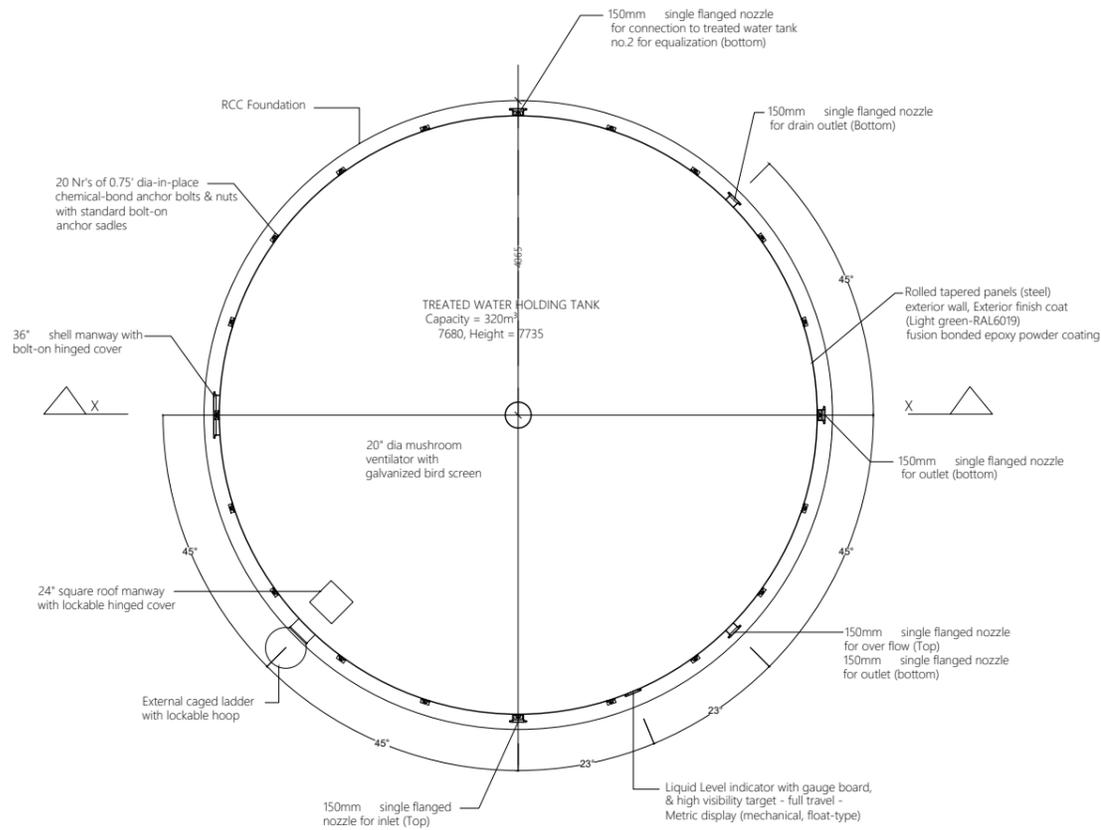
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Designed: F.I.A. Approved: I.W.

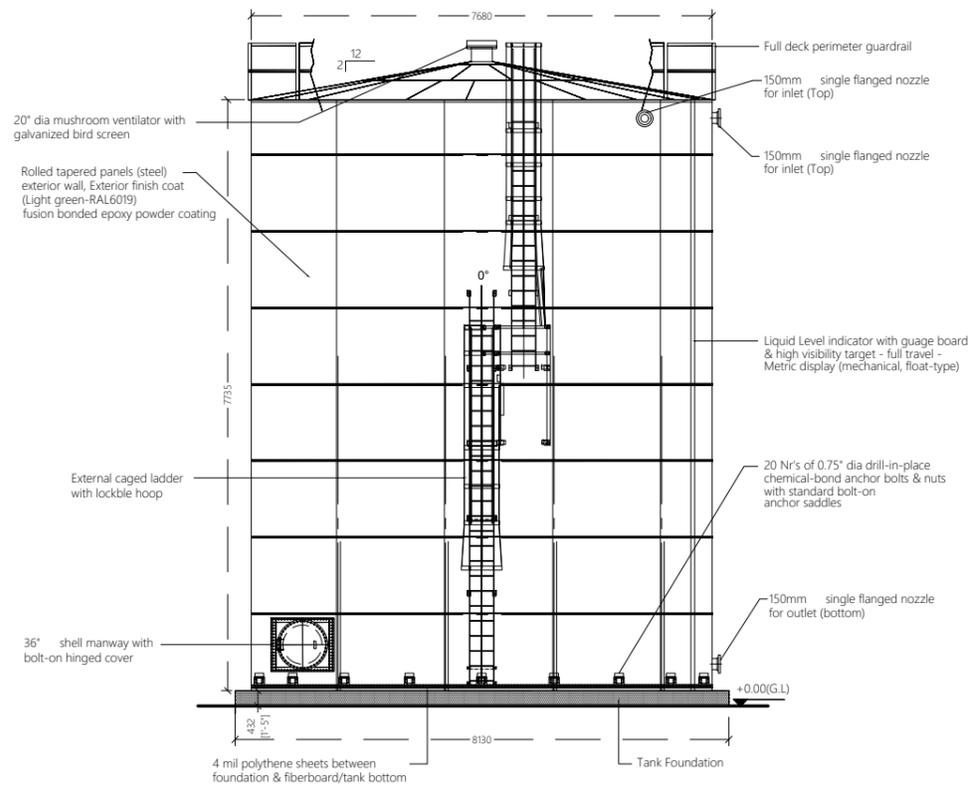
Date: Sep 2020 SCALE (A3): 1:30

Project No: EP-WS/2019/05

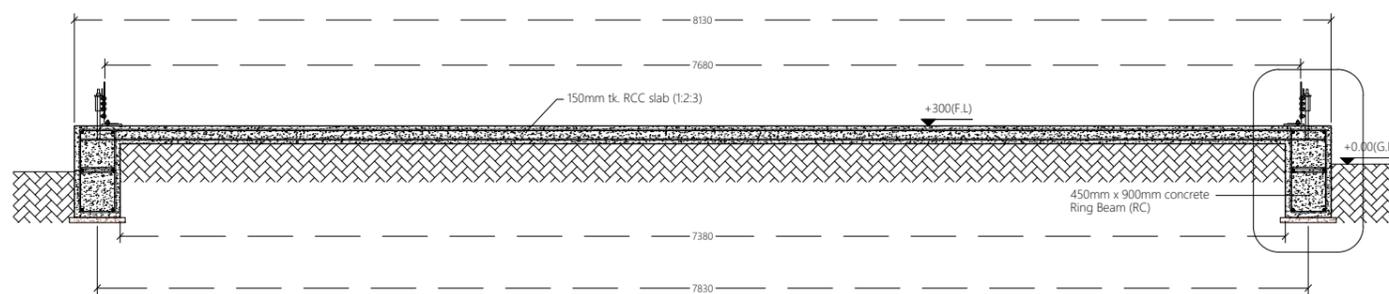
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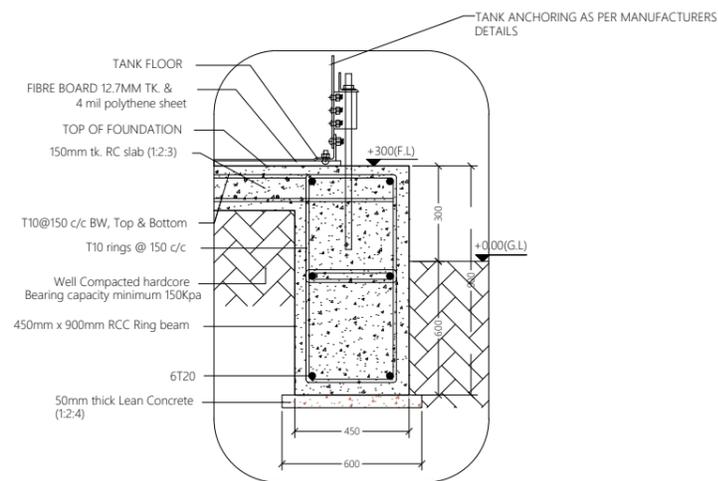
TREATED WATER HOLDING TANK AND FOUNDATION- PLAN



TREATED WATER HOLDING TANK AND FOUNDATION- ELEVATION



SECTION X-X



DETAIL

Note:-
Cover = 50mm
Lap length 50

TREATED WATER TANK DETAILS

Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

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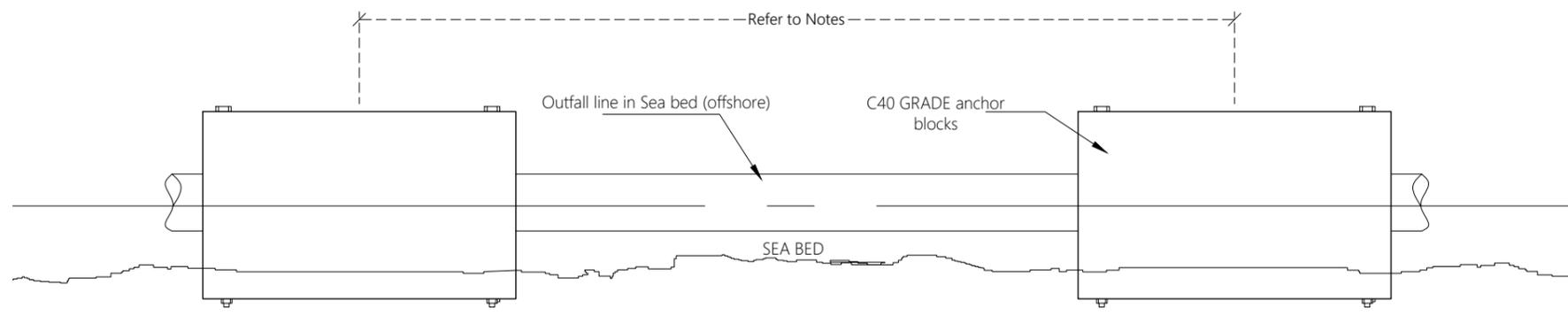
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Designed: F.I.A. Approved: I.W.

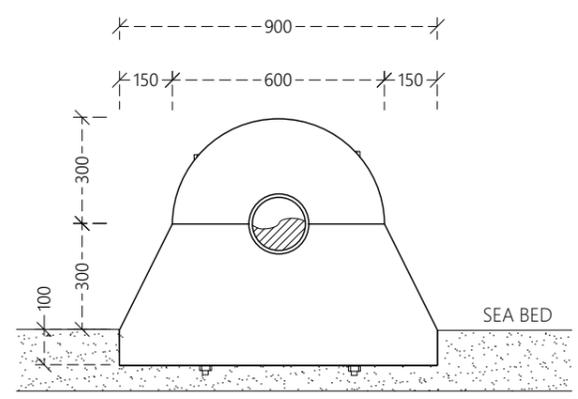
Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

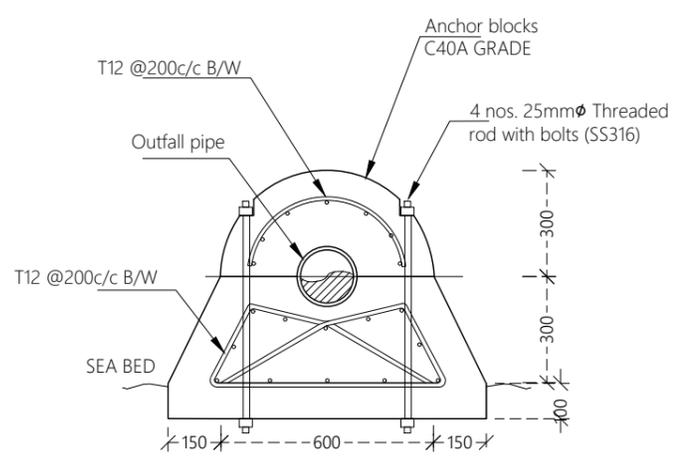
Rev: R-01 Page: W-15



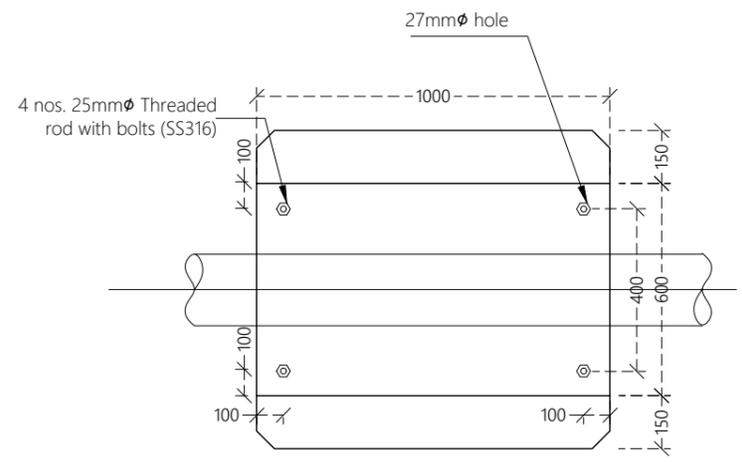
BALLAST BLOCK SIDE ELEVATION



BALLAST BLOCK FRONT ELEVATION



BALLAST BLOCK SECTION



BALLAST BLOCK PLAN

Legend

Notes:

- All backing rings for stub flanges, nuts and bolts shall be grade 316 stainless steel.
- All pipe work shall be bedded on 10mm thick neoprene rubber seat in semicircular recess matching the O.D. the pipe.
- Fabricate specific pipe clamps to provide firm clamping action according to pipe O.D.
- All structural concrete shall be of grade C40A.
- All castings shall be done using sulphate resistant portland cement to BS 4027:1996.
- All structural reinforcement shall be epoxy coating of non-pre-stressed reinforcement to ASTM-A775/A775M.
- A cover of 75mm should be given for all reinforcements.
- In shallow water (regions where the depth is less than 1m), the ballast block spacing is 3.5m. In deeper water (regions where the depth is greater than 1m), the ballast block spacing is 2.0m. All distances are from c/c of blocks.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Drawn: F.I.A. Checked: M.S.S.

Designed: F.I.A. Approved: I.W.

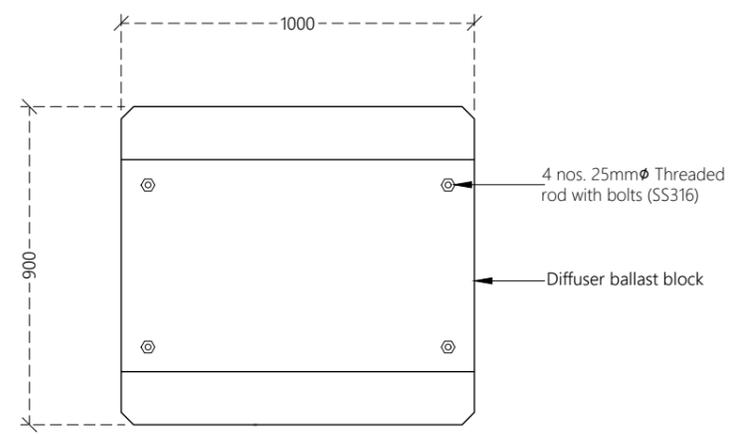
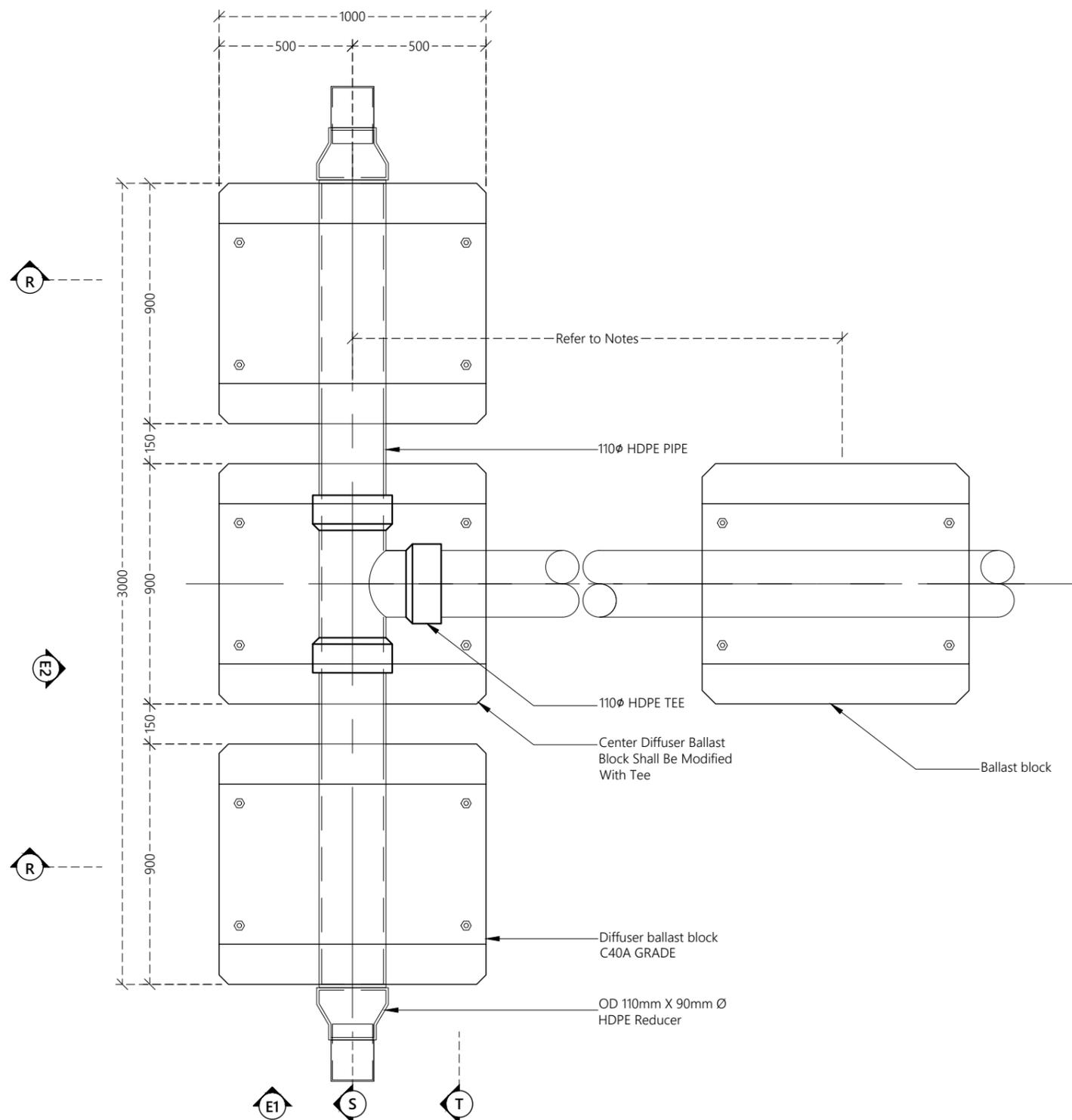
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Project No: EP-WS/2019/05

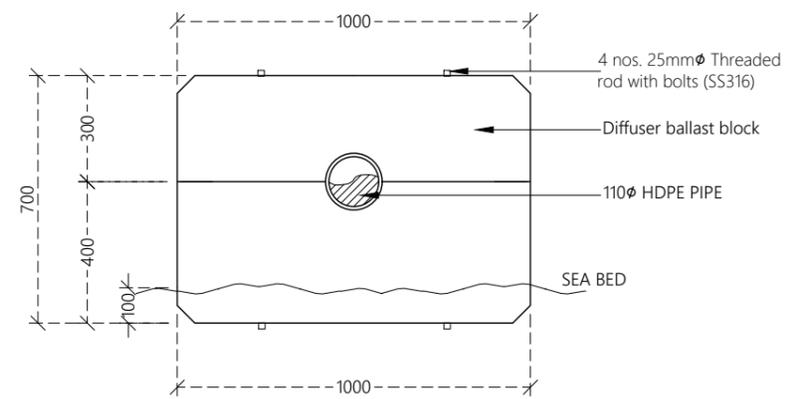
Rev: R-01 Page: W-16

BALLAST BLOCK DETAILS

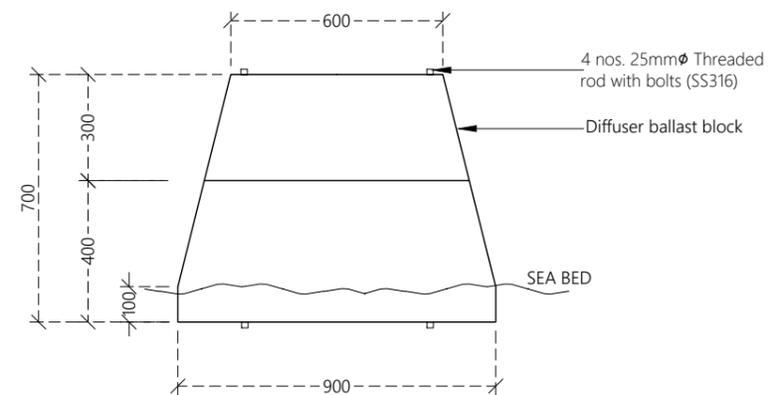
NTS



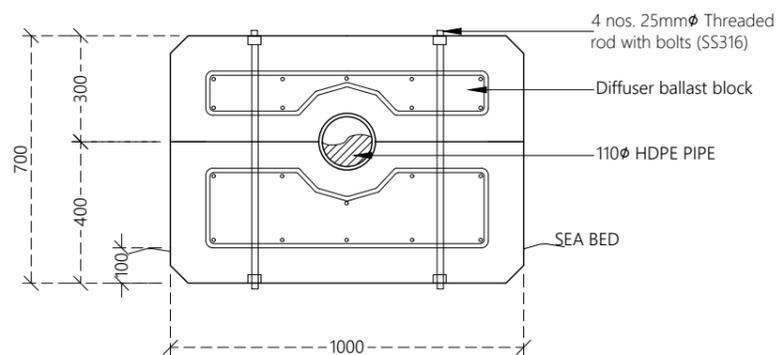
DIFFUSER BALLAST BLOCK PLAN



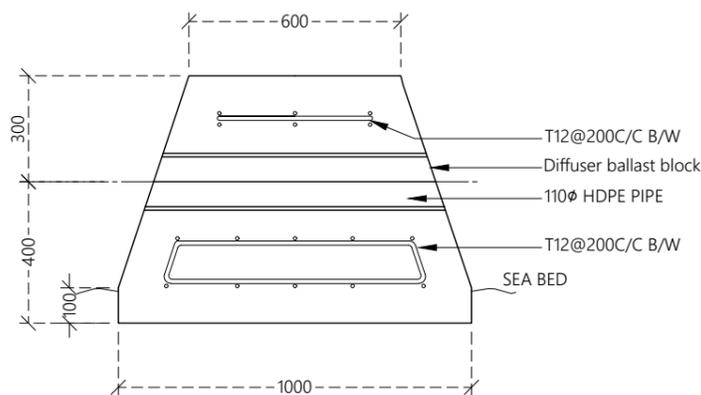
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E1



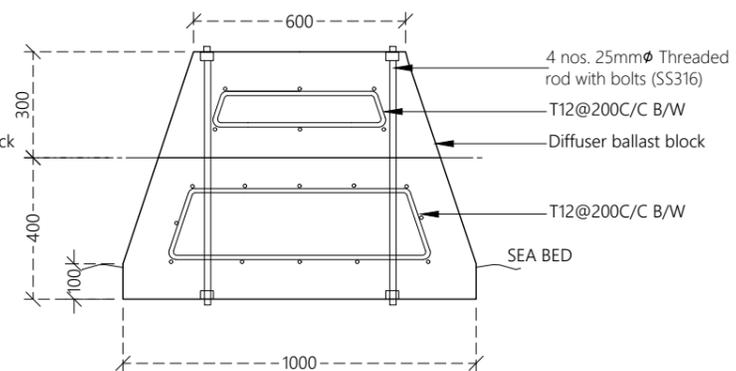
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E2



DIFFUSER BALLAST BLOCK SECTION - R



DIFFUSER BALLAST BLOCK SECTION - S



DIFFUSER BALLAST BLOCK SECTION - T

DIFFUSER DETAILS

NTS



Legend

Notes:

- All backing rings for stub flanges, nuts and bolts shall be grade 316 stainless steel.
- All pipe work shall be bedded on 10mm thick neoprene rubber seat in semicircular recess matching the O.D. the pipe.
- Fabricate specific pipe clamps to provide firm clamping action according to pipe O.D.
- All structural concrete shall be of grade C40A.
- All castings shall be done using sulphate resistant portland cement to BS 4027:1996.
- All structural reinforcement shall be epoxy coating of non-pre-stressed reinforcement to ASTM-A775/A775M.
- A cover of 75mm should be given for all reinforcements.
- In shallow water (regions where the depth is less than 1m), the ballast block spacing is 3.5m. In deeper water (regions where the depth is greater than 1m), the ballast block spacing is 2.0m. All distances are from c/c of blocks.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
001	JUNE 2020	STAGE -1	PD	SBC	SD

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 5

Sub Title:
Water Supply System in Th. Dhiyamigili

Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives



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Designed: F.I.A. Approved: I.W.

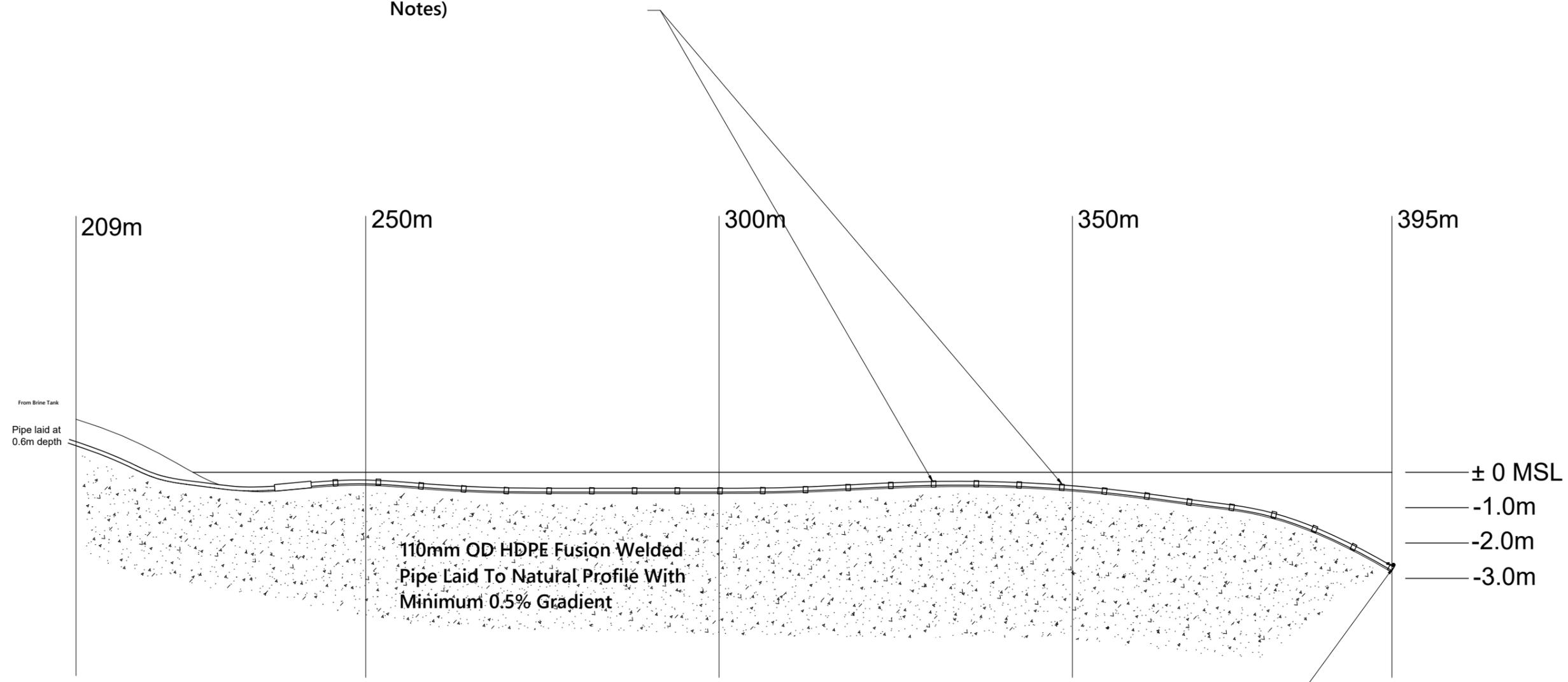
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Project No: EP-WS/2019/05

Rev: R-01 Page: W-17



Ballast Blocks placed at varying intervals (Refer to Notes)



Legend

Notes:

- The contractor to undertake a detailed inspection of the outfall site to assess the profile and condition of the reef below sea level and to prepare his methodology for installation and fixing.
- In shallow water (regions where the depth is less than 1m), the ballast block spacing is 3.5m. In deeper water (regions where the depth is greater than 1m), the ballast block spacing is 2.0m. All distances are from c/c of blocks.

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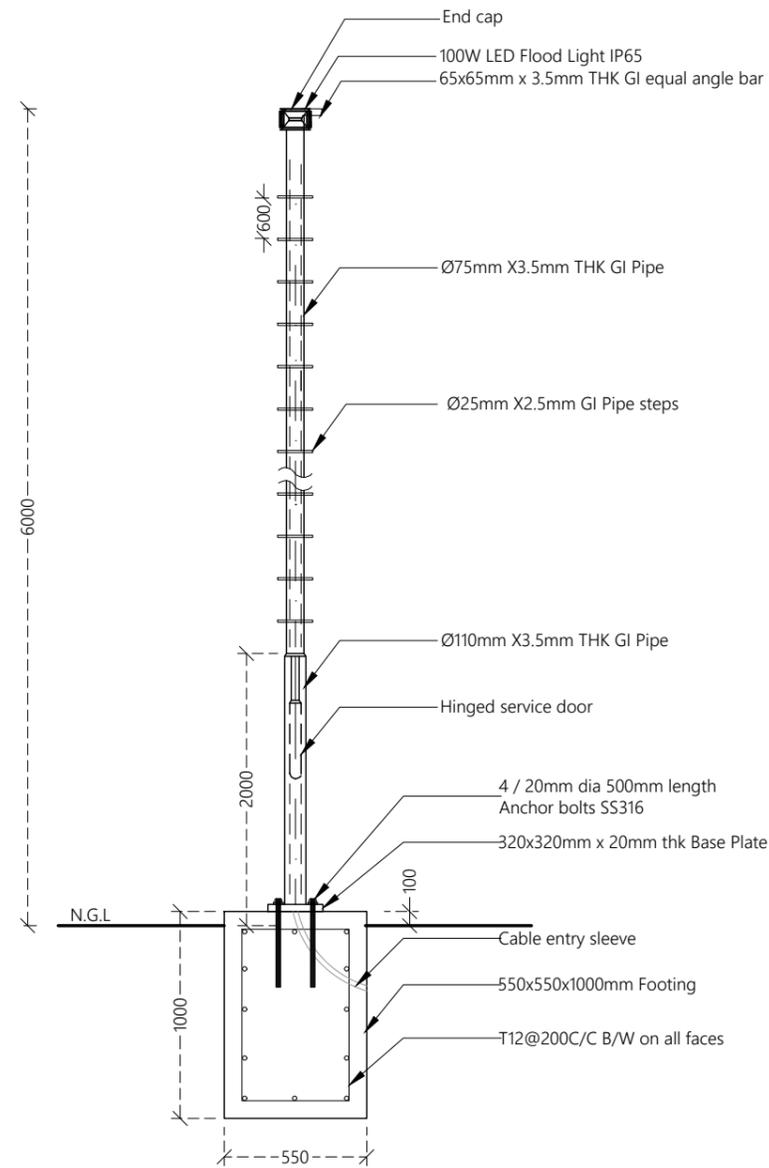


FEEDBACK INFRA
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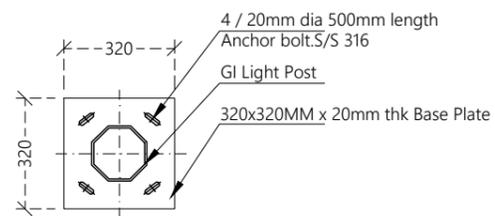
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BRINE SEA OUTFALL DETAIL

NTS



LIGHT POST DETAILS FOR STP COMPOUND (LP1)



BASE PLATE (LP1)

LIGHT POST DETAILS

NTS



Legend

- Note:**
- Concrete Cover :50mm
 - All steel members and GI SHS to be applied with 2 coats of anti-corrosive paint with epoxy finishing paint

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Rev: R-01 Page: W-19

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

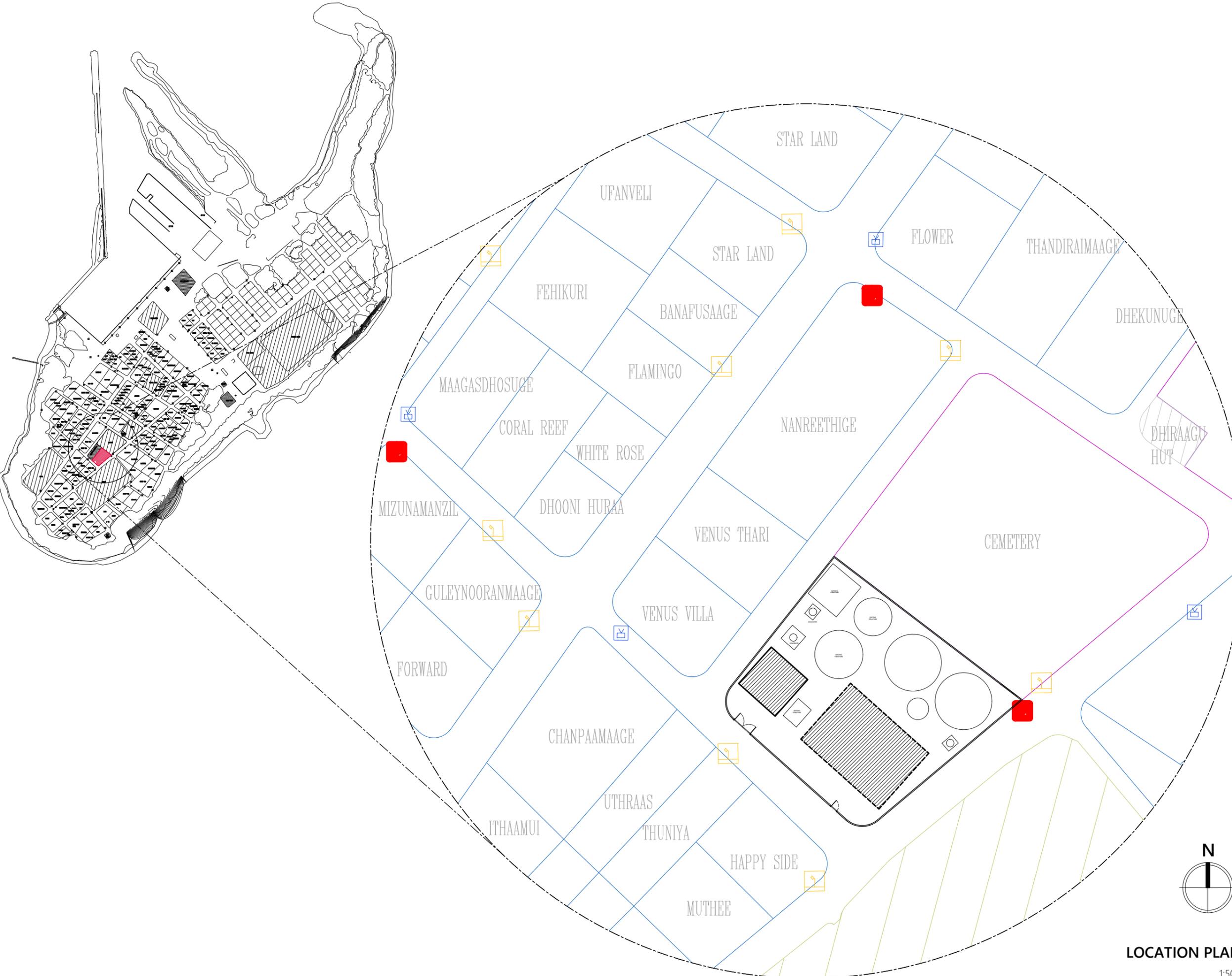
PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING AND VEHICLE SHED, TH.DHIYAMIGILI

For Ministry of National Planning, Housing and Infrastructure

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Legend

Note:

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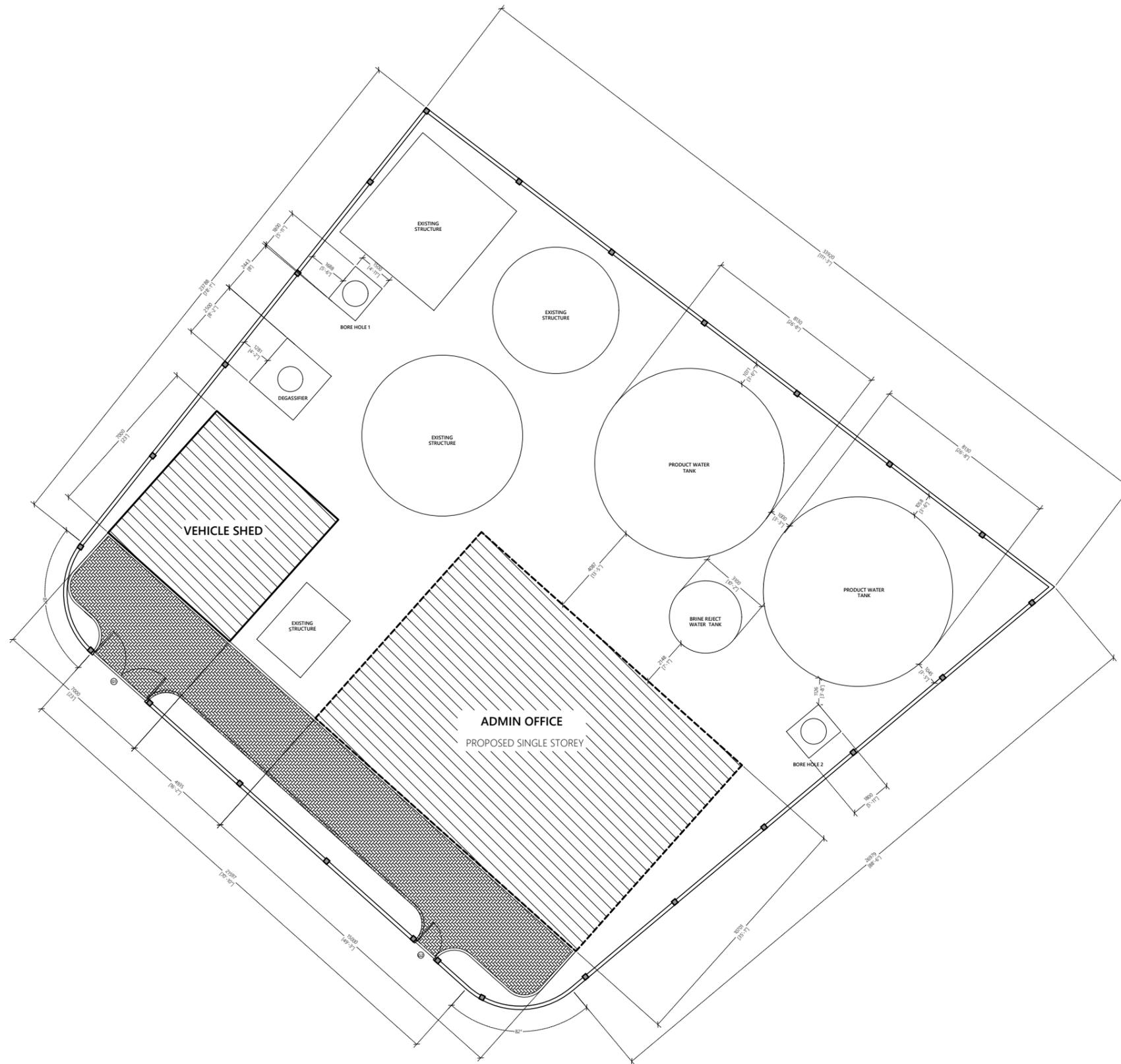



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LOCATION PLAN
1:500



Legend

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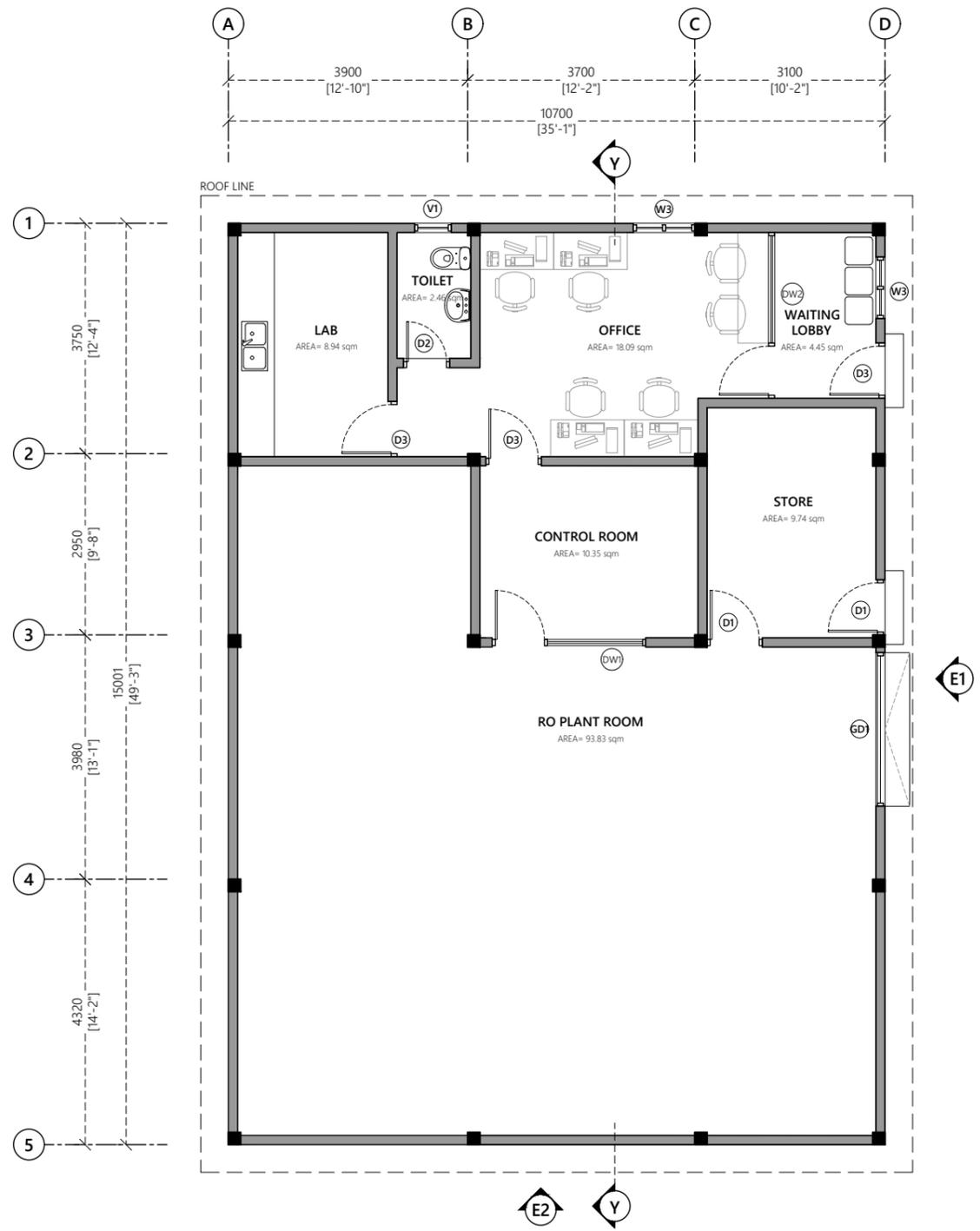
SITE PLAN

1:200

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING, TH.DHIYAMIGILI



Wall Legend:
 150mm thick masonry blocks with 20mm plaster on exterior and 12mm plaster on interior

Wall Finish:
 Internal Wall Finish: Easy to wash odour-less Nippon paint Ivory White
 External Wall Finish: Weatherboard Algae guard Nippon September Cream

Floor Finish:
 Floor Finishes: 600x600mm homogenous floor tiles with tile adhesive unless specified
 Toilet Floor Finishes: 300x300mm homogenous non skid floor tiles with tile adhesive unless specified

Notes:
 FFL of balconies and toilets should be 25mm lower than the FFL of respective floors
 Water proofing to be applied in toilets, balconies and roof terrace prior to tiling



GROUND FLOOR PLAN

1:100

Legend

Note:

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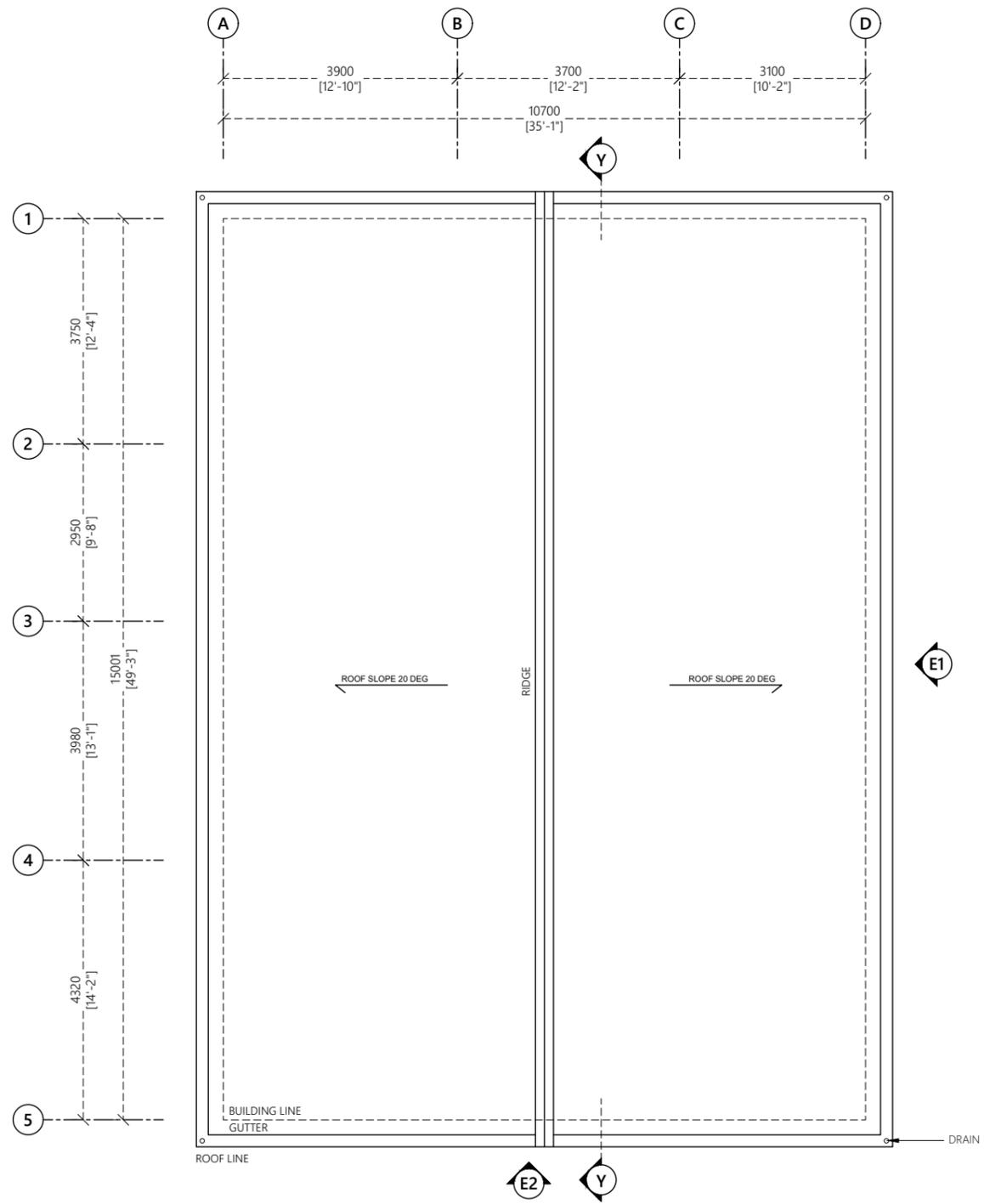


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Legend

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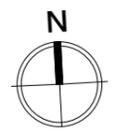
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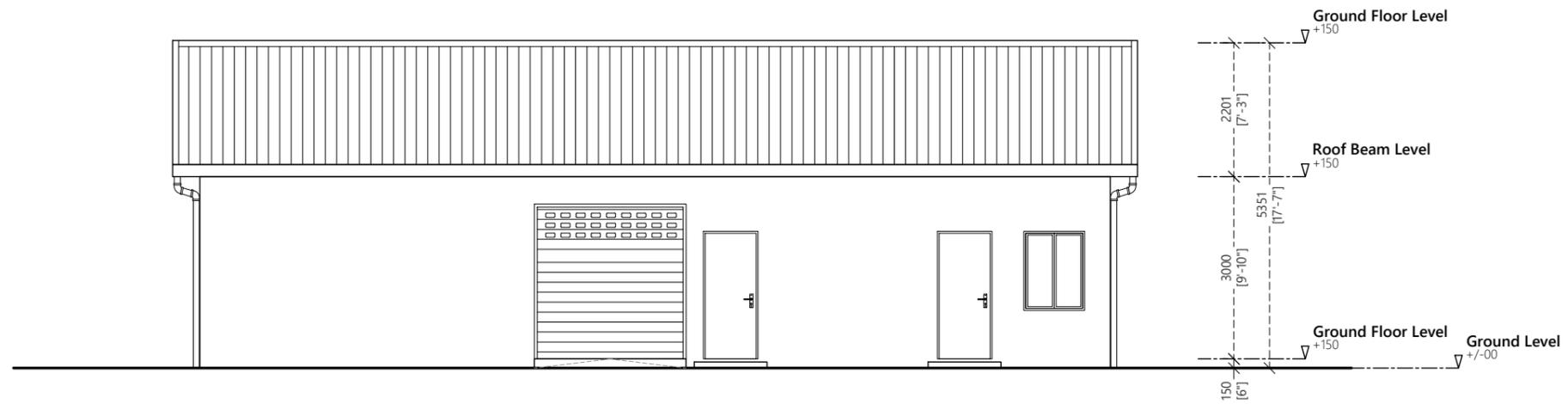
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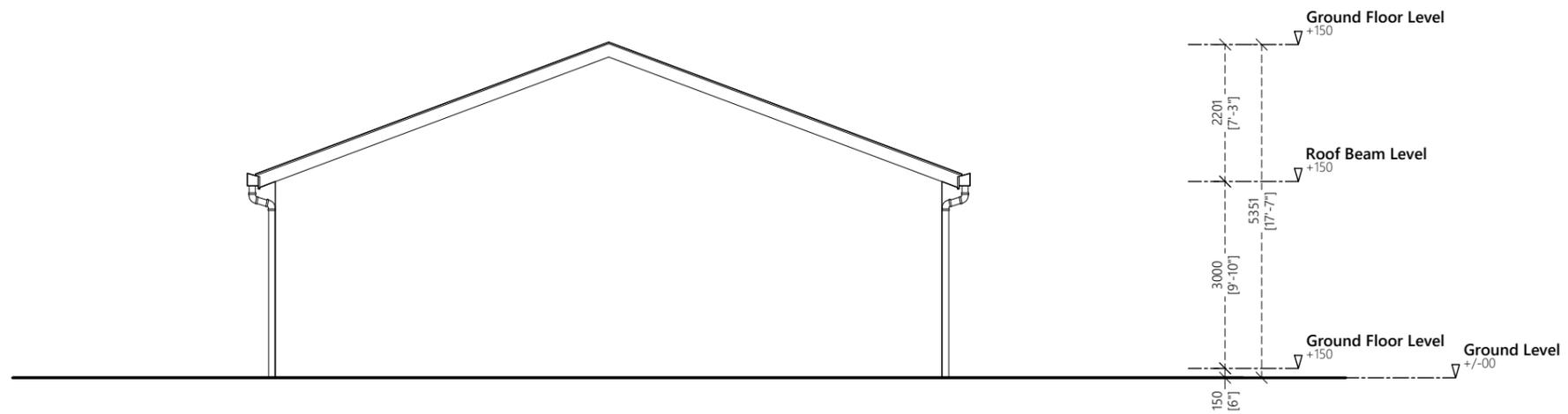
ROOF PLAN

1:100



ELEVATION E1

1:100



ELEVATION E2

1:100

Legend

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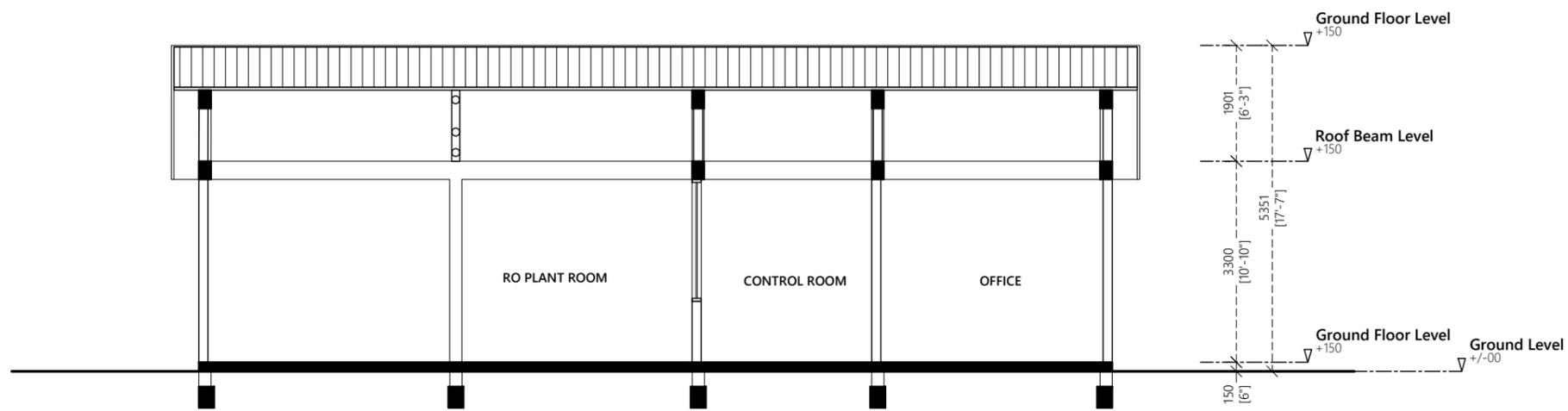


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ELEVATIONS

1:100



SECTION XX

1:100

Legend

Note:

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SECTION

1:100

Door ID	D1	D2	D3	GD1
Plan view				
Elevation view				
FFL				
Frame material	Aluminum black powder coated	Aluminum black powder coated	Aluminum black powder coated	Aluminum framed roller shutter
Panel material	Aluminum cladding sheet	Aluminum cladding sheet	Aluminum cladding sheet & Fixed clear glass	Aluminium
Openable area	1.74	1.45	1.74	6.0

General Notes:

Dimensions shown on DWG indicate effective openings of frame

All frame depths are 100mm
 All dor panel thicknesses are 35mm
 All window panel thickness are 25mm
 All frame edges shall be trimmed 3mm

All wooden components should be wood stained finish

All glazing should be of 6mm unless specified

External units must comply the following weather conditions:-
 Wind pressure: 200 kg/sqm
 Water tightness: 25 kg/sqm

All external frames / wall joints must be sealed with silicon sealant and the wedges trimmed with 12X12mm hardwood beading fixed to frames by brass nails

All hardware should be provided for the performance of all functions of the units

- Hinges shall confirm to
- Door size more than 700X1900mm
 WD: 125mm X2 sets
 SD: 150mm X3 sets
 - Door size less than 700X1900mm
 WD: 100mm X2 sets
 SD: 125mm X2 sets

Locks shall be cylindrical with master key sets

Door knobs shall be 1000mm above FFL

Legend

Note:

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DOOR & WINDOW SCHEDULE -1

1:50

Door ID	DW 1	DW 2	W3
Plan view			
Elevation view			
FFL			
Frame material	Aluminum black powder coated	Aluminum black powder coated	Aluminum black powder coated
Panel material	Aluminum cladding sheet & Fixed clear glass	Aluminum cladding sheet & Fixed clear glass	Reflective Glass
Openable area	-	-	-

Door ID	V1
Plan view	
Elevation view	
FFL	
Frame material	Aluminum black powder coated
Panel material	Reflective Glass
Openable area	0.32

General Notes:

Dimensions shown on DWG indicate effective openings of frame

All frame depths are 100mm
All door panel thicknesses are 35mm
All window panel thickness are 25mm
All frame edges shall be trimmed 3mm

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- Door size more than 700X1900mm
WD: 125mm X2 sets
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Locks shall be cylindrical with master key sets

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Legend

Note:

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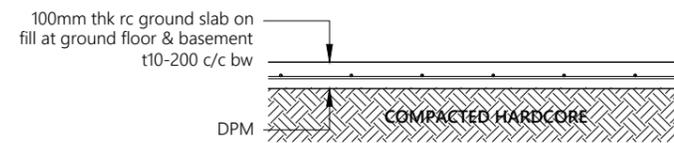
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DOOR & WINDOW SCHEDULE -2

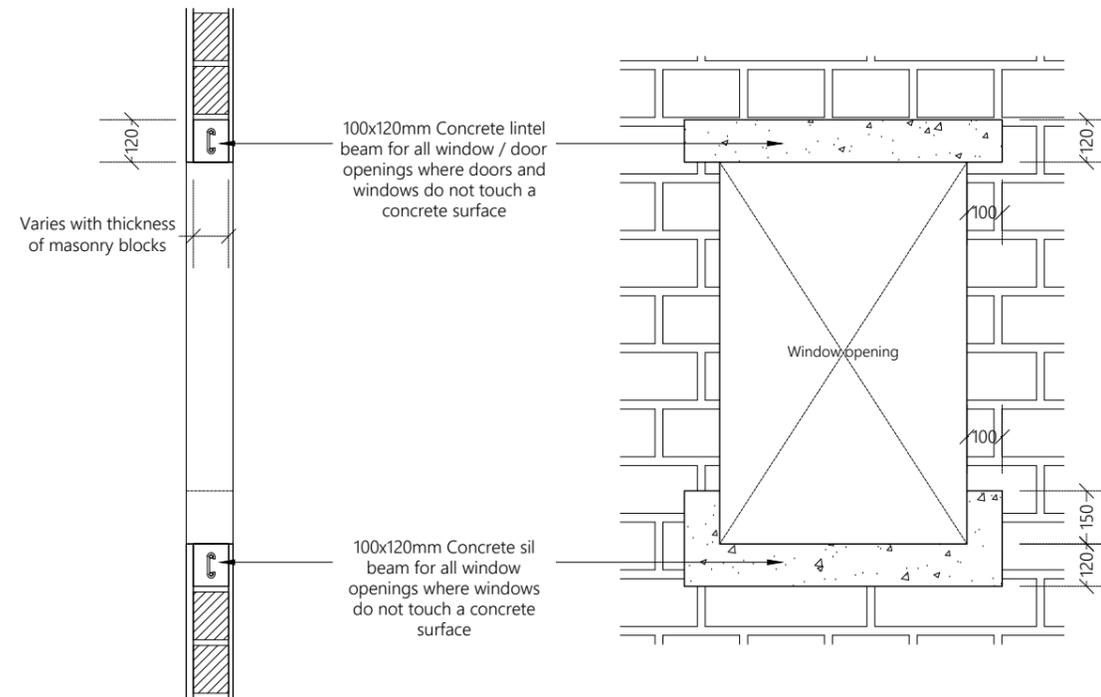


Note:

- All cover blocks shall be casted using grade C25/30 concrete with 5-10mm aggregates
- For slab, rebar spacer chairs spacing shall be minimum 1m spacing or 1 no. per 1 sqm

TYPICAL GROUND SLAB DETAIL

1:20



TYPICAL OPENING DETAIL

1:20

Legend

Note:

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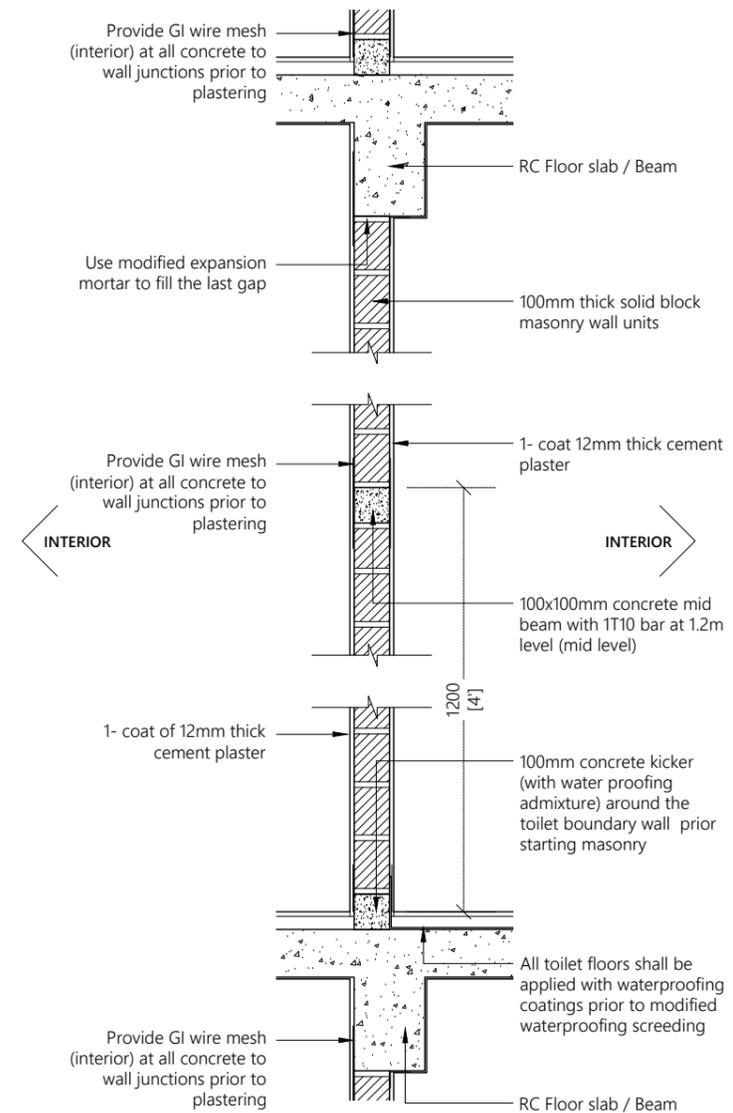
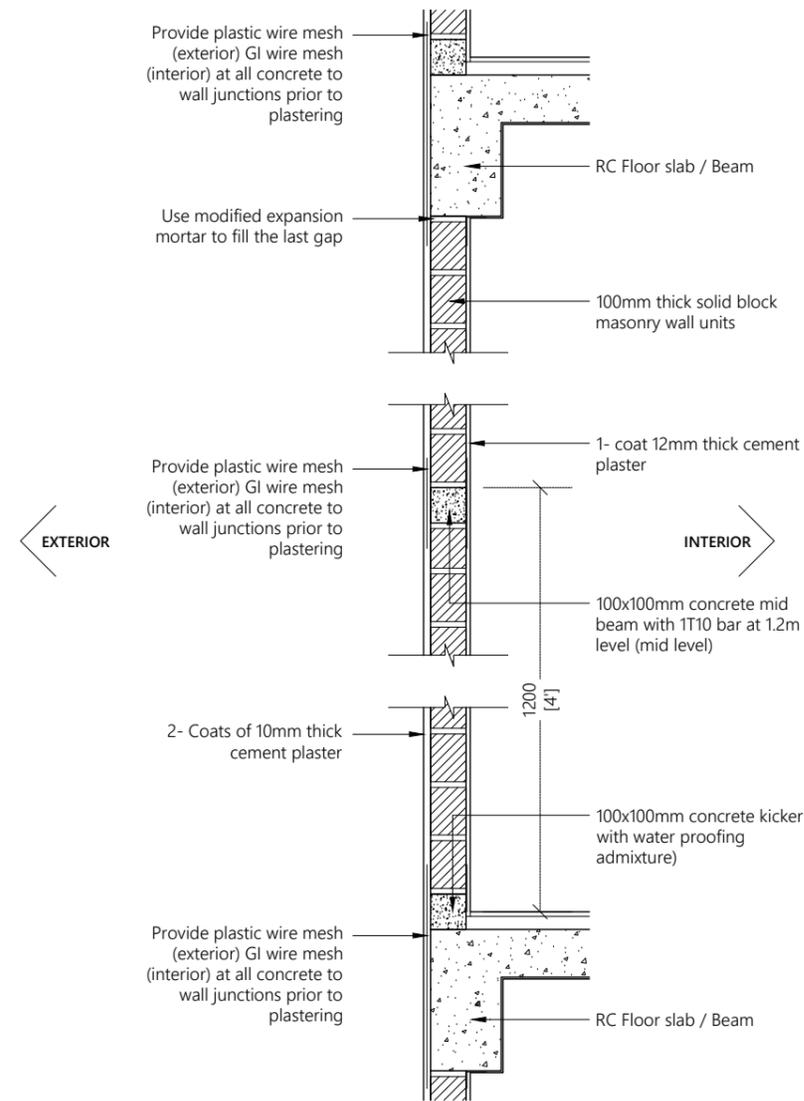


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Note:

- Concrete surfaces shall be thoroughly cleaned with water & applied with mastercast 141 or equivalent bonding mortar prior to plastering.
- Plastering mortar mix shall be 1:4 (cement: sand) ratio.
- Plaster mix shall be modified using fibre wool & mastercast 141 or equivalent plasticisers as per manufacturer's specification.
- Height of placing blocks shall be maximum 1.2m per day.
- After initial coat of plastering, water curing shall be provided for minimum 3 days & after final coat water curing shall be provided for 7 days.

Legend

Note:

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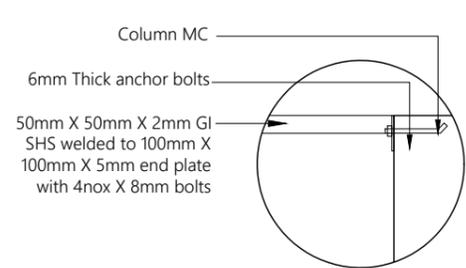
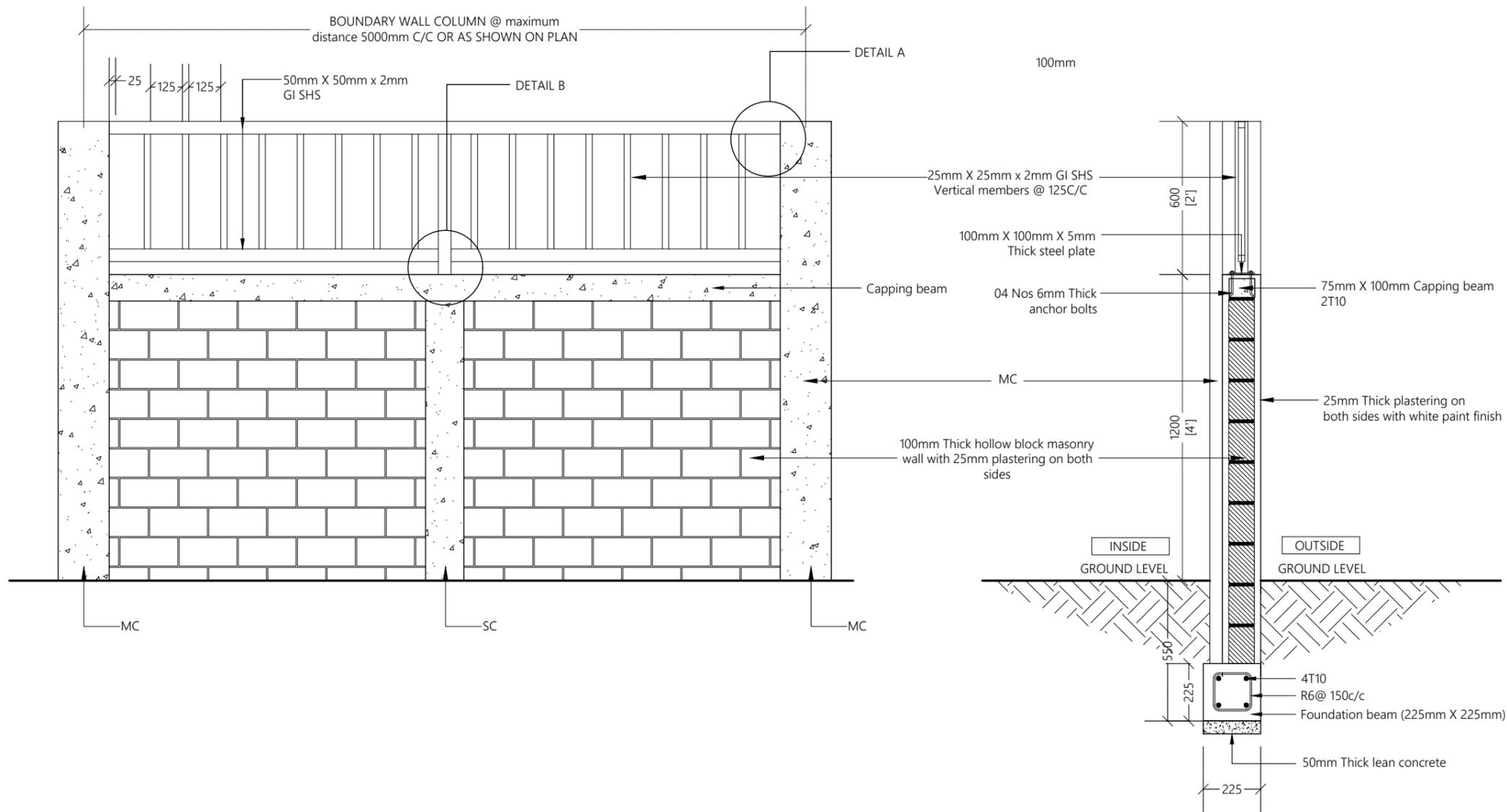
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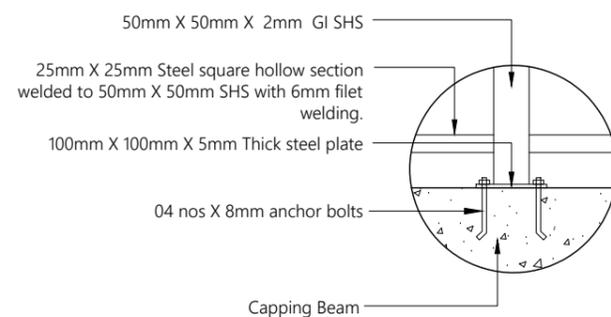
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TYPICAL WALL CONSTRUCTION DETAIL



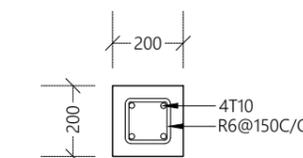
DETAIL A

1:10

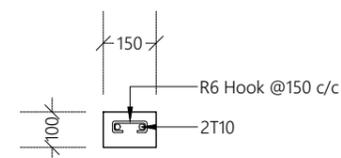


DETAIL B

1:10



MAIN COLUMN
@ maximum distance 5000mm C/C



STIFFENER COLUMN
(in between two main columns)

- NOTE:**
- FRAME MATERIAL : Steel gate frame 2.5mm thick GI sections SHS
 - All steel members and GI SHS to be applied with 2 coats of anti-corrosive paint with epoxy finishing paint
 - Allowance shall be made to fix pad lock in Gates

Legend

Note:

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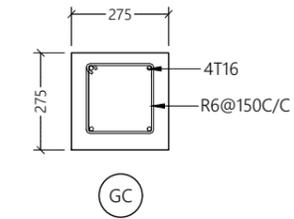
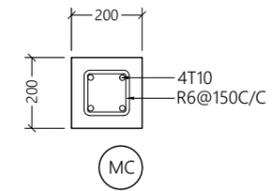
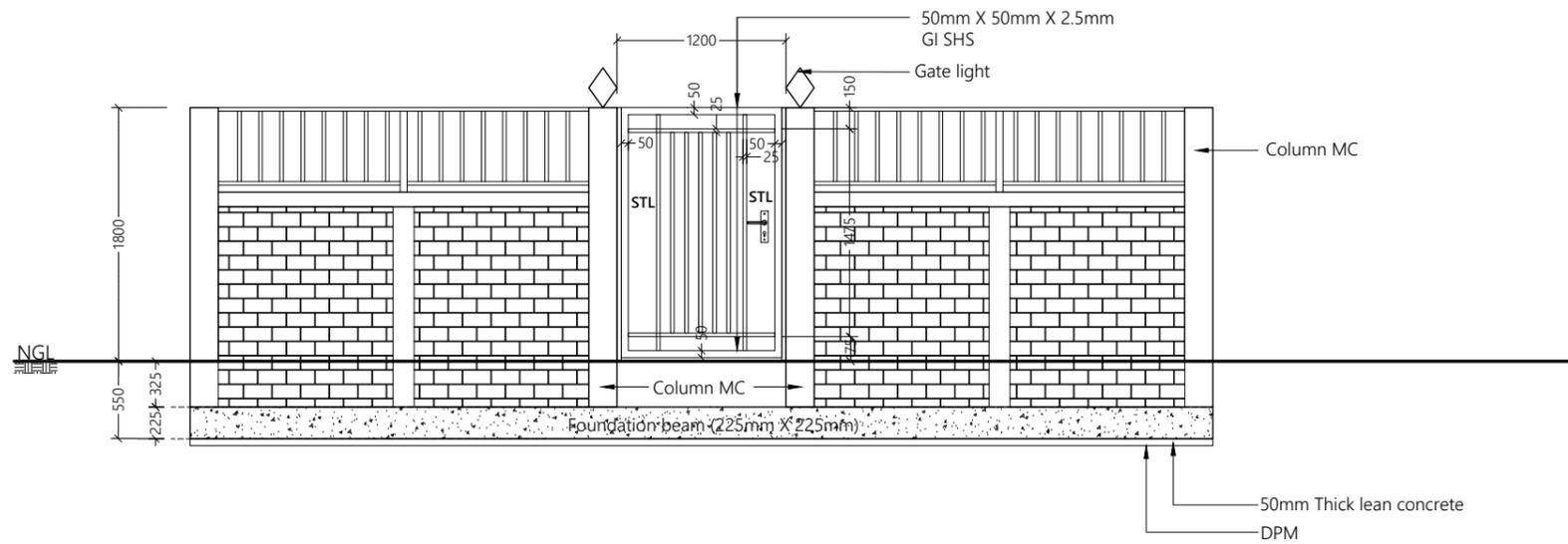
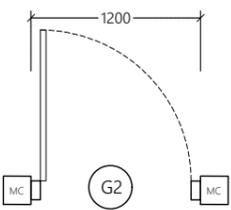
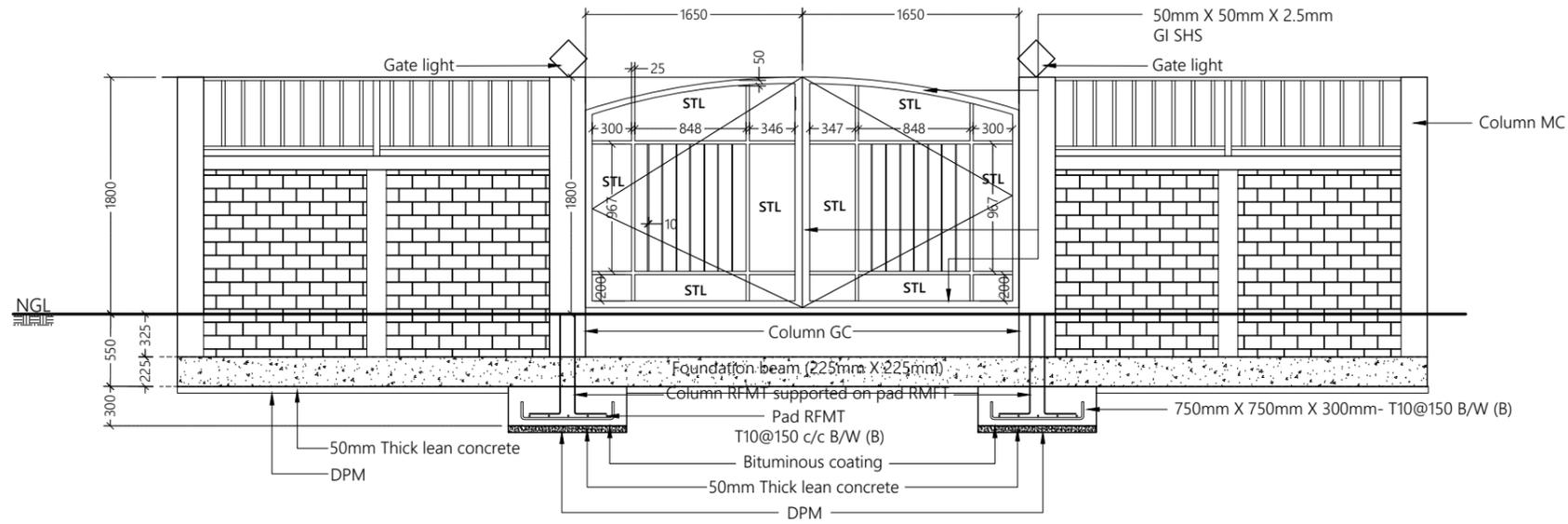
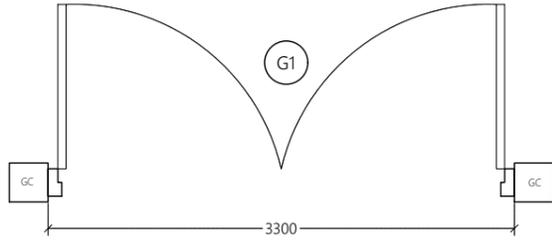
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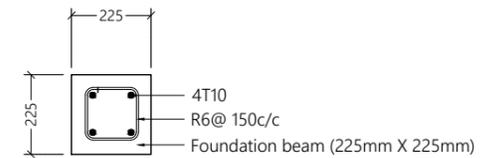
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Designed: A.S.A.	Approved: M.H.
Date: Aug 2020	SCALE (A3): 1:20
Project No: EP-WS/2019/06	
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BOUNDARY WALL DETAIL

1:20



COLUMN DETAILS
1:20



FOUNDATION BEAM DETAIL
1:20

GATE DETAILS
1:50

Legend

Note:

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	AUG 2020	STAGE -1	A.S.A.	F.I.A.	M.H.

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 Islands, Maldives – Package 6
Sub Title:
Water Supply System in GA.Dhevadhoo

Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives

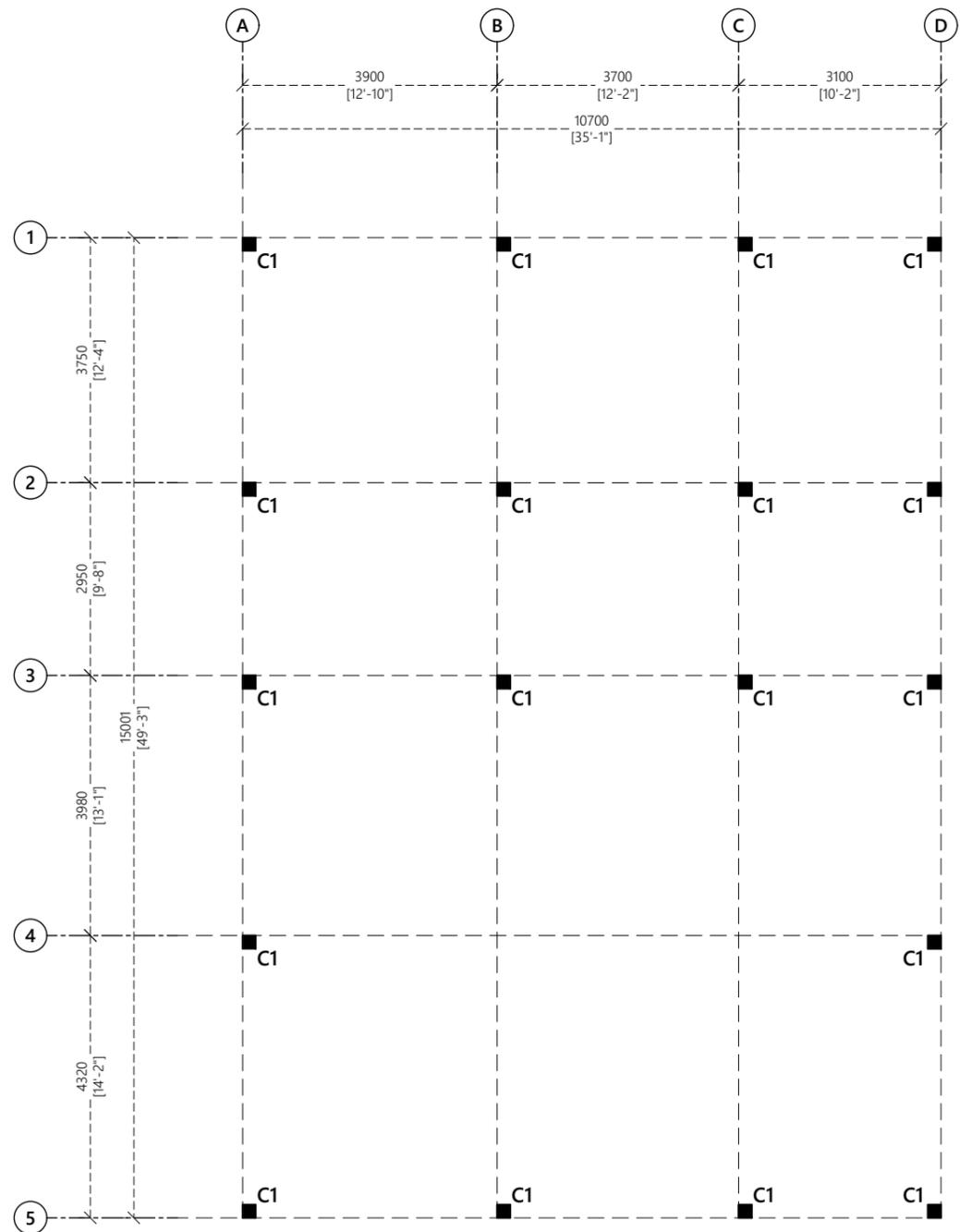


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Legend

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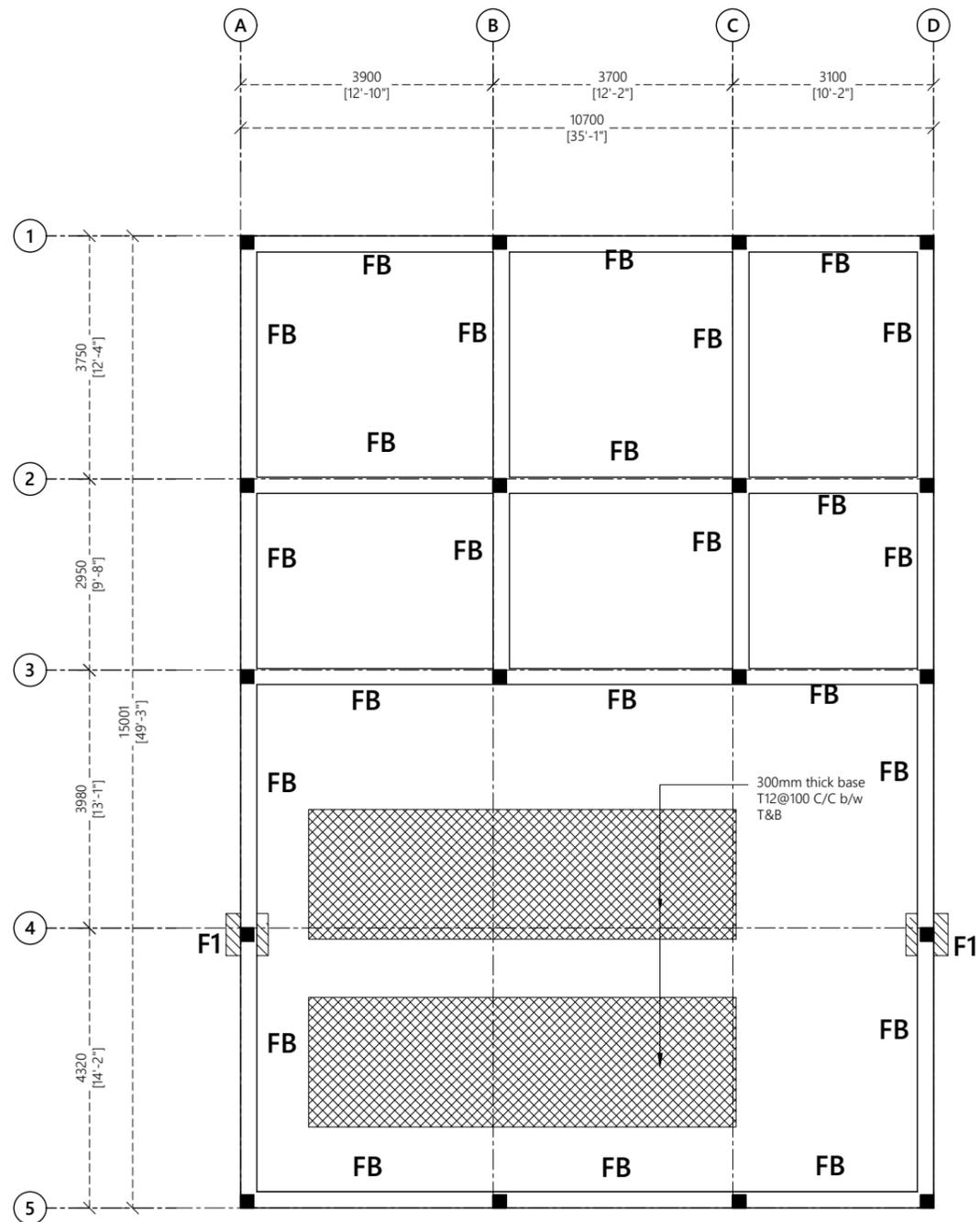


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COLUMN LAYOUT PLAN

1:100



Notes:
Foundation Depth: 600mm

FOUNDATION PLAN

1:100

Legend

Note:

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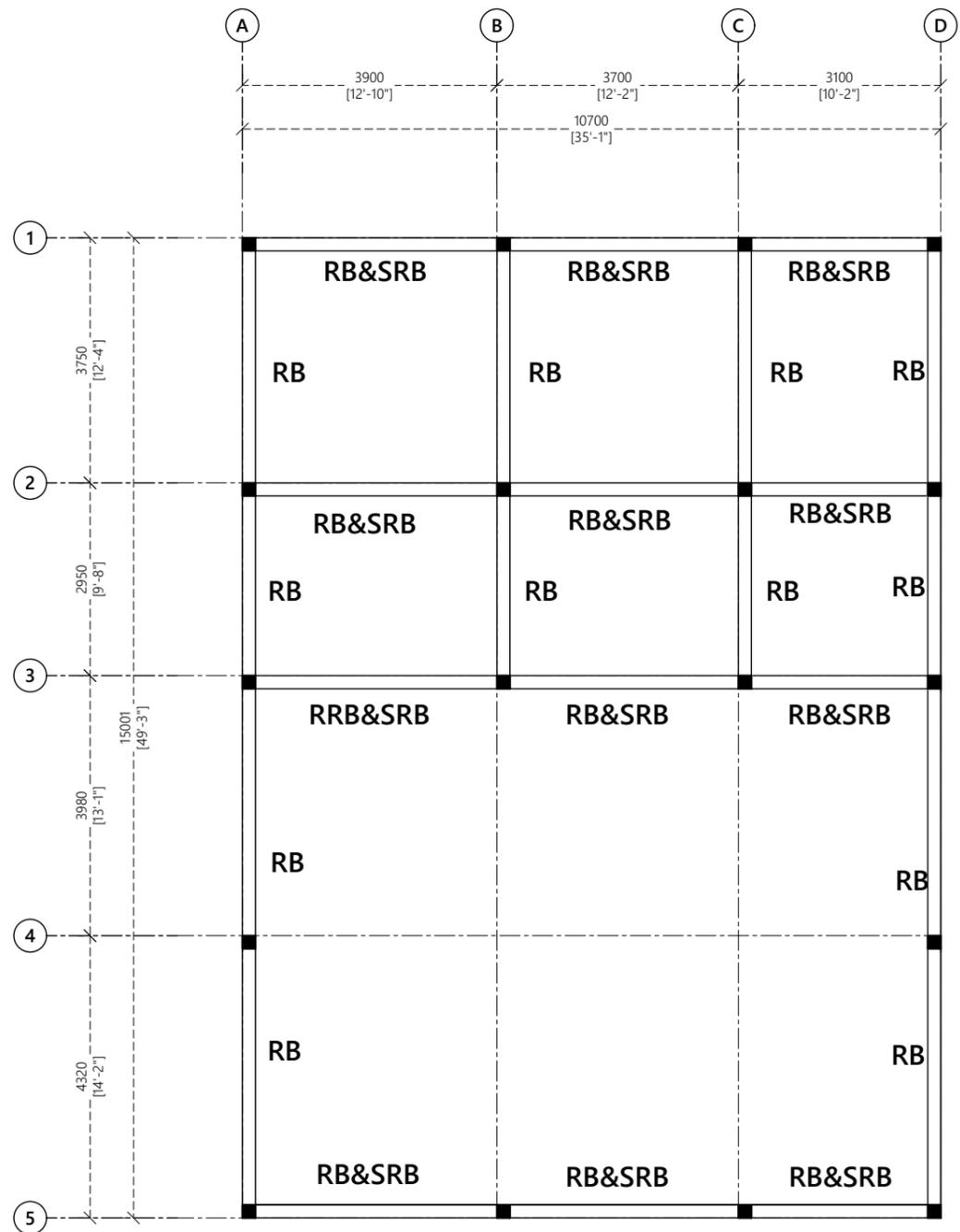


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Legend

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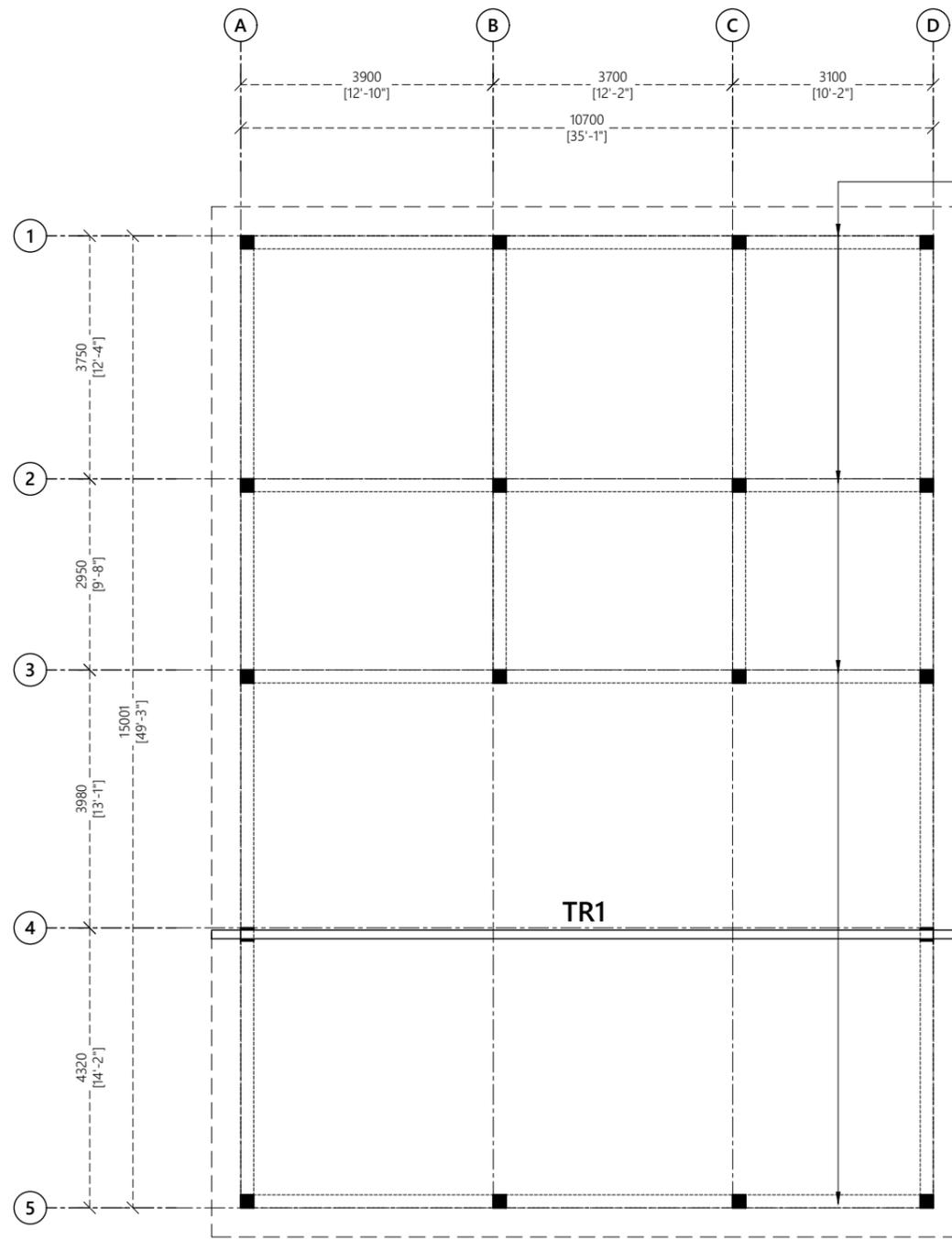


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ROOF BEAM PLAN

1:100



60.3Ø X3.2mm GI PIPE FIXED
ON TOP OF SLOPING ROOF BEAM

Legend

Note:

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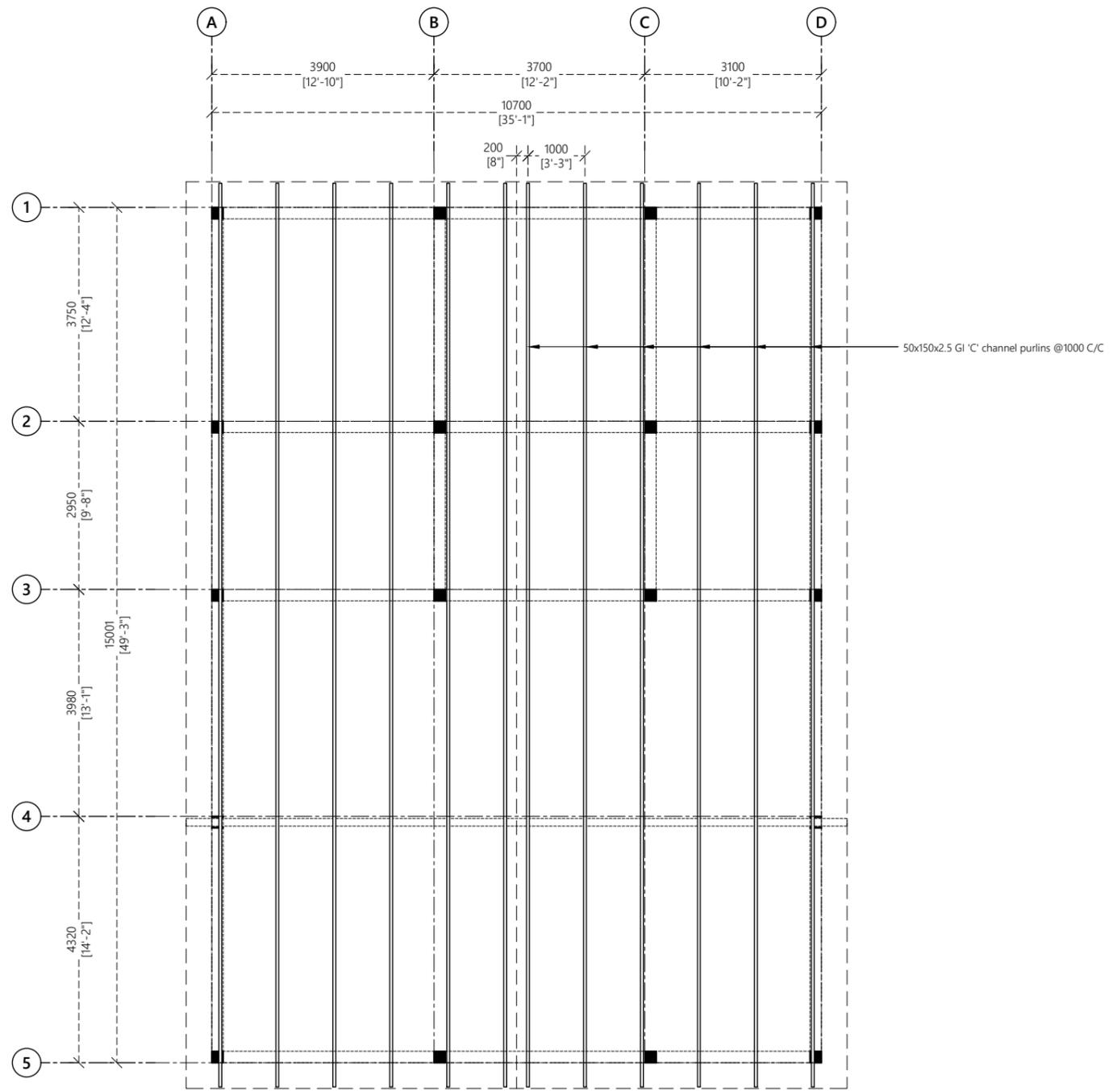


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ROOF TRUSS PLAN

1:100



Legend

Note:

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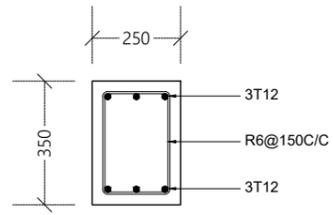
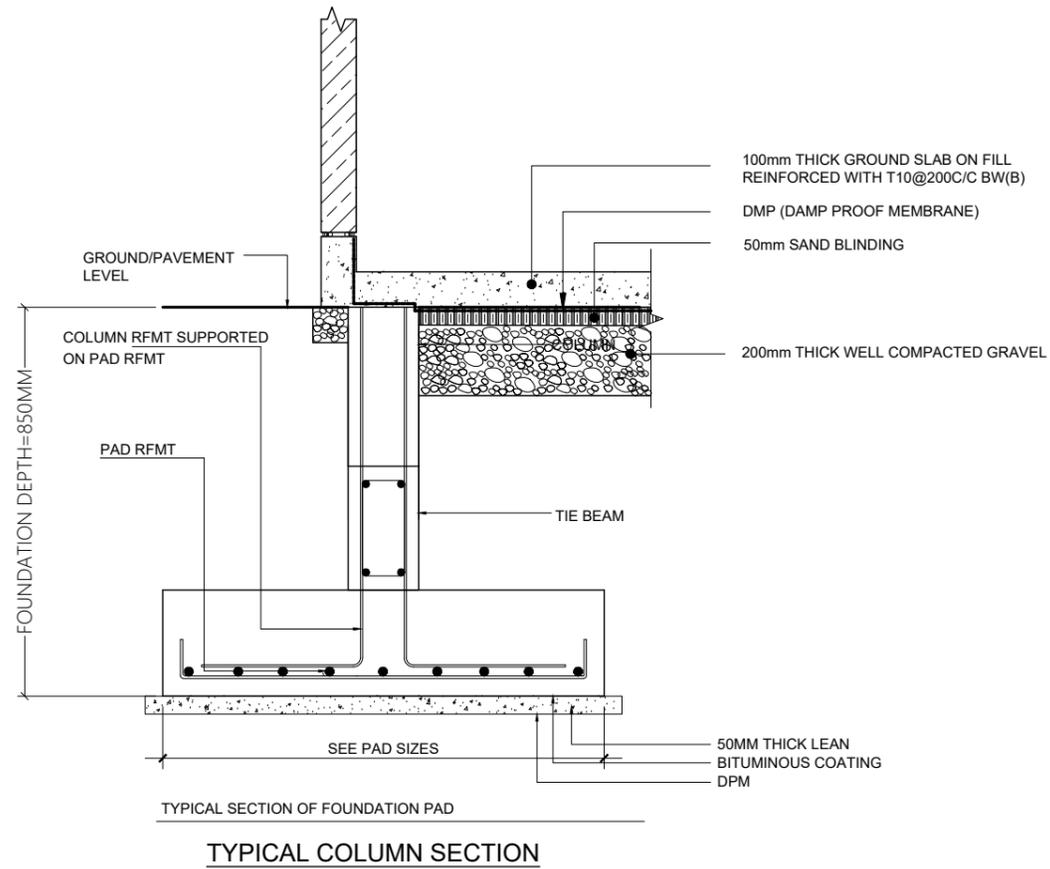
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ROOF FRAMING PLAN

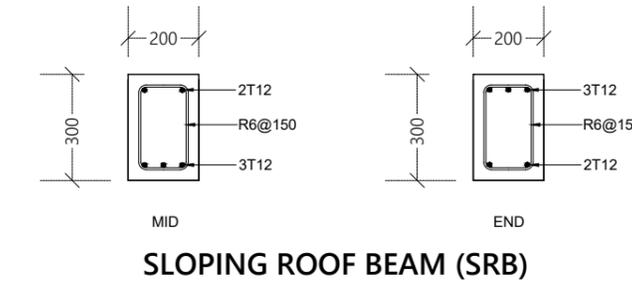
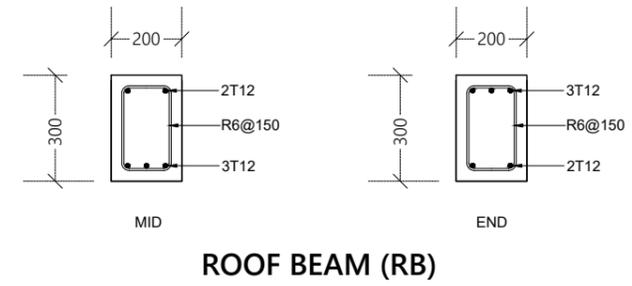
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FOUNDATION BEAM (FB)

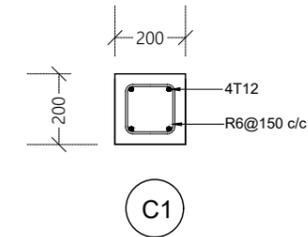
FOUNDATION PAD DETAILS

F1 - 650x650x250 - T10@150C/C B/W (B)

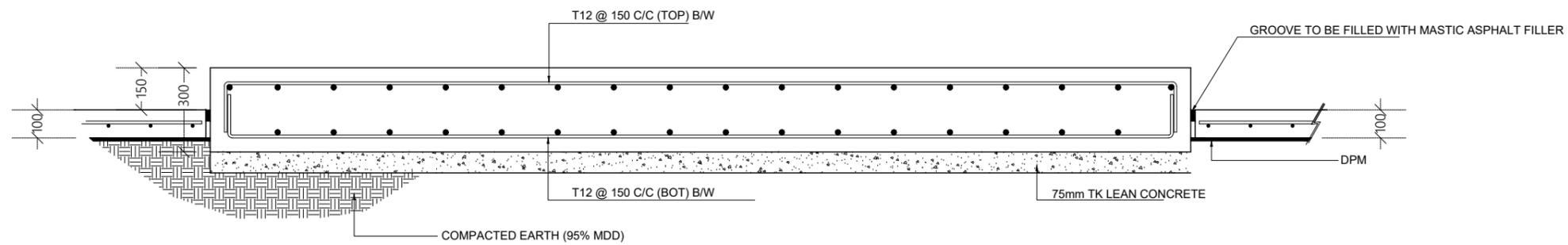


ROOF BEAM (RB)

SLOPING ROOF BEAM (SRB)



COLUMN DETAIL



RO PLANT BASE DETAIL

Legend

Note:

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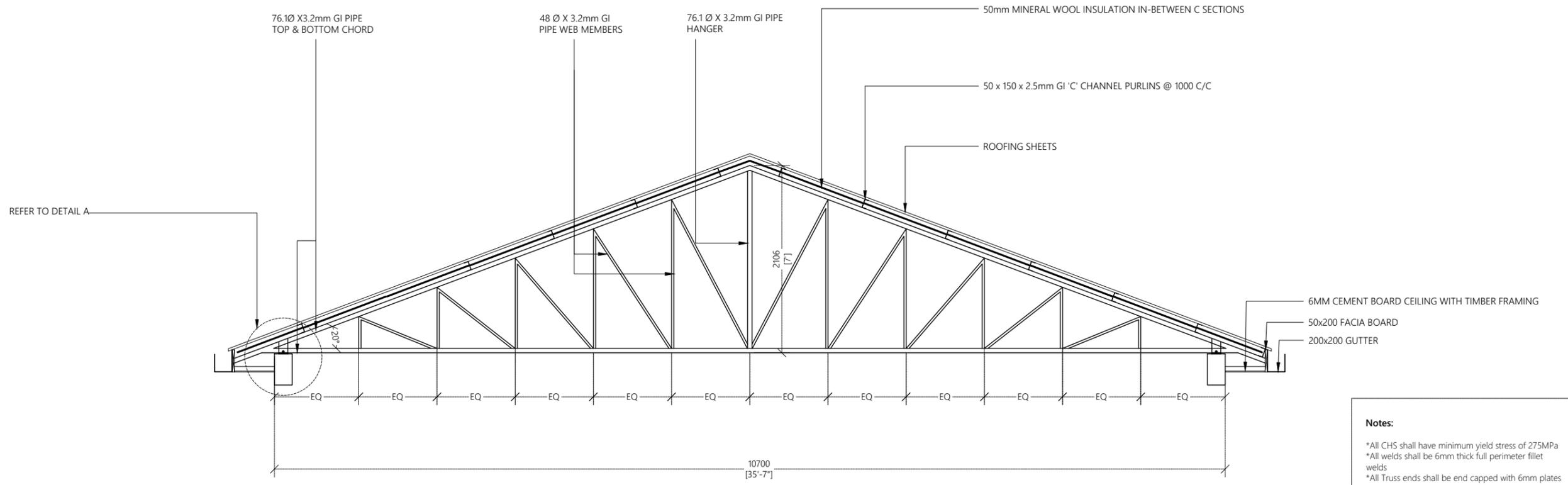
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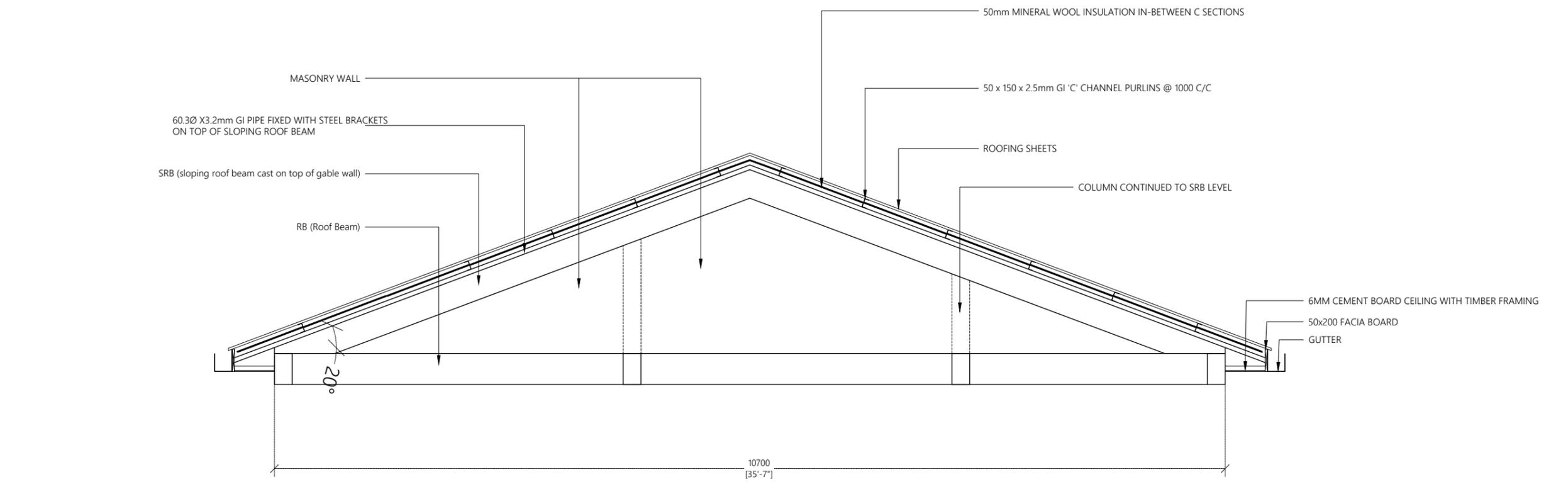
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TRUSS DETAIL TR1 @ GRID 2

1:50

Notes:
 *All CHS shall have minimum yield stress of 275MPa
 *All welds shall be 6mm thick full perimeter fillet welds
 *All Truss ends shall be end capped with 6mm plates
 *All truss members shall be protected with anti corrosive coatings



DETAIL OF 63Øx3.2MM PIPE FIXED ON GRID 1,3,4 & 5

1:50

Legend

Note:

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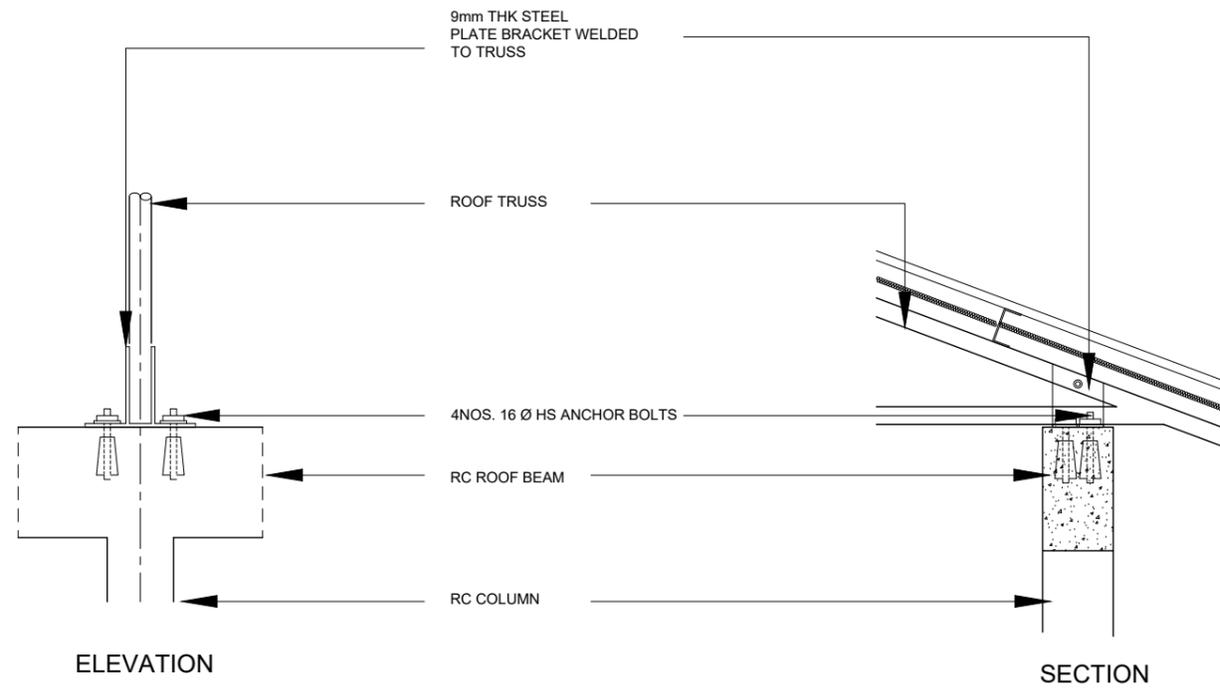
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ELEVATION

SECTION

Legend

Note:

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DETAIL A

1:20

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT VEHICLE SHED, TH.DHIYAMIGILI

Legend

Note:

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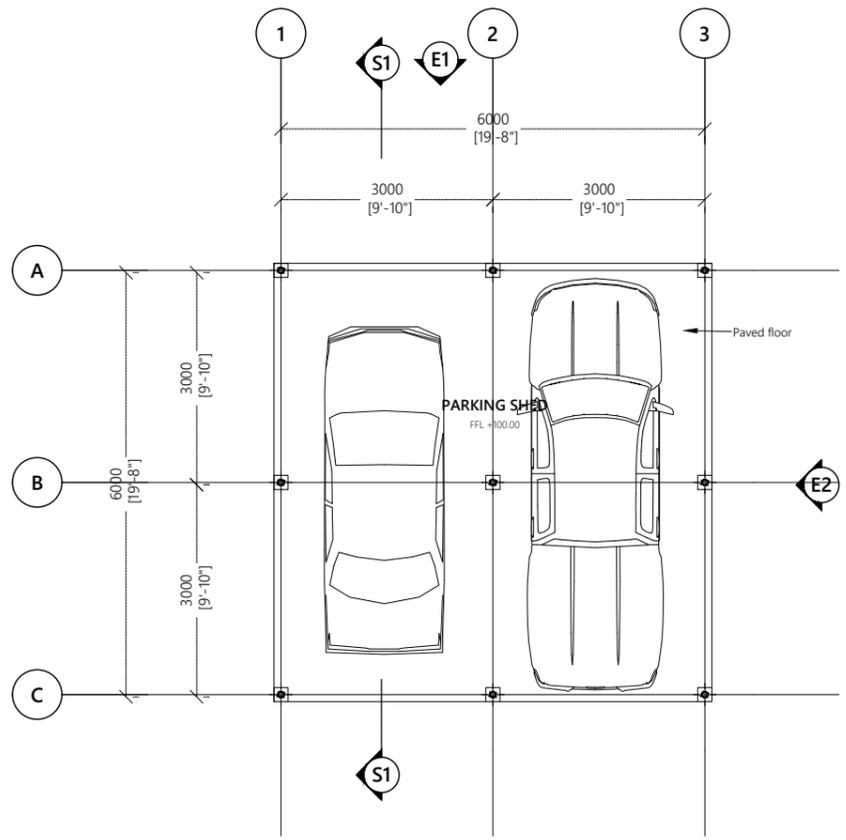
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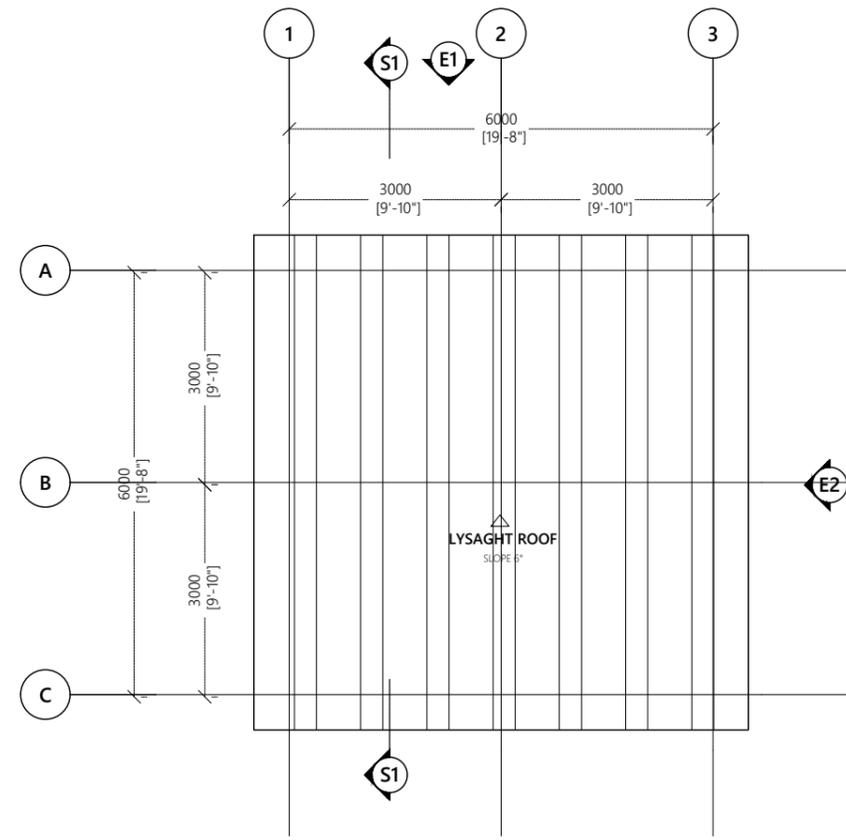
FIDBAC INFRA
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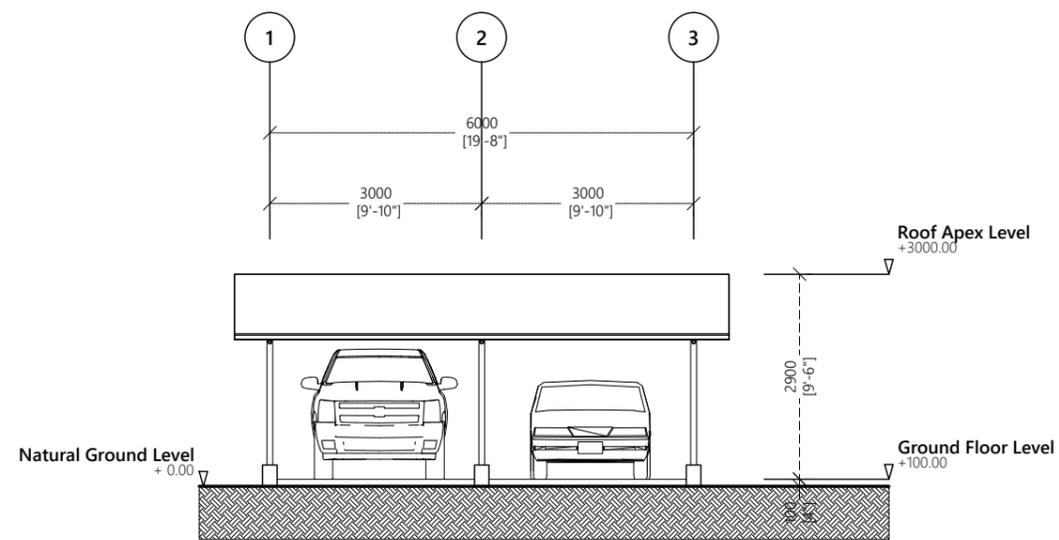
GROUND FLOOR PLAN

1:100



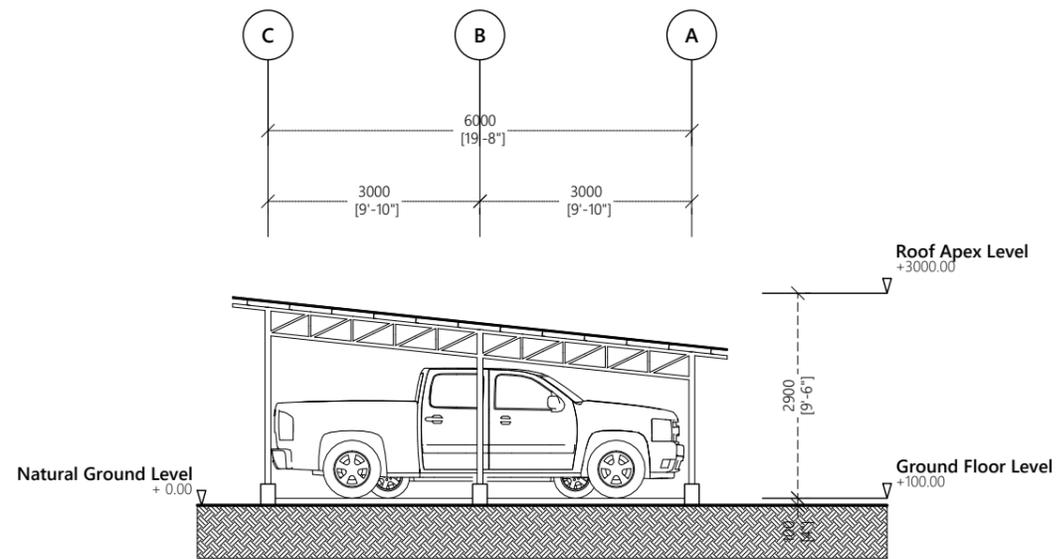
ROOF PLAN

1:100



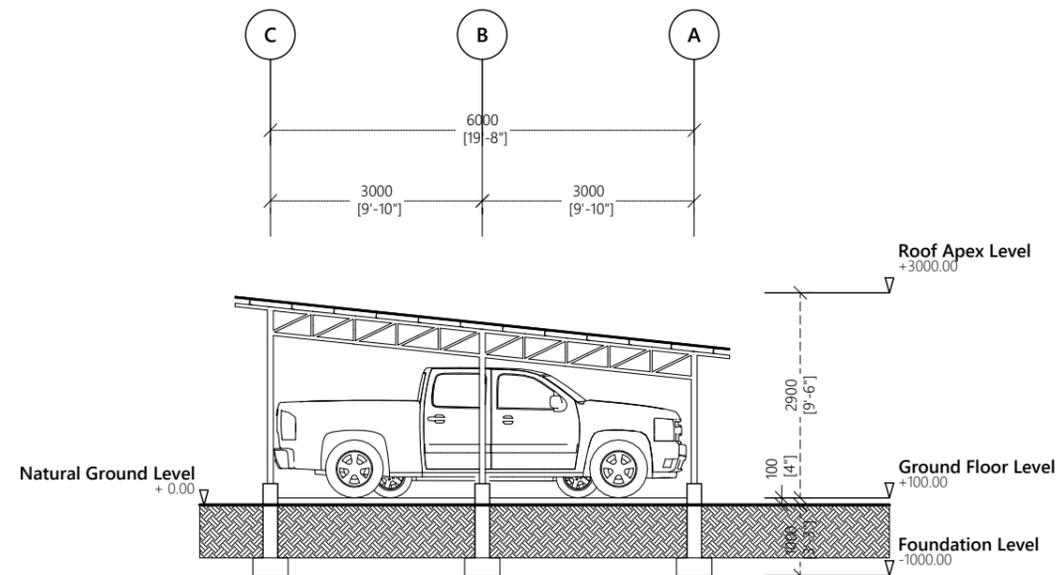
ELEVATION E1

1:100



ELEVATION E2

1:100



SECTION S1

1:100

Legend

Note:

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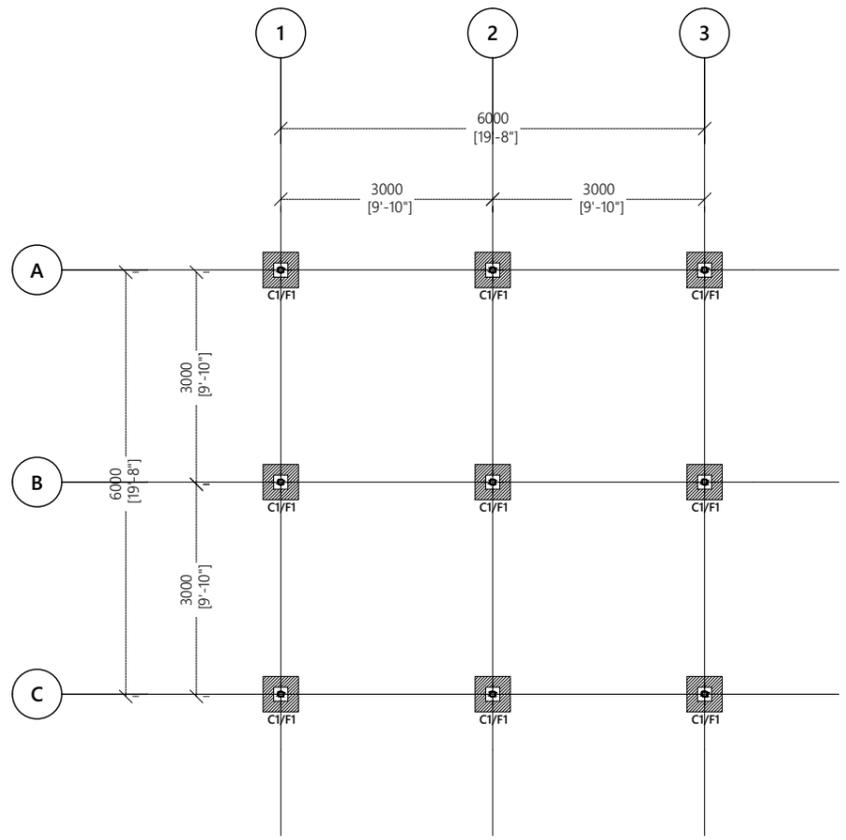
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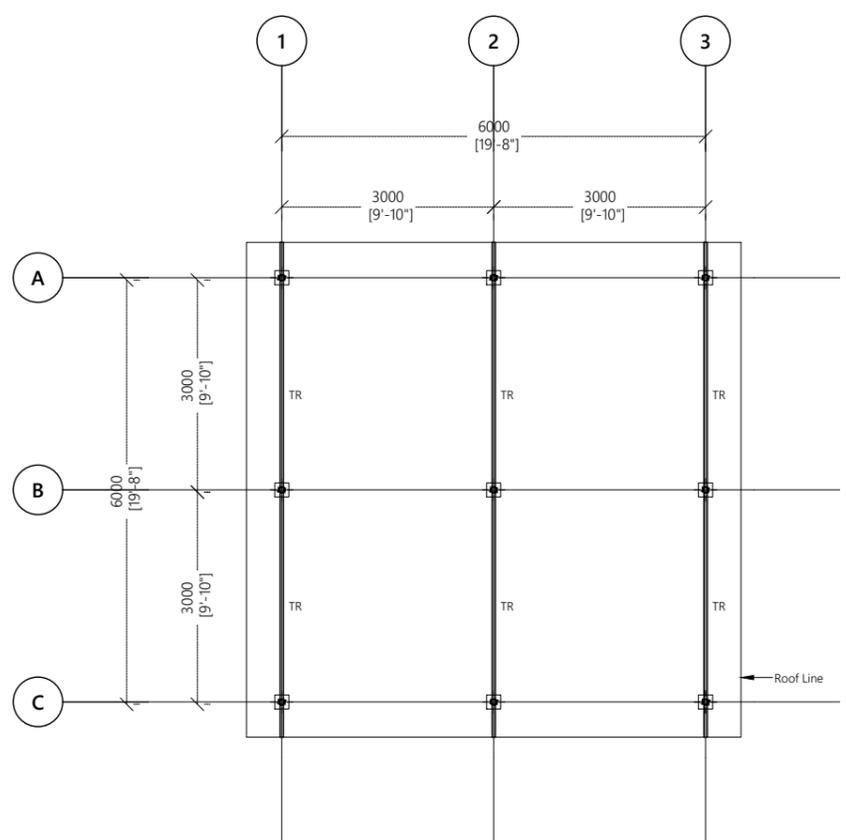
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Legend



FOUNDATION PLAN

1:100



ROOF TRUSS PLAN

1:100

Note:

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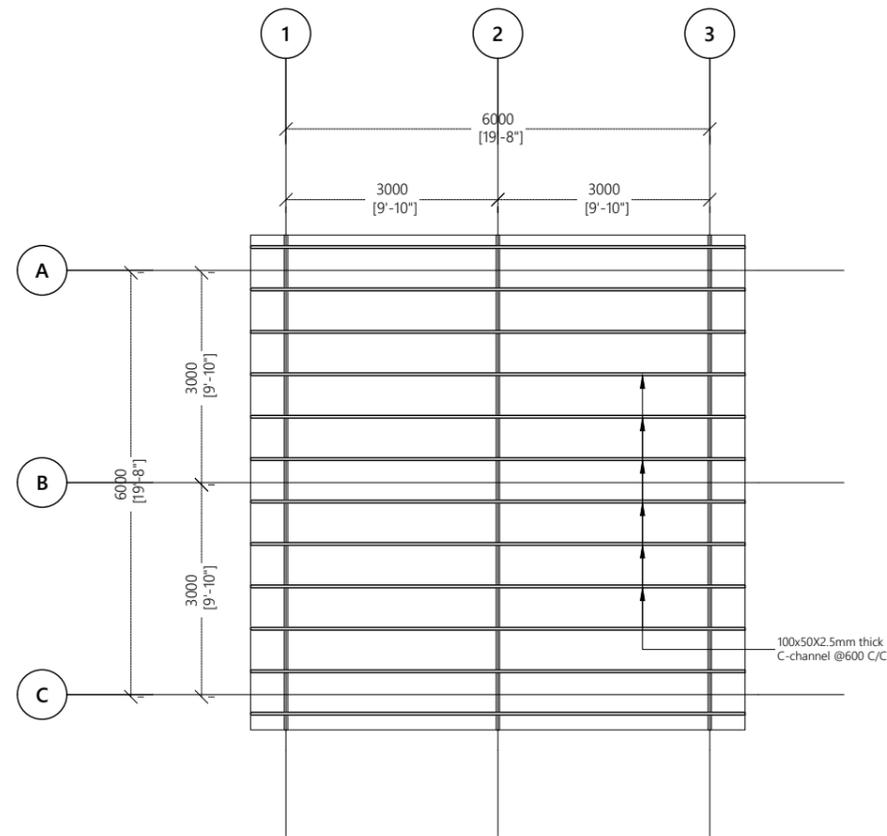


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ROOF FRAMING PLAN

1:100

Legend

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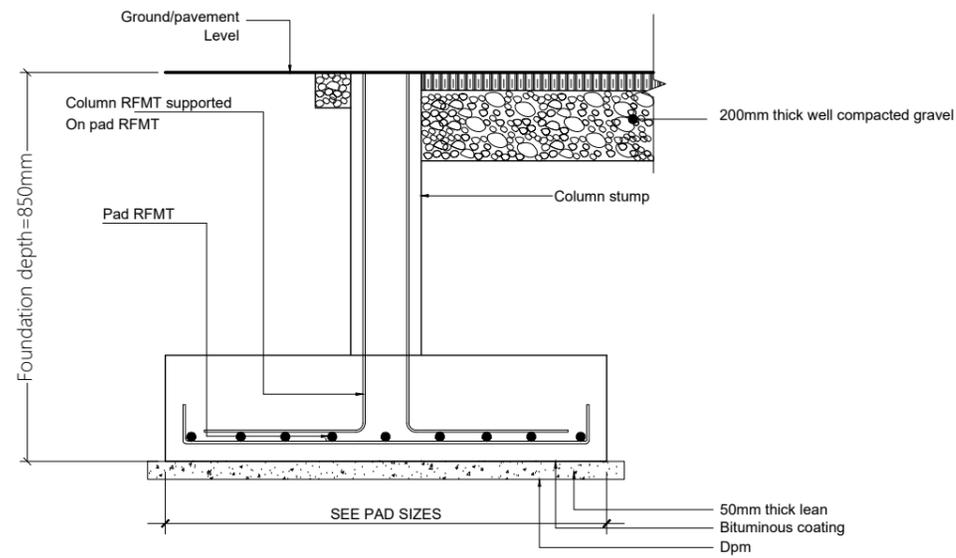


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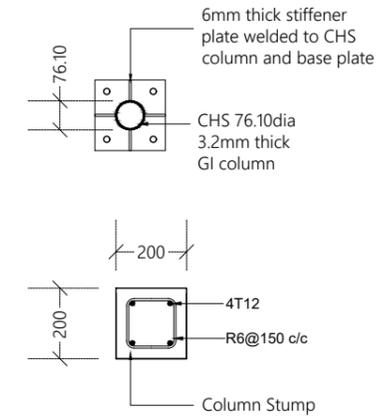
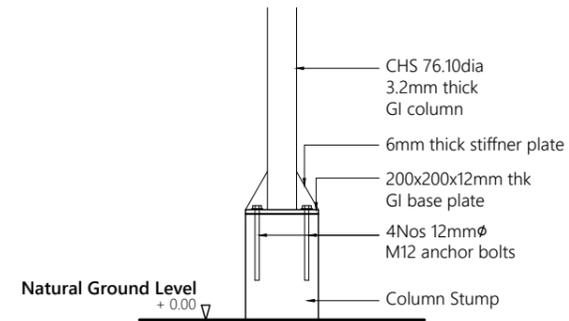
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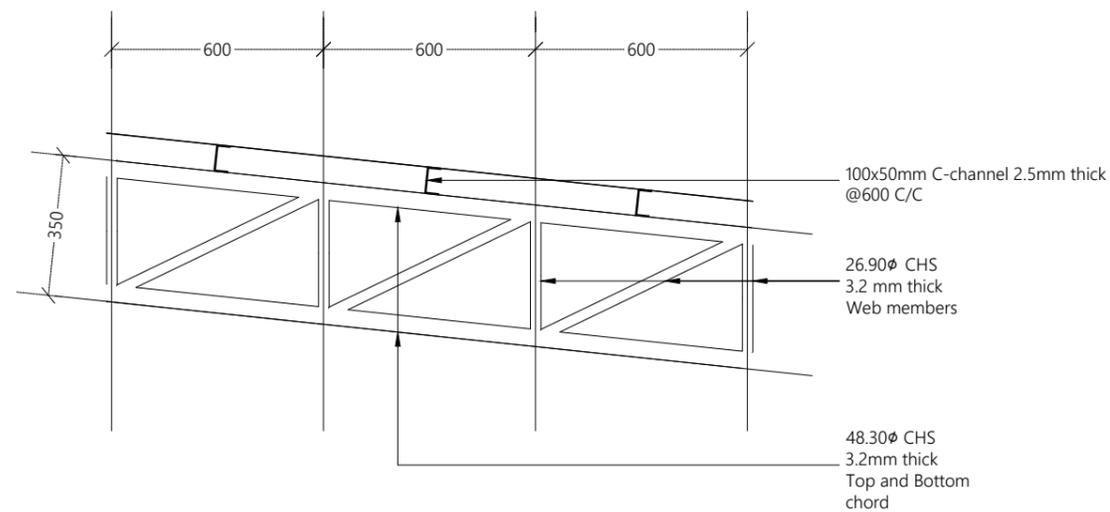
TYPICAL FOOTING DETAIL

1:20



COLUMN DETAIL

1:20



TRUSS DETAILS

1:20

Legend

Note:

- Foundation Pad Detail.**
- * F1 - 500x500x250 - T10@150C/C B/W (B)
- *All welds shall be 6mm thick full perimeter fillet welds
- *All Truss ends shall be end capped with 6mm plates
- *All truss members shall be protected with anti corrosive coatings
- *All CHS shall have a minimum yield stress of 275 MPa

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BUILDING SERVICES DRAWINGS OF
PROPOSED SINGLE STOREY BUILDING AT
RO PLANT ADMIN BUILDING, TH.DHIYAMIGILI

For Ministry of National Planning, Housing and Infrastructure

CONTENTS

BUILDING SERVICES DRAWINGS	
GROUND FLOOR POWER AND ACV LAYOUT	PAC-01
GROUND FLOOR FDP LAYOUT	FDP-01
GROUND FLOOR LIGHTING LAYOUT	EL-01
GROUND FLOOR PLUMBING LAYOUT	PL-01
GROUND FLOOR DRAINAGE LAYOUT	DR-01
ROOF DRAINAGE LAYOUT	DR-02
SITE LIGHTING LAYOUT	EL-02



Legend

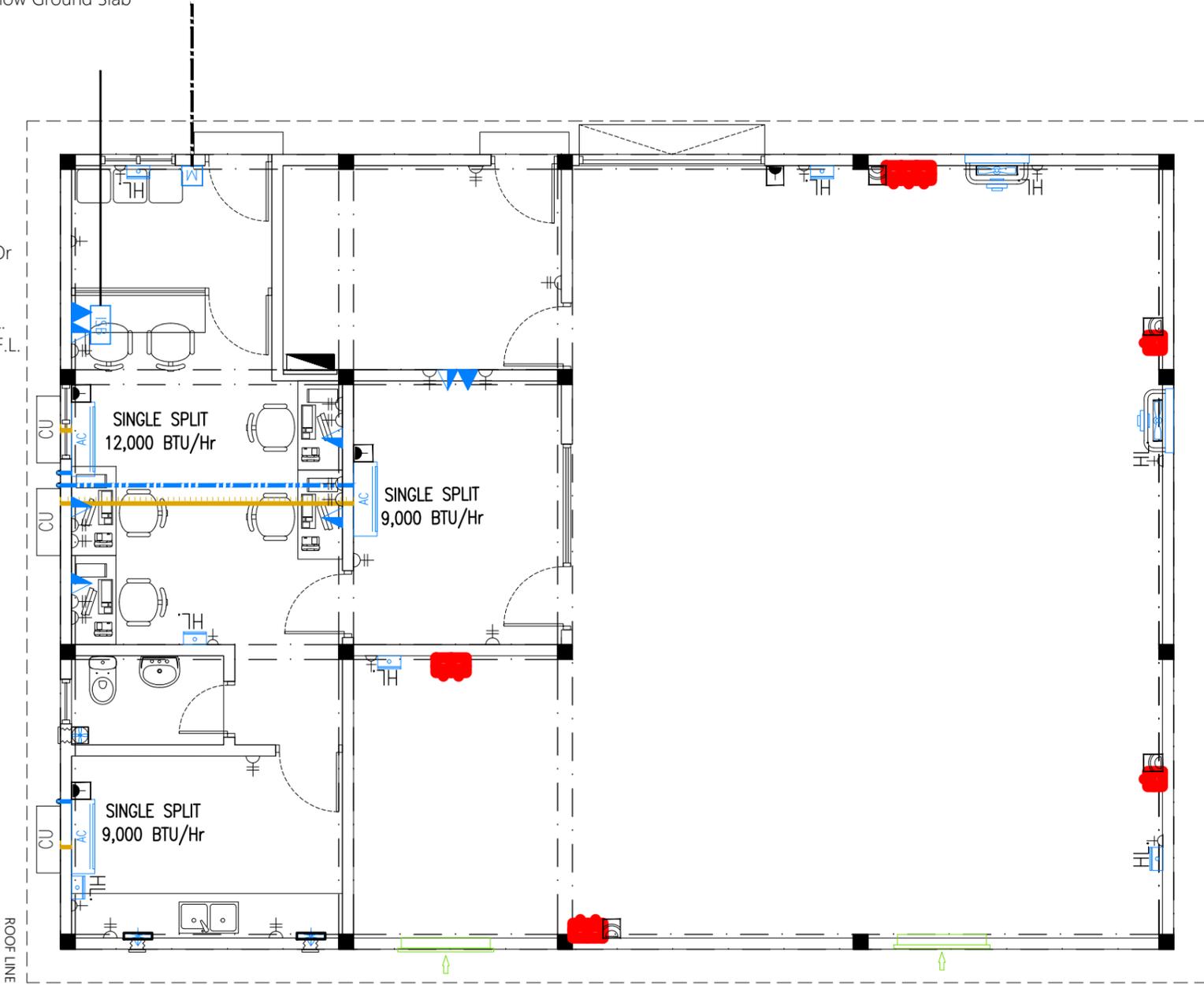
- 13A Twin Socket
- 13A Twin Socket With USB Ports
- 15A Switched Socket @ H.L.
- 15A Socket In Polycarbonate Box
- 15A Switch @ 1200mm From F.F.L.
- 13A Power Socket

- Distribution Board
- HL. High Level

- 82Ø PVC Duct For Tel./Internet Cable Lead In Below Ground Slab
- Main Incoming Cable For Power In 110Ø PVC Duct Below Ground Slab

- ISB Internet Switchboard
- Telephone Outlet
- Computer Network Outlet
- Emergency Light
- Electricity Meter

- Notes: -
- All 13A Power Outlets For Kitchen Hood Or Under Cabinet Or Wardrobe Lights At 1800mm From F.F.L.
 - All Twin Sockets At 300mm From F.F.L. Except Located At Kitchen Cupboard Area Which Shall Be At 1200mm From F.F.L.
 - All Computer, TV And Telephone Points At 300mm From F.F.L.
 - All 20A Switched Neon Indicator At 1200mm From F.F.L.



Legend

- Ref
- 250
- 400
- AC
- Wa
- CU
- Ceil
- Wa
- Sin
- Mo
- Fre

Legend

- Note:
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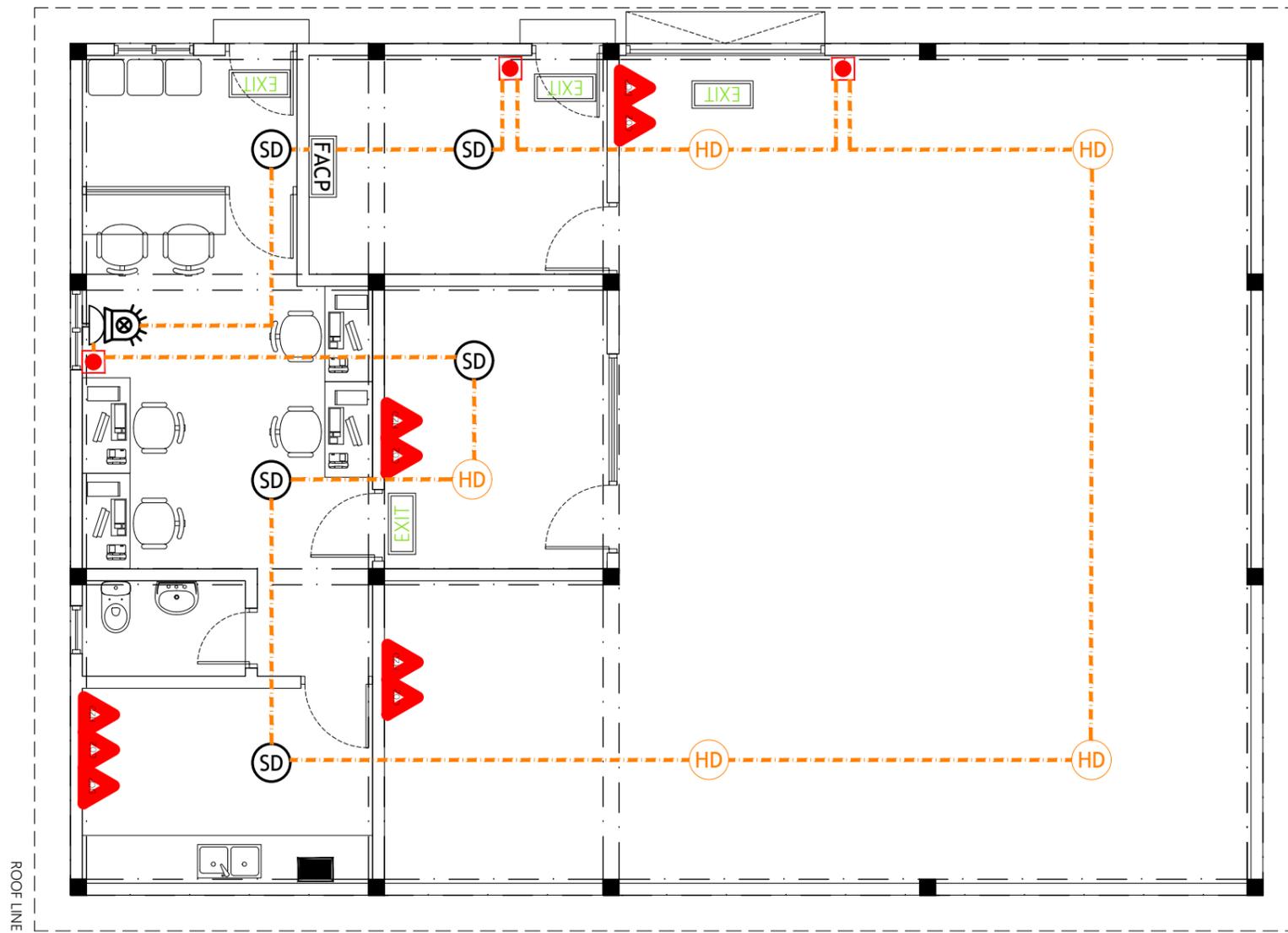
GROUND FLOOR POWER AND ACV LAYOUT

1:75



Legend

-  DCP Extinguisher (load: 6kg) In Polycarbonate Enclosure
-  CO₂ Extinguisher (load: 2kg) In Polycarbonate Enclosure
-  H₂O Extinguisher (load: 9L) In Polycarbonate Enclosure
-  Manual Call Point
-  Smoke Detector
-  Heat Detector
-  Beacon
-  Sounder Bell
-  Fire Blanket
-  2.5mm² Fire Retardant Low Smoke (FRLS) Cables In FRLS Conduits
-  Fire Alarm Control Panel
-  Exit Sign



Legend

Note:

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	AUG 2020	STAGE -1	H.R.	M.R.	M.R.

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 Islands, Maldives – Package 6
 Sub Title:
Water Supply System in GA.Dhevadhoo
 Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives



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Designed: H.R.	Approved: M.R.
Date: Aug 2020	SCALE (A3): 1:75
Project No: EP- WS/2019/06	
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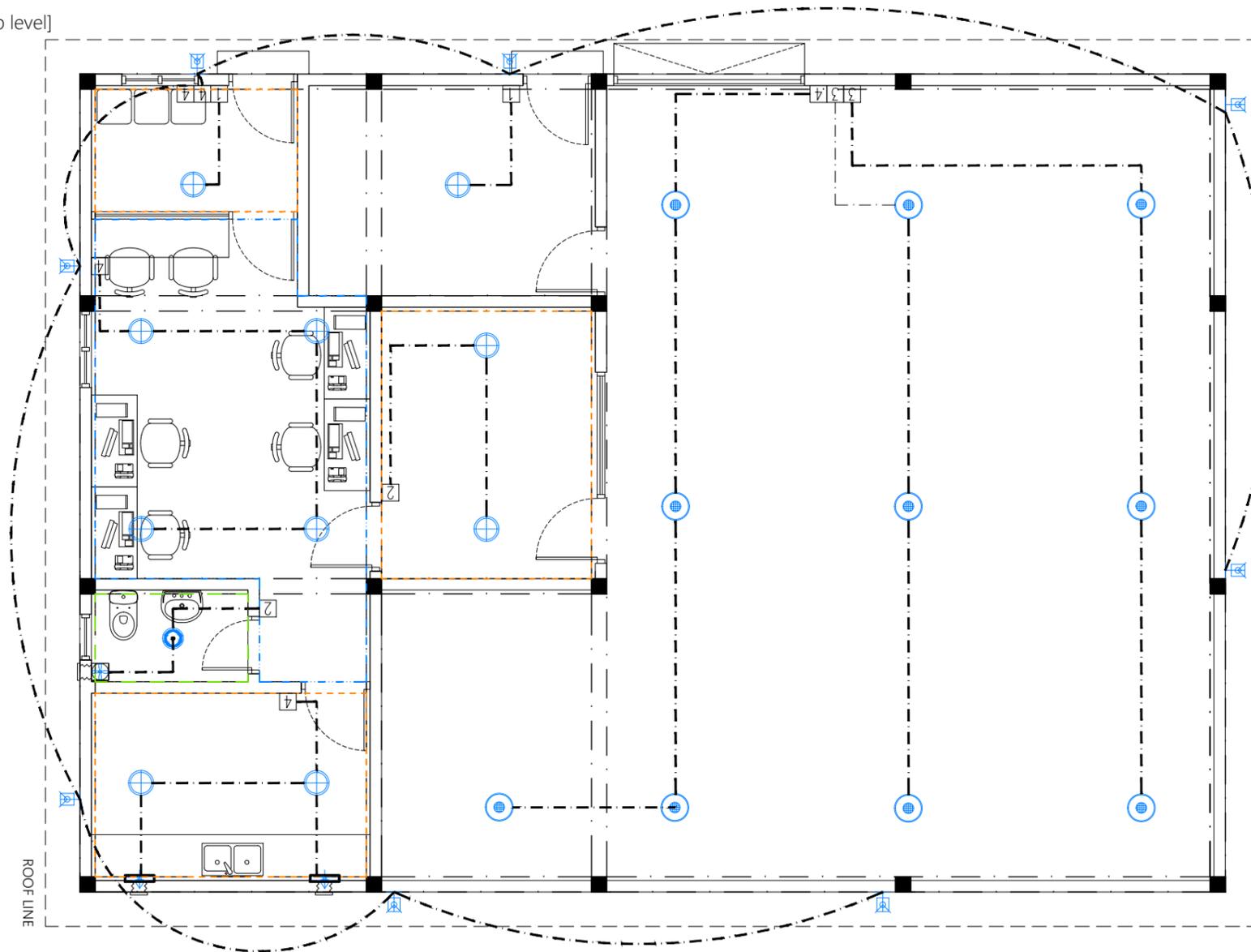
GROUND FLOOR FDP LAYOUT

1:75



Legend

-  Ceiling Light (12W)
-  Recessed Ceiling Light (12W)
-  Weather Proof Wall Light IP55 (12W)
-  60W, HPS, Low Bay Light
-  Light Switch (1 Gang - 4 Gang)
-  Two Way Light Switches (1 Gang - 4 Gang)
-  SINGLE INTAKE, CENTRIFUGAL, EXTERNAL MOTOR, 800M3/Hr
-  Ceiling Mounted Exhaust Fan 90m3/hr
-  Wall Mounted Exhaust Fan
-  Cement Board False Ceiling [200mm below beam bottom]
-  Plaster Board False Ceiling [200mm below beam bottom]
-  Plaster Board False Ceiling [at roof beam top level]



Legend

Note:

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Project No: EP- WS/2019/06	
Rev: R-00	Page: EL-01

GROUND FLOOR LIGHTING LAYOUT

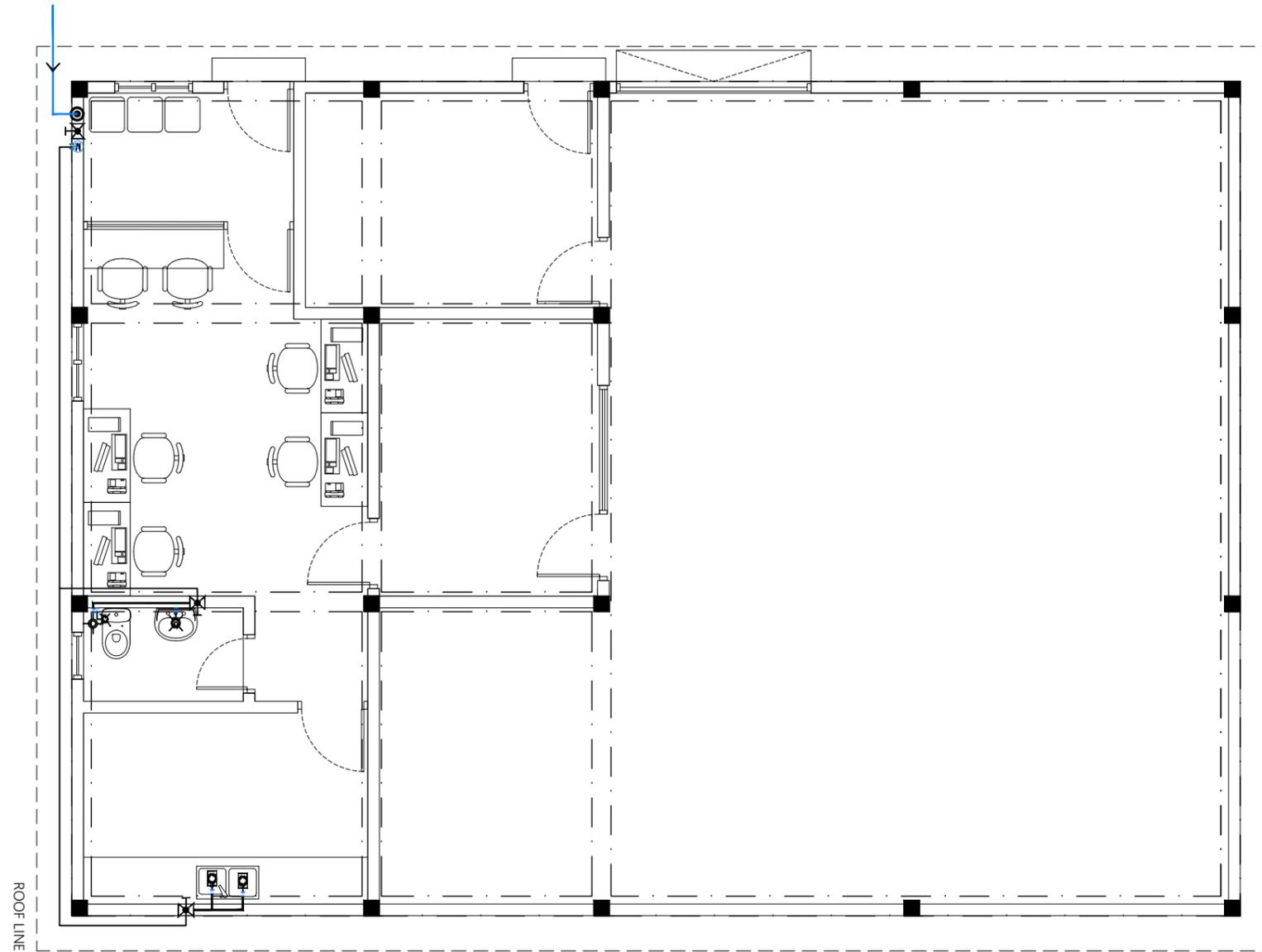
1:75



Legend

-  16Ø Cold Water Supply To Basin Faucet
-  16Ø Cold Water Supply To Bidet Shower
-  16Ø Cold Water Supply To Wall Tap
-  16Ø Cold Water Supply To Cistern
-  Gate Valve
-  Rise In Wall
-  MWSC Meter
-  25Ø Cold Water Supply Pipes Running Underground
-  20Ø Cold Water Supply Pipes Running In Wall

PIPE FROM MAINS SUPPLY



Legend

Note:

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Project No: EP- WS/2019/06	
Rev: R-00	Page: PL-01

GROUND FLOOR PLUMBING LAYOUT

1:75

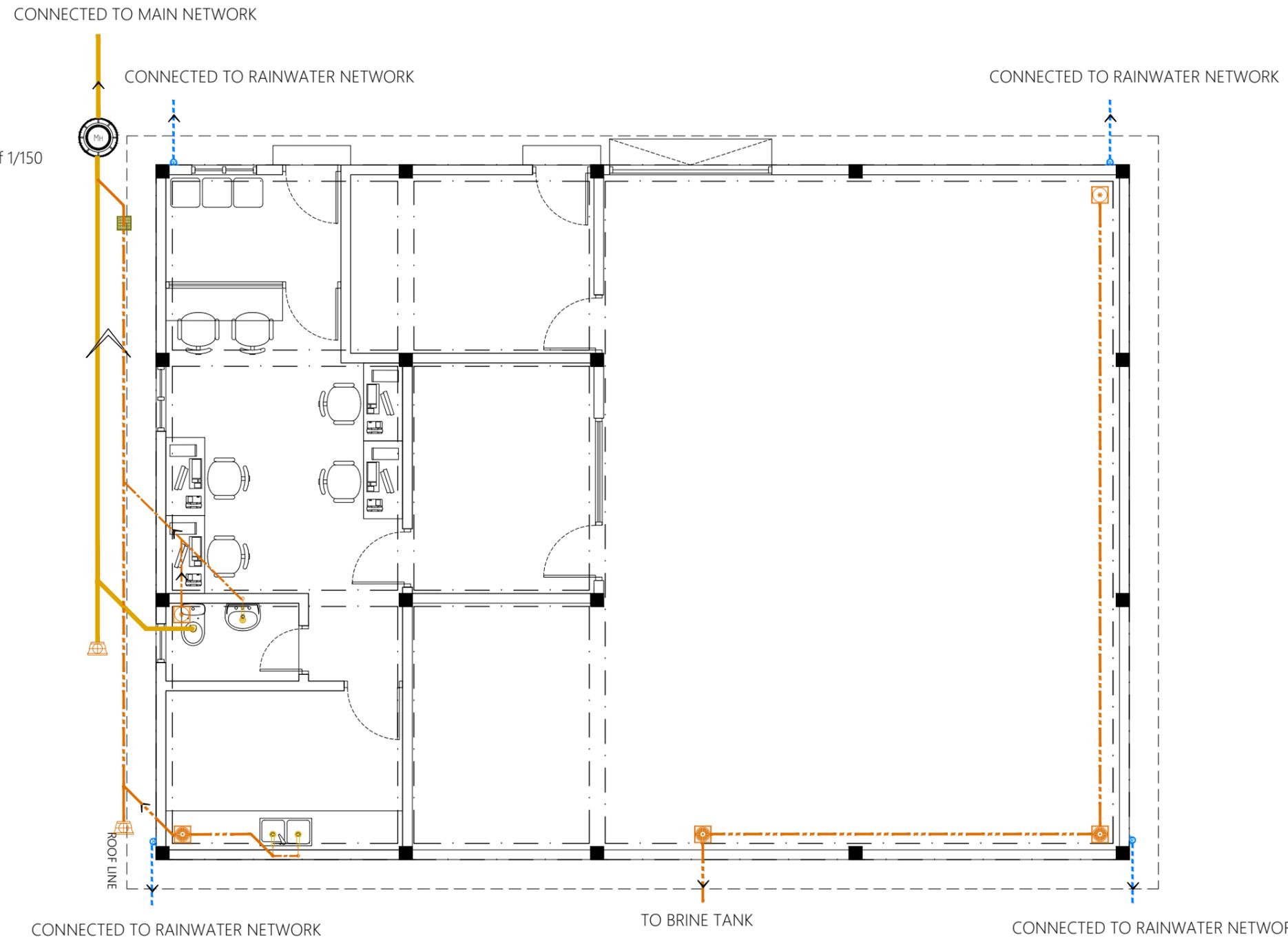


Legend

- Floor Drain
- Floor Gully
- 82Ø Soil Pipe (uPVC Pipe)
- 82Ø Soil Vent Pipe (uPVC Pipe)
- 63Ø Waste Pipe (uPVC Pipe)
- 63Ø Waste Vent Pipe (uPVC Pipe)
- 40Ø Waste Pipe (uPVC Pipe)
- 50Ø Manhole Vent Pipe (uPVC Pipe)
- 110Ø Rain Water Pipes (uPVC Pipe)
- Gully Trap
- 110Ø Rainwater Outlet
- Clean Out Point
- Bottle Trap

Notes: -

- All Drainage Pipes Should Have At A Slope Of 1/150
- All Floor Drains Should Have 'P' Traps



Legend

- Note:
- All Drainage Pipes Should Have At A Slope Of 1/150
 - All Floor Drains Should Have 'P' Traps

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MAKING SUSTAINABLE HAPPEN

Drawn: H.R.	Checked: M.R.
Designed: H.R.	Approved: M.R.
Date: Aug 2020	SCALE (A3): 1:75
Project No: EP- WS/2019/06	
Rev: R-00	Page: DR-01

GROUND FLOOR DRAINAGE LAYOUT

1:75

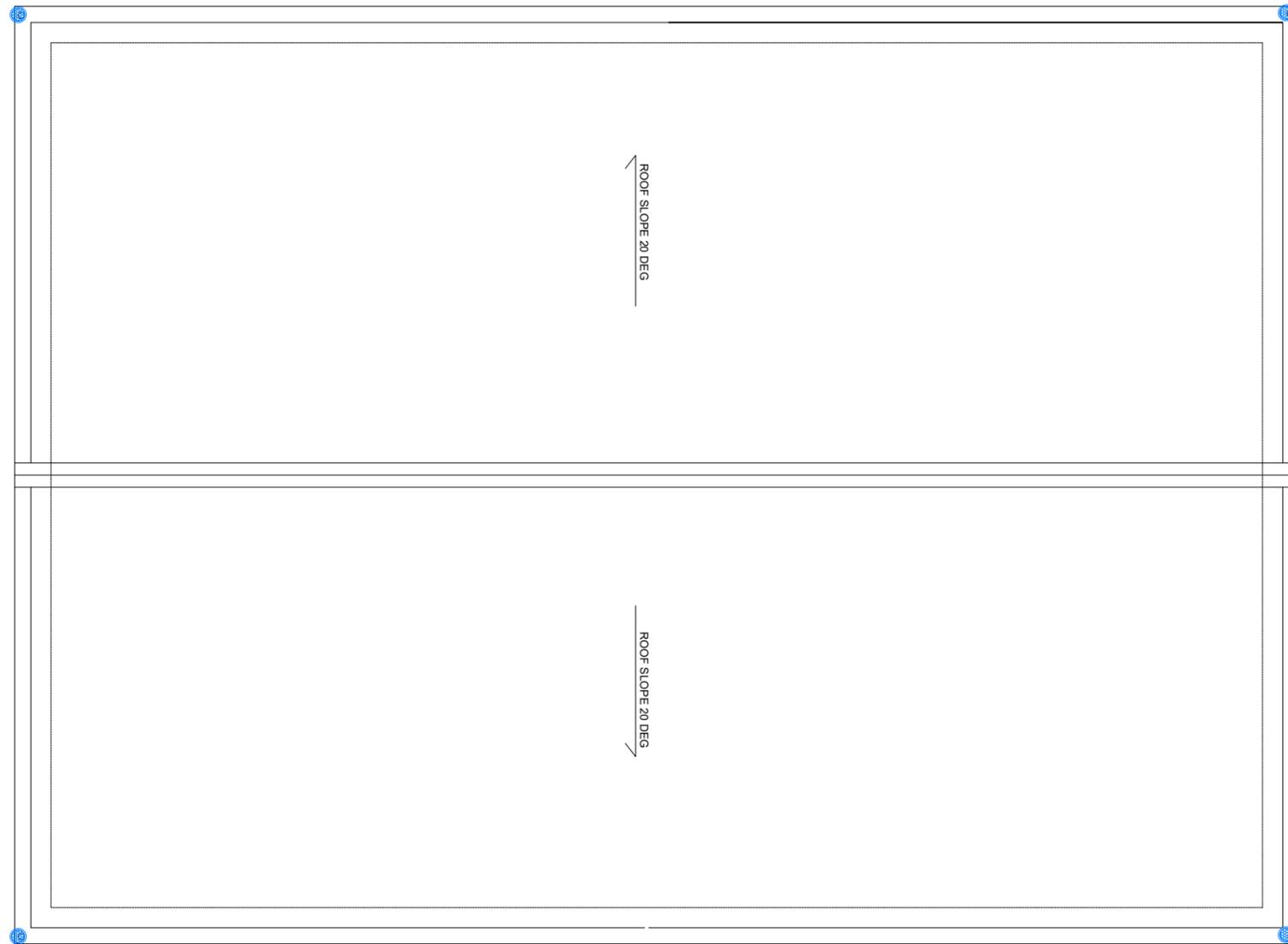


Legend

-  Floor Drain
-  Floor Gully
-  82Ø Soil Pipe (uPVC Pipe)
-  82Ø Soil Vent Pipe (uPVC Pipe)
-  63Ø Waste Pipe (uPVC Pipe)
-  63Ø Waste Vent Pipe (uPVC Pipe)
-  40Ø Waste Pipe (uPVC Pipe)
-  50Ø Manhole Vent Pipe (uPVC Pipe)
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-  110Ø Rainwater Outlet
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Notes: -

- All Drainage Pipes Should Have At A Slope Of 1/150
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Legend

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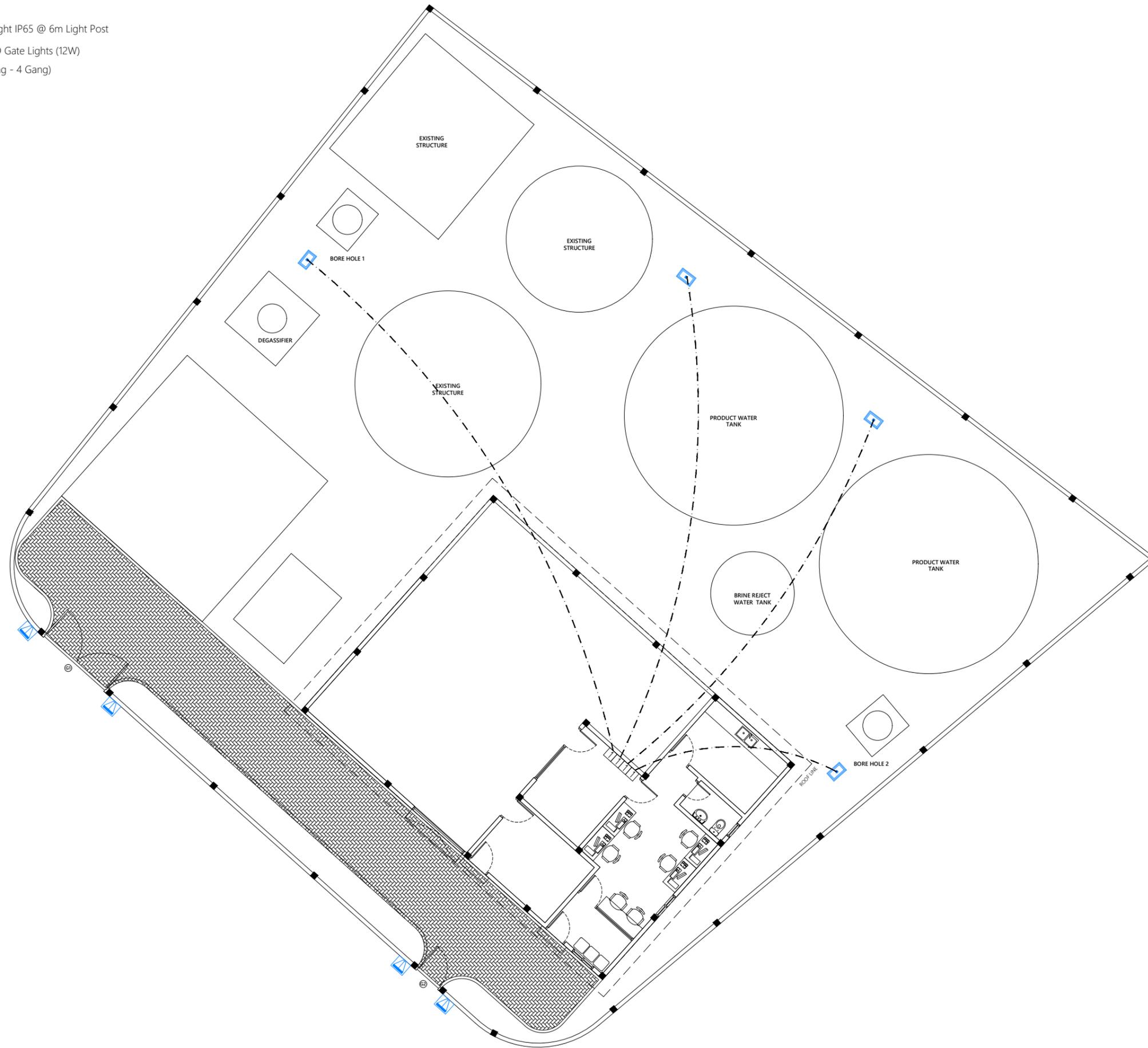
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Date: Aug 2020	SCALE (A3): 1:75
Project No: EP- WS/2019/06	
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Legend

-  100W LED Flood Light IP65 @ 6m Light Post
-  Solar Powered LED Gate Lights (12W)
-  Light Switch (1 Gang - 4 Gang)



Legend

Note:

- All Drainage Pipes Should Have At A Slope Of 1/150
- All Floor Drains Should Have 'P' Traps

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FEEDBACK INFRA
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Project No: EP- WS/2019/06	
Rev: R-00	Page: EL-02

SITE LIGHTING LAYOUT
1:150