

CONSULTANCY SERVICES FOR SURVEY, DESIGN AND EIA WORKS OF WATER SUPPLY AND
SEWERAGE FACILITIES IN 7 ISLANDS, MALDIVES

PACKAGE 4

WATER SUPPLY SYSTEM OF ADH. OMADHOO, MALDIVES

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

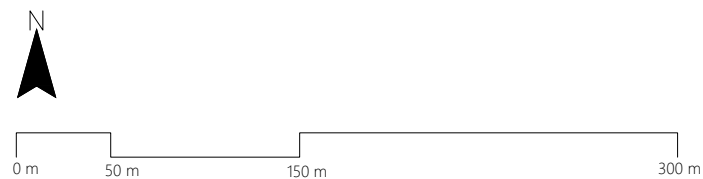


T: +960 333 3528 E: info@epoch.associates W: www.epoch.associates
A: 4A, 4th Floor, M. Ahigasdhoshuge, Fareedhee Magu Male' Republic of Maldives



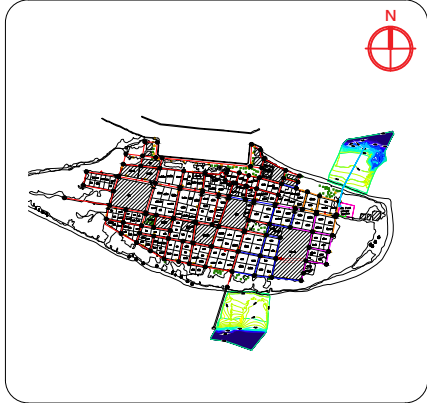
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ADH. OMADHOO WATER SUPPLY NETWORK LAYOUT

1:4000



Legend

- Ø63 HDPE Water Main Distribution Pipe
- Ø90 HDPE Water Main Distribution Pipe
- Ø140 HDPE Water Main Distribution Pipe
- Ø110 HDPE Brine Outfall Pipe
- Junction
- Ø75 HDPE Water Main Distribution Pipe
- Ø110 HDPE Water Main Distribution Pipe
- Ø160 HDPE Water Main Distribution Pipe
- Washout Valves
- Gate Valves

- Notes:
- All levels are shown in meters.
 - All levels are shown from mean sea level.
 - This drawing to be read in conjunction with all other relevant drawing and specifications.
 - All pressure pipes and fittings shall be installed using electro-fusion and butt-fusion technologies.
 - All pressure pipes shall be laid in between 0.7m - 1.0m below natural ground level to achieve best flat alignment based on topographic survey.
 - All the service connections to the mains shall be made using electro-fusion saddle and coupler.
 - Minimum size of the main water supply network shall be OD 63mm PE100, PN10, SDR17 HDPE pipe.
 - Minimum size of the house service line shall be OD 25mm PE100, PN16, SDR11 HDPE pipe.
 - Minimum size of commercial and other institutional connection service line shall be 50mm, PE100, PN16, SDR11 HDPE pipe.

MAINS DISTRIBUTION		TYPE OF PIPE
DIAMETER (mm)	LENGTH HDPE (m)	
63	4793	HDPE (PE100,PN10,SDR17)
75	855	
90	527	
110	431	
160	27	
Total	6633	

Gate Valves	- 34 nos
Washout Valves	- 03 nos

OUTFALL		TYPE OF PIPE
DIAMETER (mm)	LENGTH HDPE (m)	
110	- 51m (on land), 123m (offshore)	HDPE (PE100,PN10,SDR11)

PSM BENCHMARKS	
PERMANENT SURVEY MARK PSM_B 273580.013E, 419503.811N 0.769m From MSL	
PERMANENT SURVEY MARK PSM_C 273883.875E, 419259.936N 1.002m From MSL	

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

Title:
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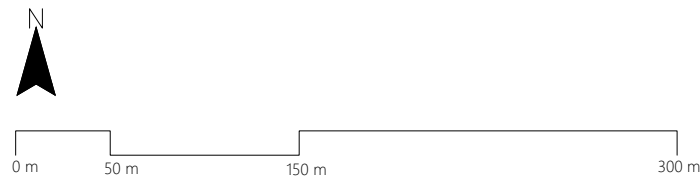
Sub Title:
Water Supply System in Adh.Omadhoo

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

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A: G. Rosary West,
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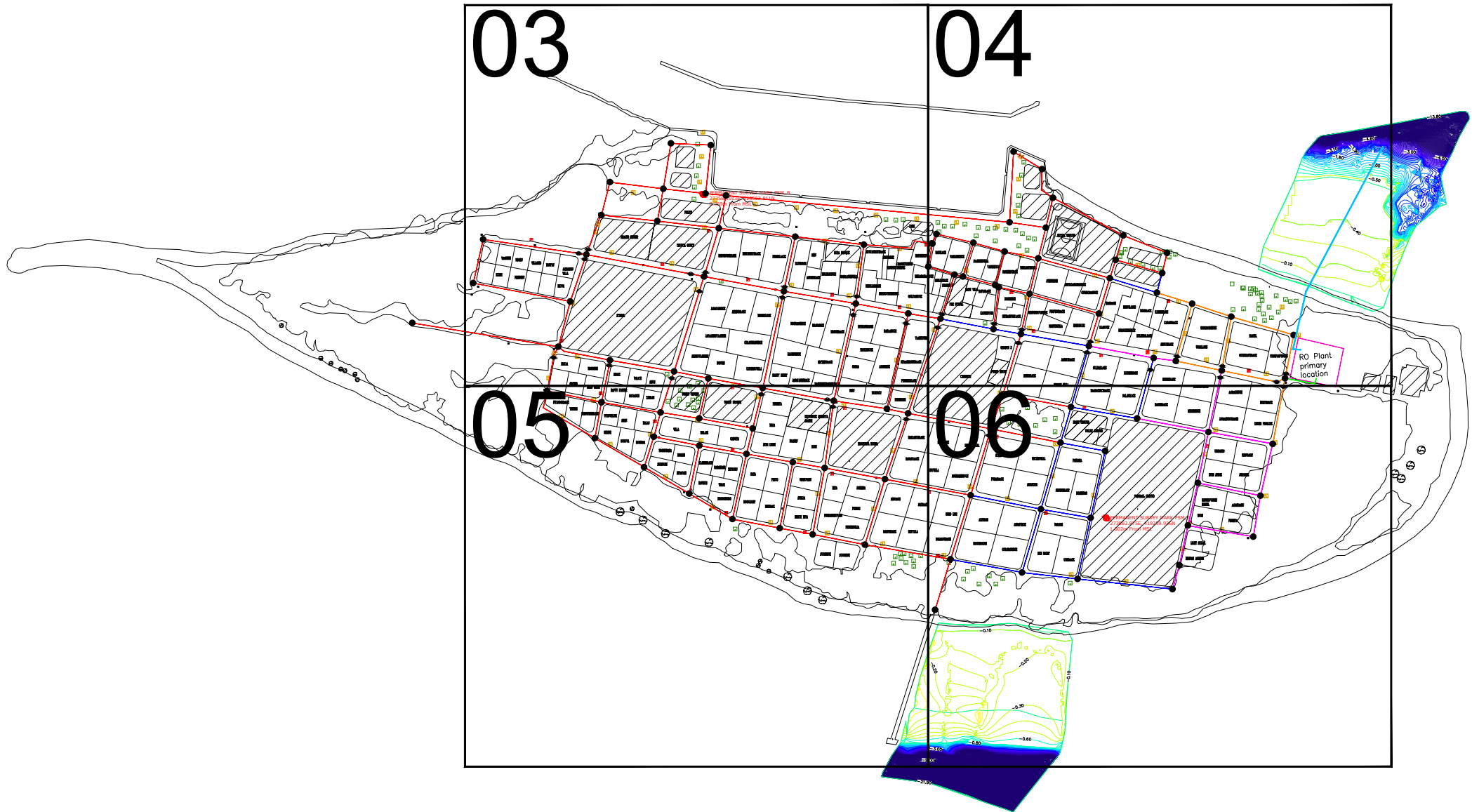
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ADH. OMADHOO WATER SUPPLY NETWORK ZONE LAYOUT

1:4000



Legend

Ø63 HDPE Water Main Distribution Pipe
Ø90 HDPE Water Main Distribution Pipe
Ø140 HDPE Water Main Distribution Pipe
Ø110 HDPE Brine Outfall Pipe
Junction
Ø75 HDPE Water Main Distribution Pipe
Ø110 HDPE Water Main Distribution Pipe
Ø160 HDPE Water Main Distribution Pipe
Washout Valves
Gate Valves

Notes:
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6. All the service connections to the mains shall be made using electro-fusion saddle and coupler.
7. Minimum size of the main water supply network shall be OD 63mm PE100, PN10, SDR17 HDPE pipe.
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	4793	HDPE (PE100/PN10,SDR17)
75	855	
90	527	
110	431	
160	27	
Total	6633	

Gate Valves - 34 nos
Washout Valves - 03 nos

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	~ 51m (on land), 123m (offshore)	HDPE (PE100/PN10,SDR11)

PSM BENCHMARKS

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0.769m From MSL

PERMANENT SURVEY MARK PSM_C
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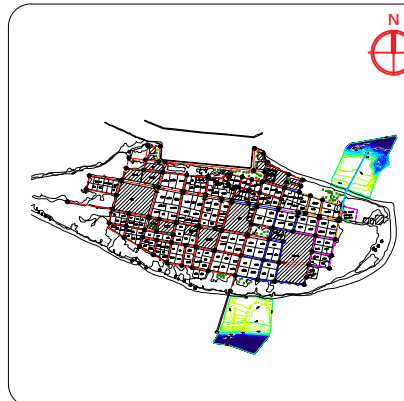
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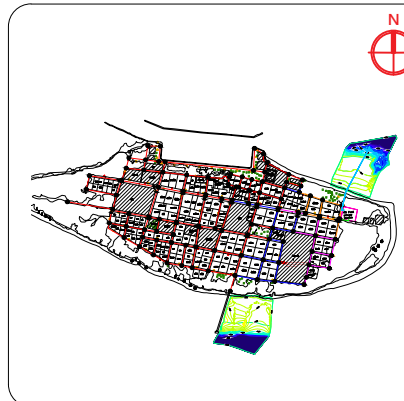
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Legend

- | | | | |
|---|------------------------------|---|----------------------|
|  | 063 HDPE Water Main |  | 075 HDPE Water Main |
| | 090 HDPE Water Main | | 0110 HDPE Water Main |
|  | 0140 HDPE Water Main |  | 0160 HDPE Water Main |
|  | 0110 HDPE Brine Outfall Pipe |  | Washout Valves |
|  | Junction |  | Gate Valves |



Notes:

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MAINS DISTRIBUTION		
DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	4793	HDPE (PE100,PN10,SDR17)
75	855	
90	527	
110	431	
160	27	
Total	6633	

OUTFALL		
DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	- 51m (on land), 123m (offshore)	HDPE (PE100, PN10, SDR11)

110	PSM BENCHMARKS
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- | | |
|---|--|
|  | PERMANENT SURVEY MARK PSM_R
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0.769m From MSL |
|  | PERMANENT SURVEY MARK PSM_C
273883.875E, 419259.936N
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Water Supply System in Adh.Omadhoo

Client:

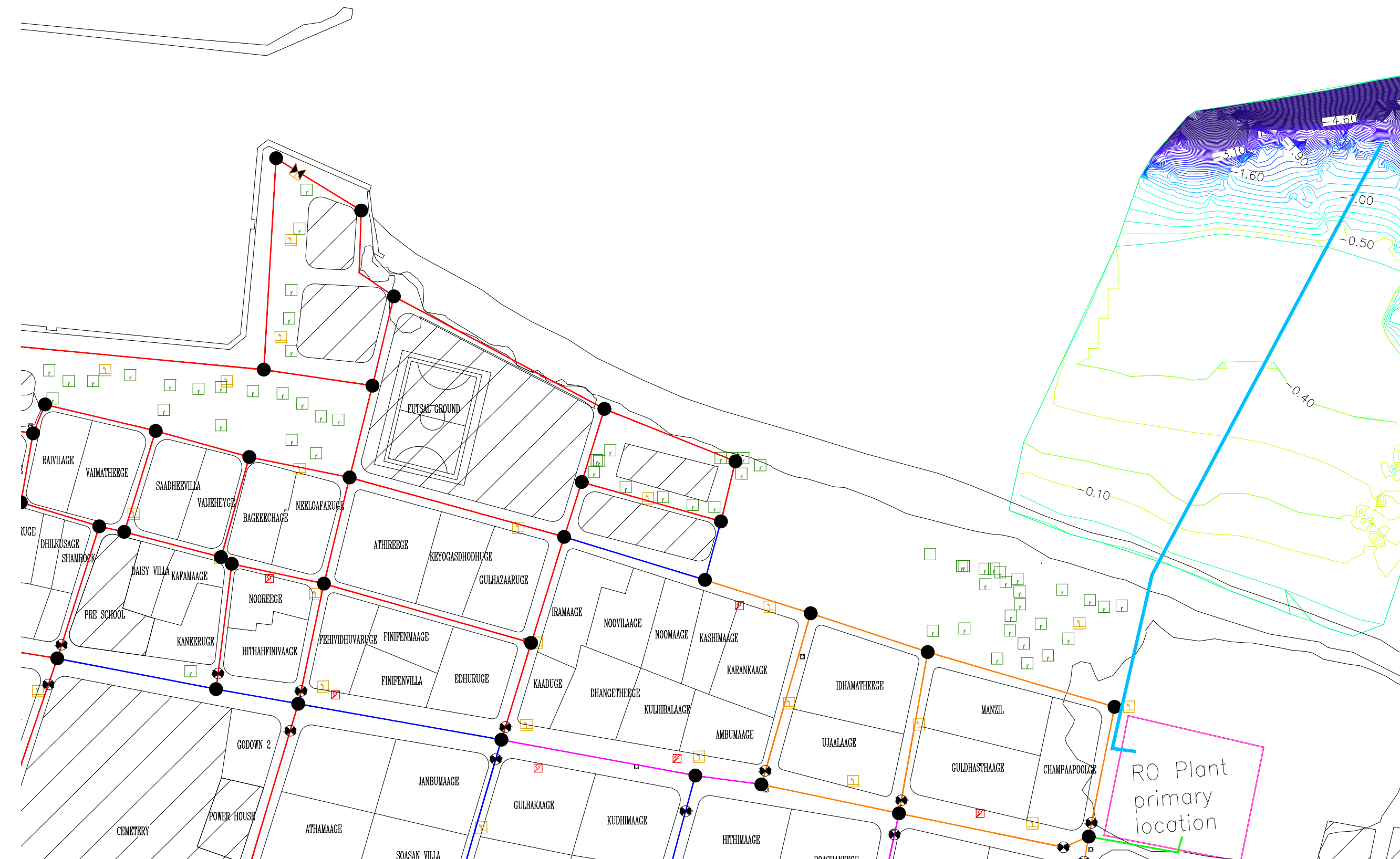
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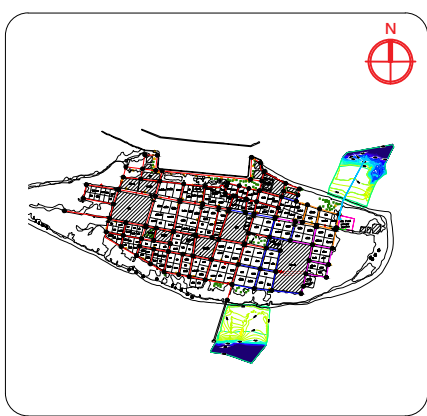


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E: info@epoch.associates
W: www.epoch.associates
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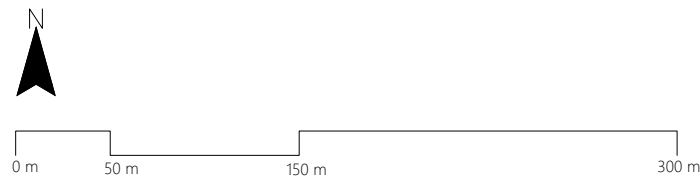
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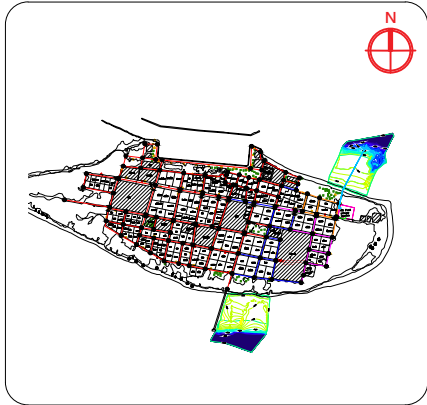
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R-01	05



ADH. OMADHOO RAINWATER COLLECTION NETWORK LAYOUT

1:4000



Legend

- Ø160 HDPE Rainwater Flow Pipe
- Ø250 HDPE Rainwater Flow Pipe
- Ø315 HDPE Rainwater Flow Pipe
- Ø200 HDPE Rainwater Flow Pipe
- Ø280 HDPE Rainwater Flow Pipe
- Junction

Notes:
1. All levels are shown in meters.
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3. This drawing to be read in conjunction with all other relevant drawing and specifications.

RAINWATER FLOW PIPES		
DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
160	388	HDPE (PE100, PN6, SDR26)
200	16	
250	117	
280	78	
315	267	
Total	866	

PSM BENCHMARKS	
PERMANENT SURVEY MARK PSM_B 273580.013E, 419503.811N 0.769m From MSL	
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Legend

- Ø160 HDPE Rainwater Flow Pipe
 Ø250 HDPE Rainwater Flow Pipe
 Ø315 HDPE Rainwater Flow Pipe
 Ø200 HDPE Rainwater Flow Pipe
 Junction

Notes:

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DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
160	388	HDPE (PE100,PN6,SDR26)
200	16	
250	117	
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Total	866	

PSM BENCHMARKS

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0.769m From MSL
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273883.875E, 419259.936N
1.002m From MSL

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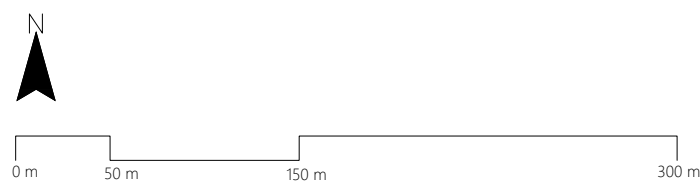
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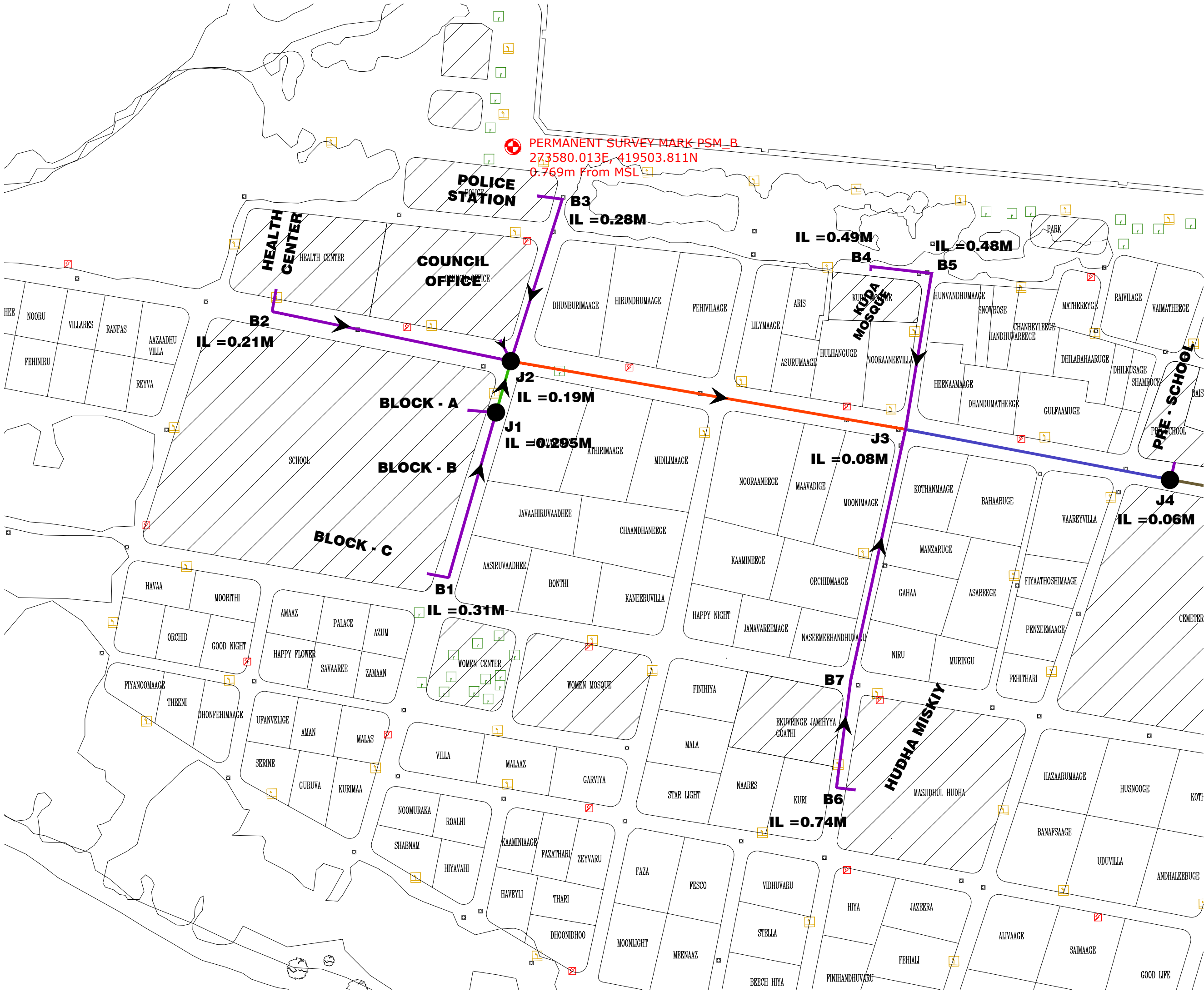
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ADH. OMADHOO RAINWATER COLLECTION NETWORK ZONE LAYOUT

1:4000



Legend

Ø160 HDPE Rainwater Flow Pipe

Ø250 HDPE Rainwater Flow Pipe

Ø315 HDPE Rainwater Flow Pipe

Ø200 HDPE Rainwater Flow Pipe

Ø280 HDPE Rainwater Flow Pipe

Junction

Notes:
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RAINWATER FLOW PIPES		TYPE OF PIPE
DIAMETER (mm)	LENGTH HDPE (m)	
160	388	HDPE (PE100, PN6, SDR26)
200	16	
250	117	
280	78	
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Total	866	

PSM BENCHMARKS

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Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 7 islands, Maldives - Package 4

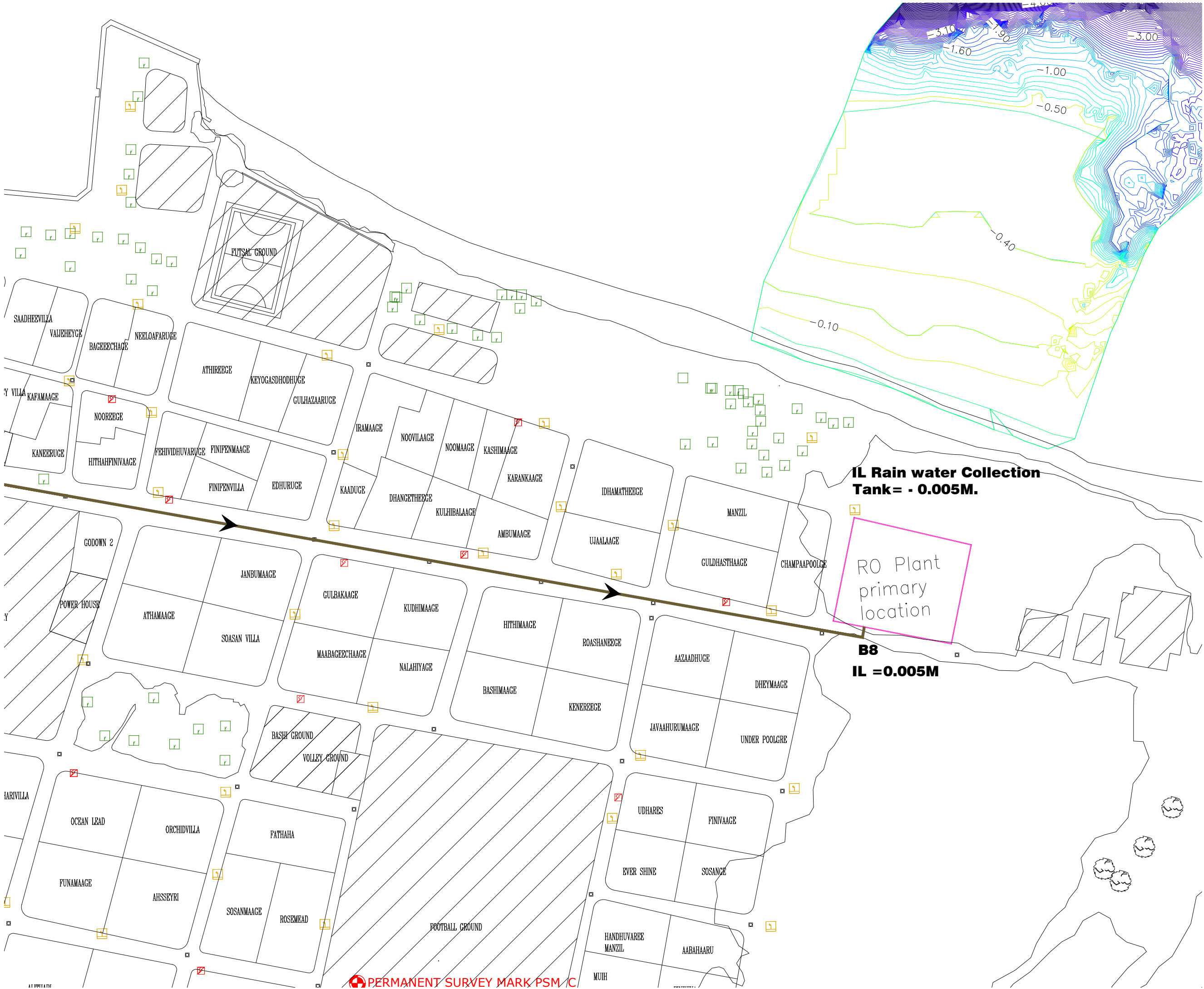
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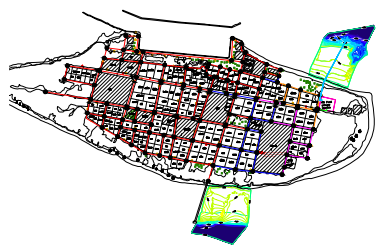

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Legend

Ø160 HDPE Rainwater Flow Pipe

Ø250 HDPE Rainwater Flow Pipe

Ø315 HDPE Rainwater Flow Pipe

Ø200 HDPE Rainwater Flow Pipe

Ø280 HDPE Rainwater Flow Pipe

● Junction

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200	16	
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PSM BENCHMARKS


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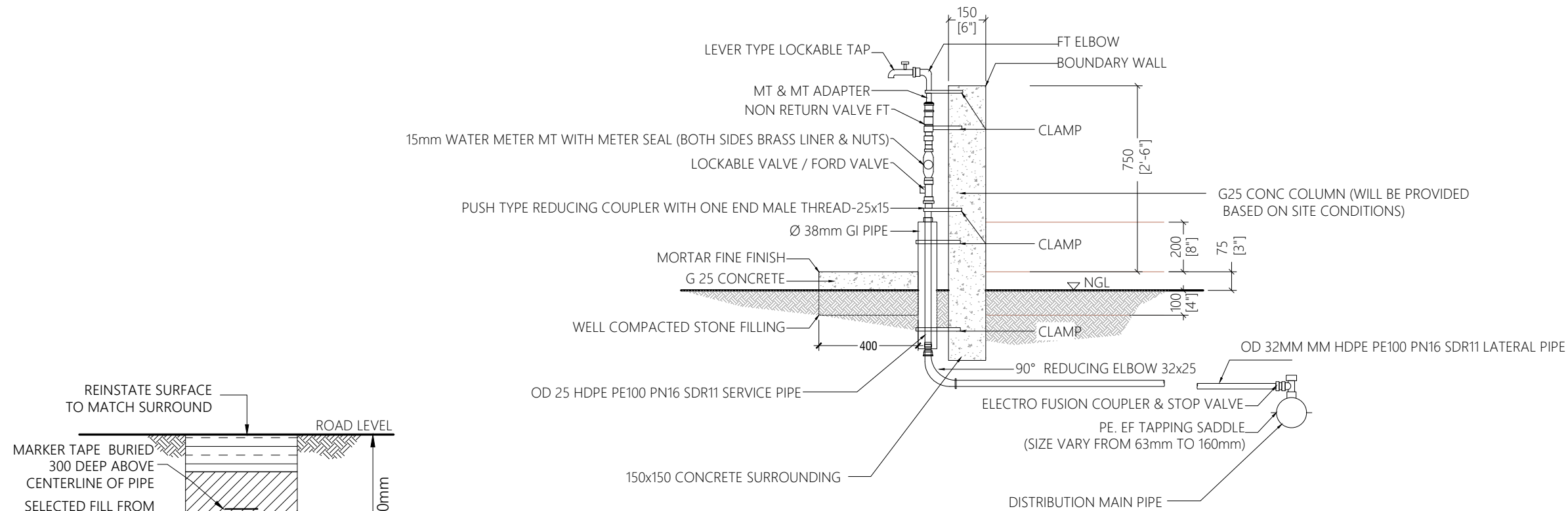


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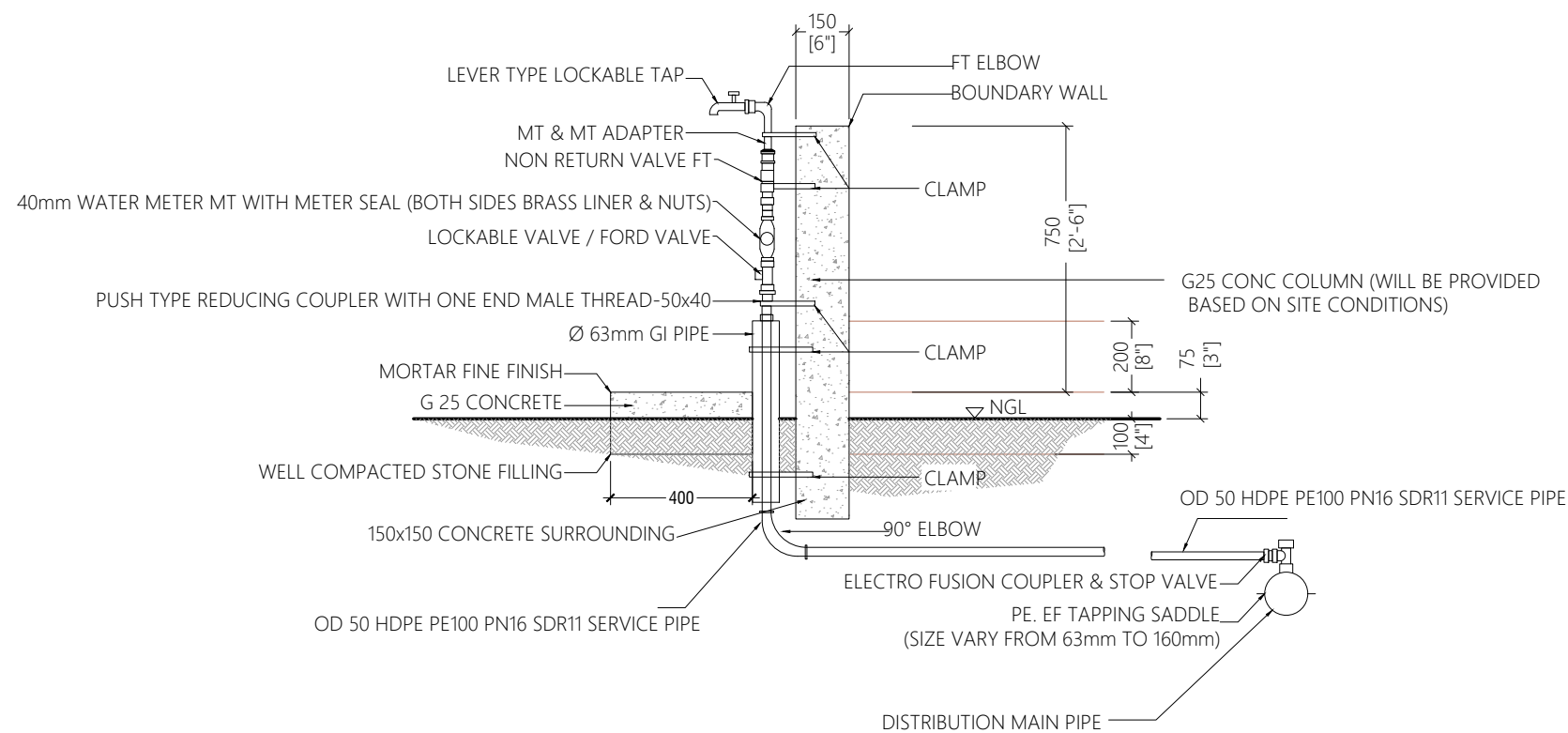


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Rev: R-01	Page: 10



WATER SUPPLY HOUSE CONNECTION DETAILS



WATER SUPPLY COMMERCIAL/INSTITUTIONAL CONNECTION DETAILS

WATER SUPPLY HOUSE AND COMMERCIAL/INSTITUTIONAL CONNECTIONS

1:20

Legend

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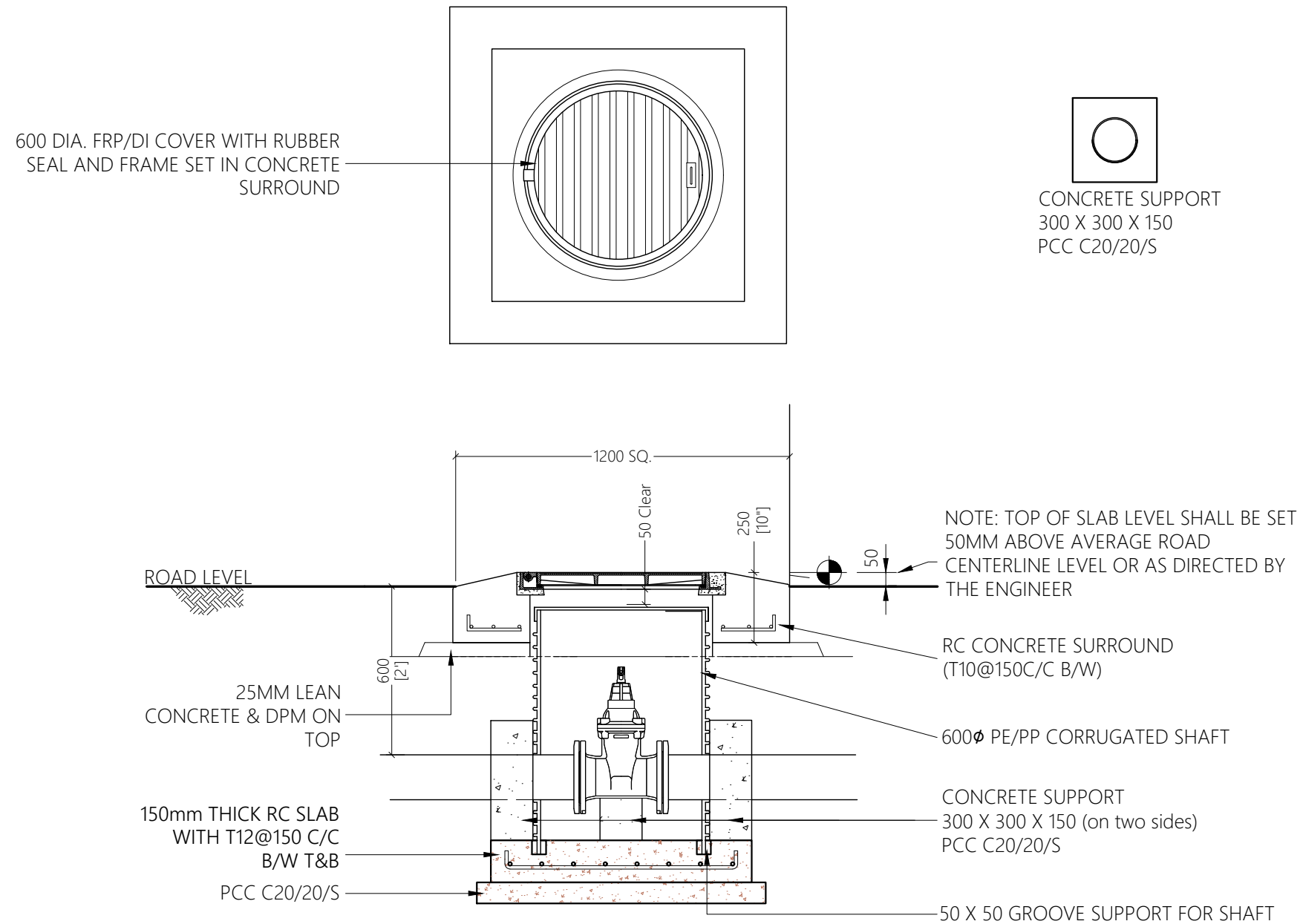
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Rev: R-01 Page: W-01



CONCRETE SUPPORT
300 X 300 X 150
PCC C20/20/S

NOTE: TOP OF SLAB LEVEL SHALL BE SET
50MM ABOVE AVERAGE ROAD
— CENTERLINE LEVEL OR AS DIRECTED BY
— THE ENGINEER

RC CONCRETE SURROUND
(T10@150C/C B/W)

600 ϕ PE/PP CORRUGATED SHAFT

CONCRETE SUPPORT
— 300 X 300 X 150 (on two sides)
PCC C20/20/S

—50 X 50 GROOVE SUPPORT FOR SHAFT

SECTION - VALVE CHAMBER

Legend

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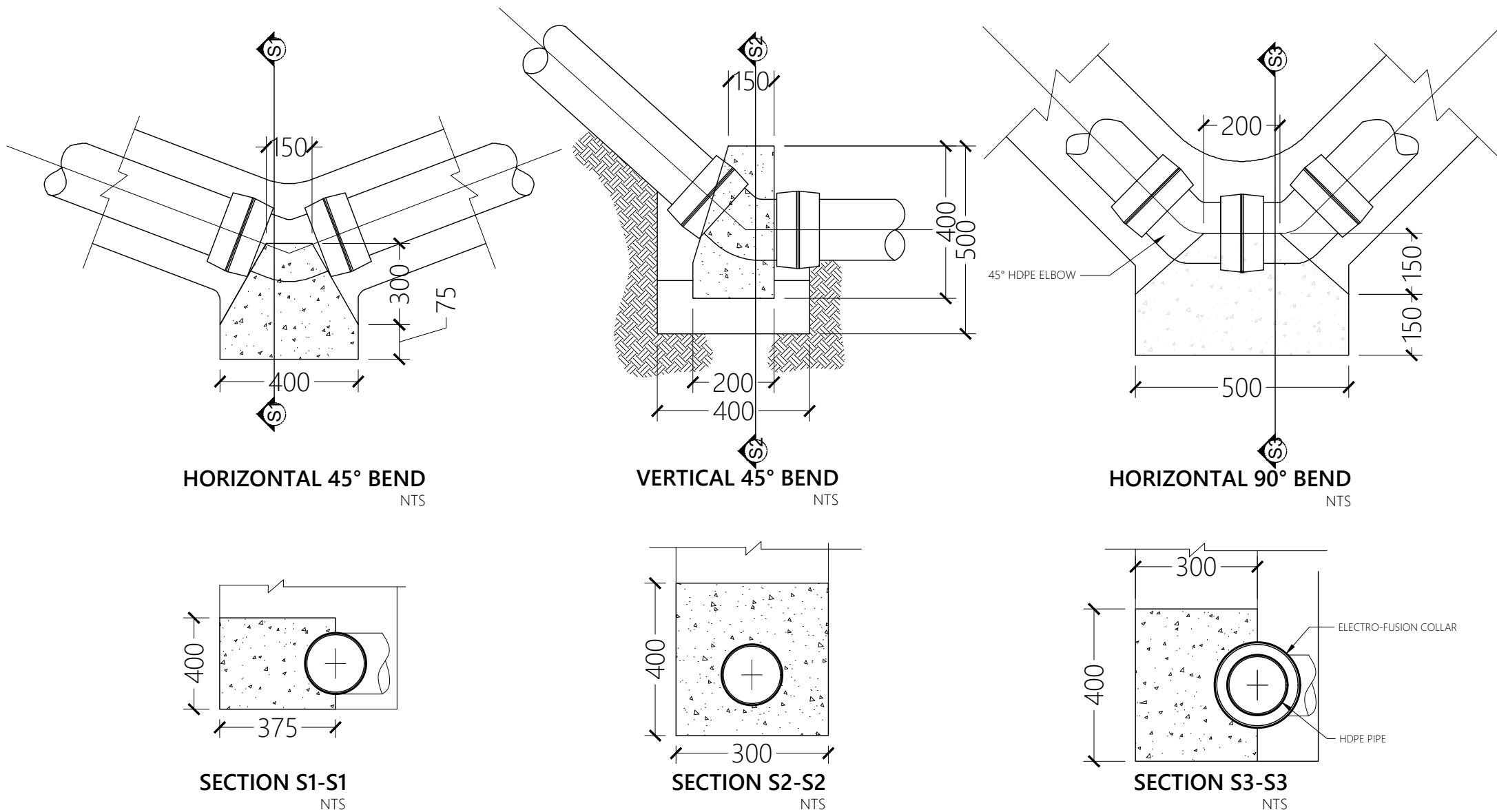
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Project No: EP-WS/2019/04

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R-01	W-02

VALVE CHAMBER DETAILS

1:20



THRUST BLOCK DETAILS

NTS

Legend

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Project No: EP-WS/2019/04	
Rev: R-01	Page: W-03



- Borehole Pump : 2 Nos
 - Flow (Q) = 18.52 m³/hr
 - Head (H) = 50 m
- High Pressure Pump : 2 Nos
 - Flow (Q) = 9.26 m³/hr
 - Pressure Range = 40-85 bar
- Transfer Pump : 2 Nos
 - Flow (Q) = 8.06 m³/hr
 - Head (H) = 17m
- Distribution Pump Set : 2 Nos
 - Flow (Q) = 34.0 m³/hr
 - Head (H) = 30 m
- Bine Pump : 2 Nos
 - Flow (Q) = 22.96 m³/hr
 - Head (H) = 15 m
- Rain Water lift Pump : 2 Nos
 - Flow (Q) = 51.65 m³/hr
 - Head (H) = 36 m
- UF Feed Pump : 2 Nos
 - Flow (Q) = 2.5 m³/hr
 - Head (H) = 35 m

- Ø90 HDPE (PE100, PN10, SDR17)
- Ø63 HDPE (PE100, PN10, SDR17)
- Ø110 HDPE (PE100, PN10, SDR17)
- Ø160 HDPE (PE100, P10, SDR17)
- Ø110 HDPE (OUTFALL PE100, PN16, SDR11)
- Ø315 HDPE (RAINWATER PE100, PN6, SDR26)

- 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 flow switches and automated valves will be provided.

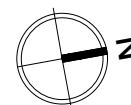
R00	JUNE 2020	STAGE -1	PD	SBC	SD
REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

Sub Title:
Water Supply System in Adh. Omadhoo

EPOCH ASSOCIATES
T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
Husnuheena Maqu, Male*, Maldives

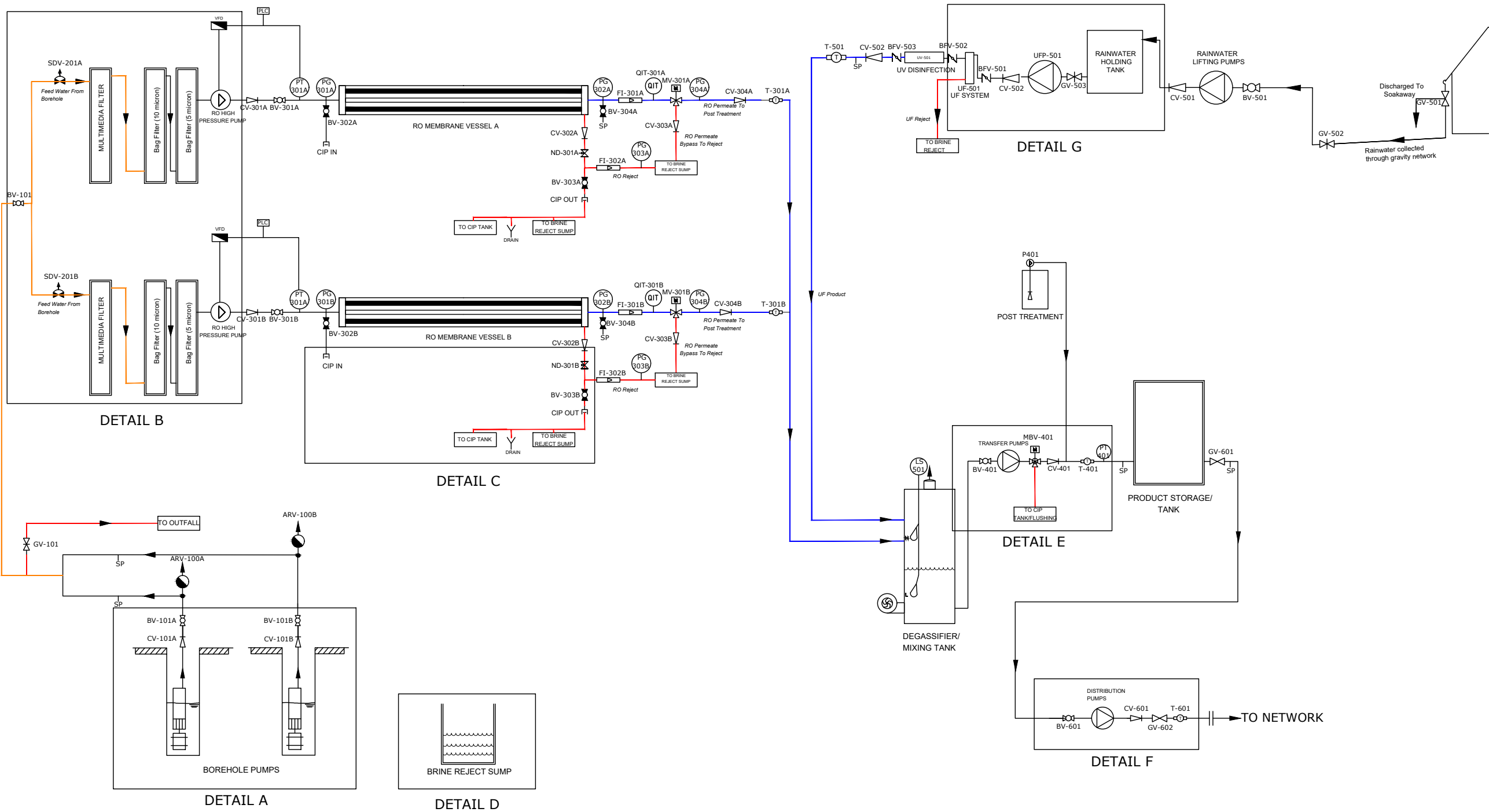
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Date: Sep 2020	SCALE (A3): 1:200
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Rev: R-01	Page: W-04



INTERNAL PIPE LAYOUT

1:200



LEGEND					
ACTUATION		VALVES		FEATURES	CONDITION
	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

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)

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 7 islands, Maldives - Package 4

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Water Supply System in Adh. Omadhoo

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		Page: W-05	

IWRM PLANT P&I OVERVIEW

NTS



LEGEND										
ACTUATION		VALVES			FEATURES		CONDITION		ABBREVIATIONS	
	MANUALLY OPERATED		BUTTERFLY		MOTORIZED BALL		FLANGED CONNECTION		VALVE NORMALLY OPEN	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		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			

NTS



Legend

Note:

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

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7 islands, Maldives - Package 4**

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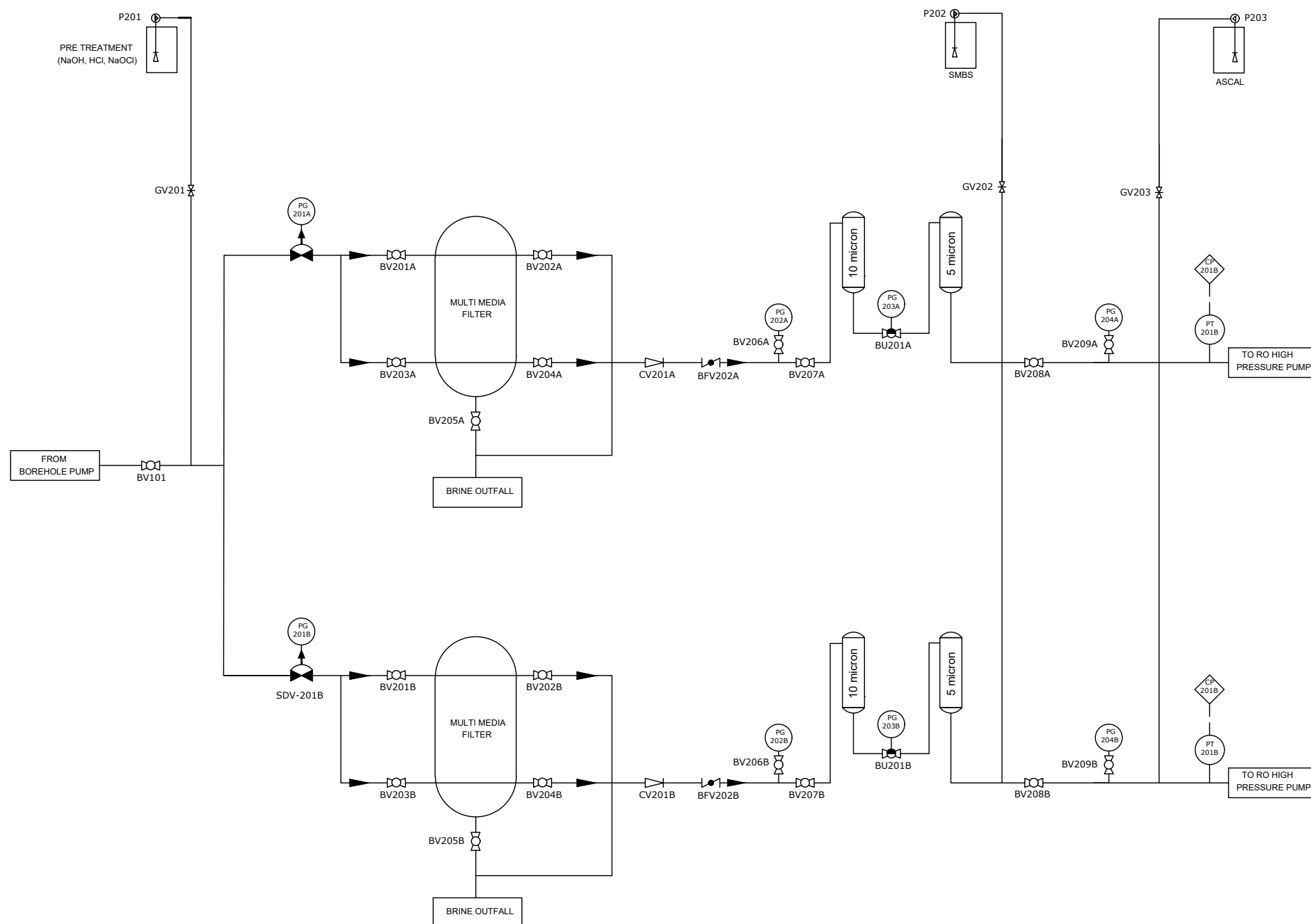
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E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
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Project No: EP-WS/2019/04	
Rev: R-01	Page: W-06




LEGEND										
ACTUATION		VALVES			FEATURES		CONDITION		ABBREVIATIONS	
	MANUALLY OPERATED		BUTTERFLY		MOTORIZED BALL		FLANGED CONNECTION		VALVE NORMALLY OPEN	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		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			

NTS

- 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.

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<p>Rev:</p> <p>R-01</p>	<p>EP-WS/2019/04</p> <p>Page:</p> <p>W-07</p>


IWRM PLANT P&I DETAIL C

Title:
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Supply and Sewerage Facilities in
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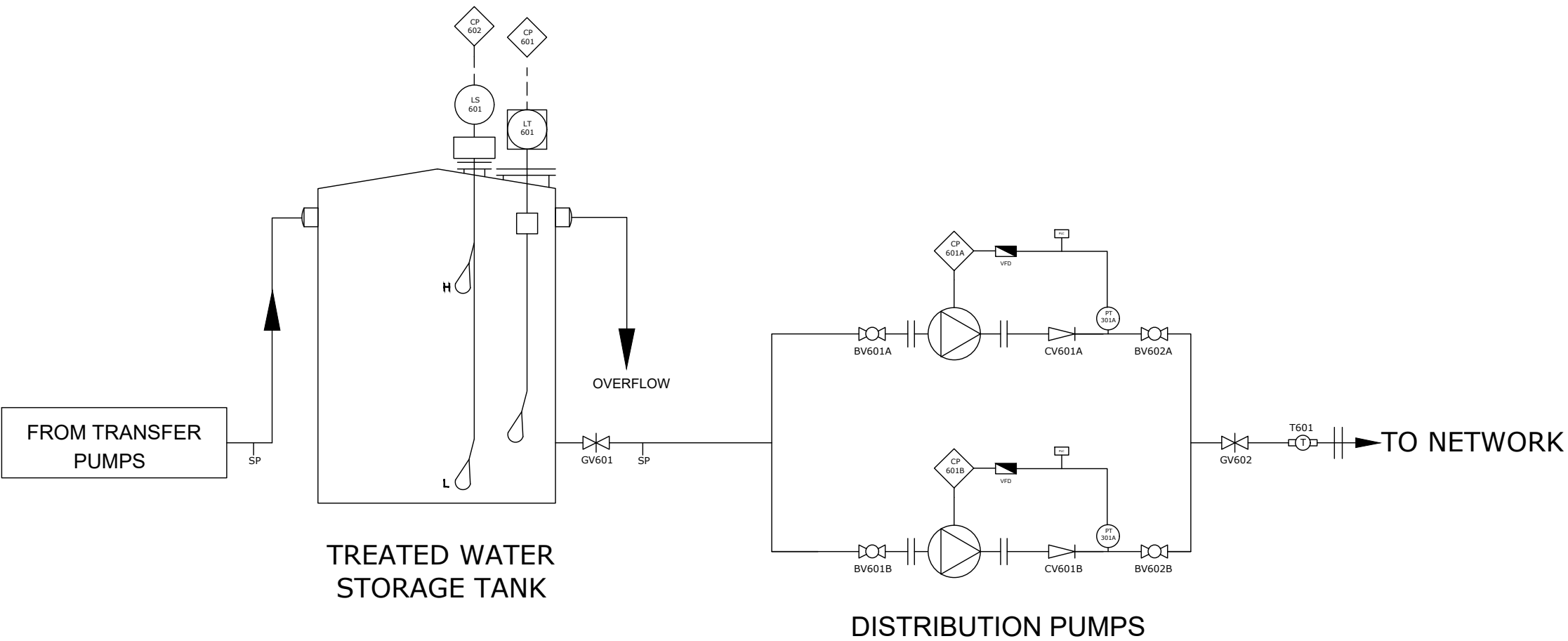
Water Supply System in Adh. Omadhoo

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<p>Date: Sep 2020</p>	<p>SCALE (A3): NTS</p>
<p>Project No:</p>	<p>EP-WS/2019/04</p>
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DETAIL F

LEGEND					
ACTUATION	VALVES		FEATURES		ABBREVIATIONS
	MANUALLY OPERATED	BUTTERFLY	MOTORIZED BALL	FLANGED CONNECTION	<div>LS - LEVEL SENSOR</div> <div>FT - FLOW TRANSMITTER</div> <div>PI - PRESSURE INDICATOR</div> <div>SP - SAMPLING POINT</div> <div>AR - AIR RELEASE</div> <div>P - PUMP</div> <div>PG - PRESSURE GAUGE</div> <div>PS - PRESSURE SENSOR</div> <div>CP - CONNECTION POINT</div> <div>LT - LEVEL TRANSMITTER</div> <div>QIT - CONDUCTIVITY INDICATOR</div> <div>PLC - PROGRAMMABLE LOGIC CONTROLLER</div>
	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	

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Title:
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Sub Title:
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E: info@epoch.associates

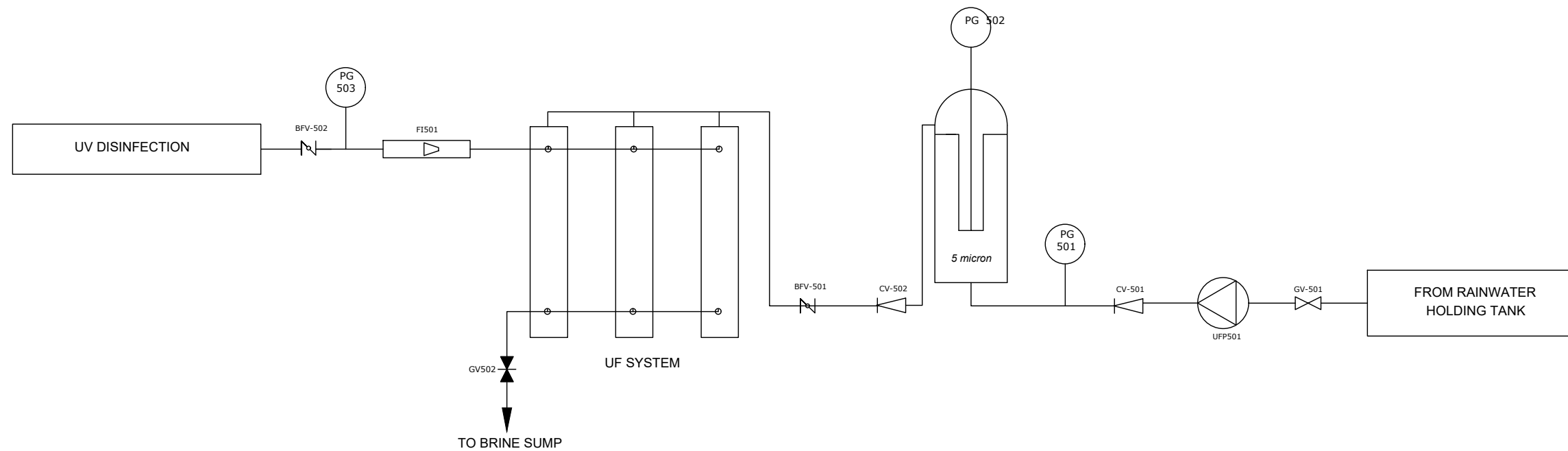
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


















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UV DISINFECTION



DETAIL G

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

IWRM PLANT P&I DETAIL G

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Legend

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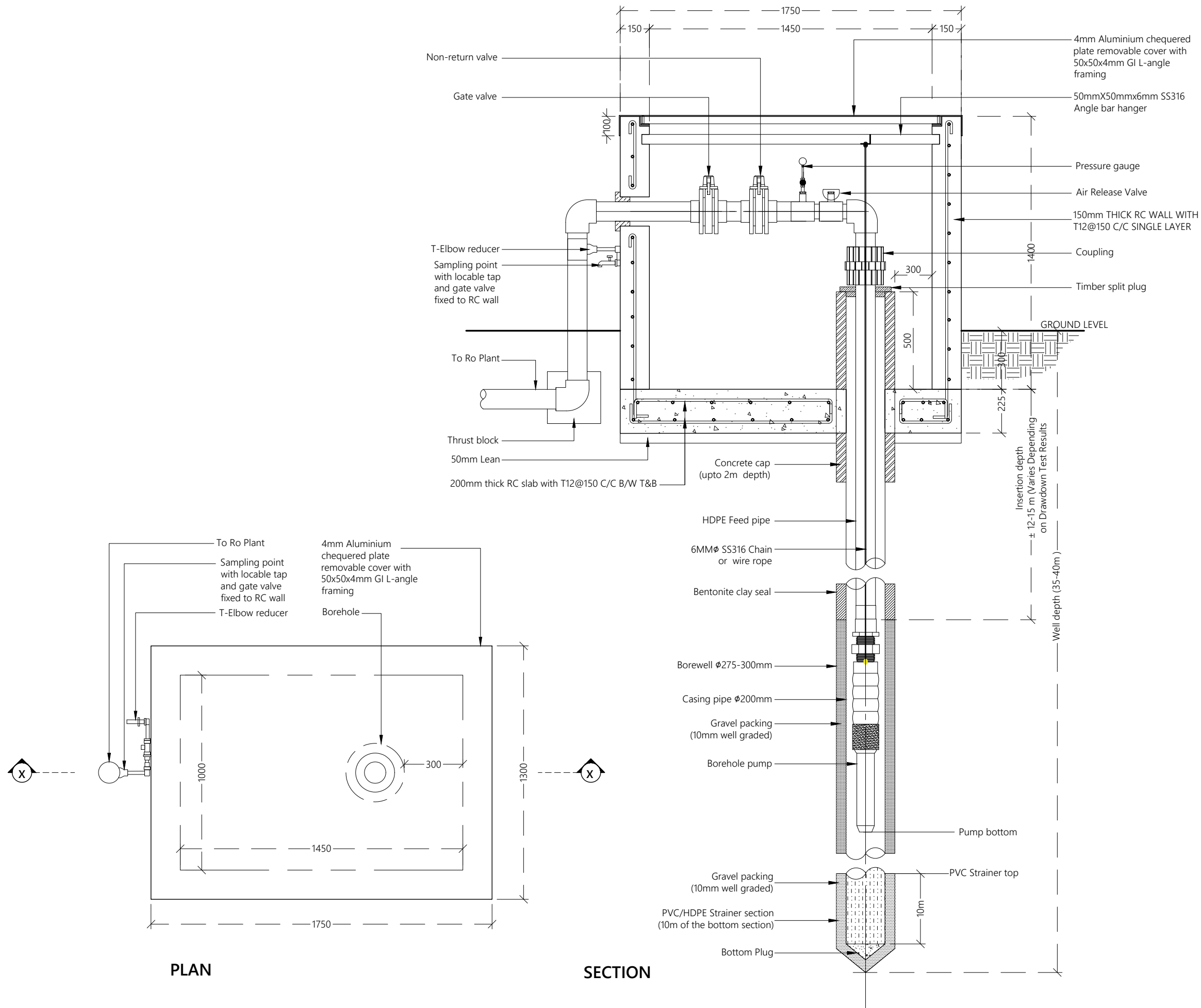
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Project No: EP-WS/2019/04

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Sub Title:
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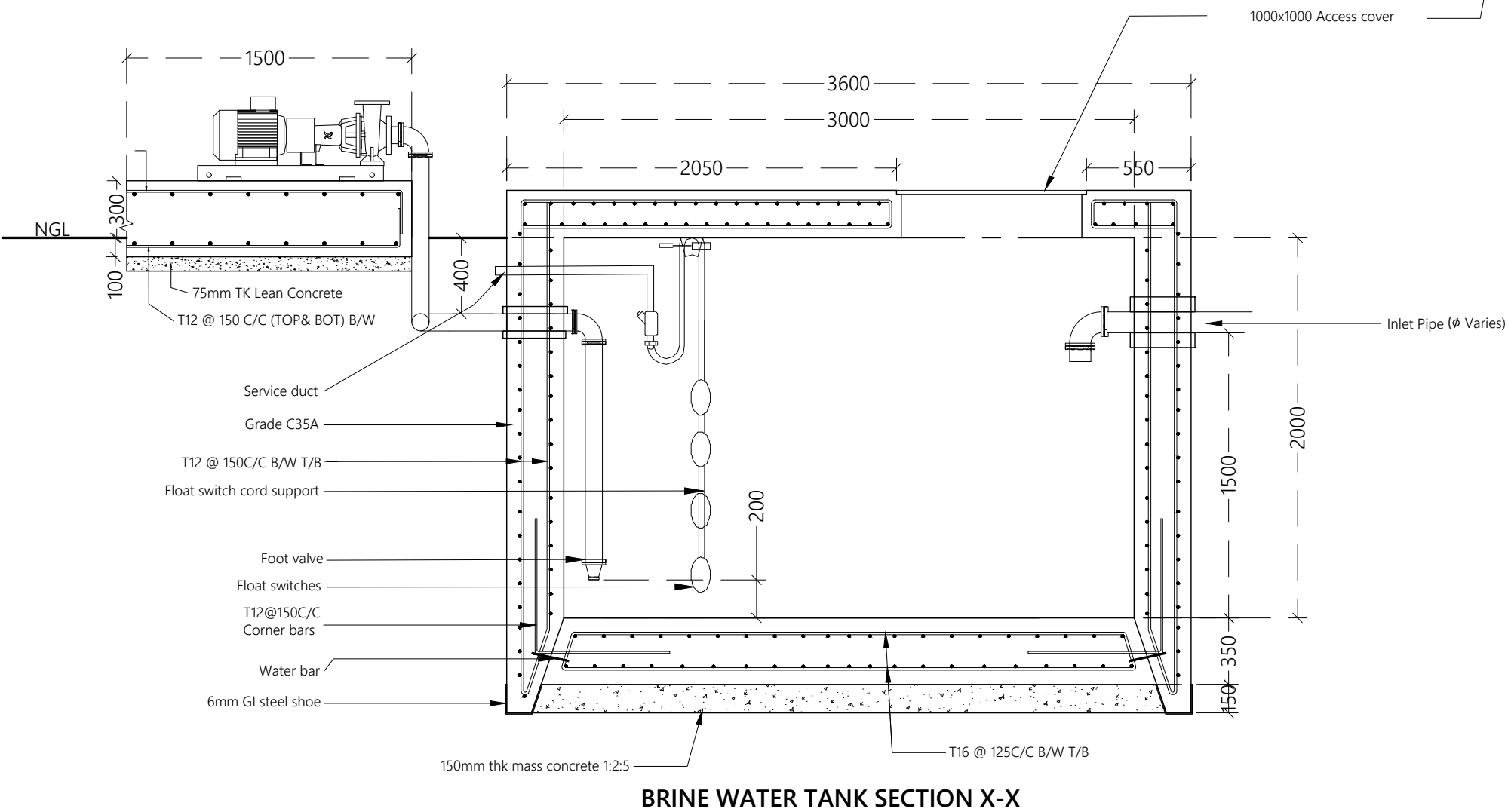
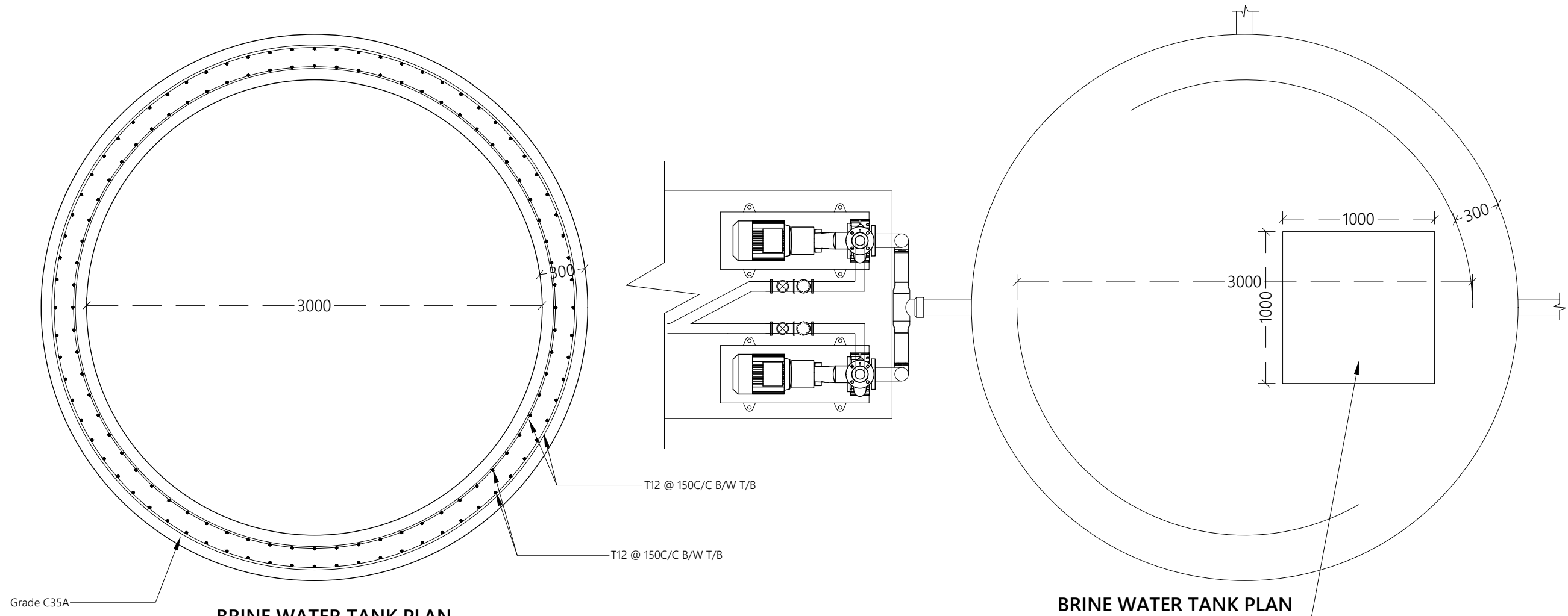



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Legend

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.

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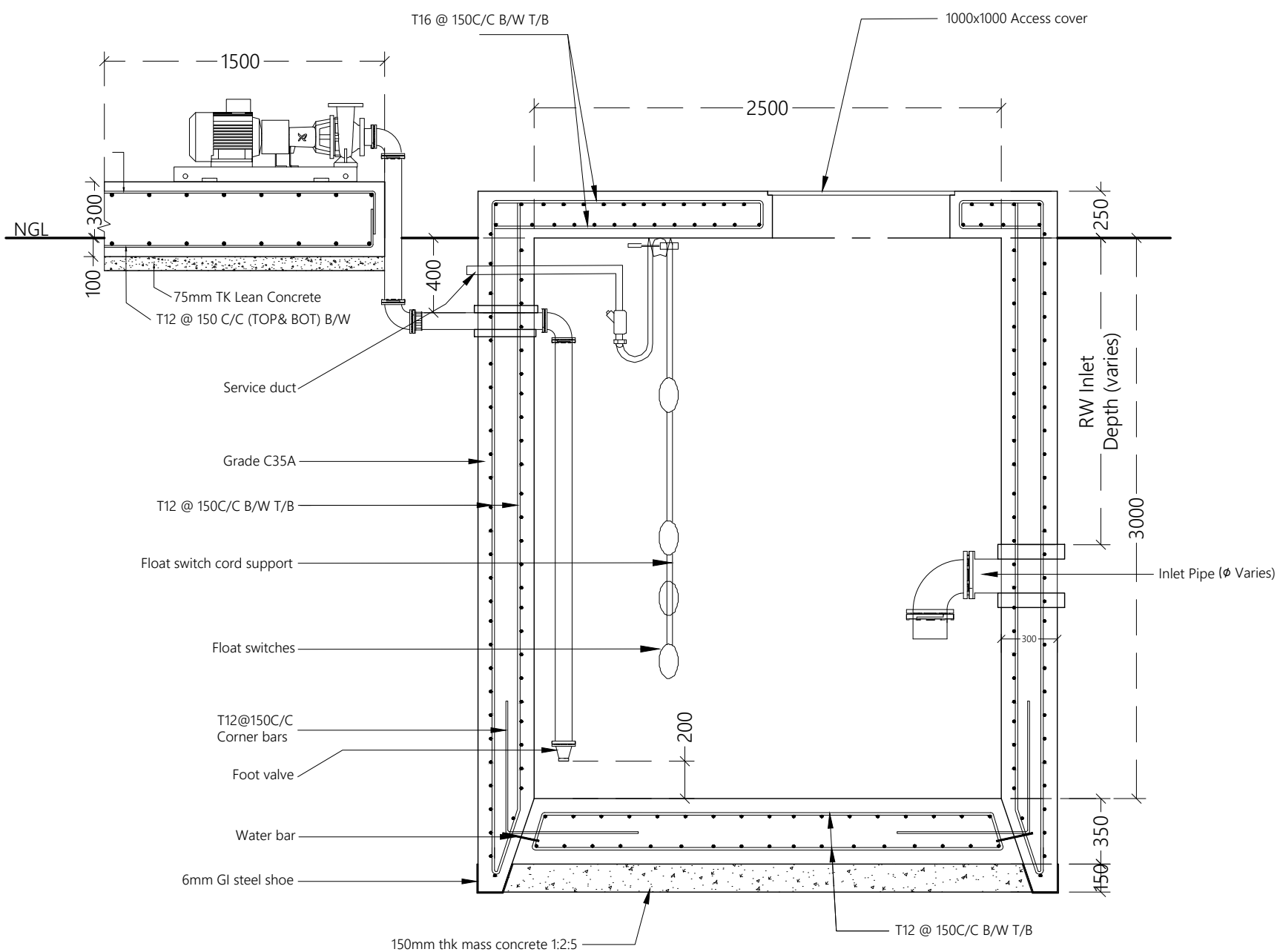
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BRINE TANK DETAILS

1:30



1000x1000 Access cover

2500

1000

1000

300

X-X

Technical drawing of a circular cross-section of a pipe. The drawing shows concentric circles representing the pipe wall. A horizontal dashed line across the center is labeled "2500". A dimension line on the right side indicates a thickness of "300". Three arrows point from labels at the bottom to the pipe wall: "Grade C35A" points to the outermost layer, "T12 @ 150C/C B/W T/B" points to the middle layer, and "T12 @ 150C/C B/W T/B" points to the innermost layer.

RAINWATER LIFT WELL DETAILS

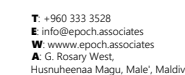
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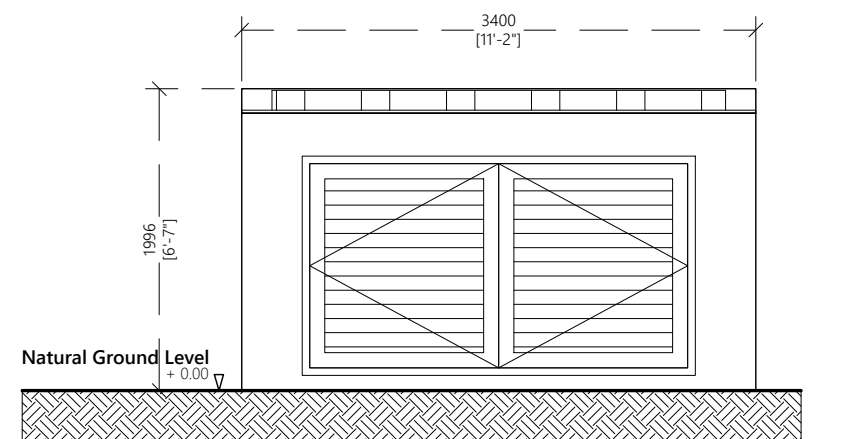
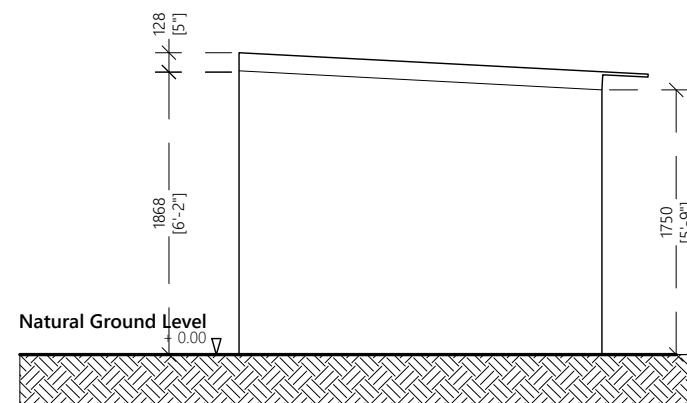
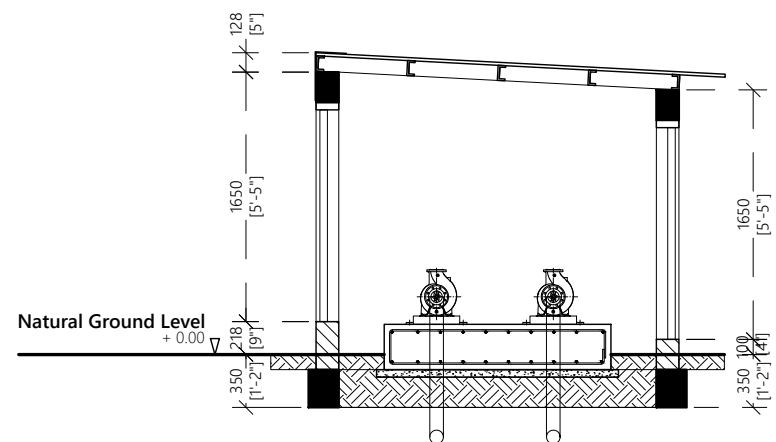
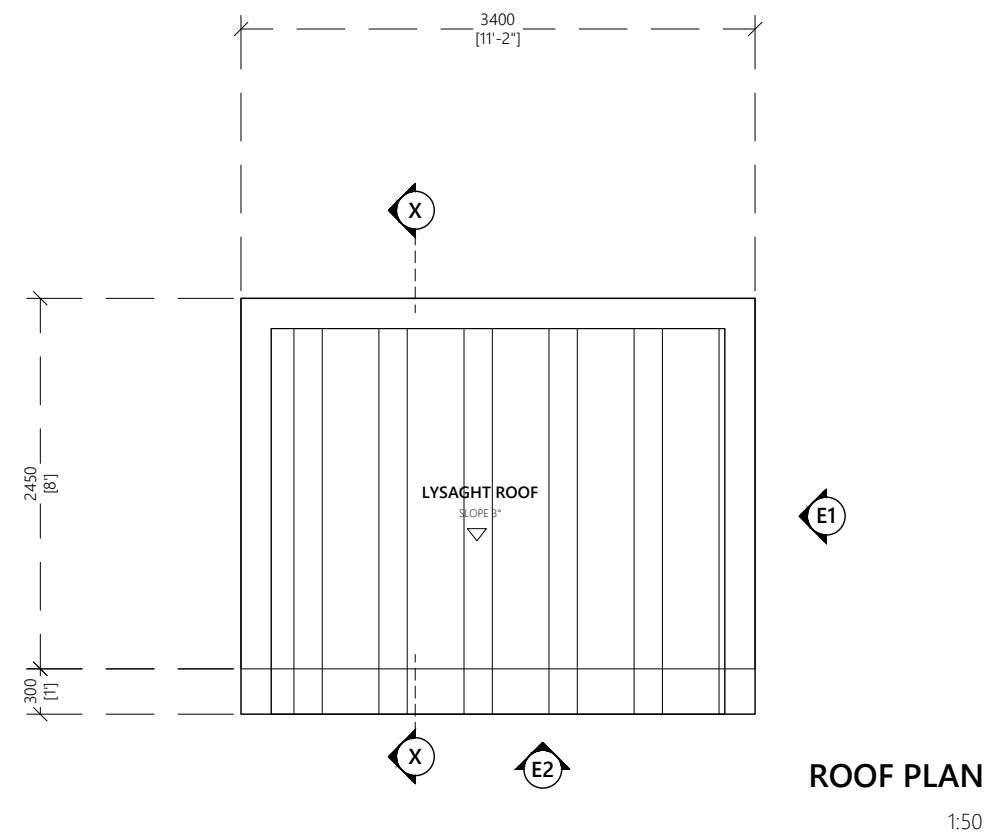
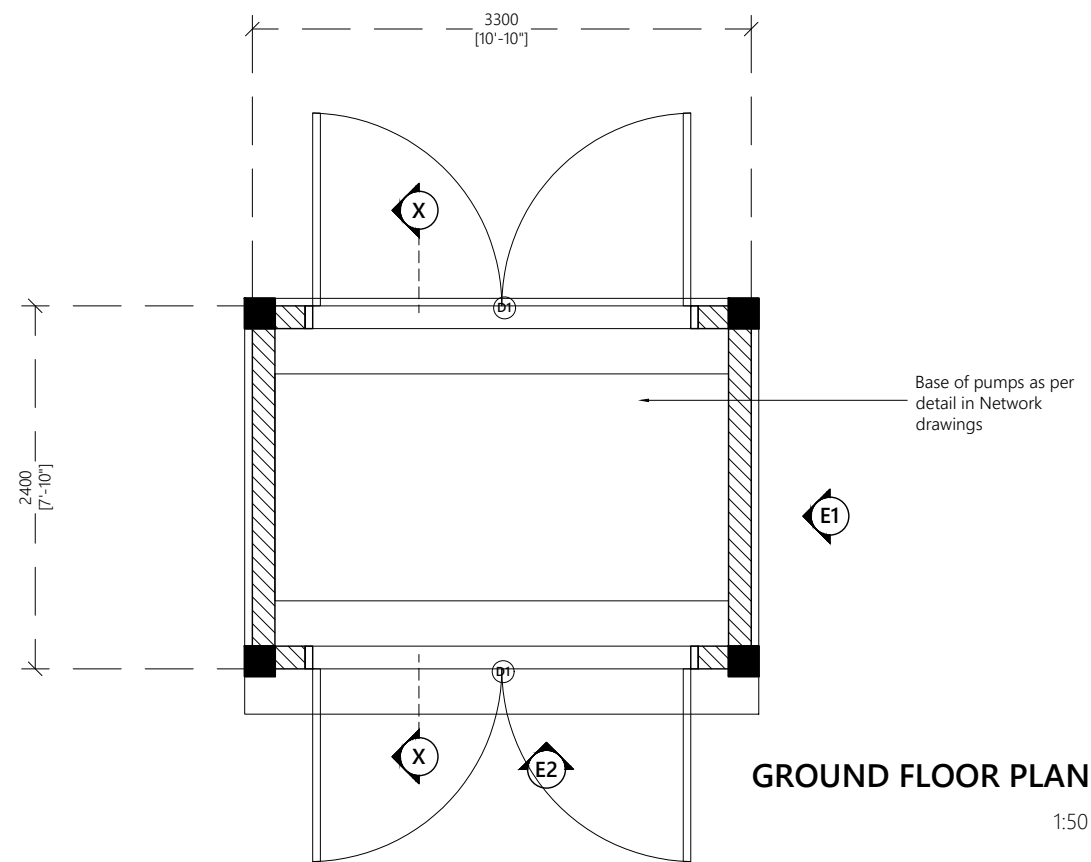
- Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
- Orientation of tanks and pipe work to suit location.
- The rainwater lift well will have a filter to prevent entry of debris and dirt.

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Sub Title:
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PUMP SHED DETAILS

Legend

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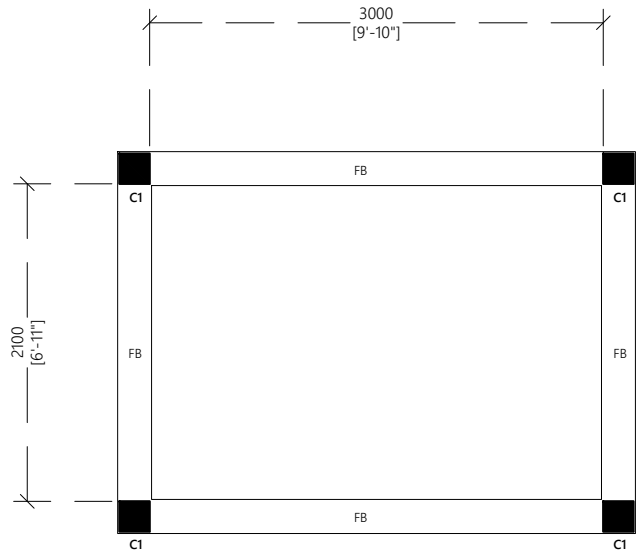
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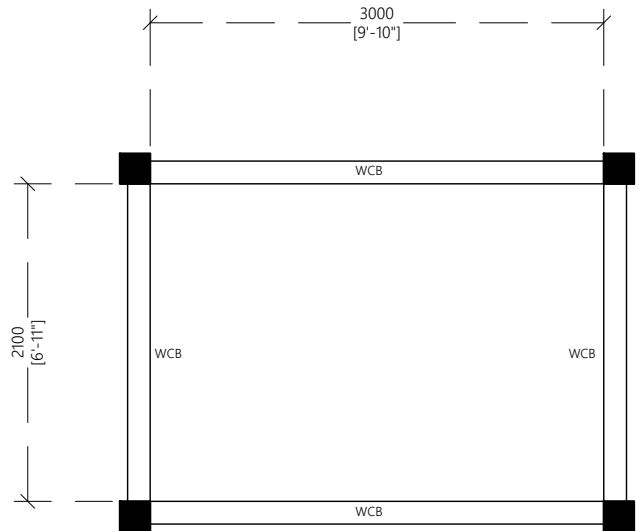
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GROUND FLOOR PLAN

1:100



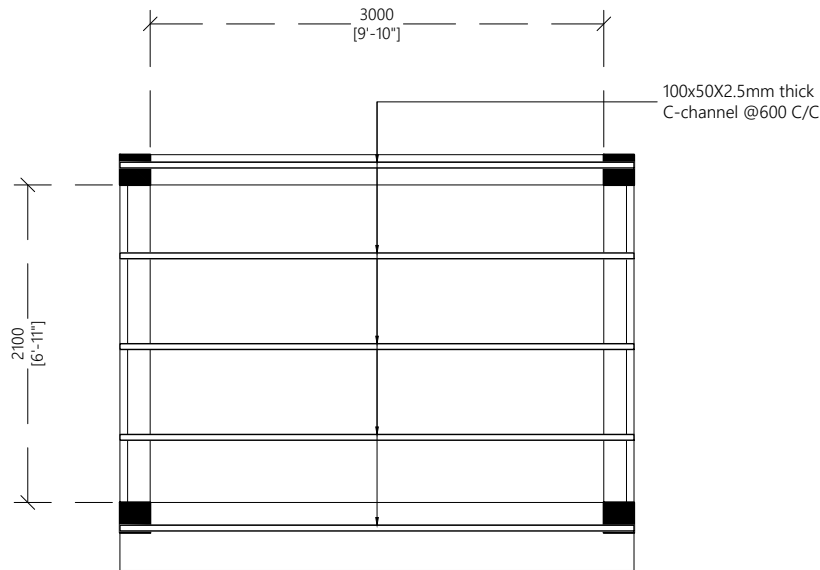
ROOF PLAN

1:100

Door ID		
Plan view		
Elevation view		<p>General Door Notes:</p> <p>Dimensions shown on DWG indicate effective openings of frame</p> <p>All frame depths are 100mm All dor panel thicknesses are 35mm All window manel thickness are 25mm Al frame edges shal be trimmed 3mm</p> <p>All wodden components should be wood stained finish</p> <p>All glazing should be of 6mm unless specified</p> <p>External units must comply the following weather conditions:- Wind pressure: 200 kg/sqm Water tightness: 25 kg/sqm</p> <p>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</p> <p>All hardware should be provided for the performance of al functions of the units</p> <p>Hinges shall confirm to</p> <ol style="list-style-type: none">Door size more than 700X1900mm WD: 125mm X2 sets SD: 150mm X3 setsDoor size less than 700X1900mm WD: 100mm X2 sets SD: 125mm X2 sets <p>Locks shall be cylindrical with master key sets</p> <p>Door knobs shall be1000mm above FFL</p>
FFL		
Frame material	600 micron powder coated aluminum frames	
Panel material	600 micron powder coated aluminum louvered panel with side aluminum frames with allowance for handle and lock	
Openable area	-	

Door Schedule

1:100



ROOF PLAN

1:100

PUMP SHED DETAILS



Legend

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

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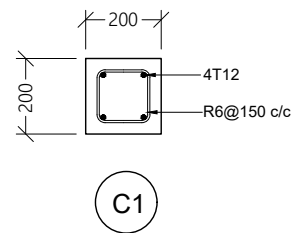
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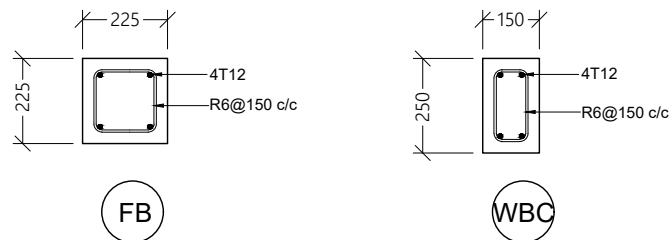
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COLUMN DETAIL

1:20



BEAM DETAILS

1:20



Legend

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REV. NO.	Date	Revision Description	Drawn	Chkd	Appd

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T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
 Husnuheenaa Magu, Male', Maldives



Drawn: F.I.A.	Checked: M.S.S.
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Designed: F.I.A.	Approved: I.W.
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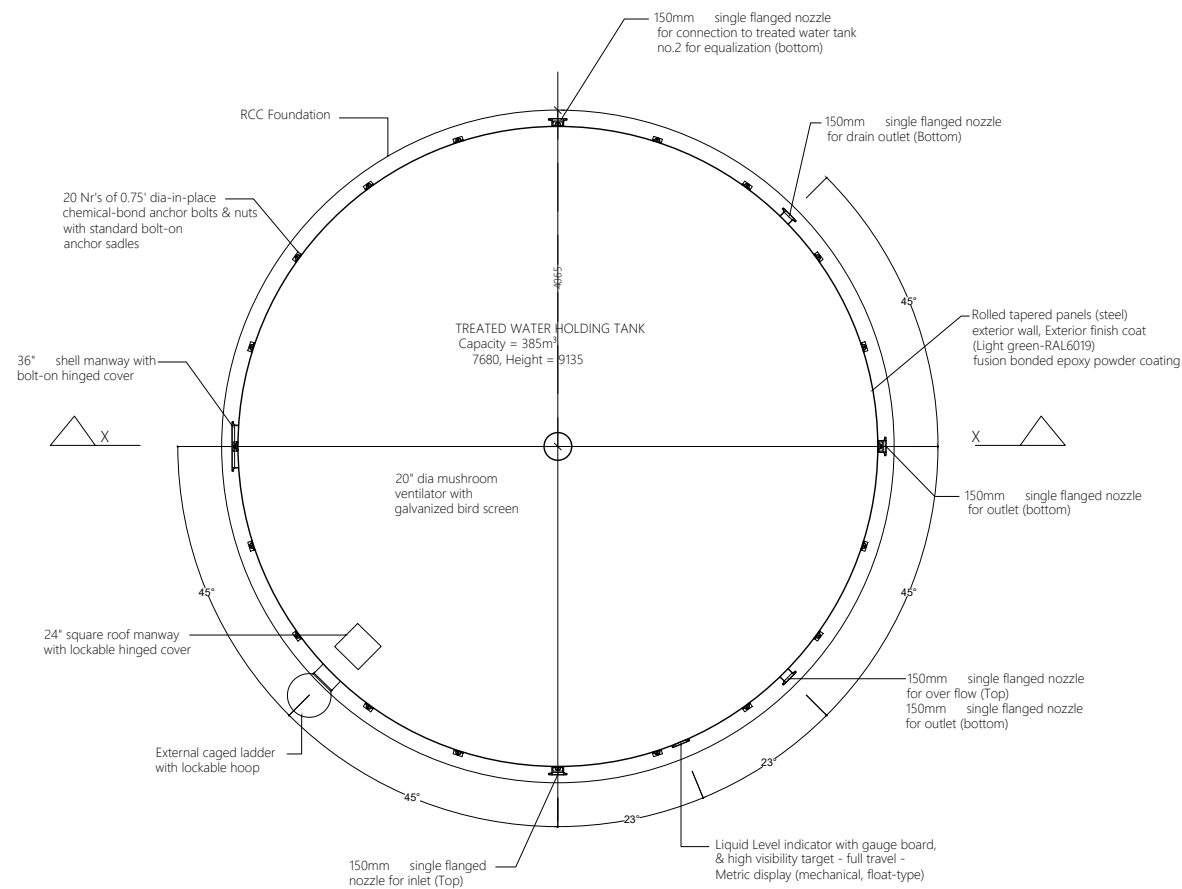
Date: Sep 2020	SCALE (A3): 1:20
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PUMP SHED DETAILS

1:20



Technical drawing of a 10,000-gallon chemical storage tank, showing elevation and structural details. The drawing includes the following components and dimensions:

- Dimensions:**
 - Overall diameter: 7680
 - Overall height: 10135
 - Foundation width: 8130
 - Manway diameter: 422
 - Manway height: 151
- Structural Details:**
 - Full deck perimeter guardrail
 - 150mm single flanged nozzle for inlet (Top)
 - 150mm single flanged nozzle for inlet (Top)
 - Liquid Level indicator with gauge board & high visibility target - full travel - Metric display (mechanical, float-type)
 - 20 N/r's of 0.75" dia drill-in-place chemical-bond anchor bolts & nuts with standard bolt-on anchor saddles
 - 150mm single flanged nozzle for outlet (bottom)
 - 4 mil polythene sheets between foundation & fiberboard/tank bottom
 - Tank Foundation
- Accessories:**
 - 20" dia mushroom ventilator with galvanized bird screen
 - Rolled tapered panels (steel) exterior wall, Exterior finish coat (Light green-RAL6019) fusion bonded epoxy powder coating
 - External caged ladder with lockbie hoop
 - 36" shell manway with bolt-on hinged cover
- Other Labels:**
 - 12
 - 0°
 - +0.00(G.L.)

The diagram illustrates the cross-section of a 1500mm diameter water storage tank. The foundation consists of a 150mm thick RC slab (1:2:3) resting on well-compacted hardcore with a minimum bearing capacity of 150 kpa. The tank wall is constructed from 150mm thick RCC (1:2:4) with 6T20 reinforcement bars. The wall is anchored into the foundation slab. The floor is made of fibre board (12.7mm thick) and 4 mil polythene sheet. The tank is shown with a height of 3000mm and a diameter of 1500mm. The foundation slab is 450mm wide. The wall is 150mm thick. The floor is 12.7mm thick. The tank is shown with a height of 3000mm and a diameter of 1500mm. The foundation slab is 450mm wide. The wall is 150mm thick. The floor is 12.7mm thick.

Labels and dimensions in the diagram include:

- TANK FLOOR
- FIBRE BOARD 12.7MM TK. & 4 mil polythene sheet
- TOP OF FOUNDATION
- 150mm tk. RC slab (1:2:3)
- T10@150 c/c BW, Top & Bottom
- T10 rings @ 150 c/c
- Well Compacted hardcore Bearing capacity minimum 150kpa
- 450mm x 900mm RCC Ring beam
- 6T20
- 50mm thick Lean Concrete (1:2:4)
- TANK ANCHORING AS PER MANUFACTURERS DETAILS
- +300(F.L)
- +0.00(G.L)
- 3000
- 450
- 600

Note:-
Cover = 50mm
Lap length 50

NTS

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Legend

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R00	JUNE 2020	STAGE -1	PD	SBC	SD

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 7 islands, Maldives - Package 4

Sub Title:
Water Supply System in Adh. Omadhoo

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



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E: info@epoch.associates
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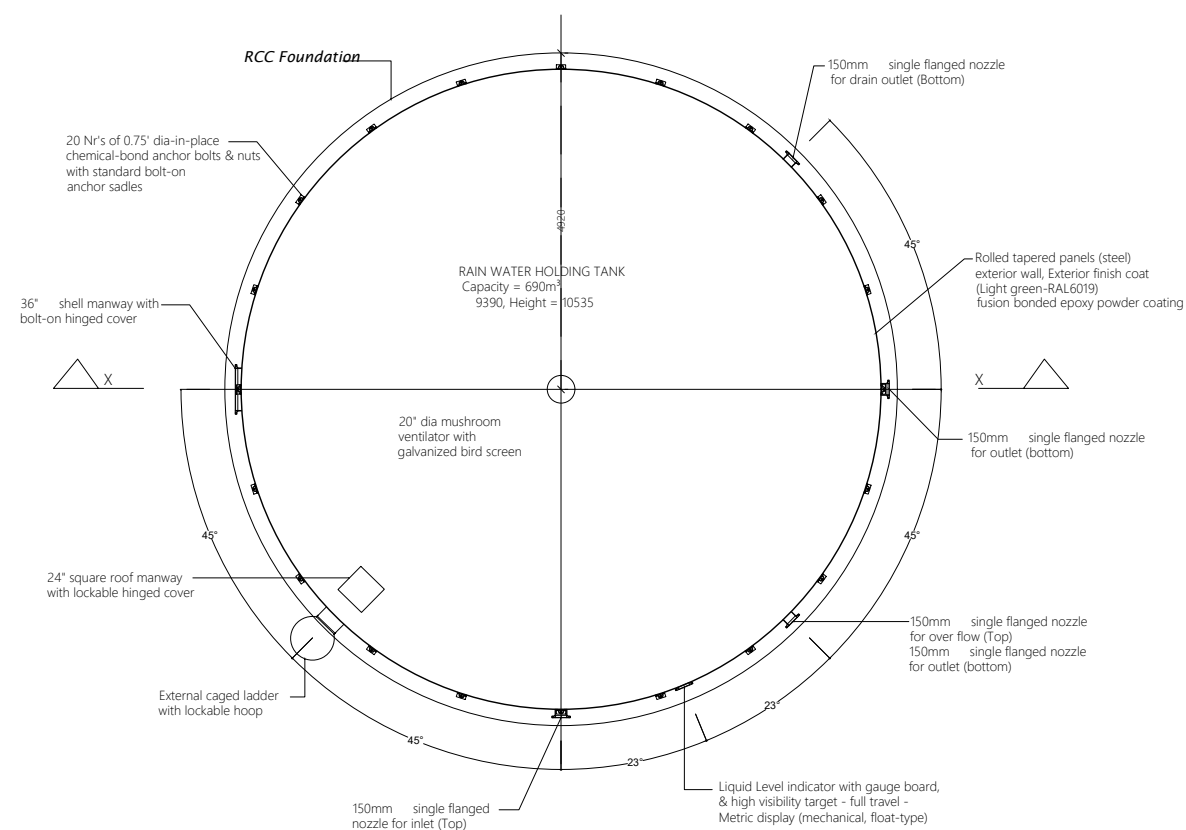
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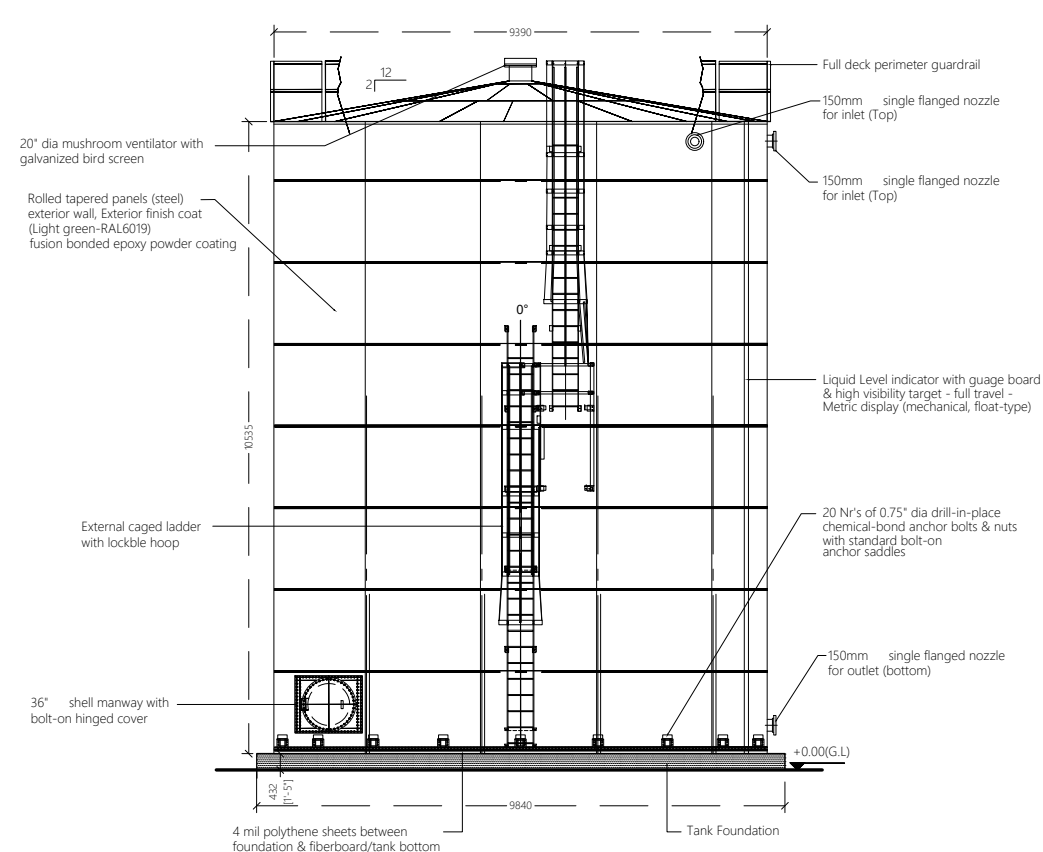
Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/04

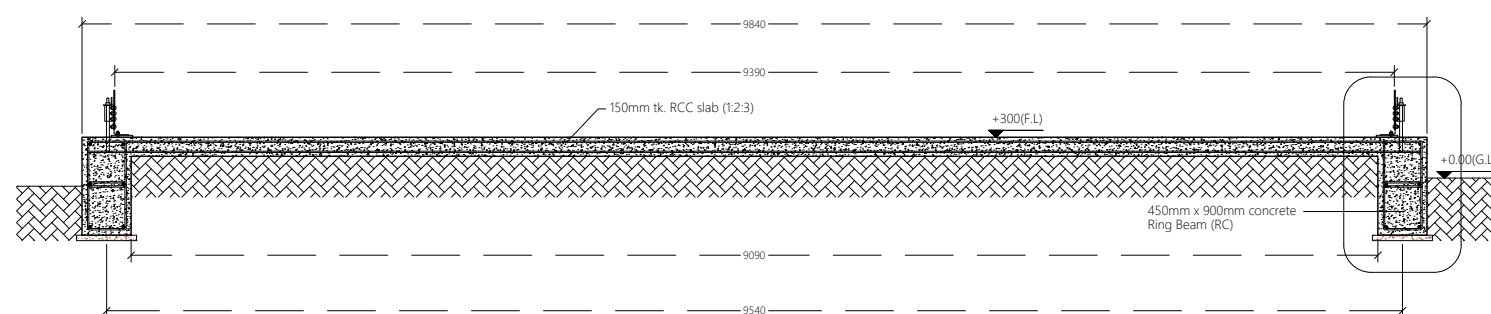
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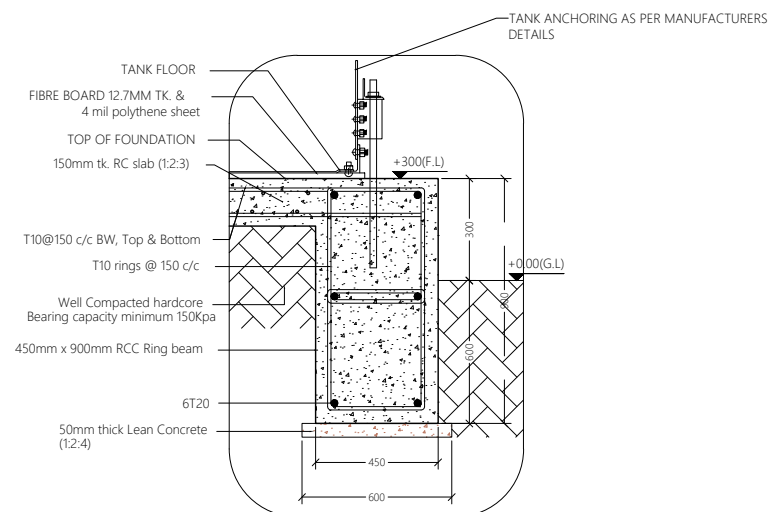
RAINWATER HOLDING TANK AND FOUNDATION- PLAN



RAINWATER HOLDING TANK AND FOUNDATION- ELEVATION



SECTION X-X

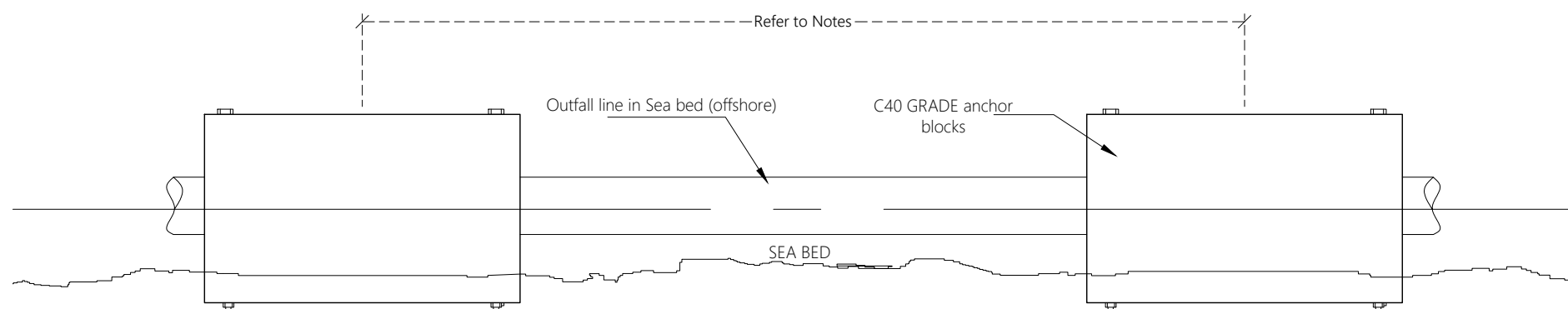


DETAIL

Note:-
Cover = 50mm
Lap length 50

RAINWATER HOLDING TANK DETAILS

NTS



Technical drawing of a structure on a sea bed. The structure consists of a rectangular base and a semi-circular top. Dimensions are given in millimeters (mm):

- Base width: 900 mm
- Base height: 300 mm
- Semi-circular top radius: 300 mm
- Top width (at the base of the semi-circle): 600 mm
- Top height (from the base of the semi-circle to the top): 300 mm
- Overall height: 600 mm (300 mm + 300 mm)
- Overall width: 900 mm

The structure is shown on a sea bed, indicated by the label "SEA BED" and a hatched area representing the seabed.

T12 @200c/c B/W

Anchor blocks C40A GRADE

4 nos. 25mm ϕ Threaded rod with bolts (SS316)

Outfall pipe

T12 @200c/c B/W

SEA BED

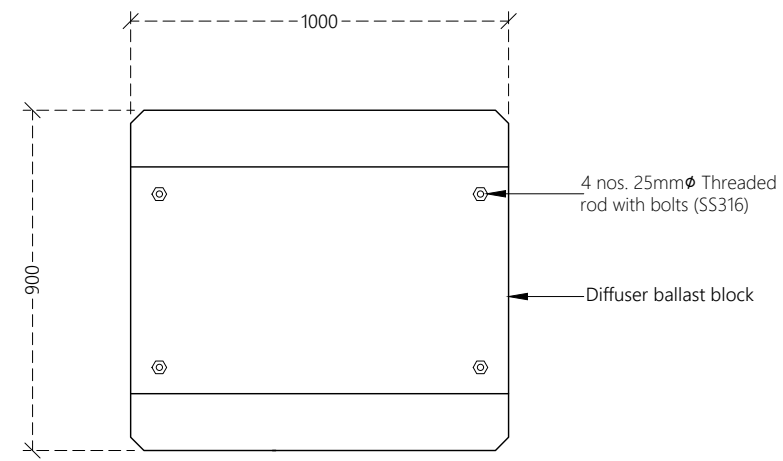
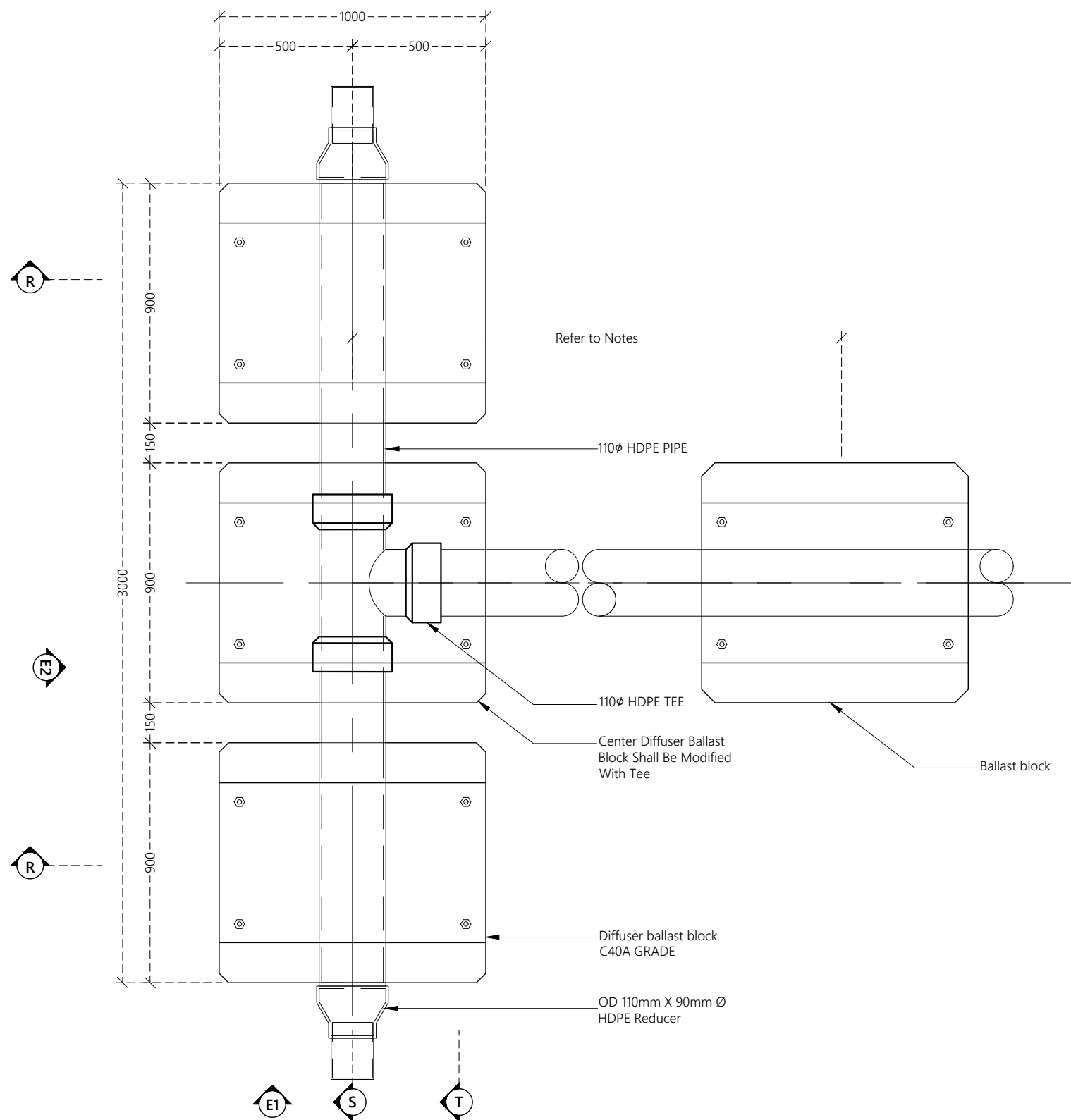
150 600 150

300 300 100

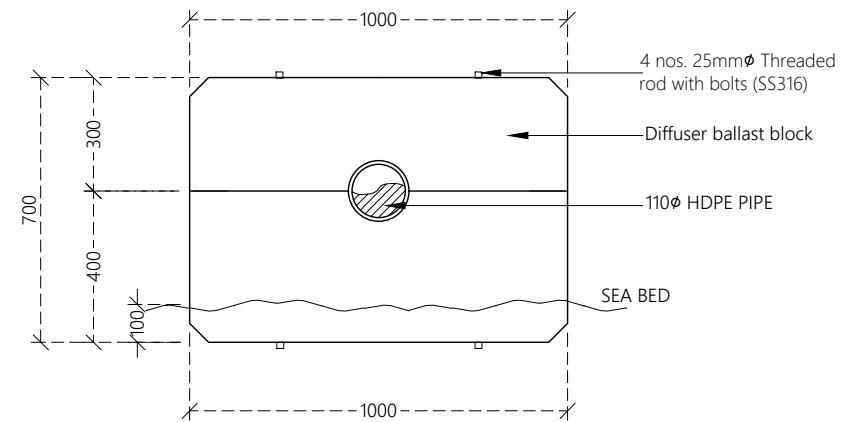
Technical drawing of a rectangular plate with the following dimensions and annotations:

- Overall width: 1000
- Overall height: 1500
- Plate thickness: 27mm ϕ hole
- Four nos. 25mm ϕ Threaded rod with bolts (SS316) are shown, with two rods passing through the plate.
- Dimensions for the rods: 100 (from top edge), 400 (between rods), 600 (from bottom edge), and 100 (from bottom edge).
- Dimensions for the plate: 100 (from top edge), 150 (from bottom edge), and 100 (from bottom edge).

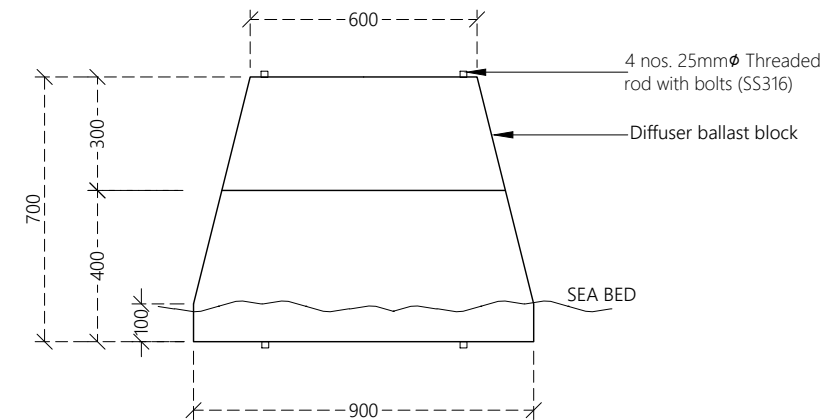
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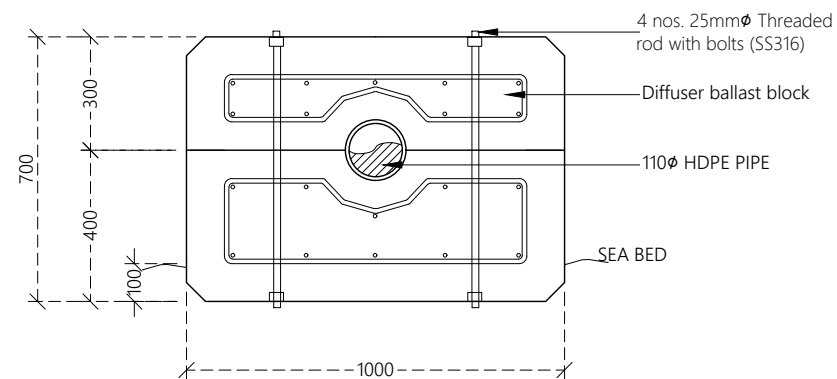
DIFFUSER BALLAST BLOCK PLAN



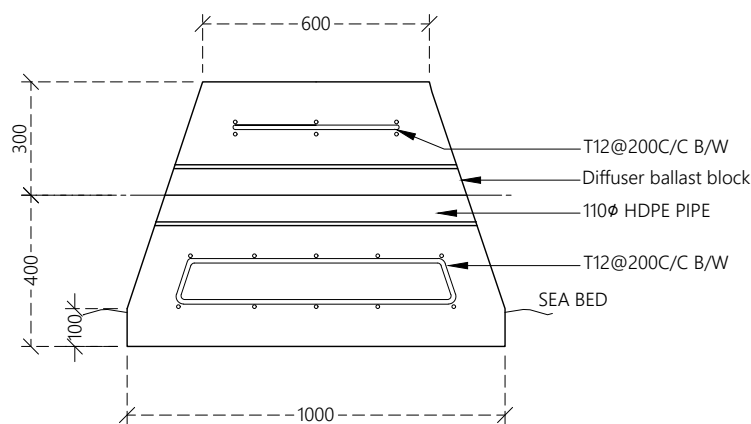
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E1



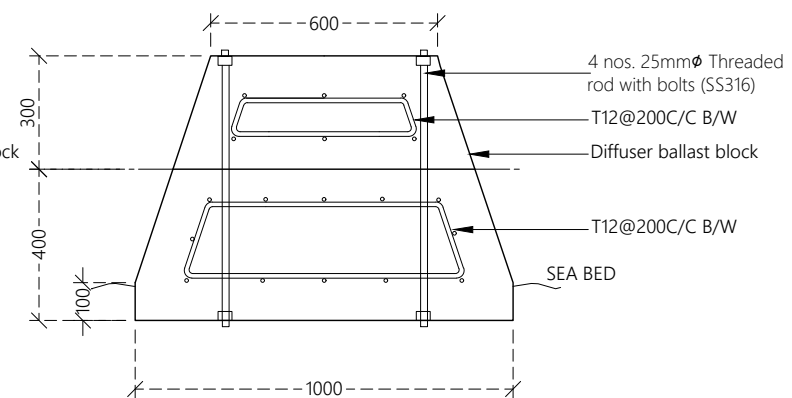
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E2



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.
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Title:

Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 7 islands, Maldives - Package 4

Sub Title:

Water Supply System in Adh. Omadhoo

Client:

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

EPOCH

T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rossary West,
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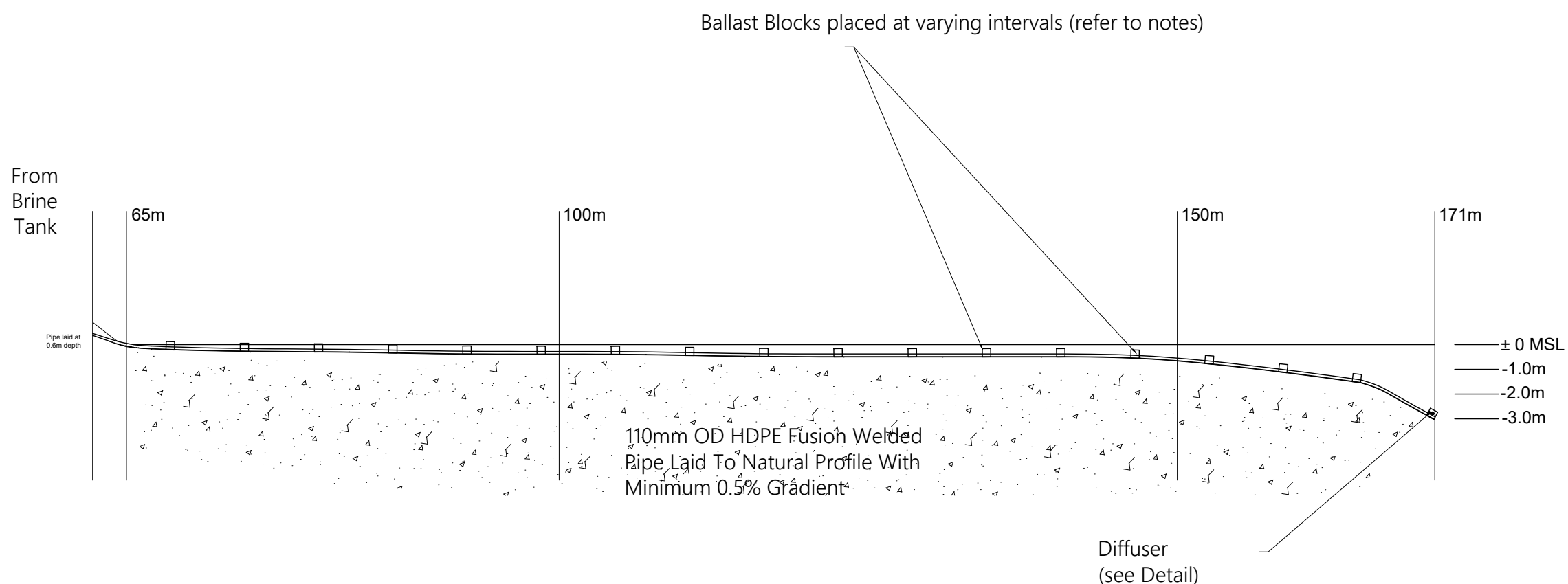
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Project No: EP-WS/2019/04

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Notes:

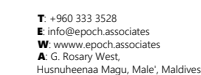
- The contractor to undertake a detailed inspection of the outfall site to assess the profile and condition of the reef below sea level and to prepare his methodology for installation and fixing.
- In shallow water (regions where the depth is less than 1m), the ballast block spacing is 3.5m. In deeper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

R00	JUNE 2020	STAGE -1	PD	5BC	S
REV. NO.	Date	Revision Description	Drawn	Chkd	App

Title:
**Consultancy Services for Survey,
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Supply and Sewerage Facilities in
7 islands, Maldives - Package 4**

Sub Title:
Water Supply System in Adh. Omadhoo

Client:
**Ministry of National Planning, Housing and
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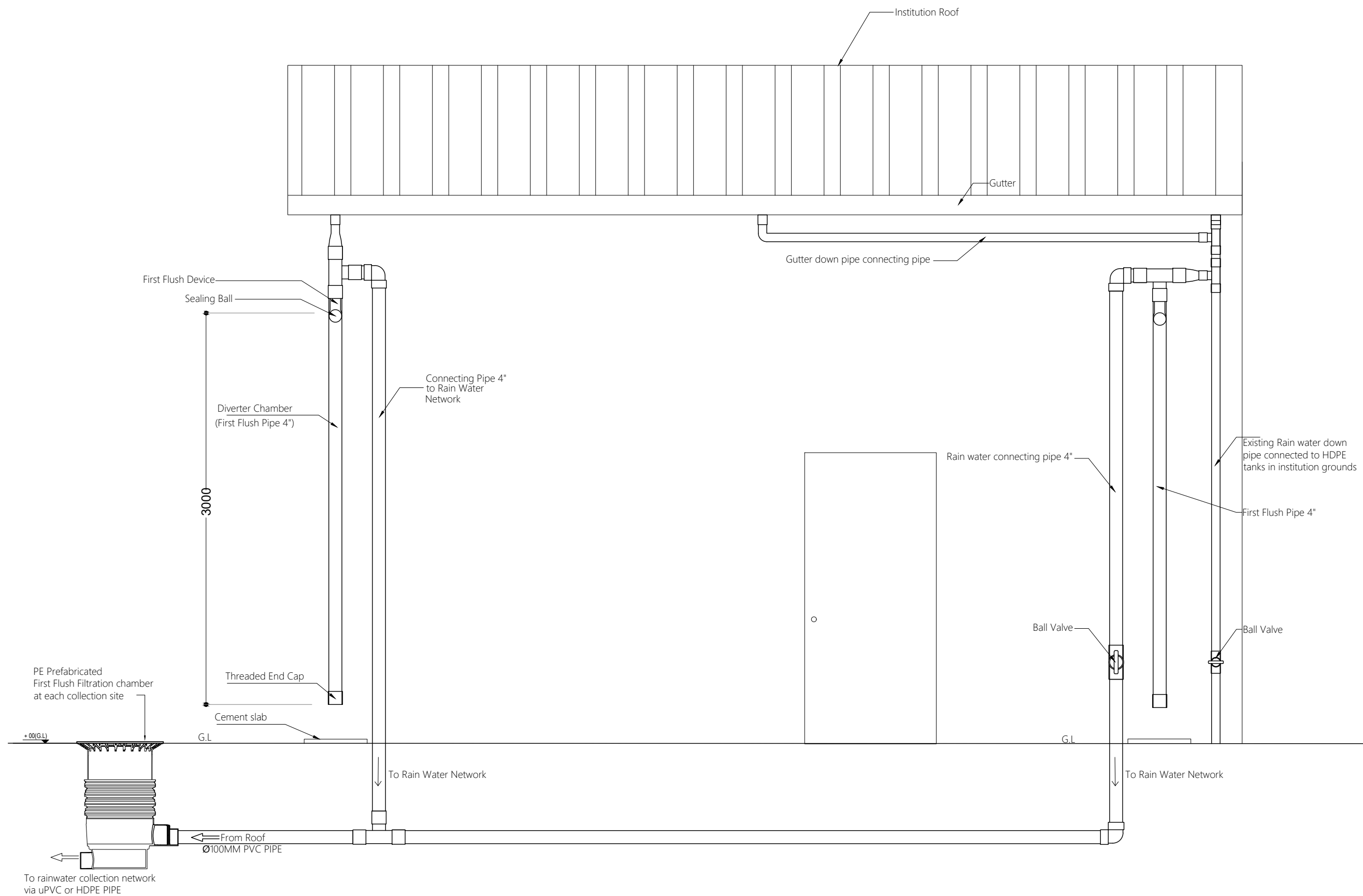
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BRINE SEA OUTFALL DETAIL

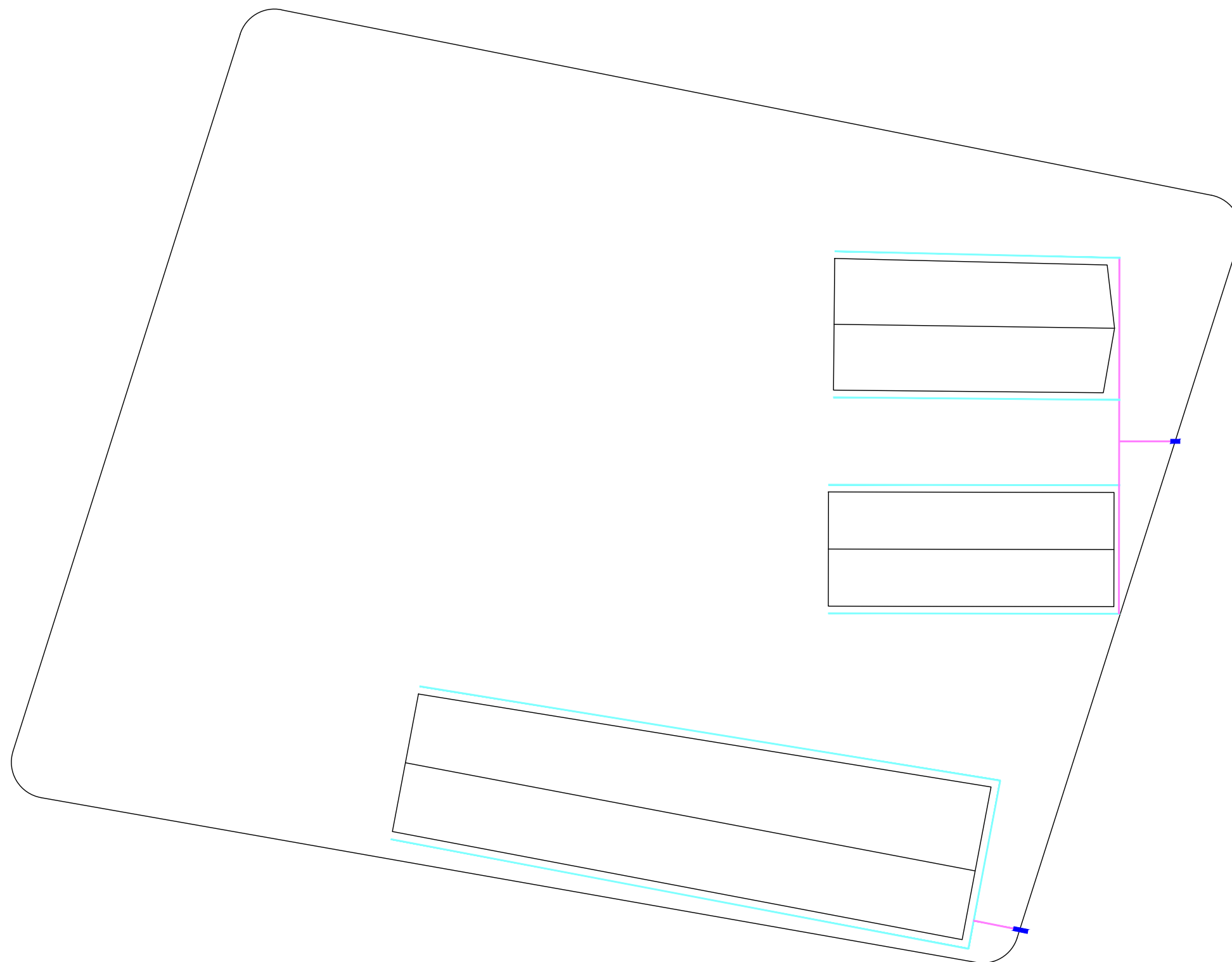
NTS



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1:400



— = PVC PIPES Ø160mm
— = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH =
246m

APPROXIMATE GUTTER LENGTH = 190m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 38m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 208m

R00	JUNE 2020	STAGE -1	PD	5BC	S
REV. NO.	Date	Revision Description	Drawn	Chkd	App

Title:

Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 7 islands, Maldives - Package 4

Sub Title:

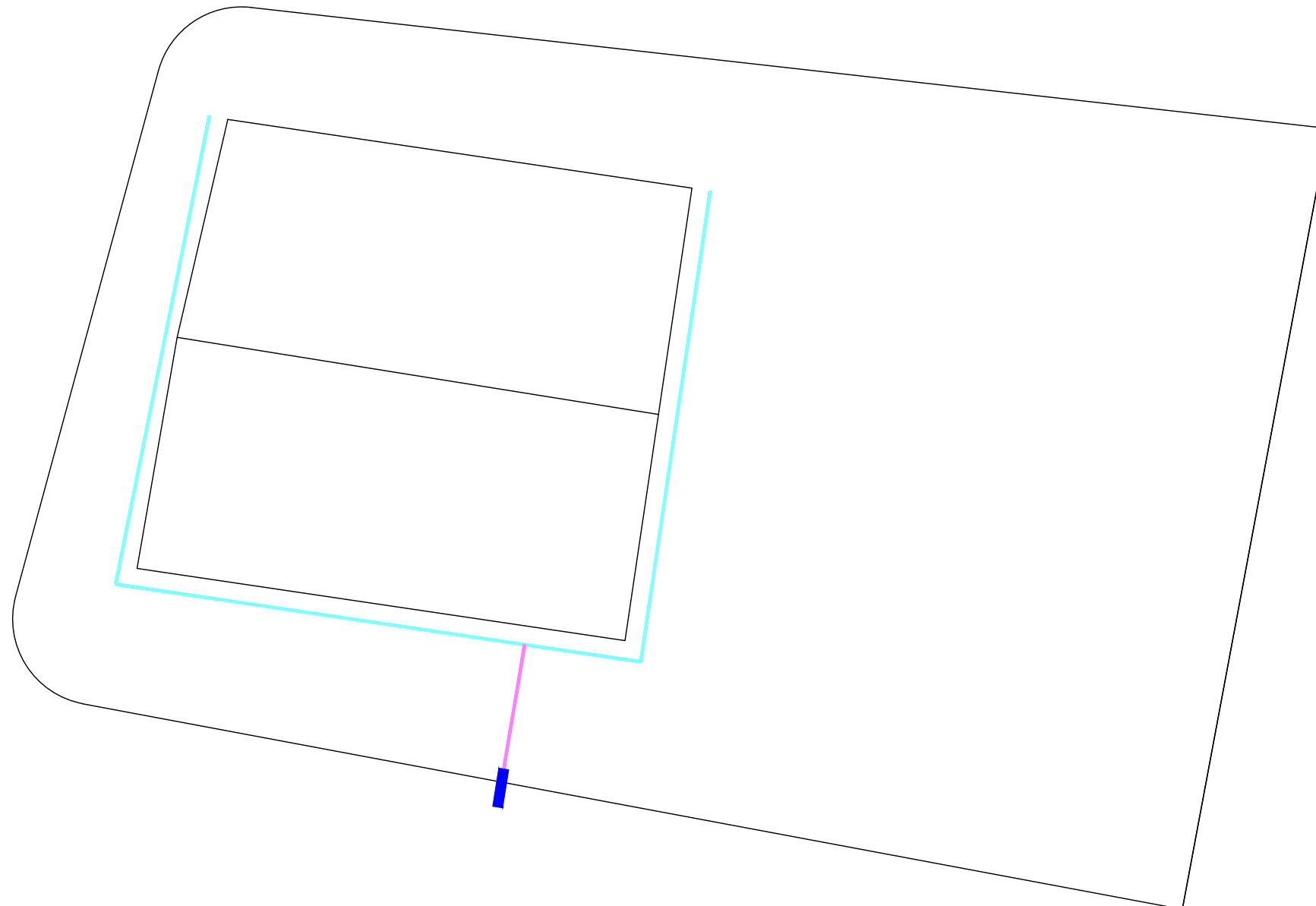
Water Supply System in Adh. Omadhoo

Client:

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T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
 Husnuheena Maqu, Male', Maldives

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Date: Sep 2020	SCALE (A3): 1:400
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INTERNAL NETWORK LAYOUT- HEALTH CENTER

1:200



Legend

———— = PVC PIPES Ø160mm

———— = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 57m

APPROXIMATE GUTTER LENGTH = 34m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 5m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 52m

R00	JUNE 2020	STAGE -1	PD	SBC	SD
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Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 7 islands, Maldives - Package 4

Sub Title:

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E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
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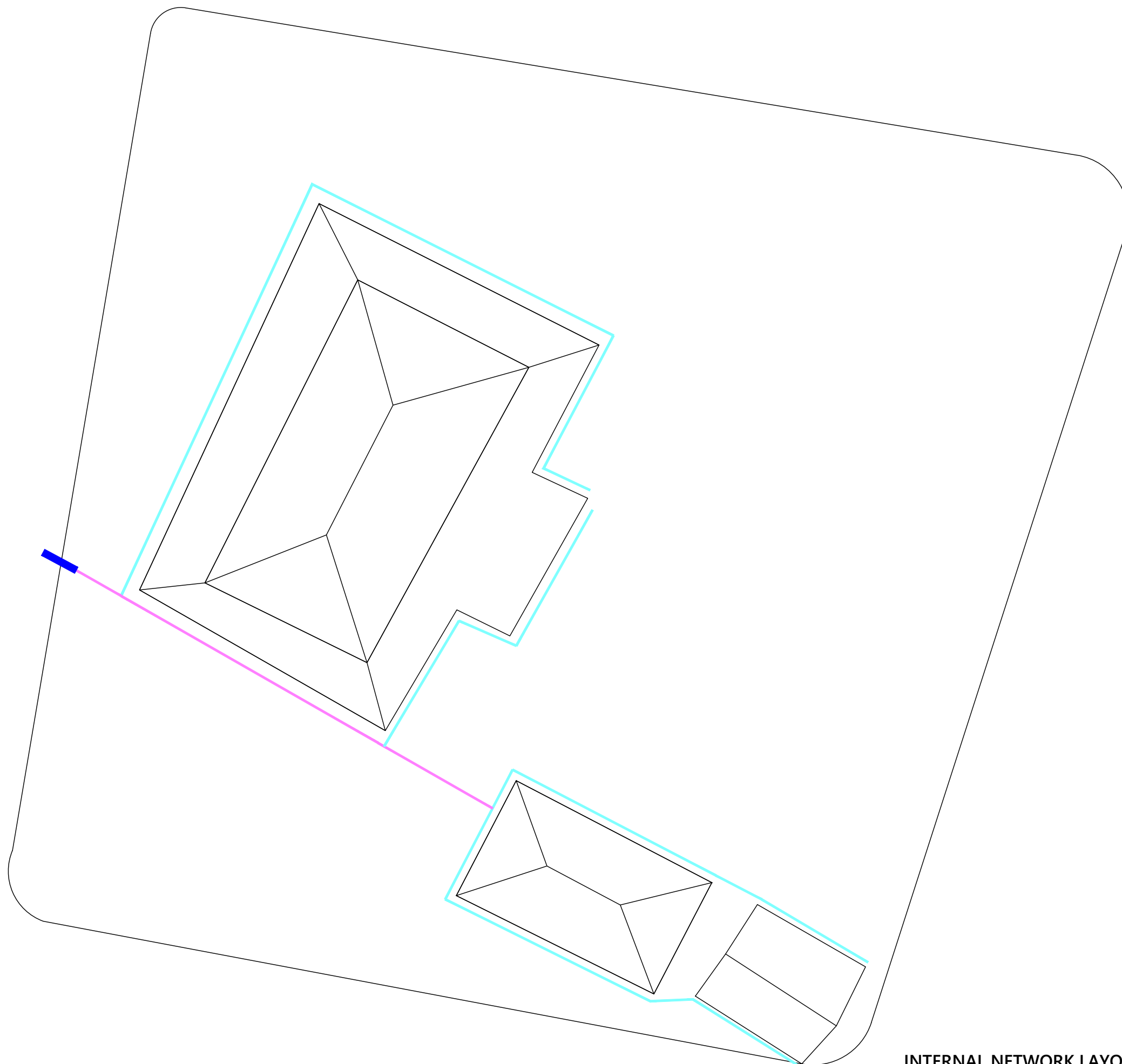
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Date: Sep 2020	SCALE (A3): 1:200
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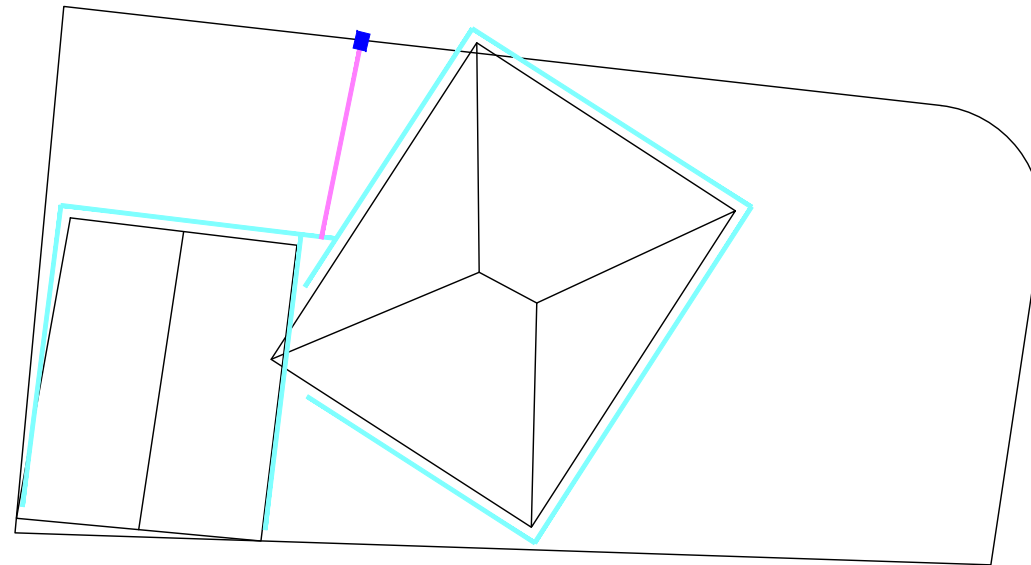


— = PVC PIPES Ø160mm
— = PVC PIPES Ø110mm

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 113m

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Legend

———— = PVC PIPES Ø160mm

— = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH =
63m

APPROXIMATE GUTTER LENGTH = 53m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 5m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 58m

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

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**Consultancy Services for Survey,
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T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
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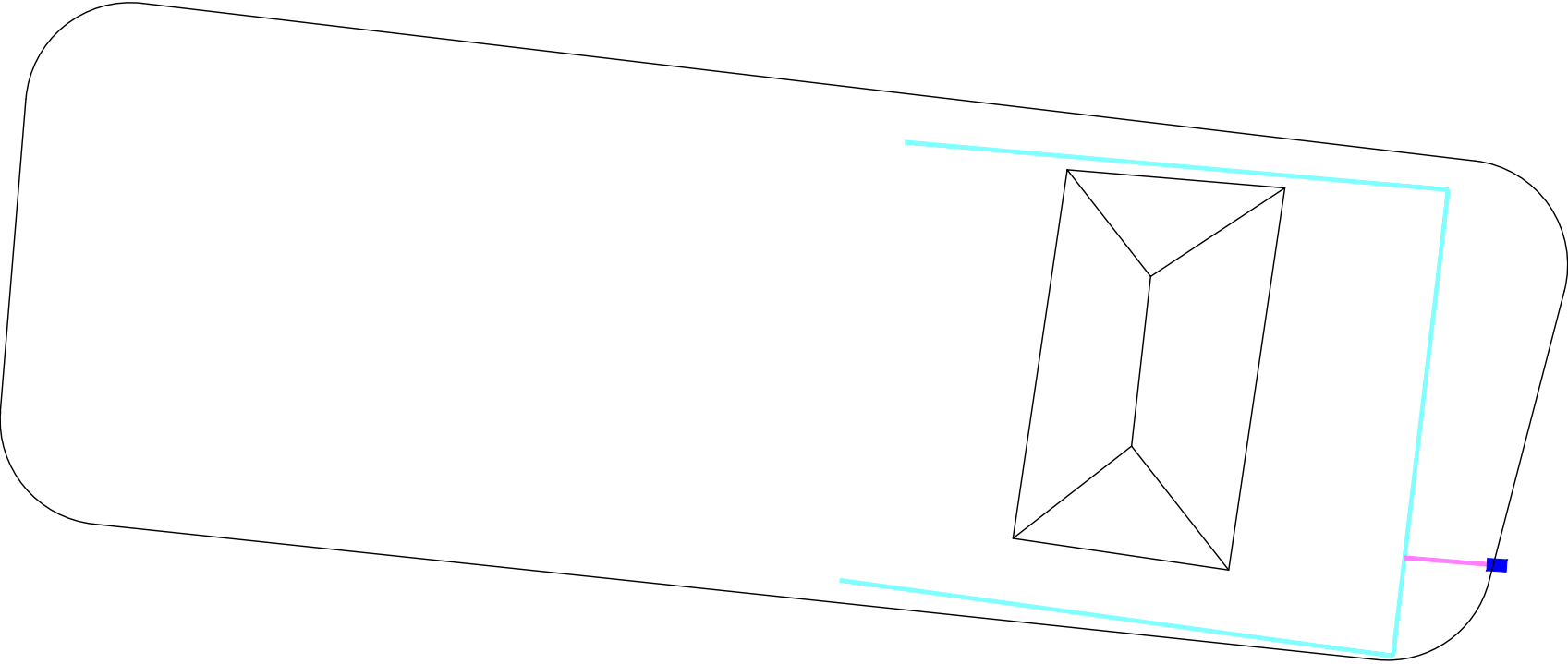
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INTERNAL NETWORK LAYOUT- KUDA MISKIY

1:200



INTERNAL NETWORK LAYOUT- POLICE STATION

1:200



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 48m

APPROXIMATE GUTTER LENGTH = 34m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 3m


APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 45m

R00	JUNE 2020	STAGE -1	PD	SBC	SD
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Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives



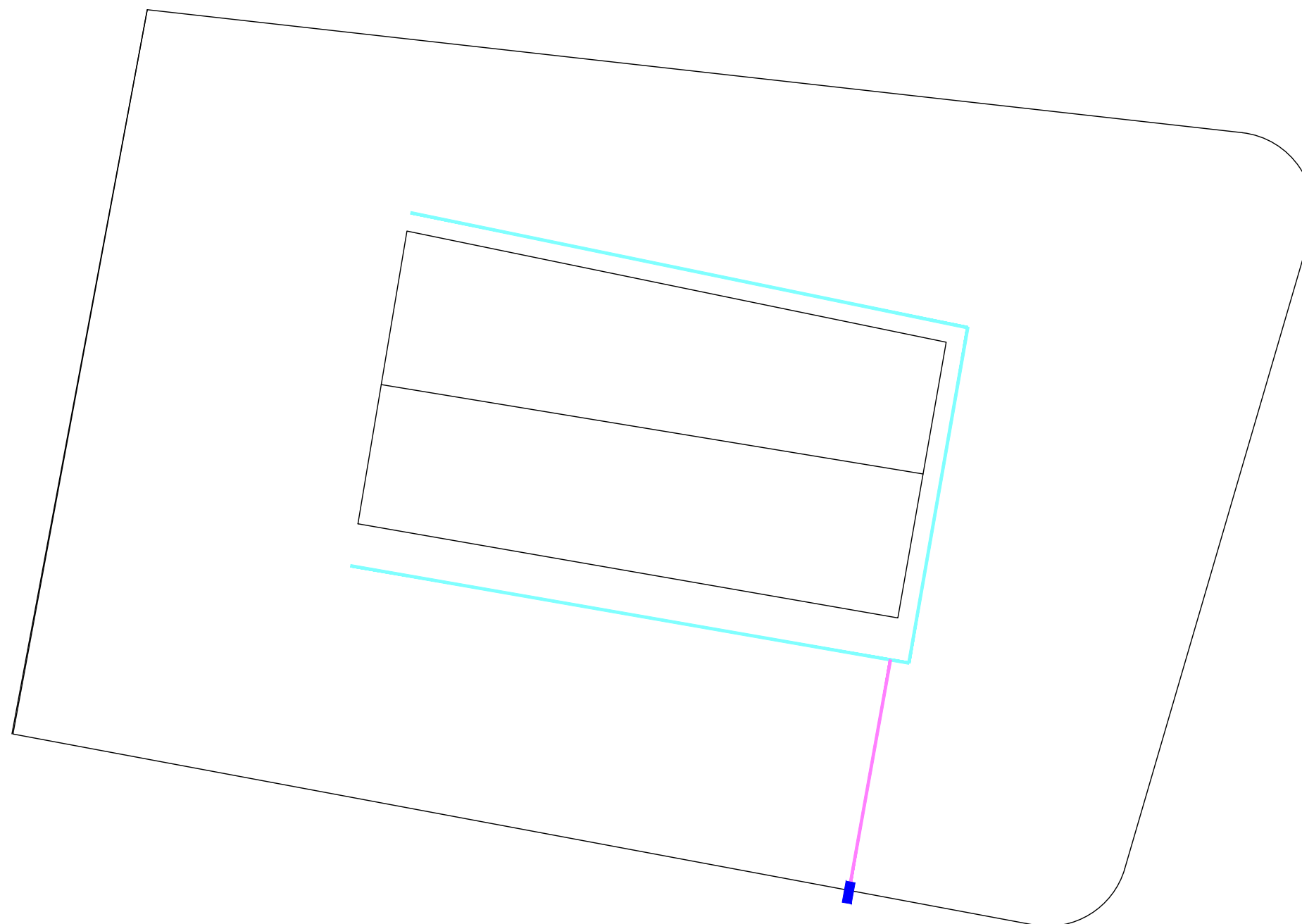
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T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
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— = PVC PIPES Ø160mm
— = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 65m

APPROXIMATE GUTTER LENGTH = 42m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 9m

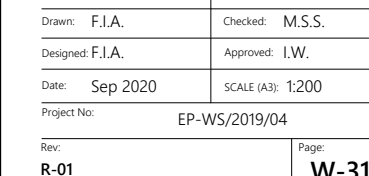
APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 56m

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

Title:
**Consultancy Services for Survey,
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7 islands, Maldives - Package 4**

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Water Supply System in Adh. Omadhoo

Client:
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Infrastructure, Republic of Maldives**





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

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

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T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
 Husnuheenaa Magu, Male', Maldives



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Checked:	M.S.S.
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Approved: I.W.

Date: Sep 2020

SCALE (A3): NTS

Project No:

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R-0

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LIGHT POST DETAILS

NTS

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

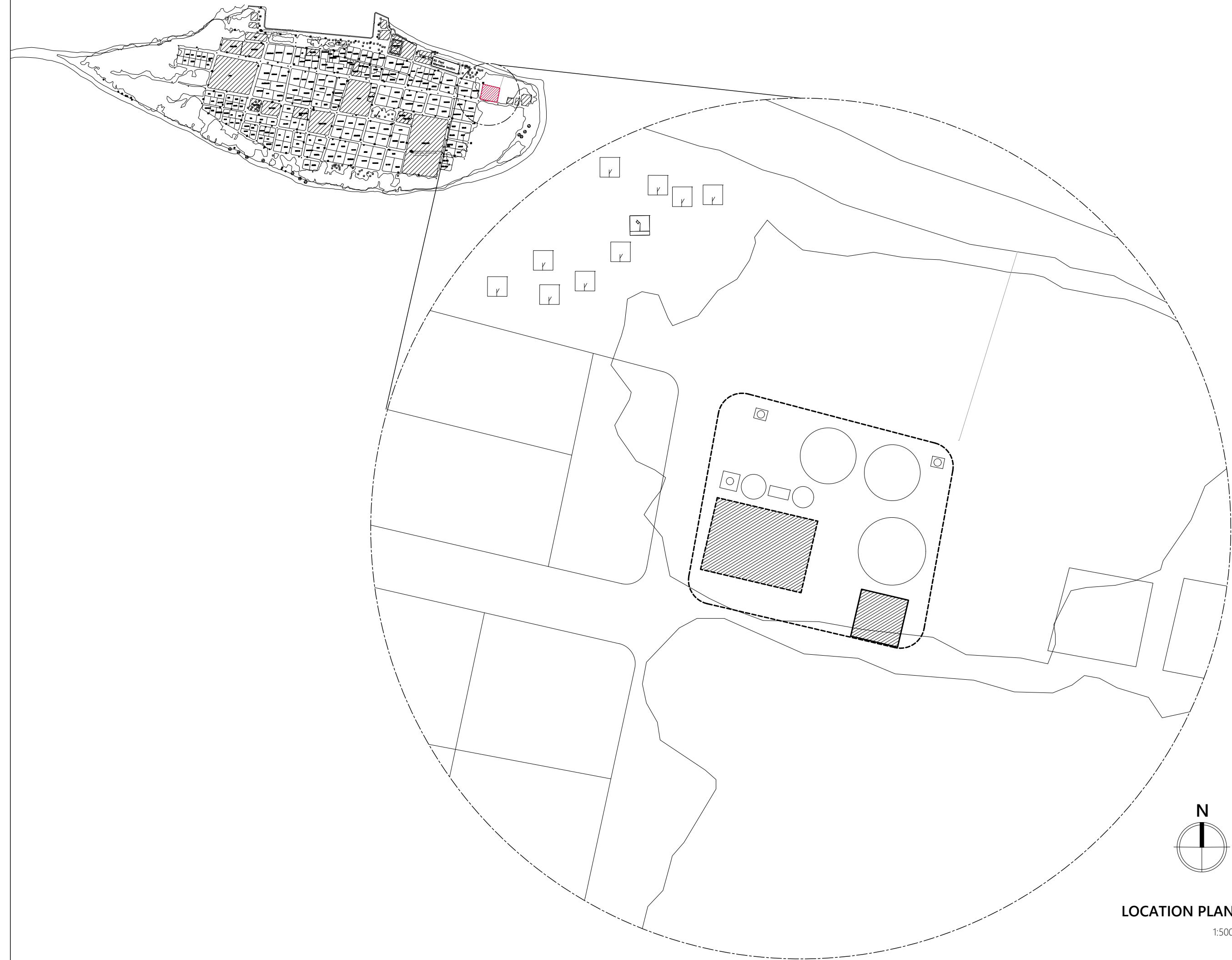
PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING & VEHICLE SHED, ADH.OMADHOO

For Ministry of National Planning, Housing and Infrastructure

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Section	A.6 (2)
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Roof Truss Plan	S.4 (2)
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Legend

Note:

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

Title:
**Consultancy Services for
Survey, Design and EIA works of
Water Supply and Sewerage
Facilities
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Sub Title:
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Client:
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T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
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Checked:	F.I.A.
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Designed: A.S.A.

Approved: M.H.

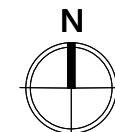
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SCALE (A3): 1:500



Project No: EP-WS/2019/04

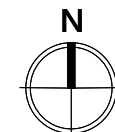
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R-00	A.1 (1)
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1:200

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T : +960 333 3528 E : info@epoch.associates W : www.epoch.associates A : G. Rosary West, Husnuheena Magu, Male*, Maldives			
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Date: Sep 2020		SCALE (A3): 1:200	
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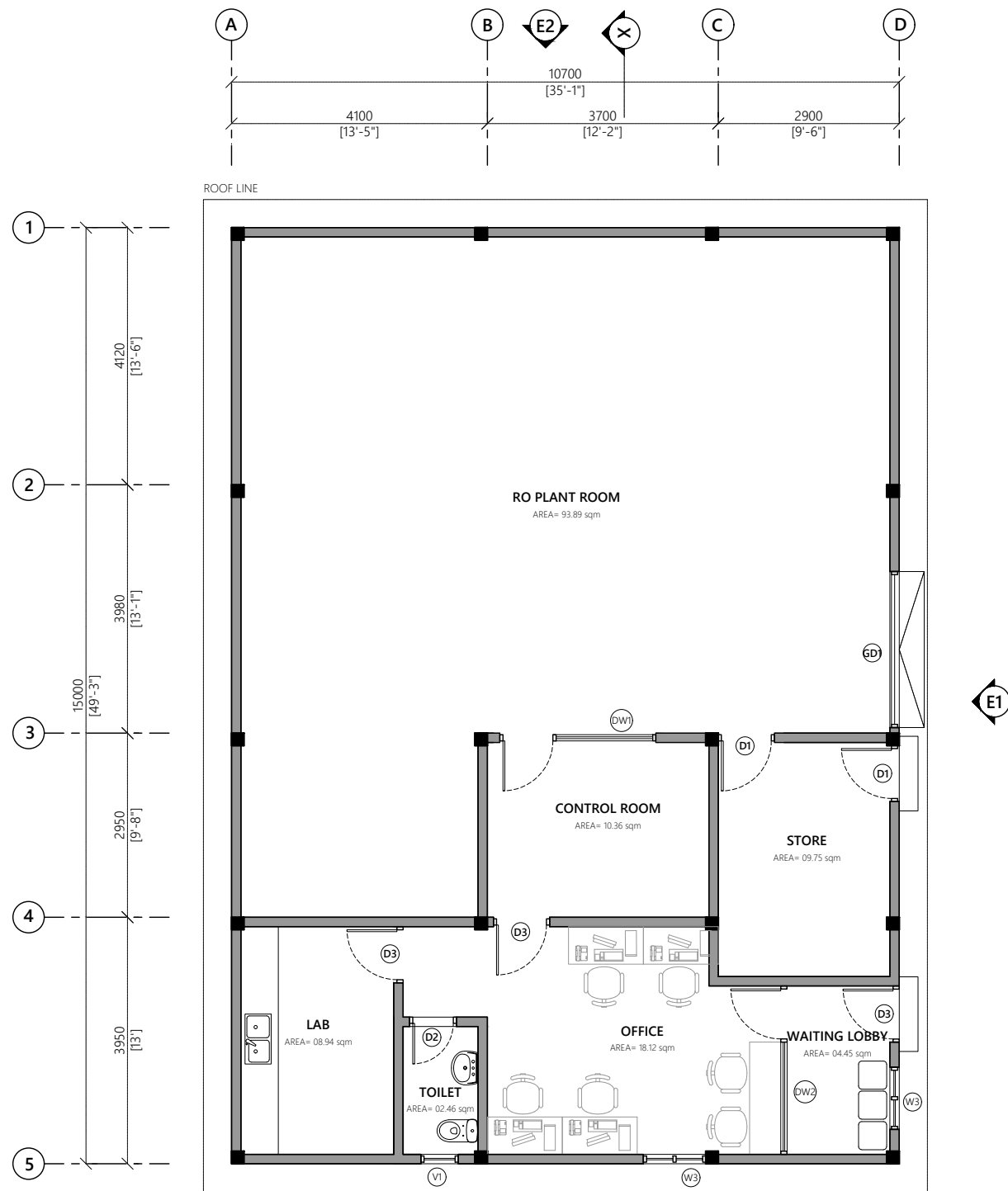
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Date: Sep 2020	SCALE (A3): 1:200		
Project No: EP-W5/2019/04			
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ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING, ADH.OMADHOO



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

Toilet and shower walls: 300x300mm ceramic wall lanka tiles up to ceiling height with tile adhesive, use joint filler of appropriate color for grouting joints between tiles

Floor Finish:

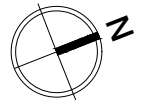
Floor Finishes: 600x600mm homogenous floor tiles with tile adhesive unless specified

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

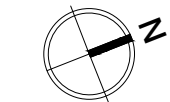
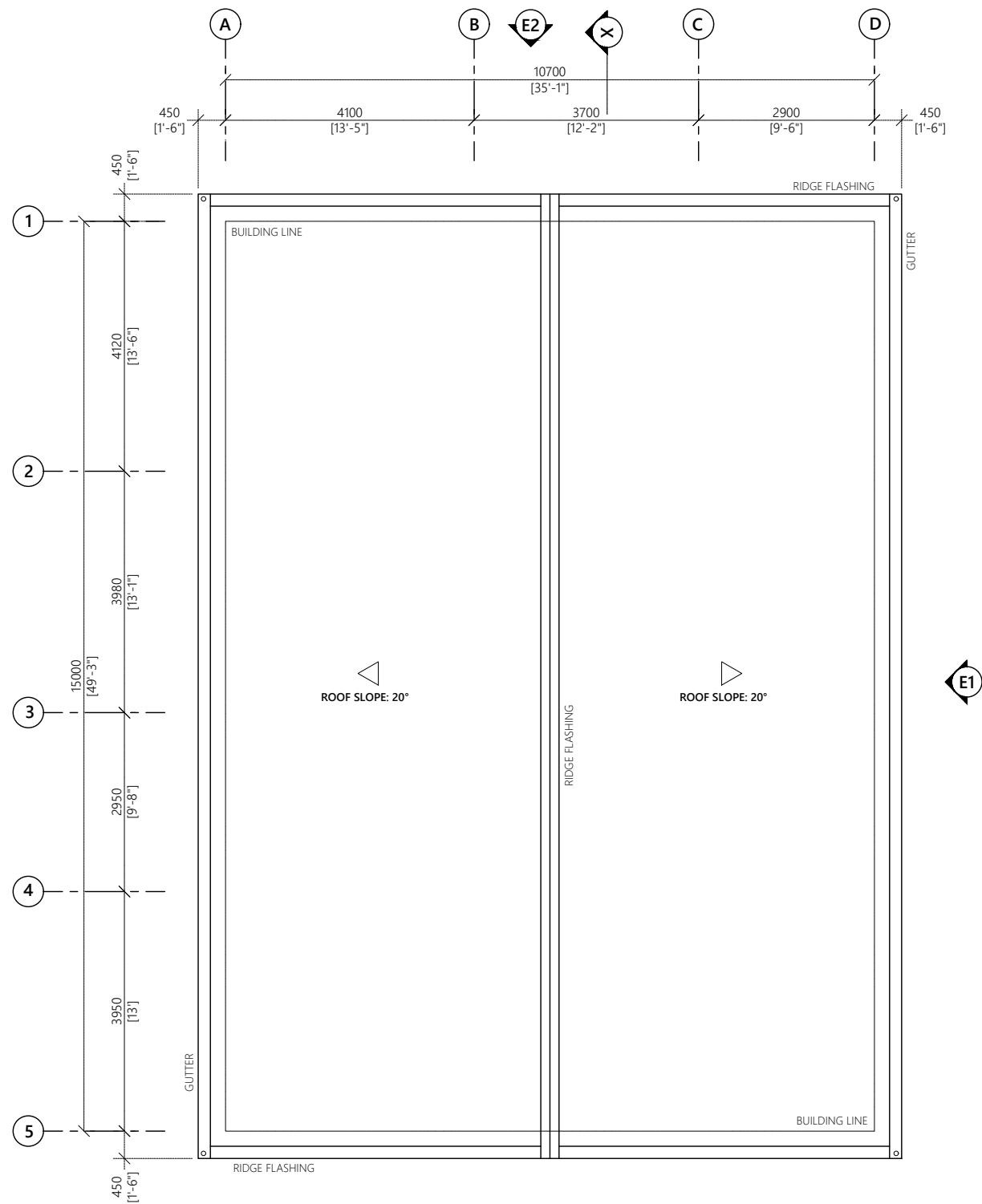
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Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 7 Islands, Maldives – Package 4
Sub Title:
Water Supply System in Adh. Omadhoo

Client:
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ROOF PLAN

1:100

Legend

Note:

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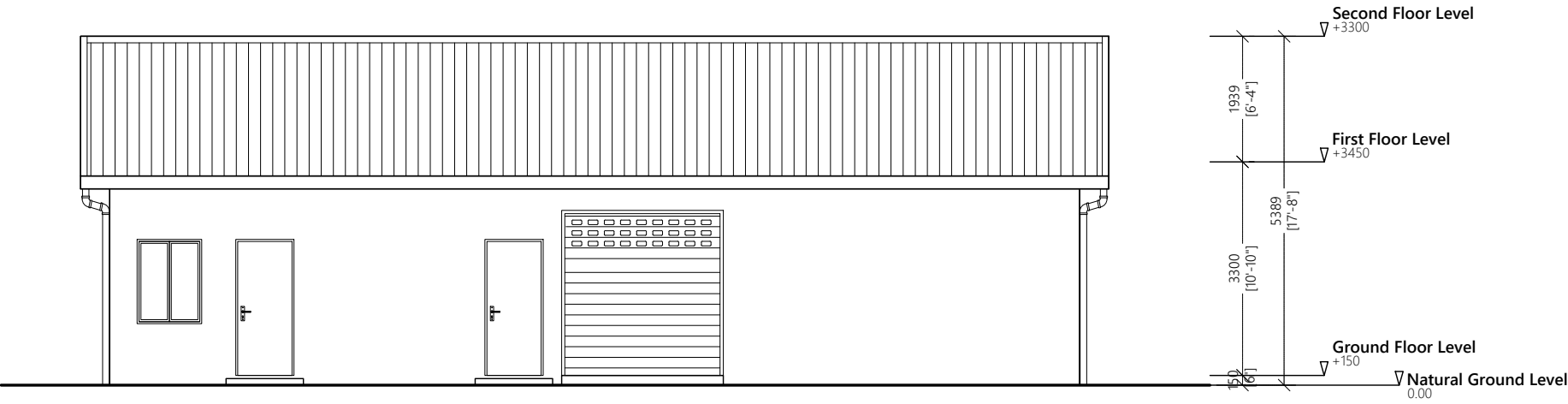
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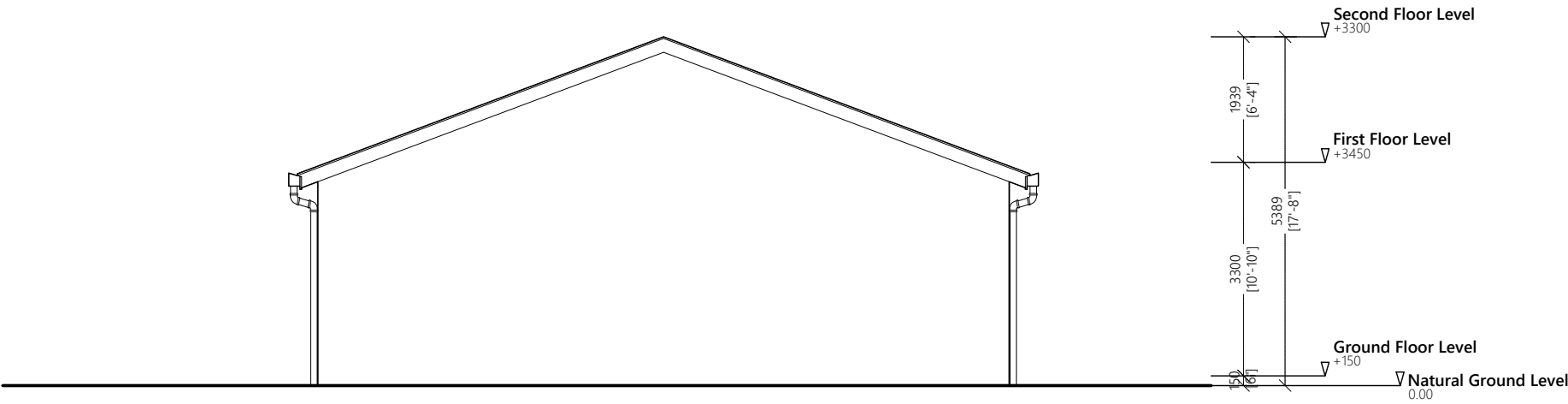
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ELEVATION E1
1:100



ELEVATION E2
1:100

Legend

Note:

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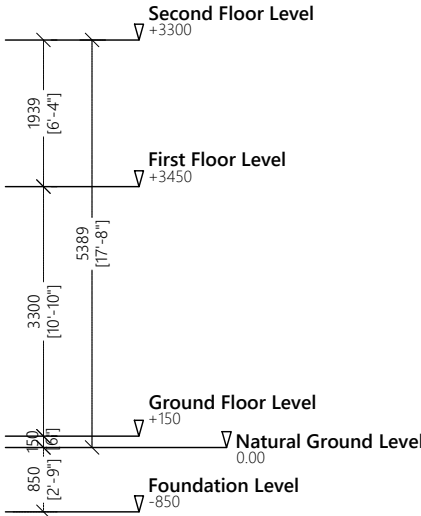
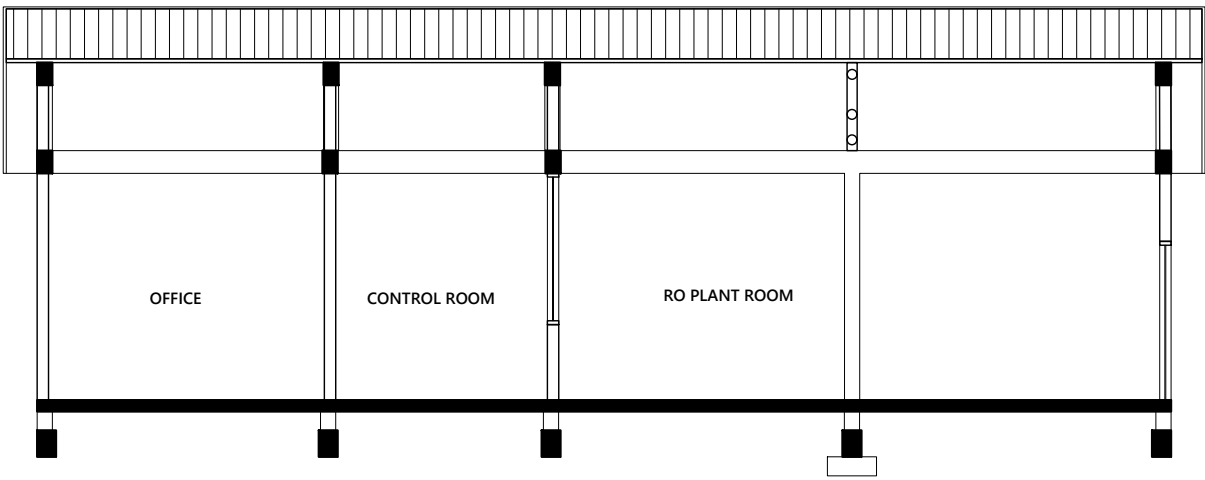
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SECTION XX

1:100

SECTION

1:100

Legend

Note:

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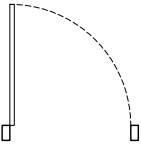
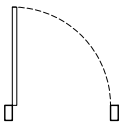
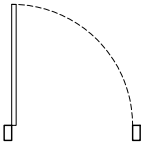
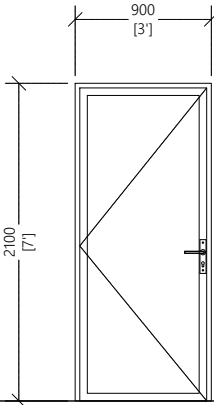
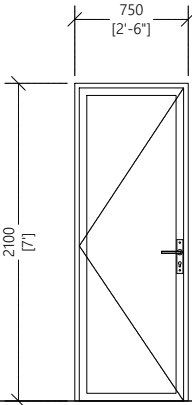
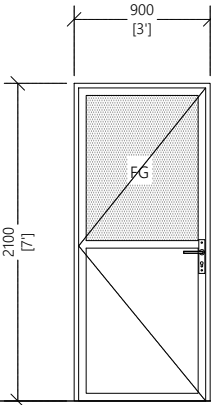
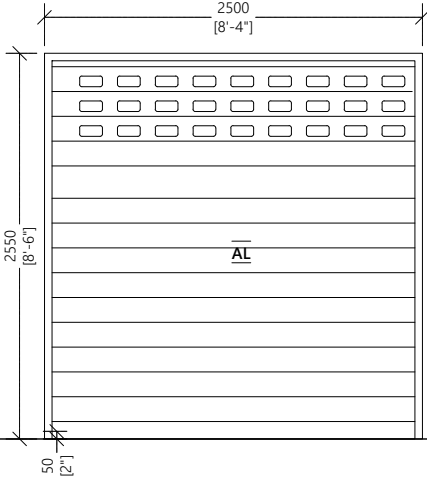


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Door ID	D1	D2	D3	GD1
Plan view				
Elevation view				
FFL				
Frame material	Aluminum black powder coated	Aluminum black powder coated	Aluminum black powder coated	Aluminum framed roller shutter
Panel material	Aluminum cladding sheet	Aluminum cladding 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
Al 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 al functions of the units

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

Locks shall be cylindrical with master key sets

Door knobs shall be1000mm above FFL

DOOR & WINDOW SCHEDULE -1

1:50

Legend

Note:

R00	AUG 2020	STAGE -1	A.S.A.	F.I.A.	M.H.
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Sub Title:

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Client:

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Door ID	DW 1	DW 2	W2
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 dor panel thicknesses are 35mm All window manel thickness are 25mm Al frame edges shal be trimmed 3mm
All wodden 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 al functions of the units
Hinges shall confirm to 1. Door size more than 700X1900mm WD: 125mm X2 sets SD: 150mm X3 sets 2. Door size less than 700X1900mm WD: 100mm X2 sets SD: 125mm X2 sets
Locks shall be cylindrical with master key sets
Door knobs shall be1000mm above FFL

DOOR & WINDOW SCHEDULE -2

1:50

Legend

Note:

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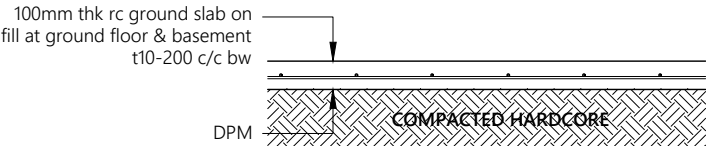
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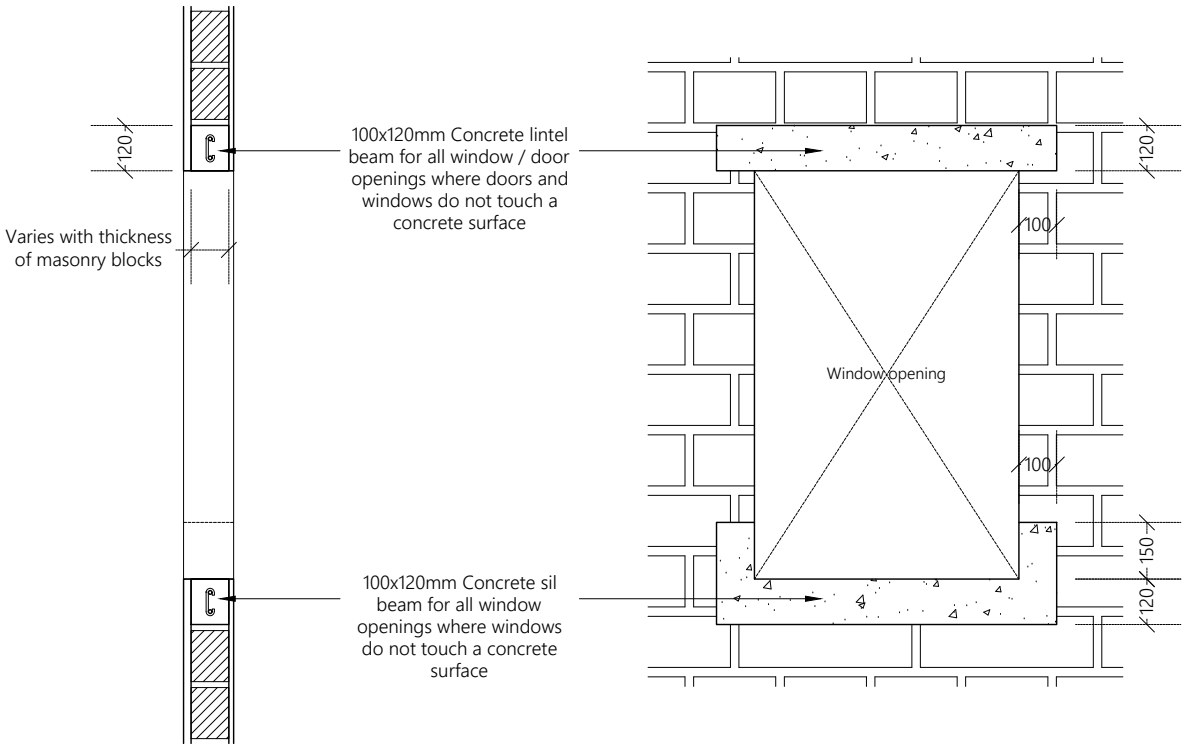
A.5 (2)



- 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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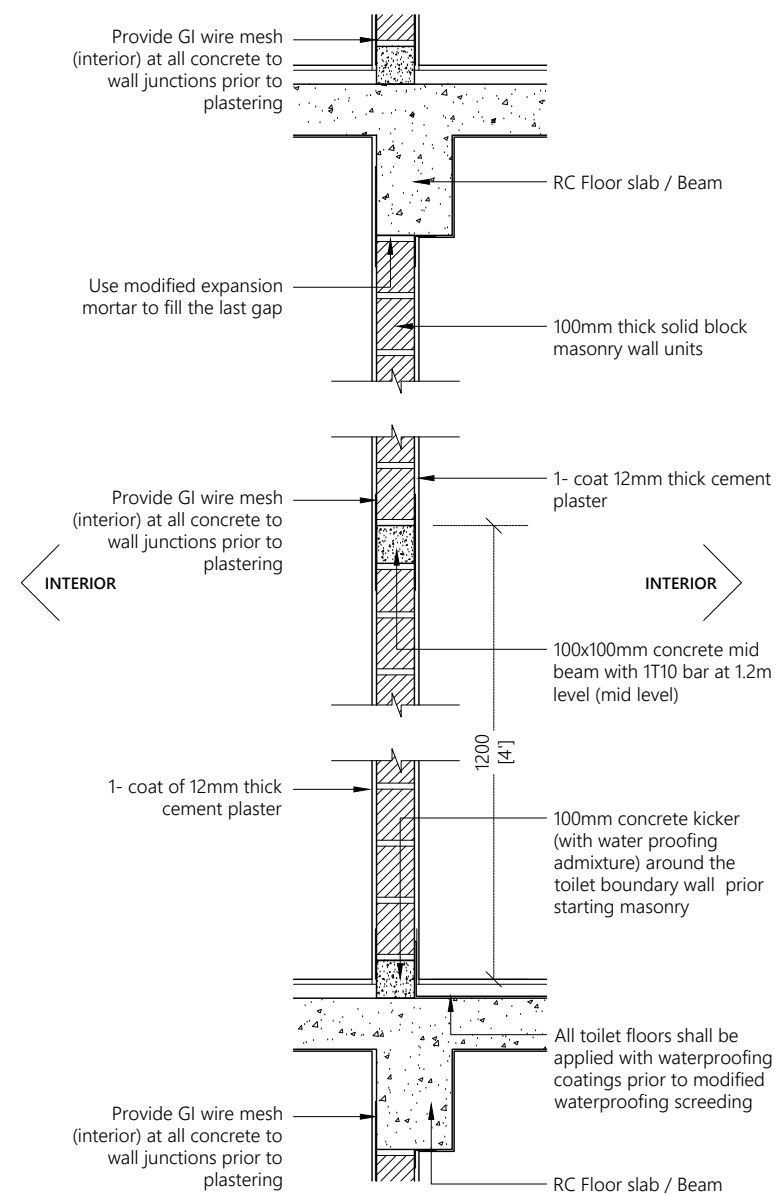


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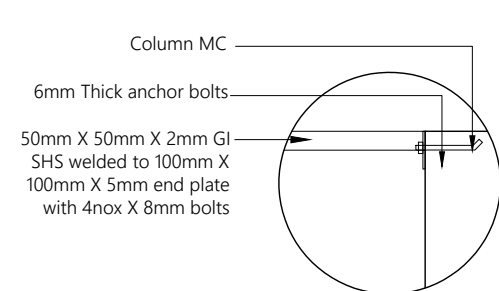
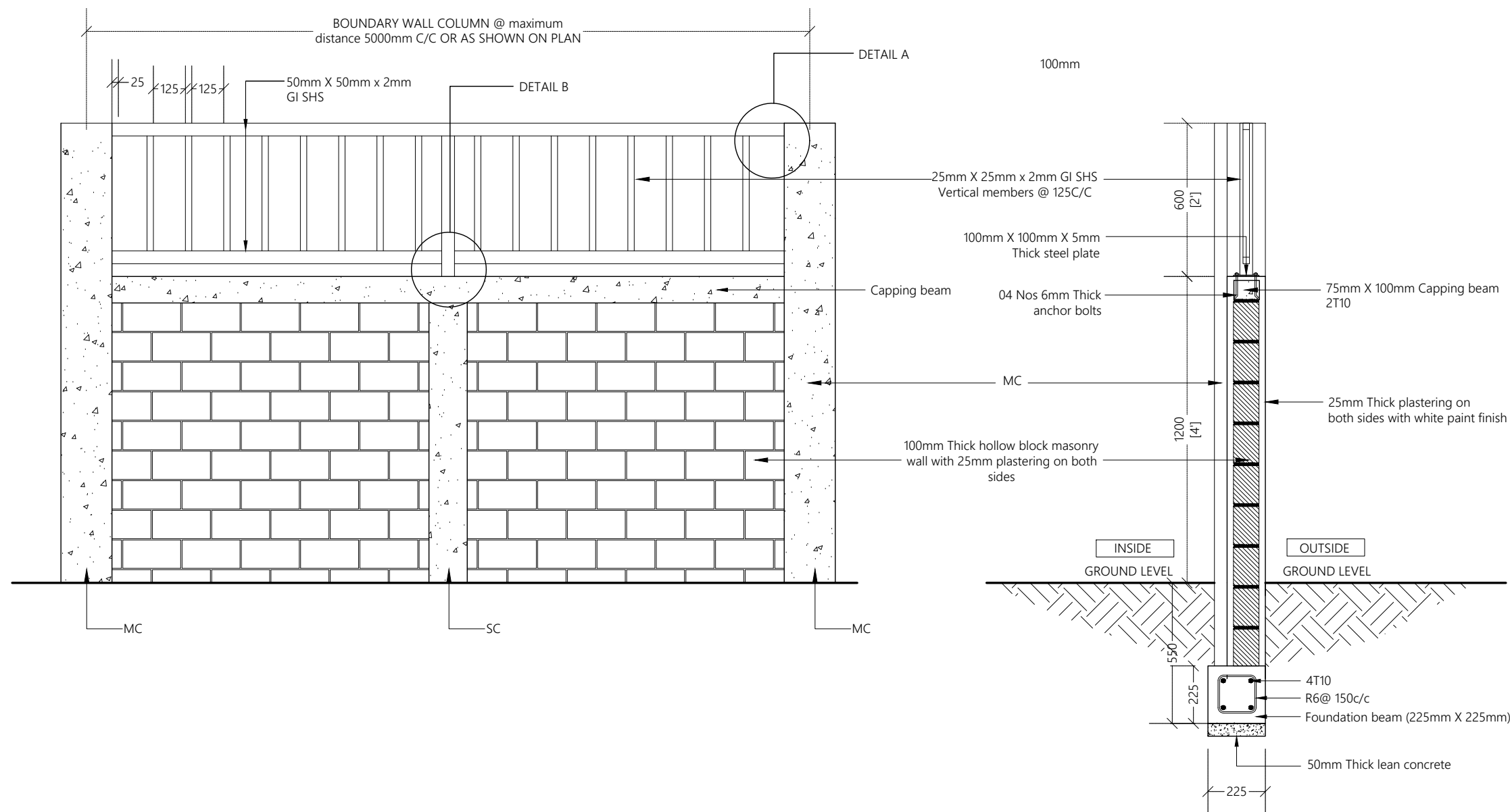
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- Concrete surfaces shall be thoroughly cleaned with water & applied with mastercast 141 or equivalent bonding mortar prior to plastering.
- Plastering mortar mix shall be 1:4 (cement: sand) ratio.
- Plaster mix shall be modified using fibre wool & 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.

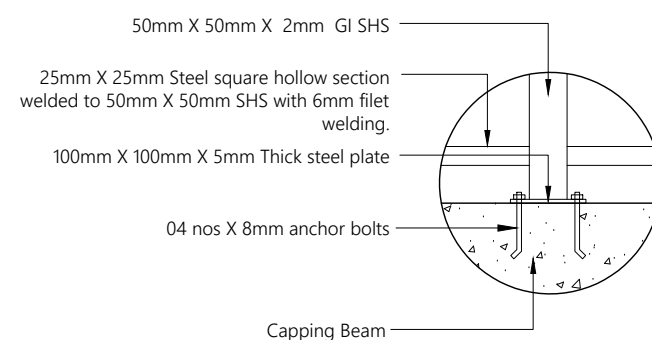
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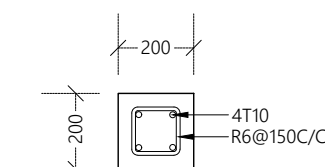
DETAIL A

1:10

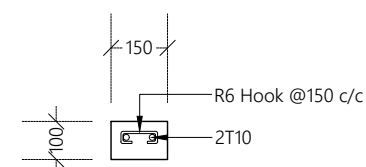


DETAIL B

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

BOUNDARY WALL DETAIL

1:20

Legend

Note:

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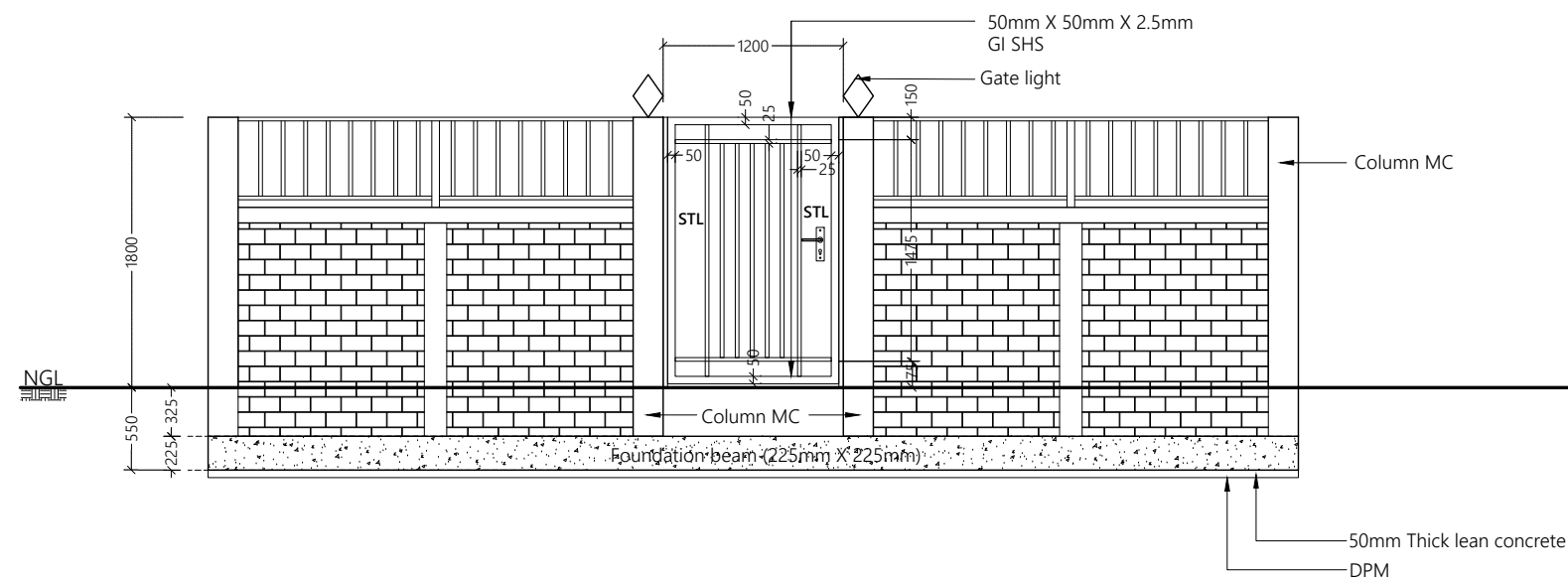
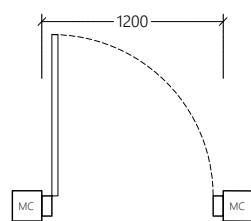
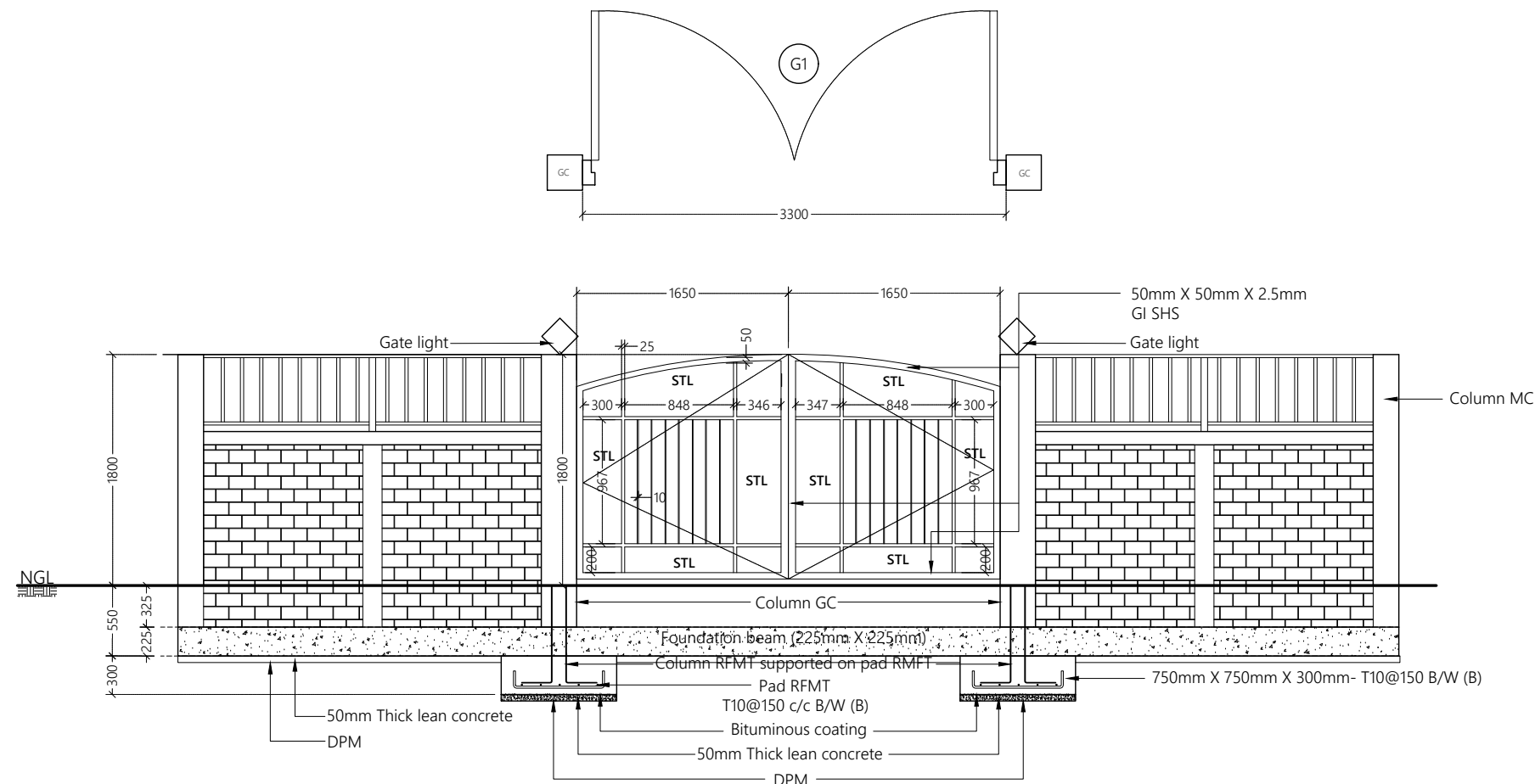
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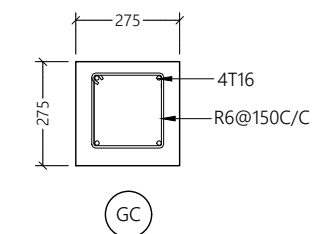
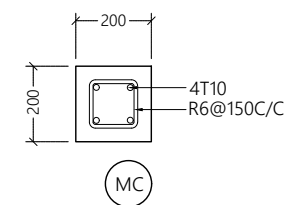
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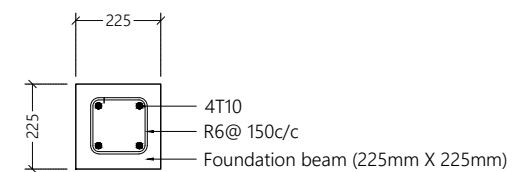
GATE DETAILS

1:50



COLUMN DETAILS

1:20



FOUNDATION BEAM DETAIL

1:20

Legend

Note:

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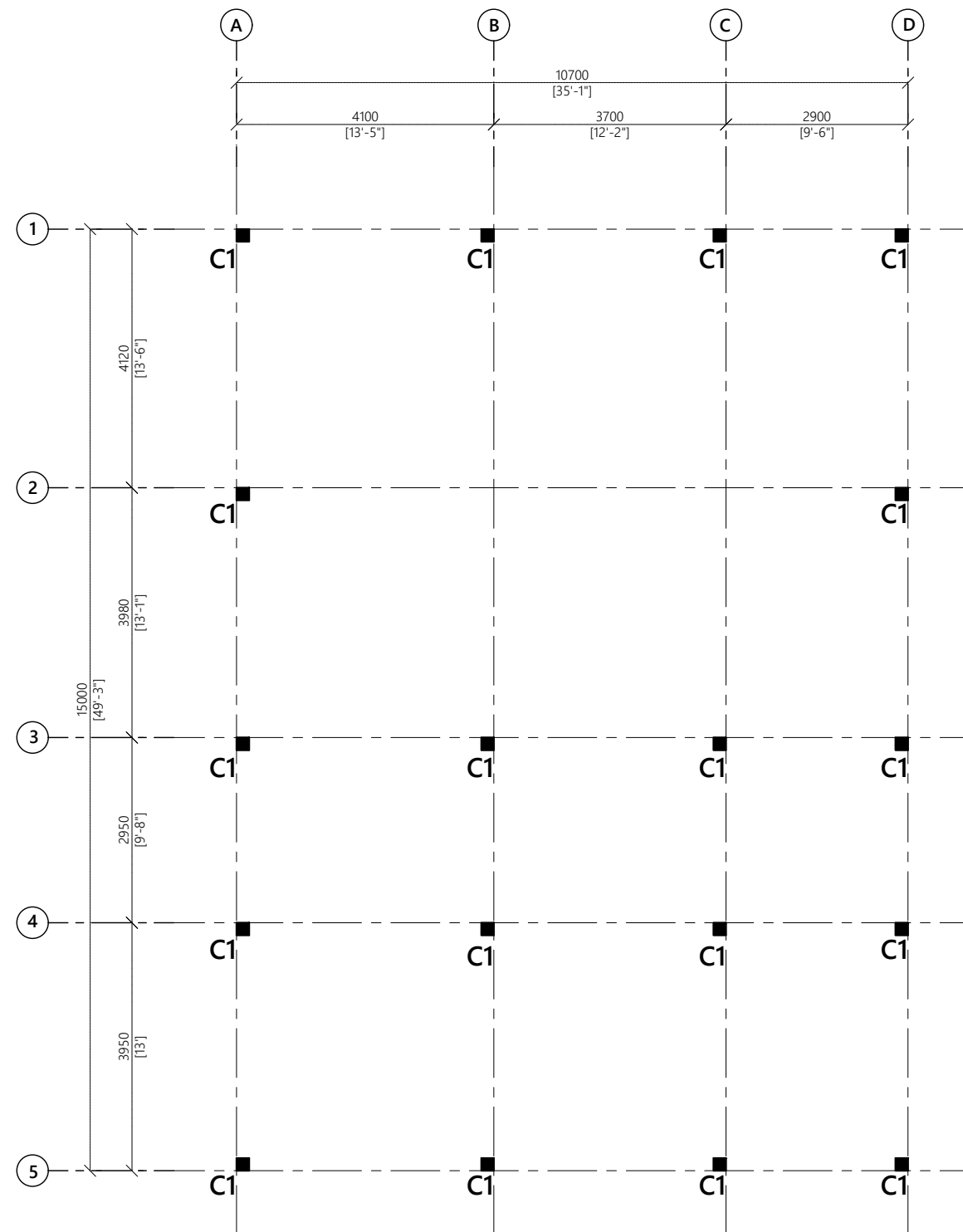
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COLUMN LAYOUT PLAN

1:100

Legend

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Foundation Depth: 600mm

1:100

Legend

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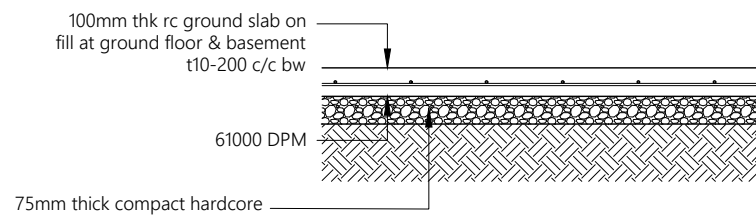


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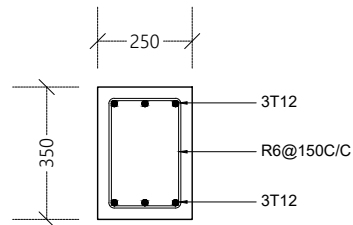


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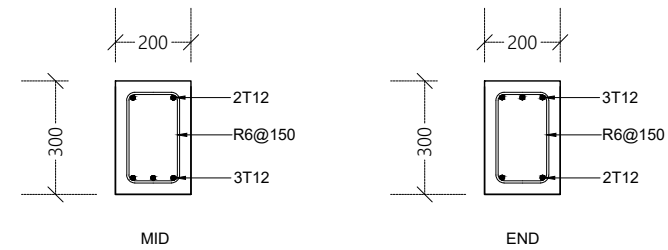
- All cover blocks shall be casted using grade C25/30 concrete with 5-10mm aggregates
- For slab, rebar spacer chairs spacing shall be minimum 1m spacing or 1 no. per 1 sqm

TYPICAL GROUND SLAB DETAIL

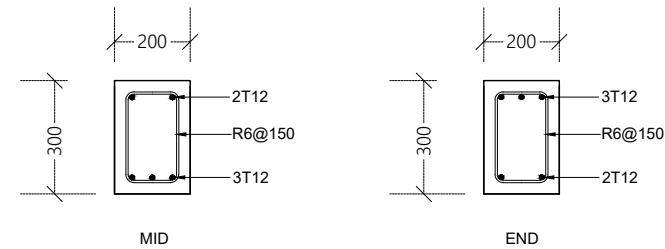
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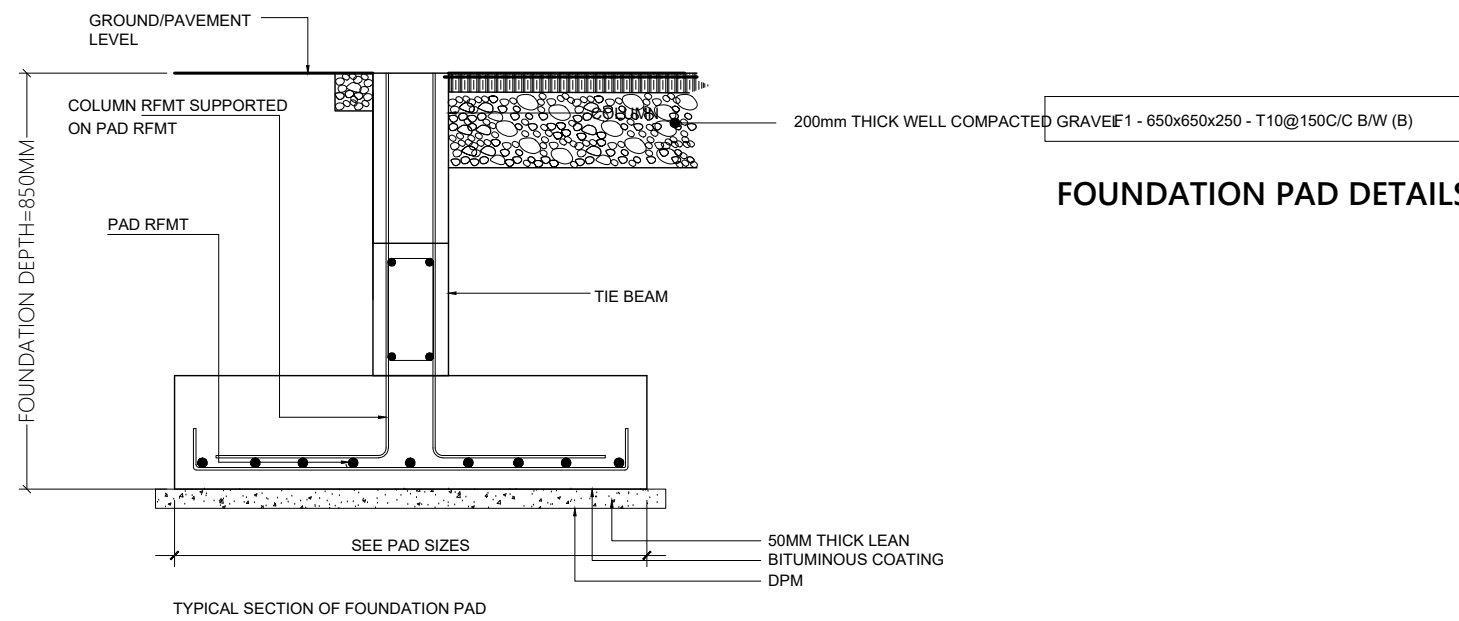
FOUNDATION BEAM (FB)



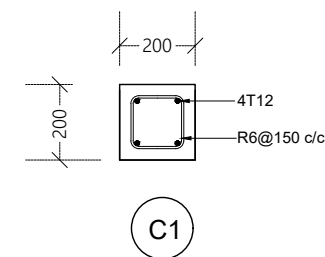
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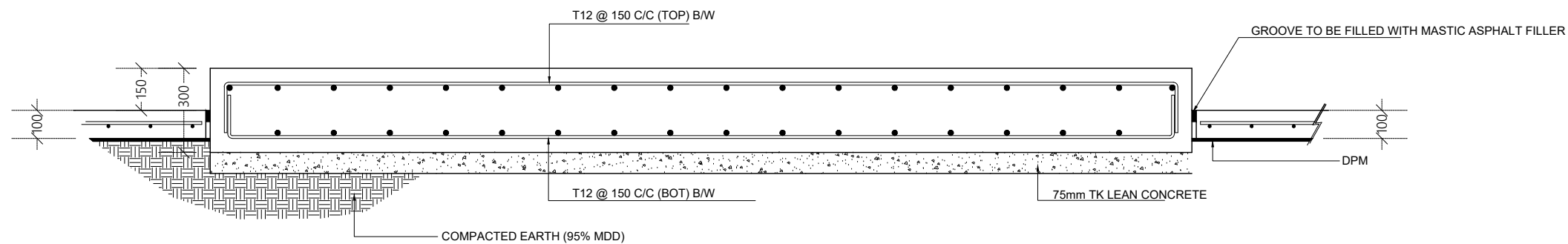
SLOPING ROOF BEAM (SRB)



FOUNDATION PAD DETAILS



COLUMN DETAIL



RO PLANT BASE DETAIL

Legend

Note:

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Title:
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 Sub Title:
Water Supply System in Adh. Omadhoo

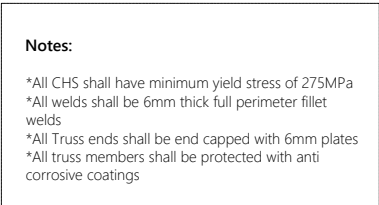
Client:
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EPOCH
 T: +960 333 3528
 E: info@epoch.associates
 W: www.epoch.associates
 A: G. Rosary West, Huseenuheena Magu, Male', Maldives

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STRUCTURAL DETAILS

1:20



1:50



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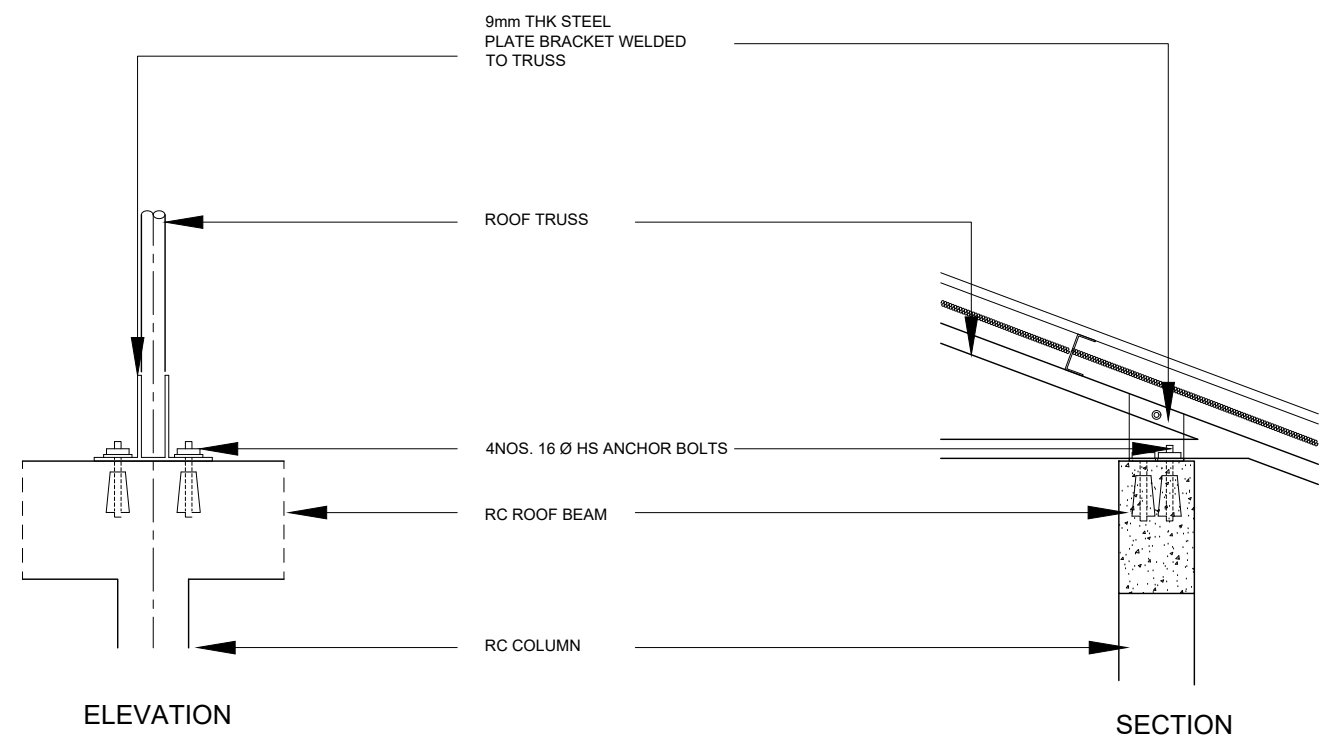


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DETAIL A

1:20

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT VEHICLE SHED, ADH.OMADHOO



Legend

Note:

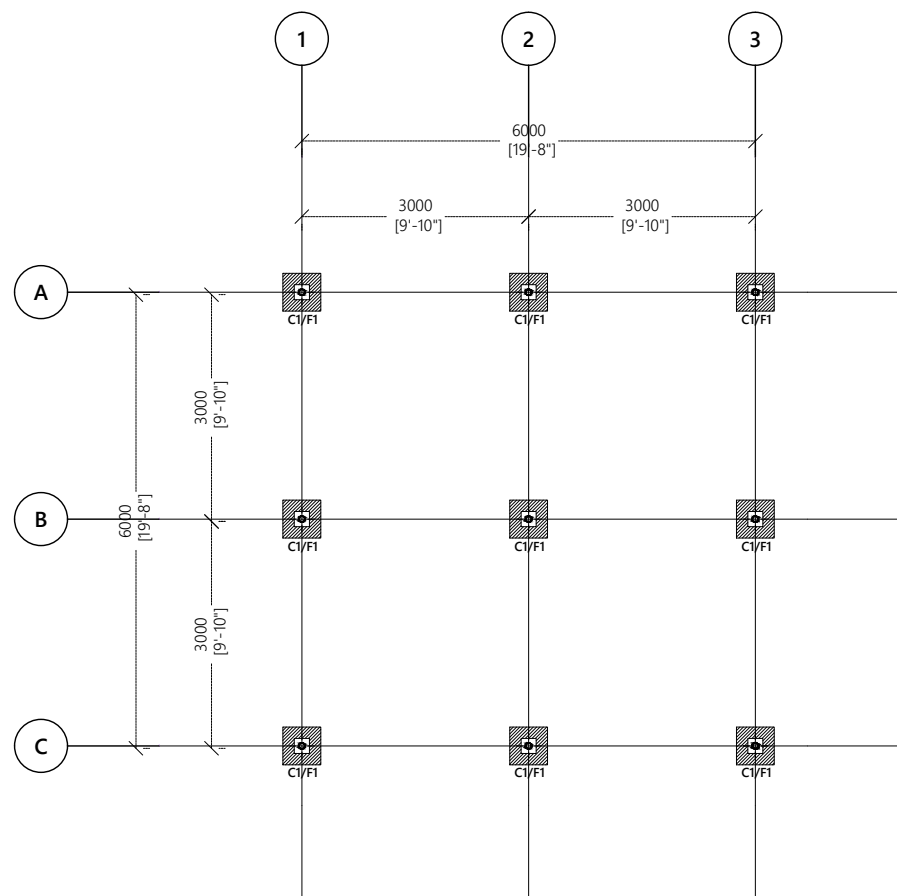
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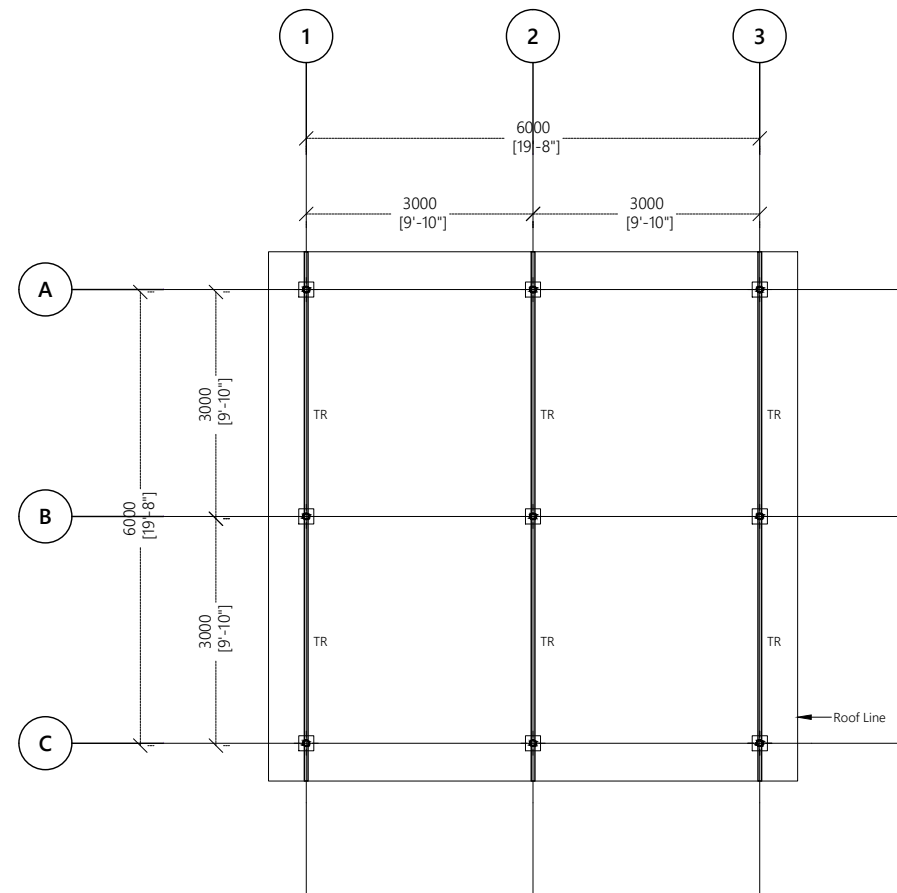


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FOUNDATION PLAN

1:100



ROOF TRUSS PLAN

1:100

Legend

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E: info@epoch.associates
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Designed: A.S.A.

Approved: M.H.

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SCALE (A3): 1:100

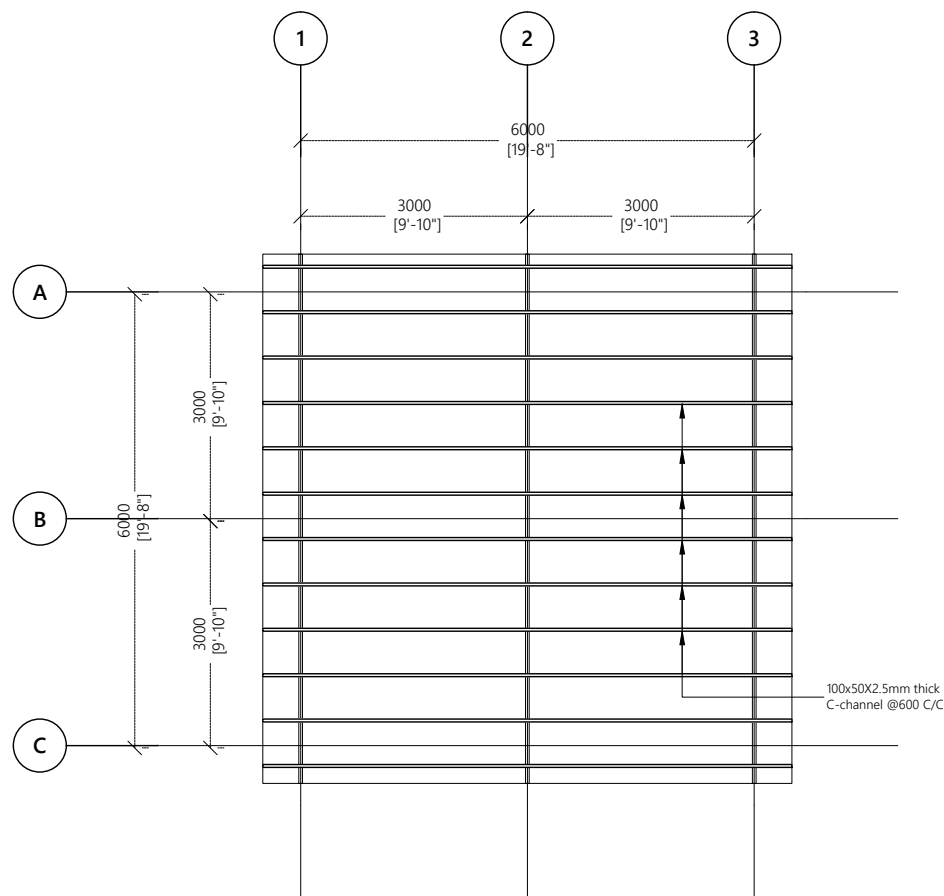
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ROOF FRAMING PLAN

1:100

Legend

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E: info@epoch.associates
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BUILDING SERVICES DRAWINGS OF
PROPOSED SINGLE STOREY BUILDING AT
RO PLANT ADMIN BUILDING, ADH. OMADHOO






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 |

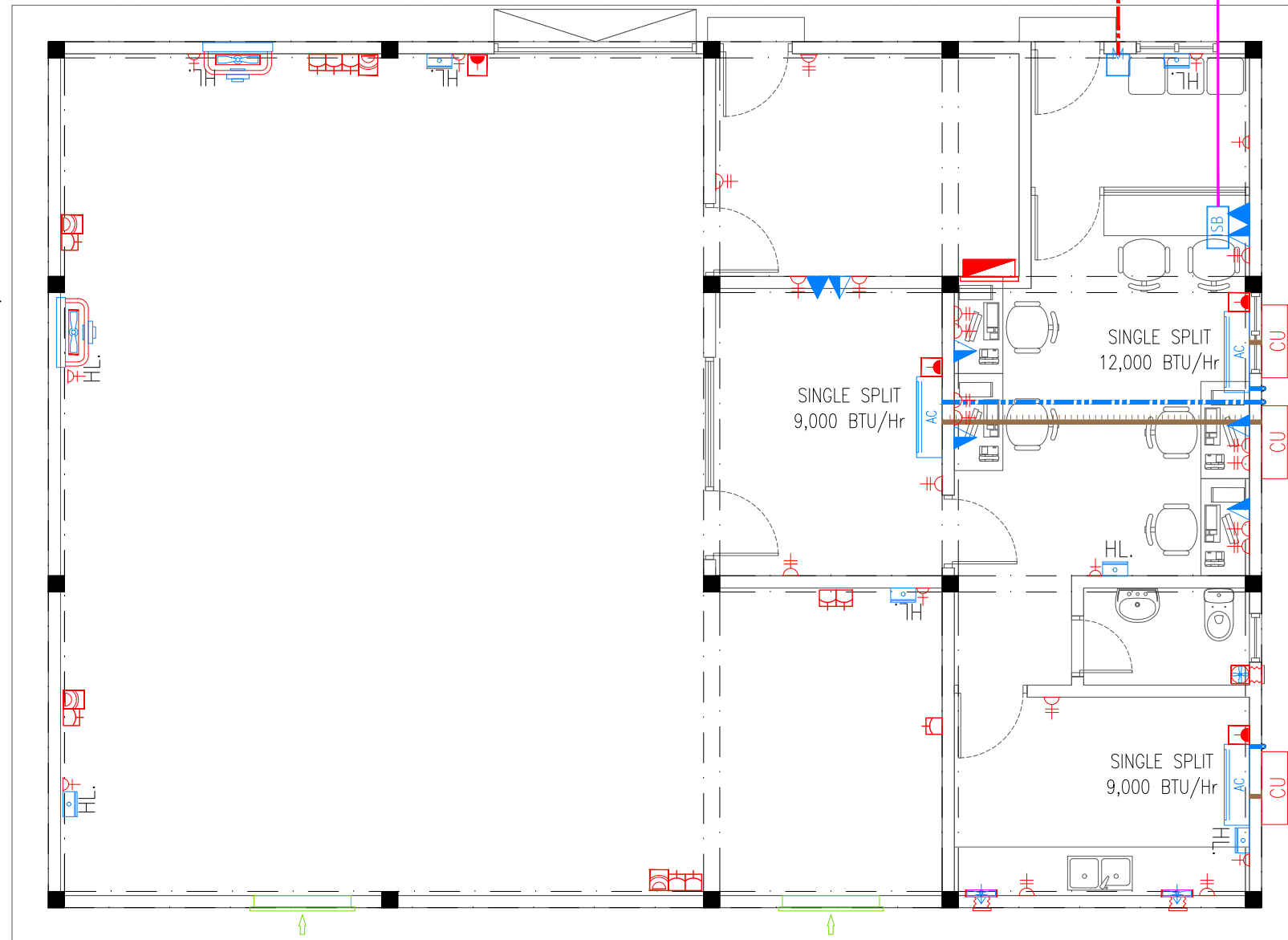
- | | |
|---|-------------------------|
|  | Internet Switchboard |
|  | Telephone Outlet |
|  | Computer Network Outlet |
|  | Emergency Light |
|  | Electricity Meter |

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

- | | |
|--|--|
|  | Refrigerant Pipes |
|  | 25Ø Condensate Drain Pipe |
| | ▶ 40Ø Condensate Drain Riser Pipe |
|  | Wall Mount Air Conditioner |
|  | Outdoor Condensing Unit |
|  | Ceiling Mounted Exhaust Fan 90m3/hr |
|  | Wall Mounted Exhaust Fan |
|  | Single Intake, Centrifugal, External Motor, 800m3/hr |
|  | Fresh Air Intake Grille/screen |



GROUND FLOOR POWER AND ACV LAYOUT

1:75

Legend

Note:

- 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.

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Sub Title:

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Client:

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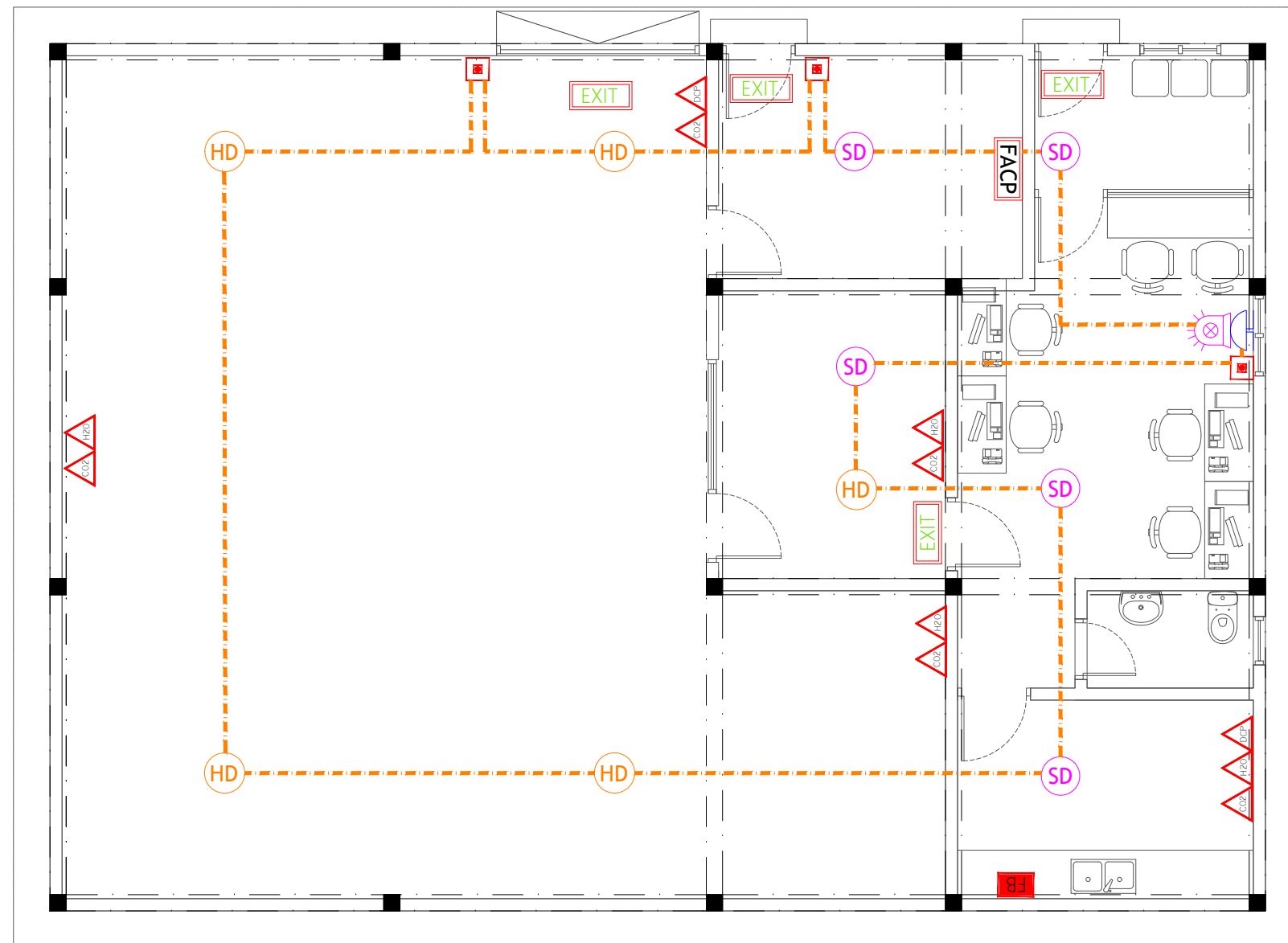
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Legend

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



GROUND FLOOR FDP LAYOUT

1:75

Legend

Note:













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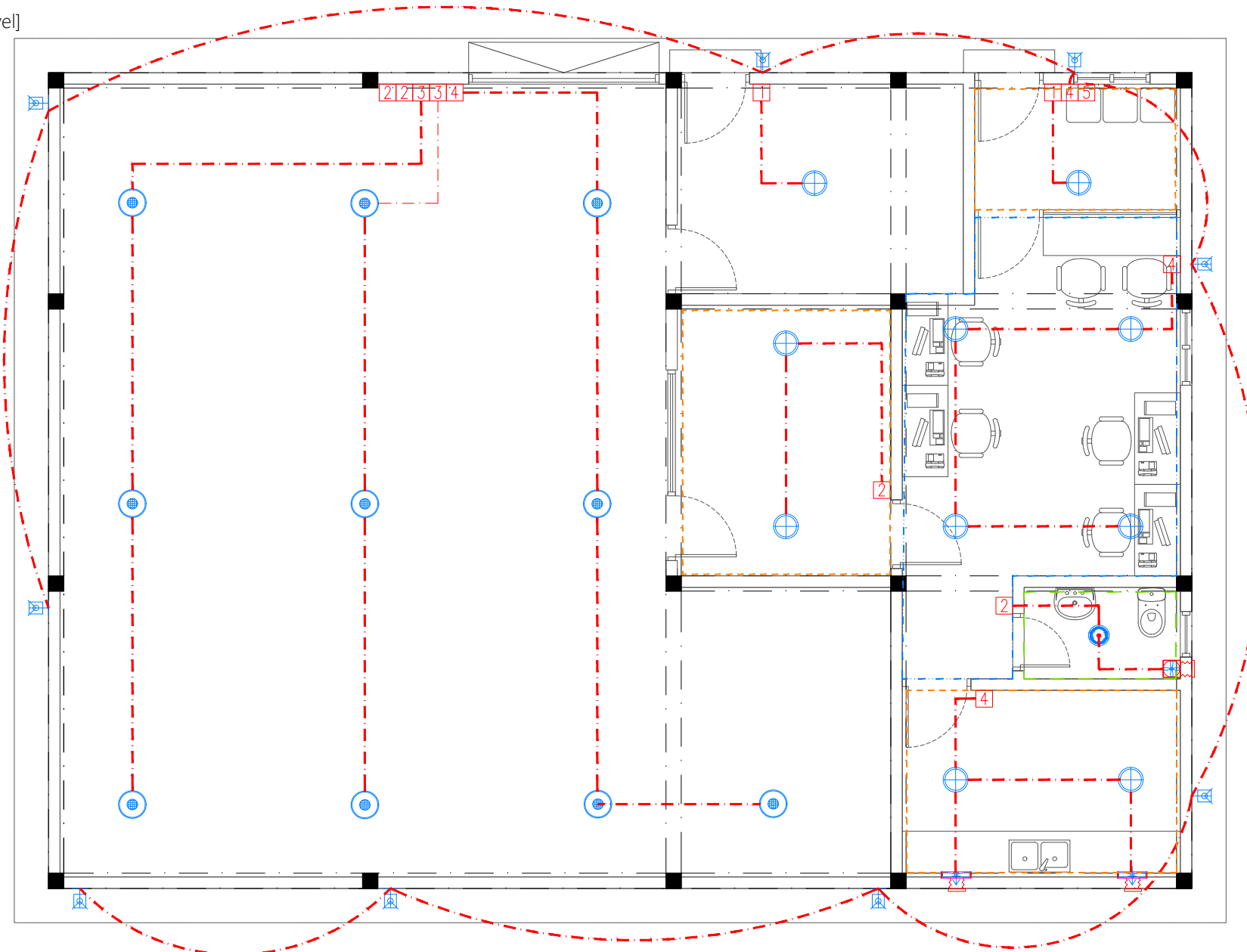
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-  Ceiling Light (12W)
-  Recessed Ceiling Light (12W)
-  Weather Proof Wall Light IP55 (12W)
-  60W, HPS, Low Bay Light
-  Light Switch (1 Gang - 4 Gang)
-  Two Way Light Switches (1 Gang - 4 Gang)
-  SINGLE INTAKE, CENTRIFUGAL, EXTERNAL MOTOR, 800M3/Hr
-  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]



GROUND FLOOR LIGHTING LAYOUT

1:75

Legend

Note:

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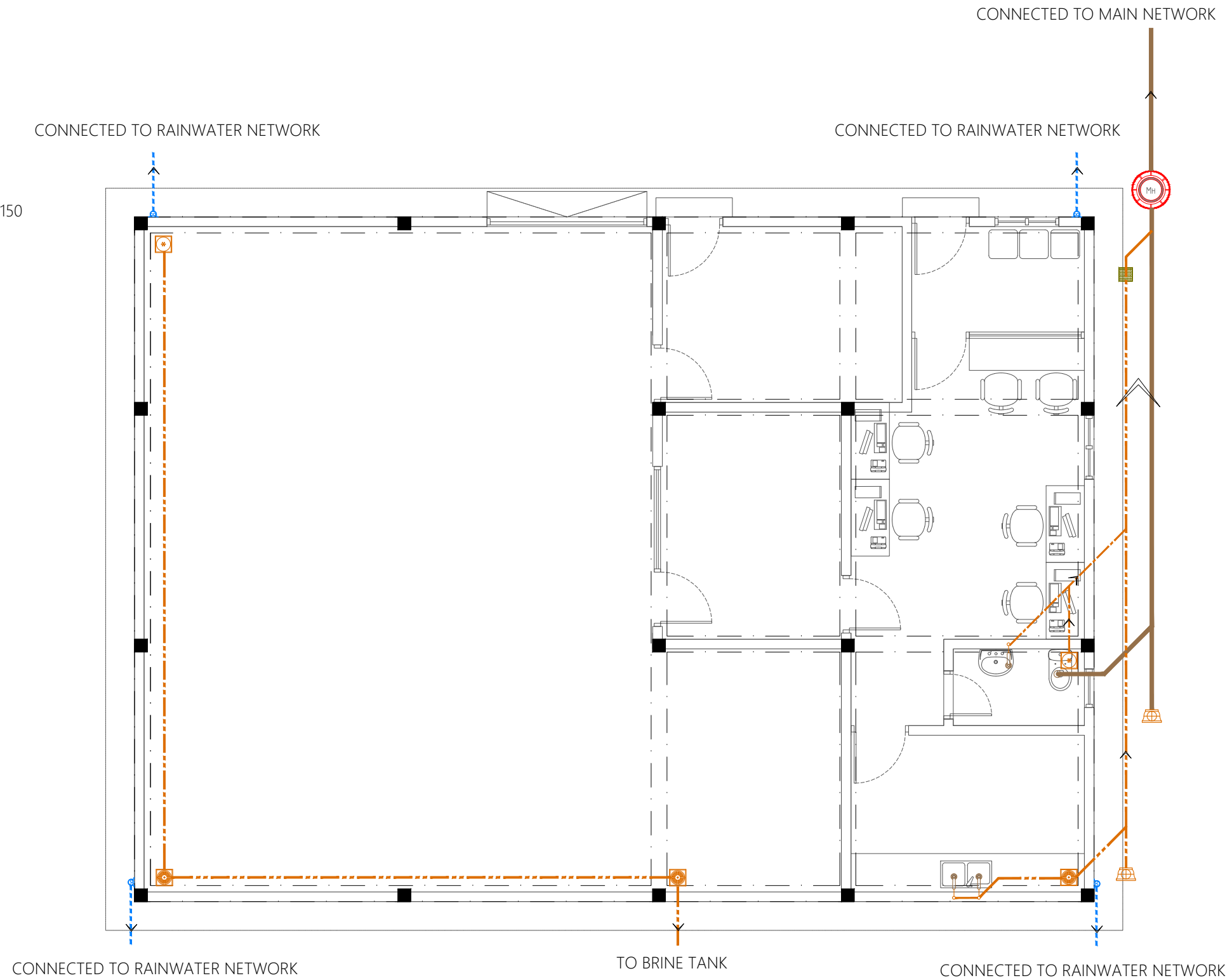


Legend

-  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



GROUND FLOOR DRAINAGE LAYOUT

1:75

Legend

Note:

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

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T: +960 333 3528
E: info@epoch.associates
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- 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



ROOF DRAINAGE LAYOUT

1:75



Legend

- Note:
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- All Floor Drains Should Have 'P' Traps

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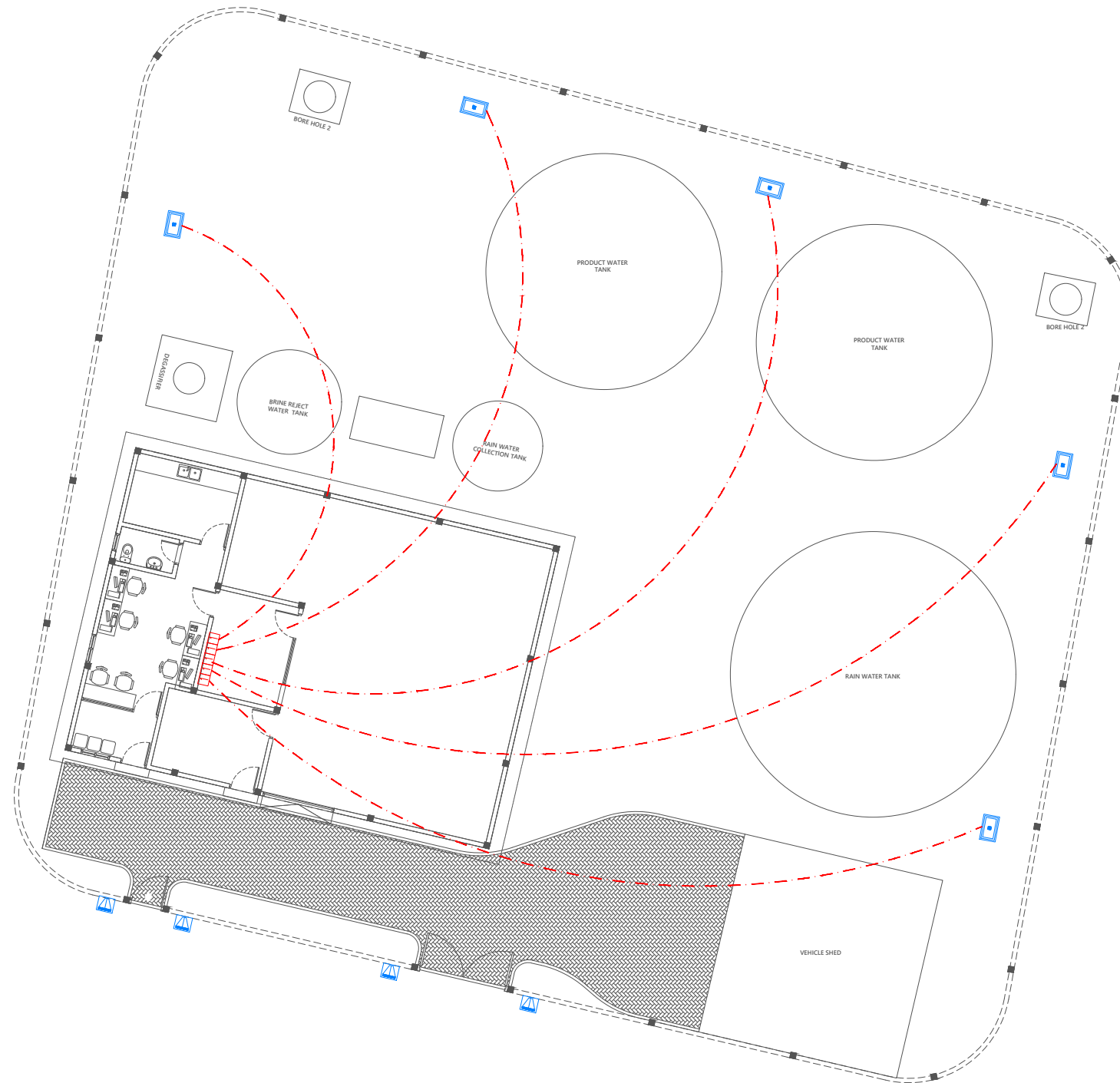

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Legend

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



Legend

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SITE LIGHTING LAYOUT