

CONSULTANCY SERVICES FOR SURVEY, DESIGN AND EIA WORKS OF WATER SUPPLY AND
SEWERAGE FACILITIES IN 5 ISLANDS, MALDIVES

PACKAGE 6

WATER SUPPLY SYSTEM OF L.HITHADHOO, MALDIVES

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

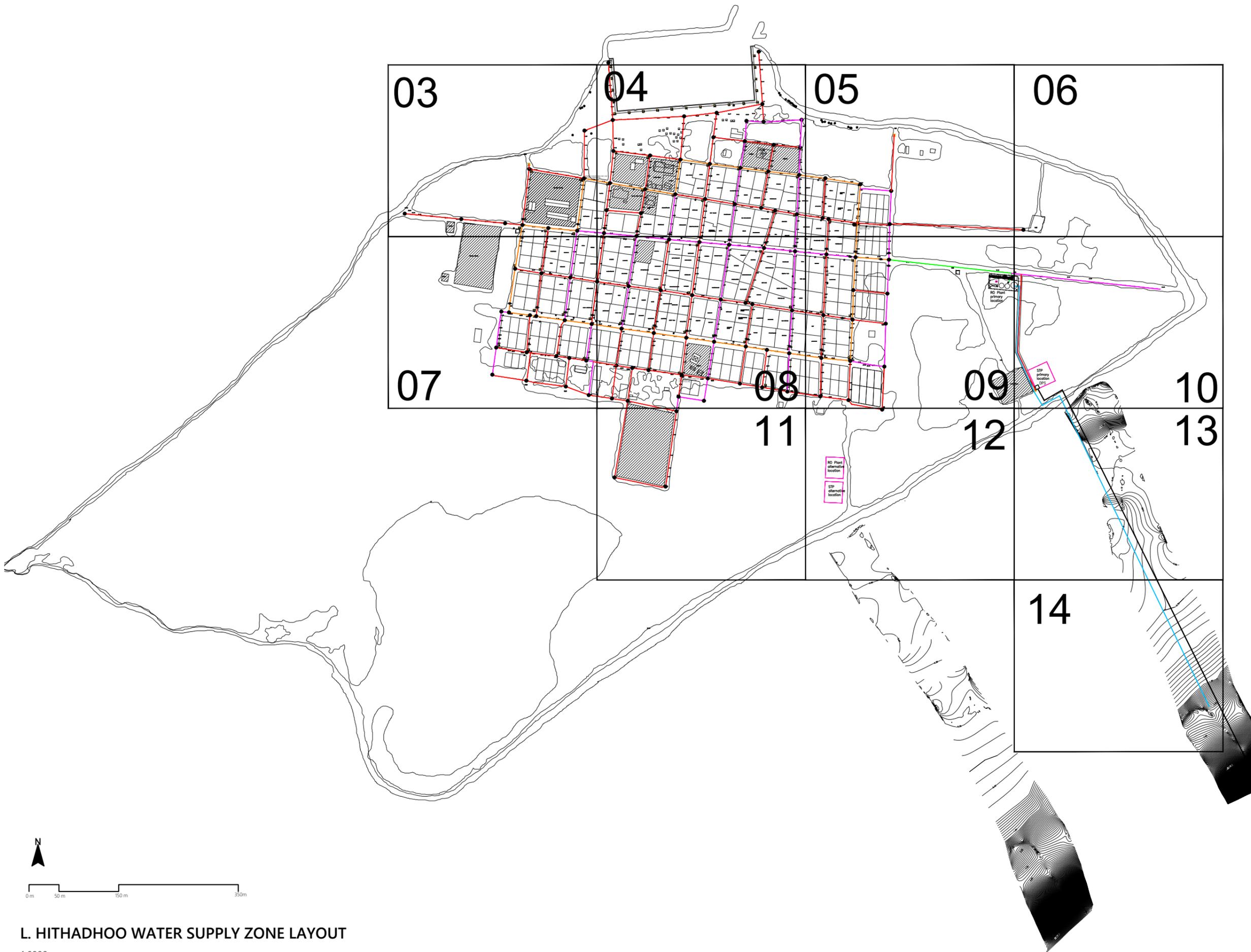


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- Legend**
- Ø63 HDPE Water Main Distribution Pipe
 - Ø90 HDPE Water Main Distribution Pipe
 - Ø150 HDPE Water Main Distribution Pipe
 - Ø75 HDPE Water Main Distribution Pipe
 - Ø110 HDPE Water Main Distribution Pipe
 - Ø110 HDPE Brine Outfall Pipe
 - Gate Valves
 - Junction
 - ✕ Washout Valves

- Notes:**
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 5. 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.
 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	6936	HDPE (PE100,PN10,SDR17)
90	2844	
110	1725	
150	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	828	HDPE (PE100,PN10,SDR11)

PSM BENCHMARKS

PERMANENT SURVEY MARK PSM_5363 32059.497E, 199025.942N 0.996m From MSL
PERMANENT SURVEY MARK PSM_5364 32119.956E, 198953.066N 1.066m From MSL
PERMANENT SURVEY MARK PSM_5365 320825.261E, 198697.178N 0.996m From MSL

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 5 islands, Maldives - Package 6

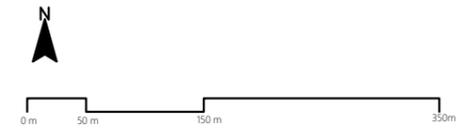
Sub Title:
Water Supply System in L. Hithadhoo

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

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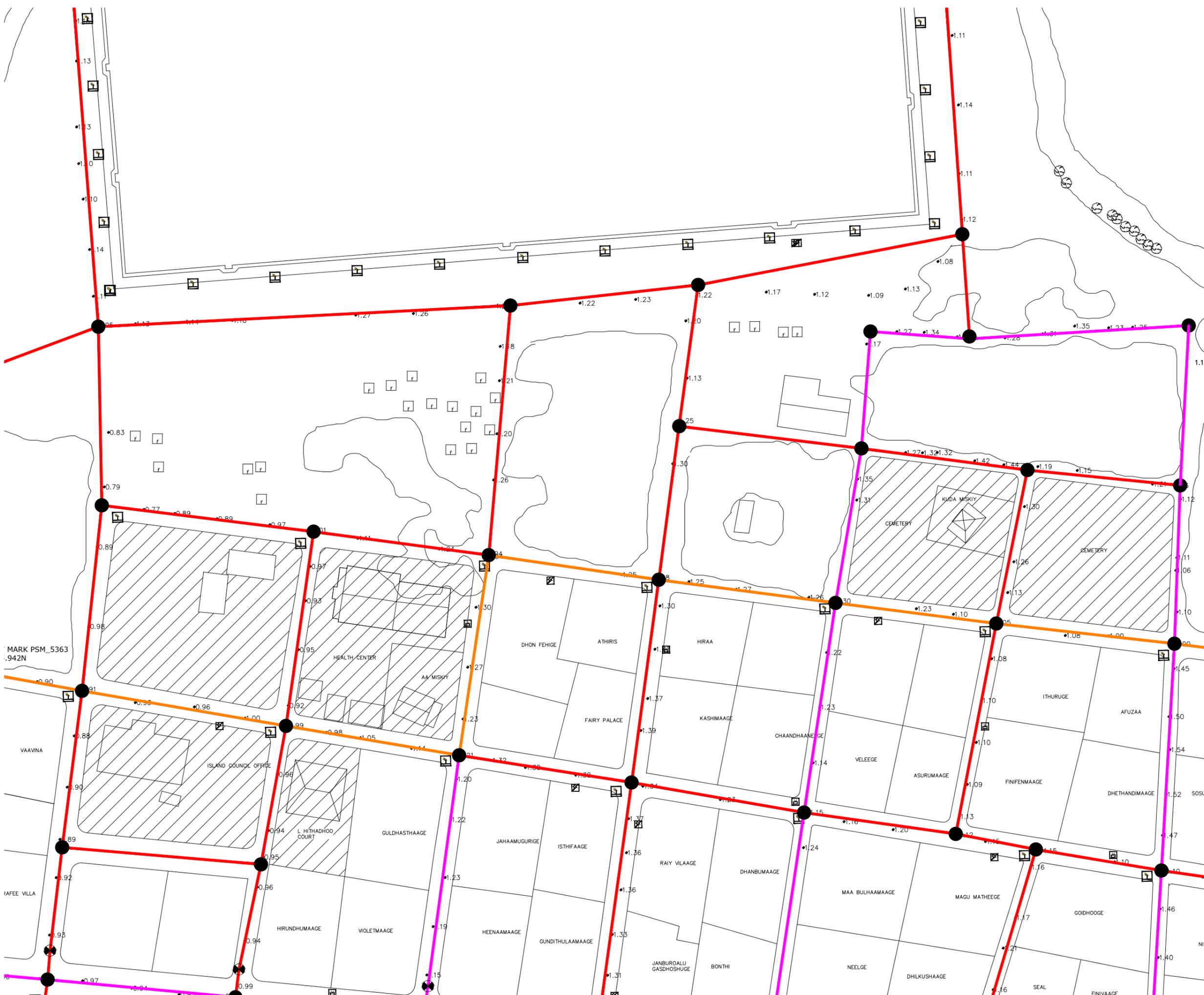
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Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:6000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 02



L. HITHADHOO WATER SUPPLY ZONE LAYOUT

1:6000



- Legend**
- 063 HDPE Water Main Distribution Pipe
 - 075 HDPE Water Main Distribution Pipe
 - 090 HDPE Water Main Distribution Pipe
 - 0110 HDPE Water Main Distribution Pipe
 - 0160 HDPE Water Main Distribution Pipe
 - 0110 HDPE Brine Outfall Pipe
 - Gate Valves
 - Washout Valves
 - Junction

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MAINS DISTRIBUTION

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90	2844	
110	1225	
160	224	
Total	11779	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	828	HDPE (PE100,PN10,SDR11)

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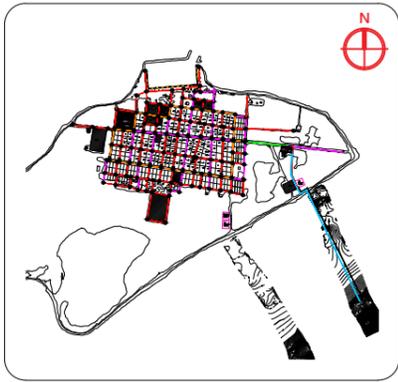
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Date: Aug 2020	SCALE (A3): 1:1000
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Rev: R-01	Page: 04



Legend

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- Ø90 HDPE Water Main Distribution Pipe
- Ø160 HDPE Water Main Distribution Pipe
- Ø160 HDPE Water Main Distribution Pipe
- Ø75 HDPE Water Main Distribution Pipe
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110	1725	
160	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	03 nos	

OUTFALL

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Rev: **R-01** Page: **05**





Legend

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- Ø90 HDPE Water Main Distribution Pipe
- Ø150 HDPE Water Main Distribution Pipe
- Gate Valves
- Junction
- Ø75 HDPE Water Main Distribution Pipe
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- Legend**
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 - 0160 HDPE Water Main Distribution Pipe
 - 0110 HDPE Water Main Distribution Pipe
 - Gate Valves
 - Junction
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63	6936	HDPE (PE100,PN10,SDR17)
90	2844	
110	1725	
160	724	
Total	11779	
Gate Valves	27 nos	
Washout Valves	03 nos	

OUTFALL

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110	828	HDPE (PE100,PN10,SDR11)

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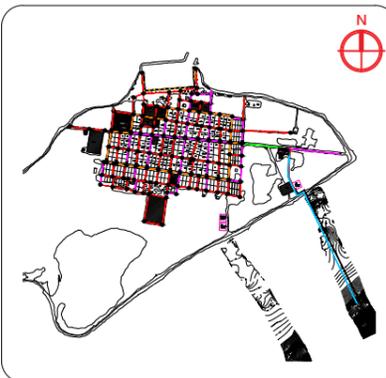
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Maldivian Infrastructure Development

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- Legend**
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 - Ø90 HDPE Water Main Distribution Pipe
 - Ø110 HDPE Water Main Distribution Pipe
 - Ø75 HDPE Water Main Distribution Pipe
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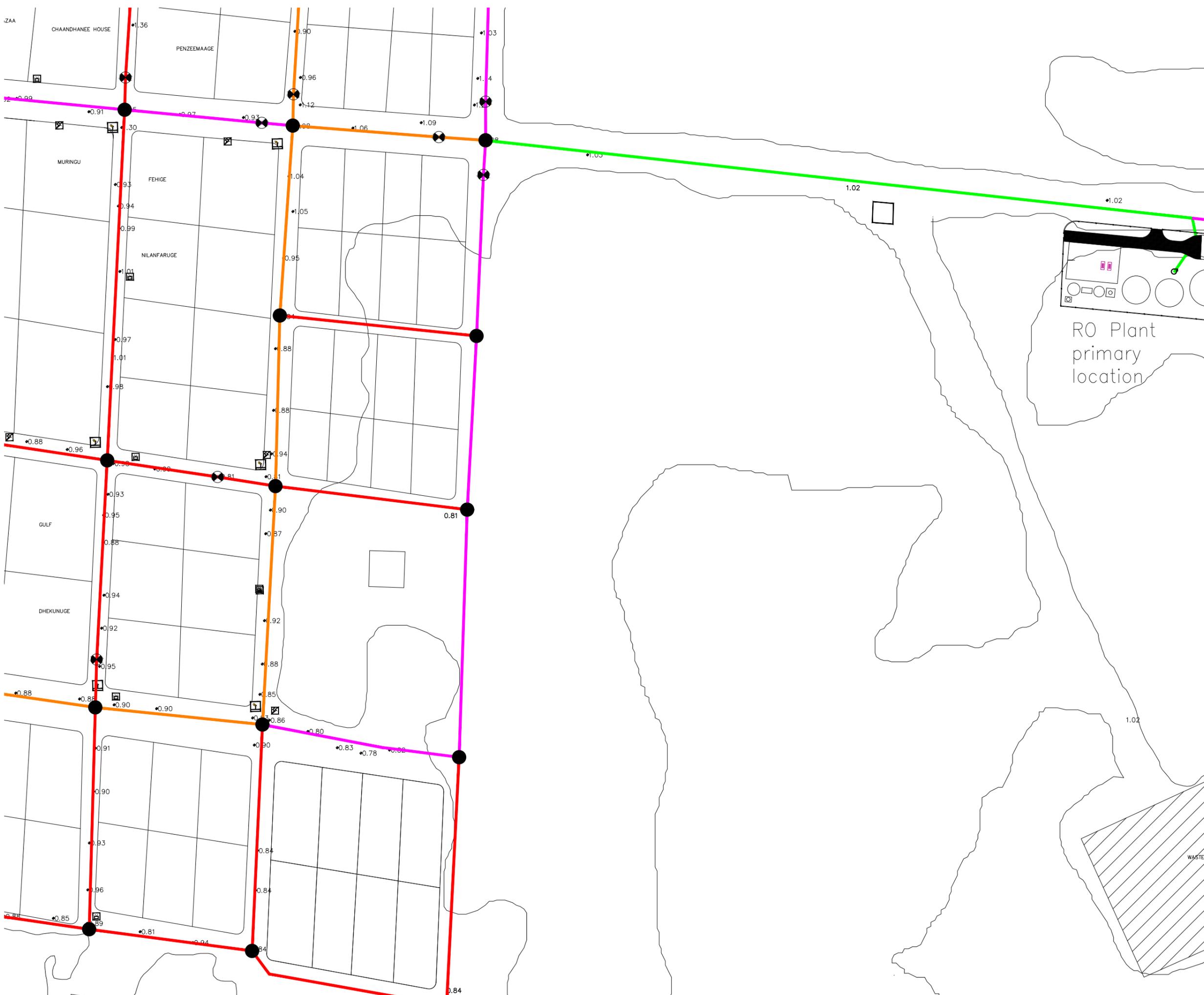
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- Legend**
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OUTFALL

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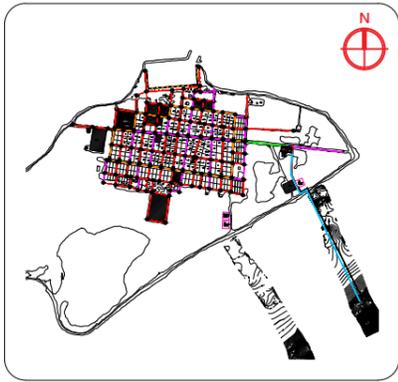
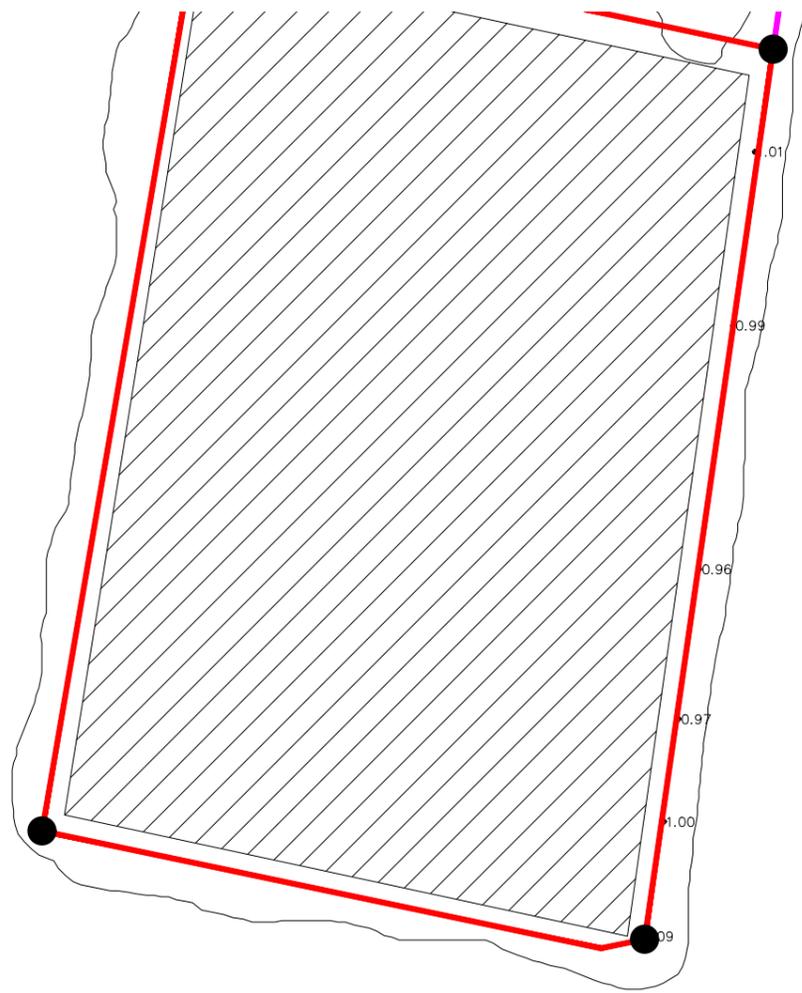
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Legend

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- Ø90 HDPE Water Main Distribution Pipe
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OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	828	HDPE (PE100,PN10,SDR11)

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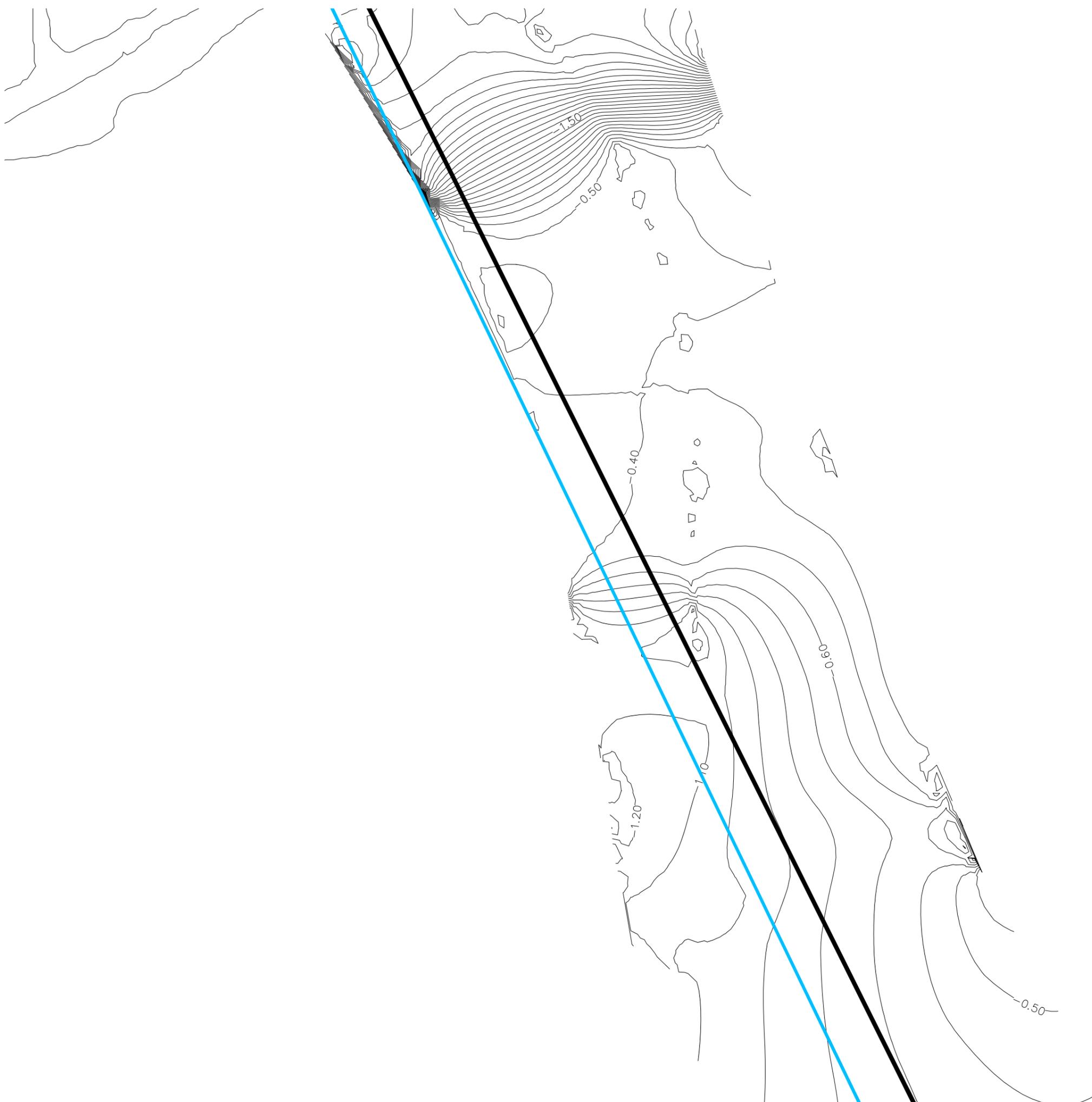
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 A: G. Rosary West,
 Husnuheena Magu, Male', Maldives

Maldiviyah Shifayatu Koppa

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Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/06	





Legend

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

- Notes:
1. All levels are shown in meters.
 2. All levels are shown from mean sea level.
 3. This drawing to be read in conjunction with all other relevant drawing and specifications.
 4. All pressure pipes and fittings shall be installed using electro-fusion and butt-fusion technologies.
 5. 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.
 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	6936	HDPE (PE100,PN10,SDR17)
90	2844	
110	1725	
160	224	
Total	11729	
Gate Valves	27 nos	
Washout Valves	03 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	828	HDPE (PE100,PN10,SDR11)

PSM BENCHMARKS

PERMANENT SURVEY MARK PSM_5363 32059.497E, 199025.942N 0.996m From MSL
PERMANENT SURVEY MARK PSM_5364 32119.956E, 198953.066N 1.066m From MSL
PERMANENT SURVEY MARK PSM_5365 320825.261E, 198697.178N 0.996m From MSL

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

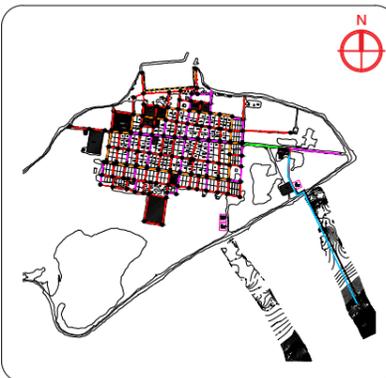
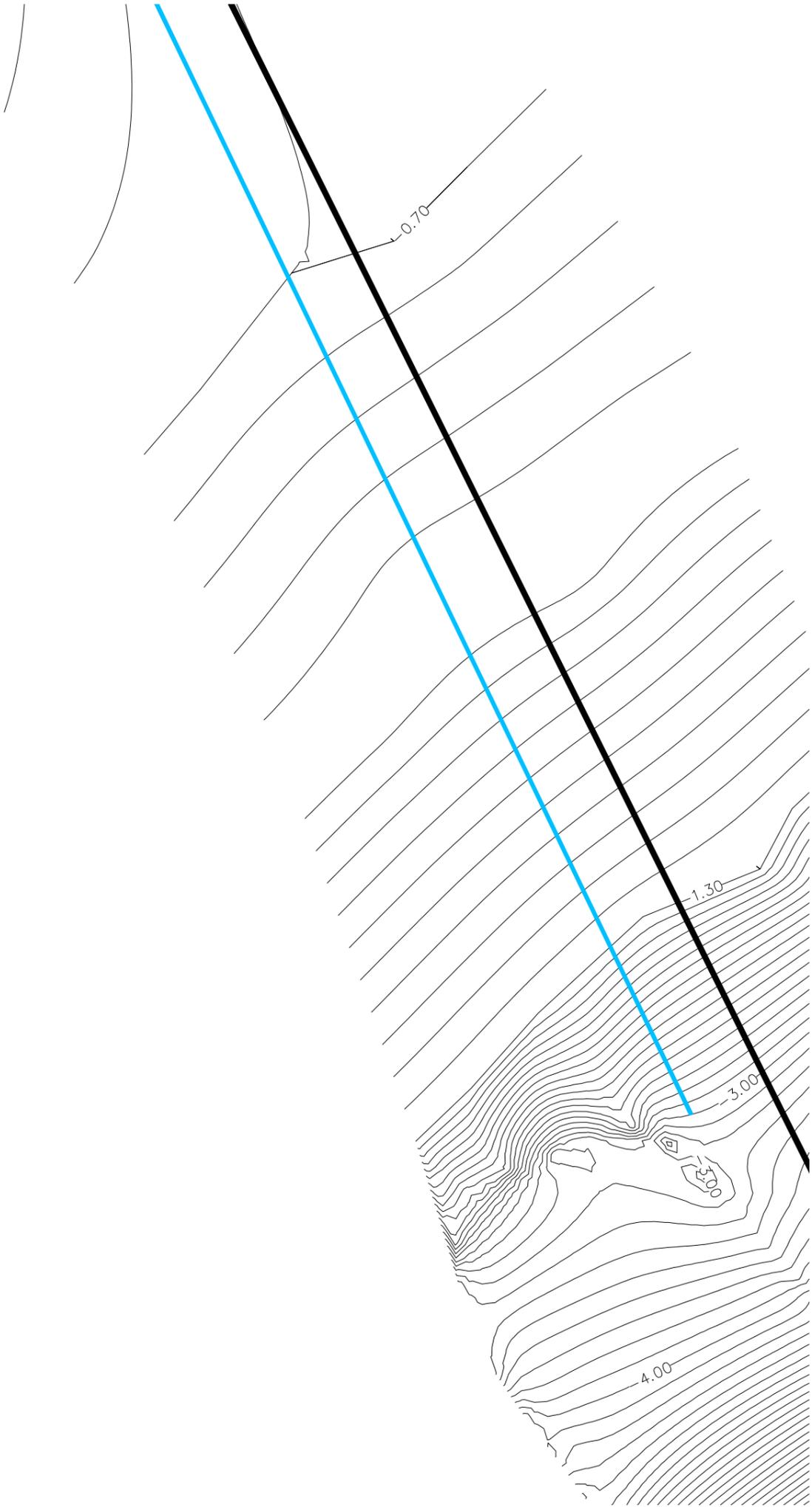
Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6

Sub Title:
Water Supply System in L. Hithadhoo

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

 EPOCH <small>ASSOCIATES</small> T: +960 333 3528 E: info@epoch.associates W: www.epoch.associates A: G. Rosnay West, Husnuheena Magu, Male', Maldives	 FEEDBACK INFRA <small>Maldiviya Shifanayana Kappoo</small>
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Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/06	



Legend

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

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160	224	
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Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	828	HDPE (PE100,PN10,SDR11)

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Feedback
 Infrastructure

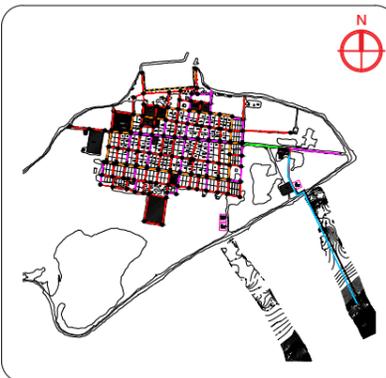
Drawn: F.I.A. Checked: M.S.S.

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

Date: Aug 2020 SCALE (A3): 1:1000

Project No: EP-WS/2019/06

Rev: **R-01** Page: **14**



Legend

- Ø180 HDPE Rainwater Flow Pipe
- Ø200 HDPE Rainwater Flow Pipe
- Ø225 HDPE Rainwater Flow Pipe
- Ø315 HDPE Rainwater Flow Pipe
- Junction

Notes:
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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 (m)	TYPE OF PIPE
180	738	HDPE (PE100,PN6,SDR26)
200	18	
225	62	
315	632	
Total	1450	

PSM BENCHMARKS

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FEEDBACK INFRA
 Maldiviyin Shifanayn

Drawn: F.I.A. Checked: M.S.S.
 Designed: F.I.A. Approved: I.W.

Date: Aug 2020 SCALE (A3): 1:6000

Project No: EP-WS/2019/06

Rev: **R-01** Page: **15**



L. HITHADHOO RAINWATER COLLECTION NETWORK LAYOUT
 1:6000



Legend

- Ø160 HDPE Rainwater Flow Pipe
- Ø200 HDPE Rainwater Flow Pipe
- Ø315 HDPE Rainwater Flow Pipe
- Ø225 HDPE Rainwater Flow Pipe
- Ø315 HDPE Rainwater Flow Pipe
- Junction

Notes:
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001	JUNE 2020	STAGE -1	PD	SBC	SD

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Maldiviya Shifoshaaru Koppa

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:6000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 17



Legend

- Ø100 HDPE Rainwater Flow Pipe
- Ø200 HDPE Rainwater Flow Pipe
- Ø315 HDPE Rainwater Flow Pipe
- Ø225 HDPE Rainwater Flow Pipe
- Ø315 HDPE Rainwater Flow Pipe
- Junction

Notes:
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RAINWATER FLOW PIPES

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100	738	HDPE (PE100,PN6,SDR26)
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315	632	
Total	1450	

PSM BENCHMARKS

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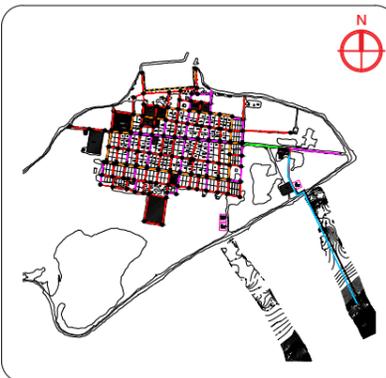
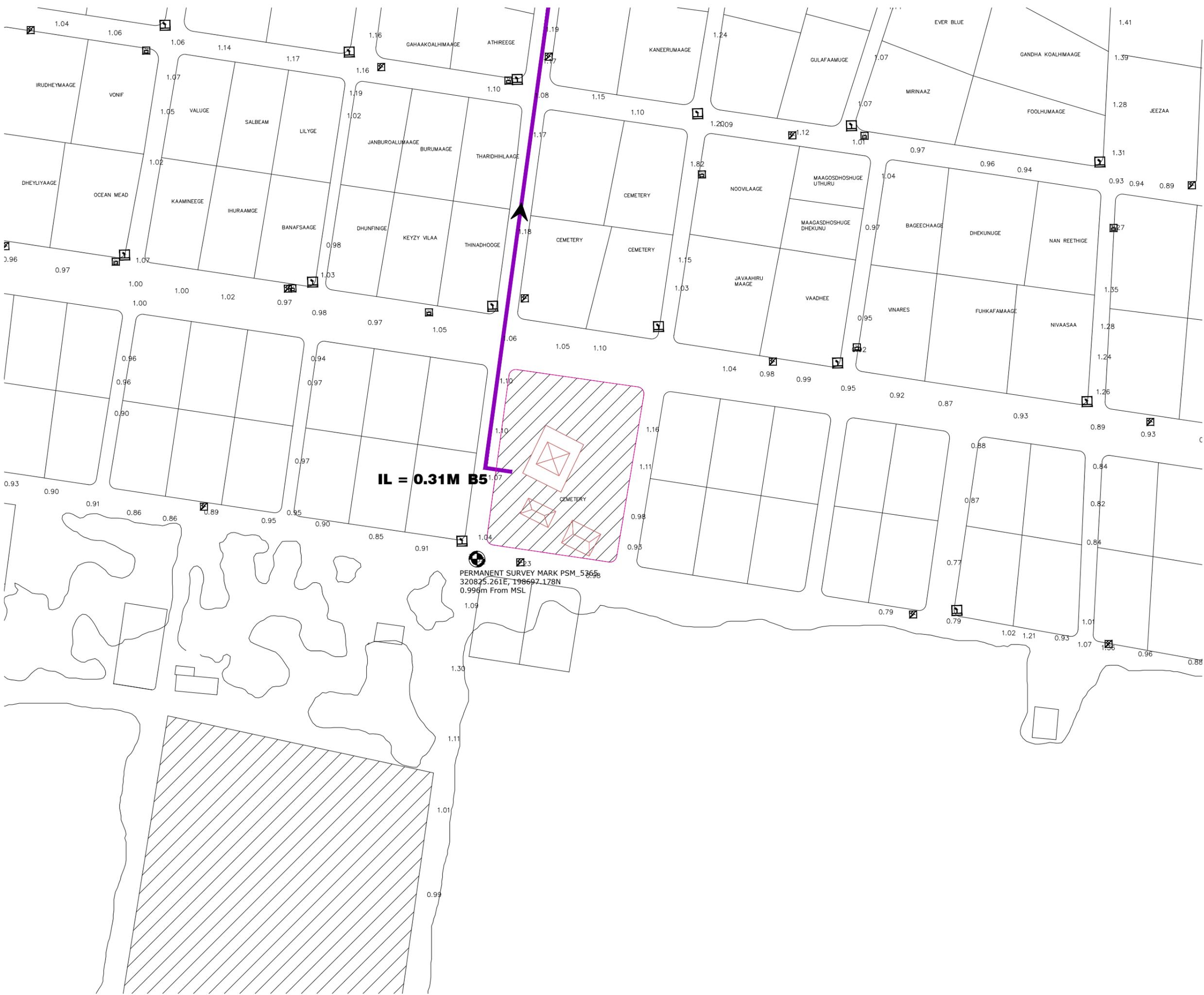
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Project No: EP-WS/2019/06	
Rev: R-01	Page: 19



Legend

- Ø160 HDPE Rainwater Flow Pipe
- Ø200 HDPE Rainwater Flow Pipe
- Ø315 HDPE Rainwater Flow Pipe
- Ø225 HDPE Rainwater Flow Pipe
- Ø315 HDPE Rainwater Flow Pipe
- Junction

Notes:
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RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH (m)	TYPE OF PIPE
160	738	HDPE (PE100, PMS, SDR26)
200	18	
225	62	
315	632	
Total	1450	

PSM BENCHMARKS

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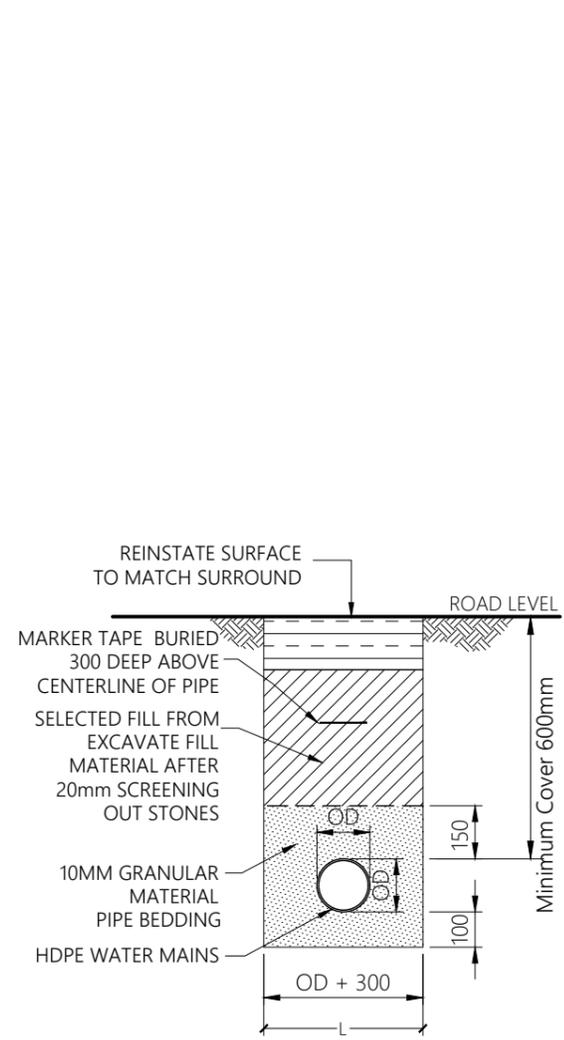
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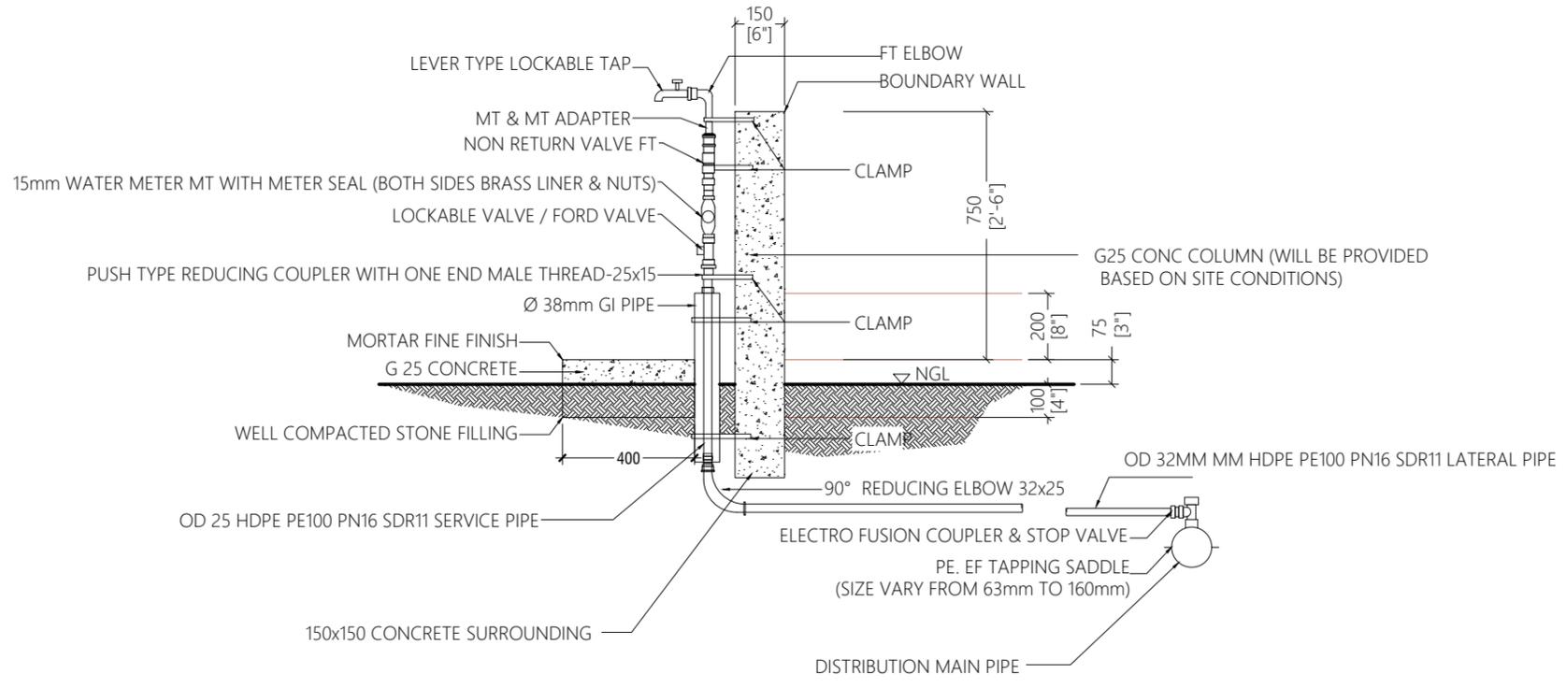
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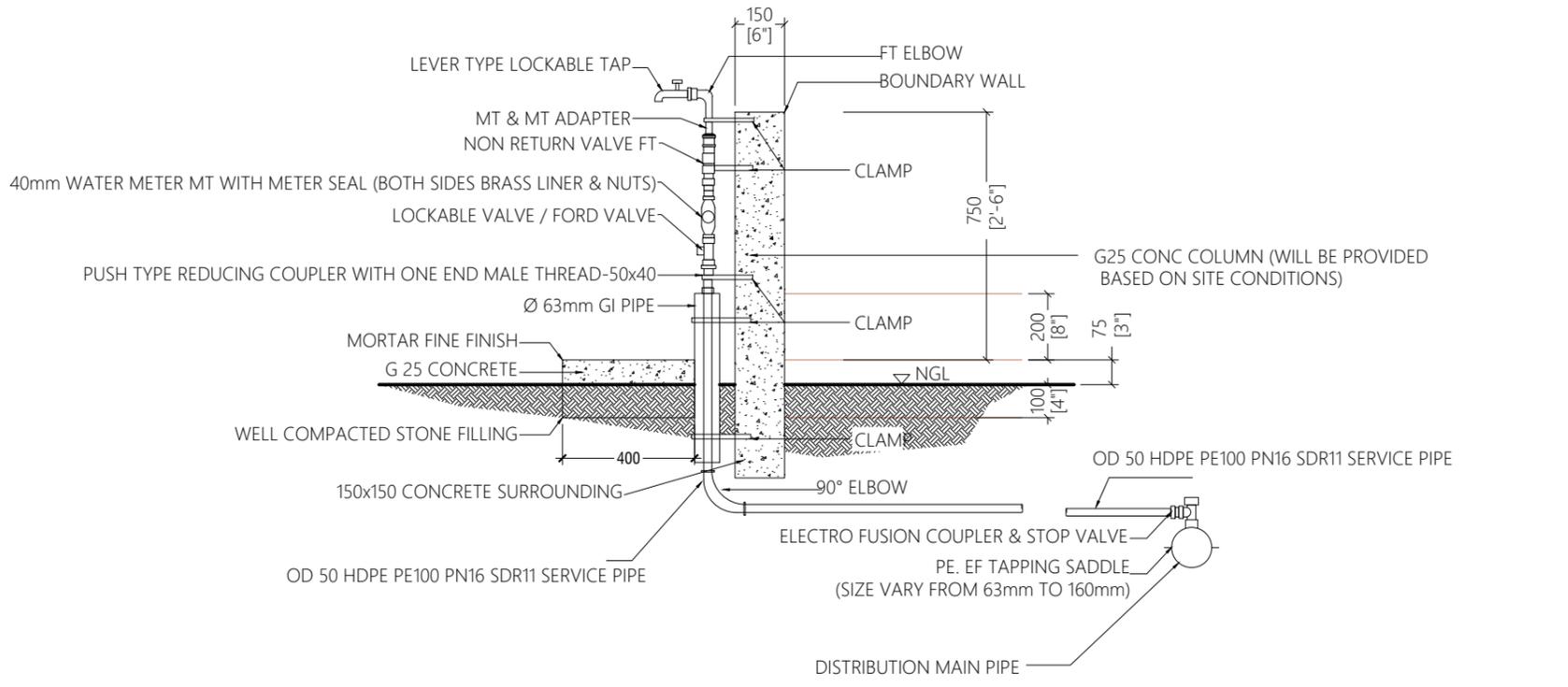
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 Date: Aug 2020 SCALE (A3): 1:6000
 Project No: EP-WS/2019/06
 Rev: R-01 Page: 20



TRENCH & BEDDING DETAILS



WATER SUPPLY HOUSE CONNECTION DETAILS



WATER SUPPLY COMMERCIAL/INSTITUTIONAL CONNECTION DETAILS

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 5 islands, Maldives - Package 6

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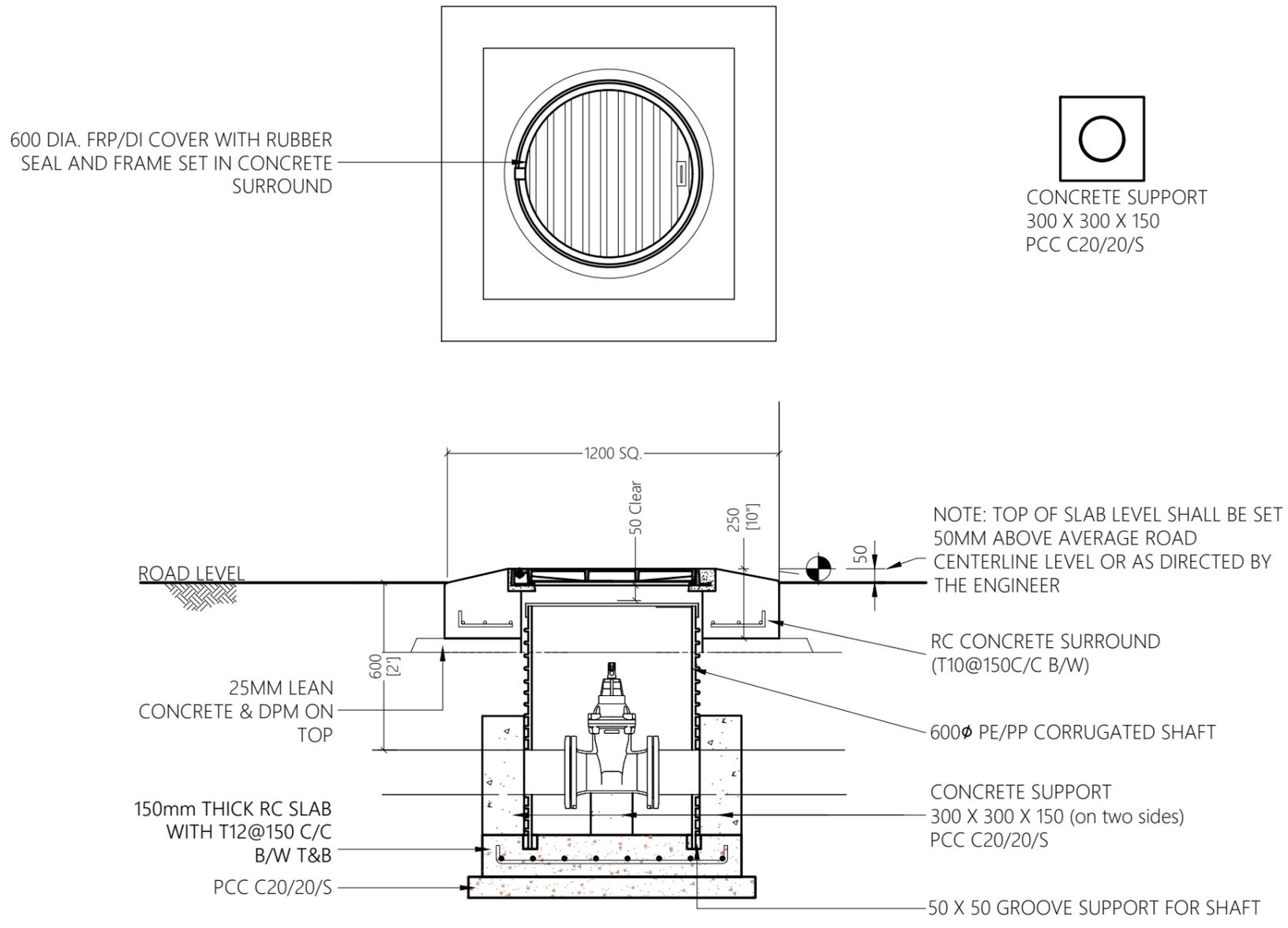
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Project No: EP-WS/2019/06	
Rev: R-01	Page: W-01

WATER SUPPLY HOUSE AND COMMERCIAL/INSTITUTIONAL CONNECTIONS

1:20



SECTION - VALVE CHAMBER

Legend

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

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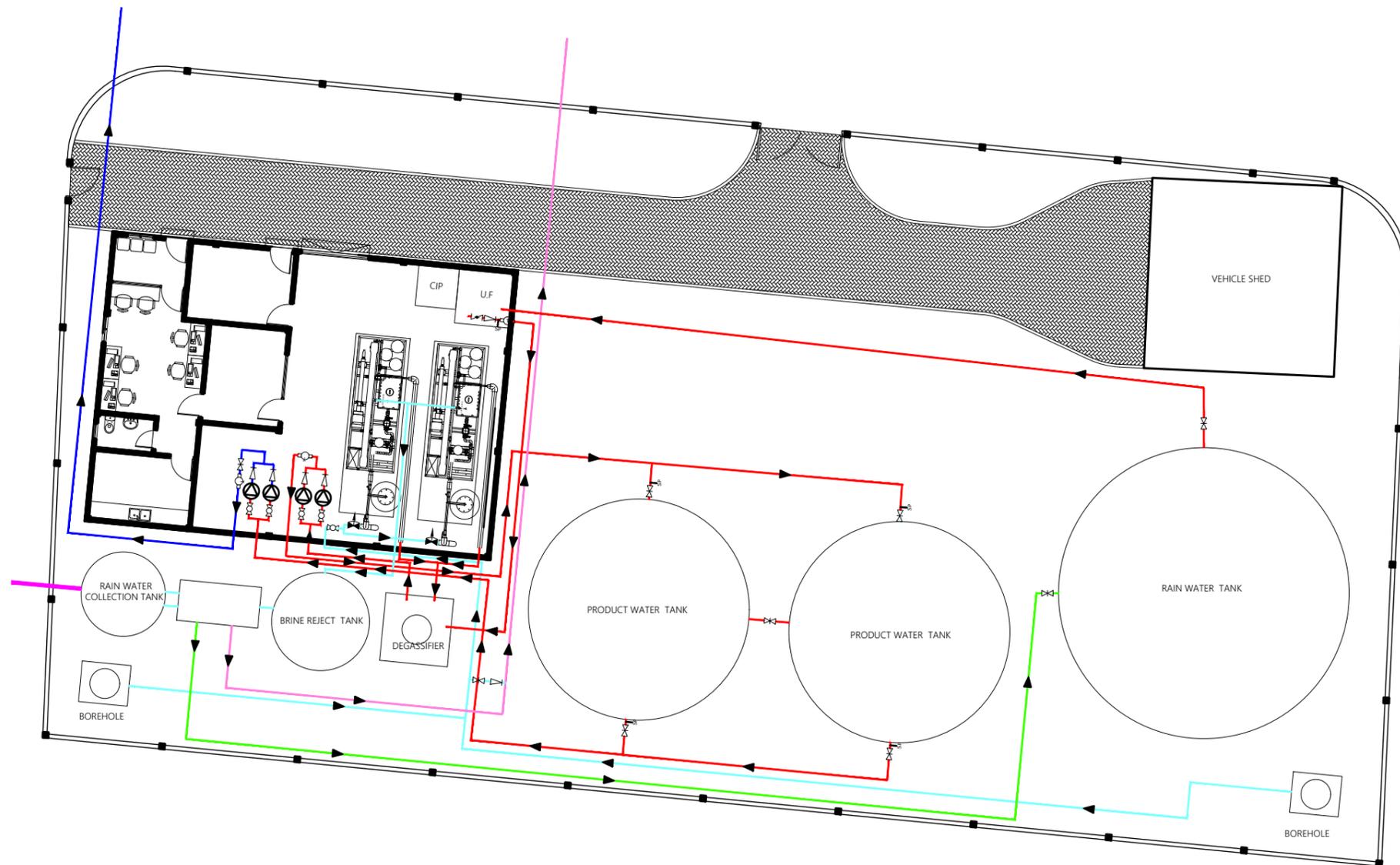
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Date: Aug 2020 SCALE (A3): 1:20
Project No: EP-WS/2019/06
Rev: R-01 Page: W-02

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FEEDBACK INFRA
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VALVE CHAMBER DETAILS

1:20



PUMP DETAILS

- Borehole Pump : 2 Nos
 - Flow (Q) = 20.37 m³/hr
 - Head (H) = 35 m
- High Pressure Pump : 2 Nos
 - Flow (Q) = 10.19 m³/hr
 - Pressure Range = 40-85 bar
- Transfer Pump : 2 Nos
 - Flow (Q) = 8.61 m³/hr
 - Head (H) = 16m
- Distribution Pump Set : 2 Nos
 - Flow (Q) = 14.4 m³/hr
 - Head (H) = 35 m
- Brine Pump : 2 Nos
 - Flow (Q) = 14.26 m³/hr
 - Head (H) = 29 m
- Rain Water lift Well Pump : 2 Nos
 - Flow (Q) = 54.79 m³/hr
 - Head (H) = 17m
- UF Feed Pump : 2 Nos
 - Flow (Q) = 2.5 m³/hr
 - Head (H) = 35 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, P10, SDR17)
- Ø110 HDPE (OUTFALL PE100, PN16, SDR11)
- Ø300 HDPE (RAINWATER PE100, PN6, SDR26)

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.

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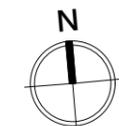
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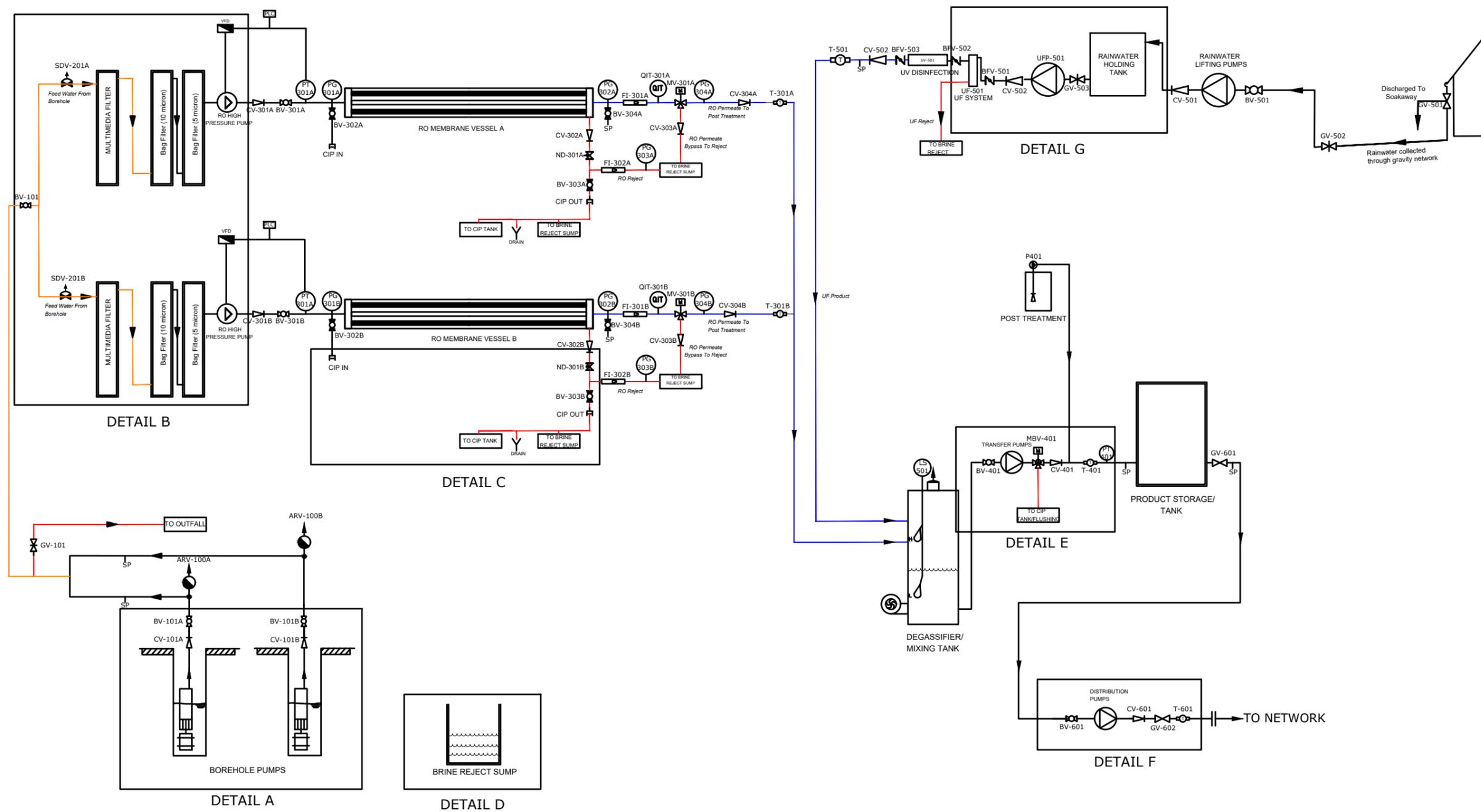
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Date: Aug 2020	SCALE (A3): 1:20
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-04

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

IWRM PLANT P&I OVERVIEW

NTS

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

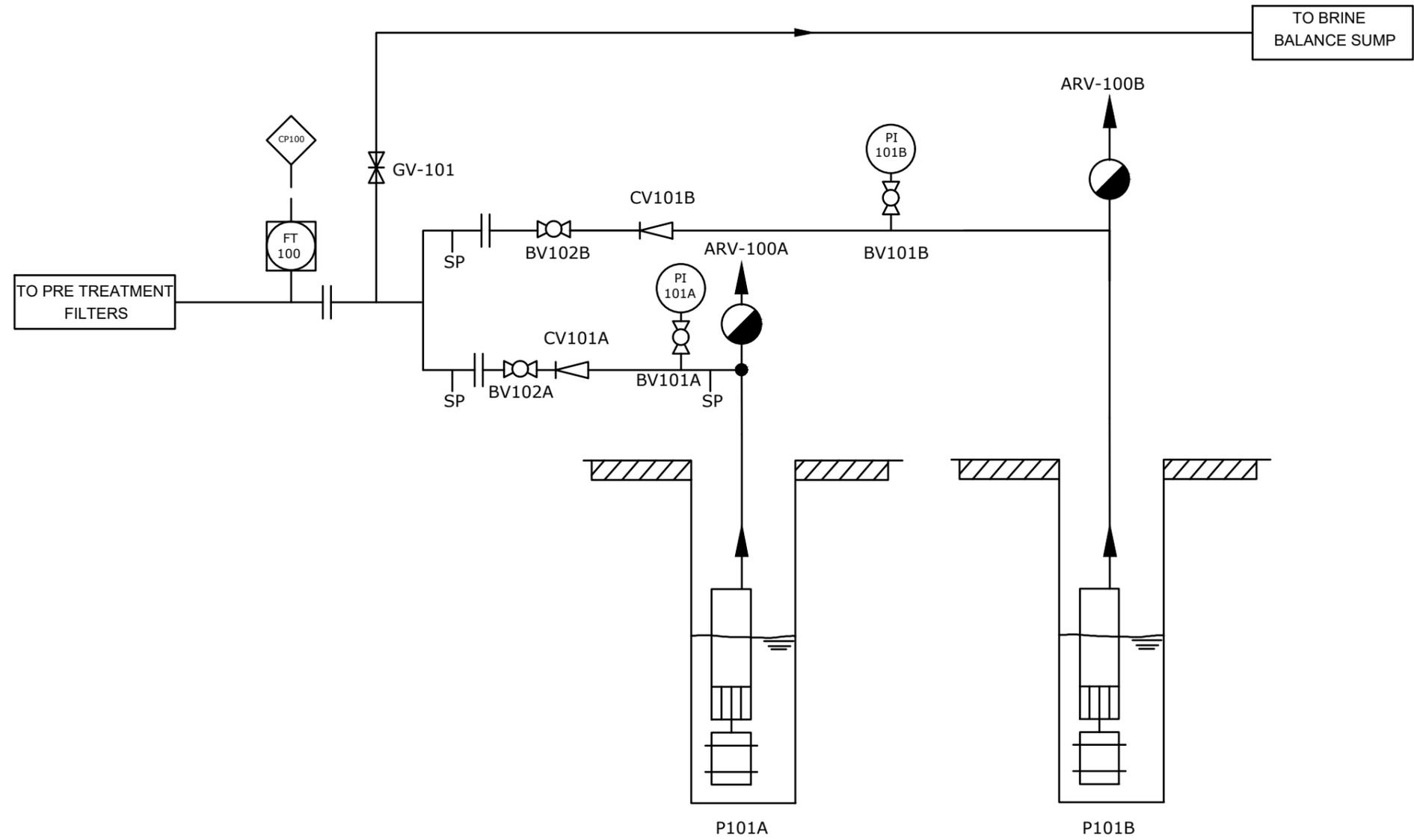
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Date: Aug 2020	SCALE (A3): 1:20
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-05



BOREHOLE PUMPS

DETAIL A

Legend

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

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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	

IWRM PLANT P&I DETAIL A

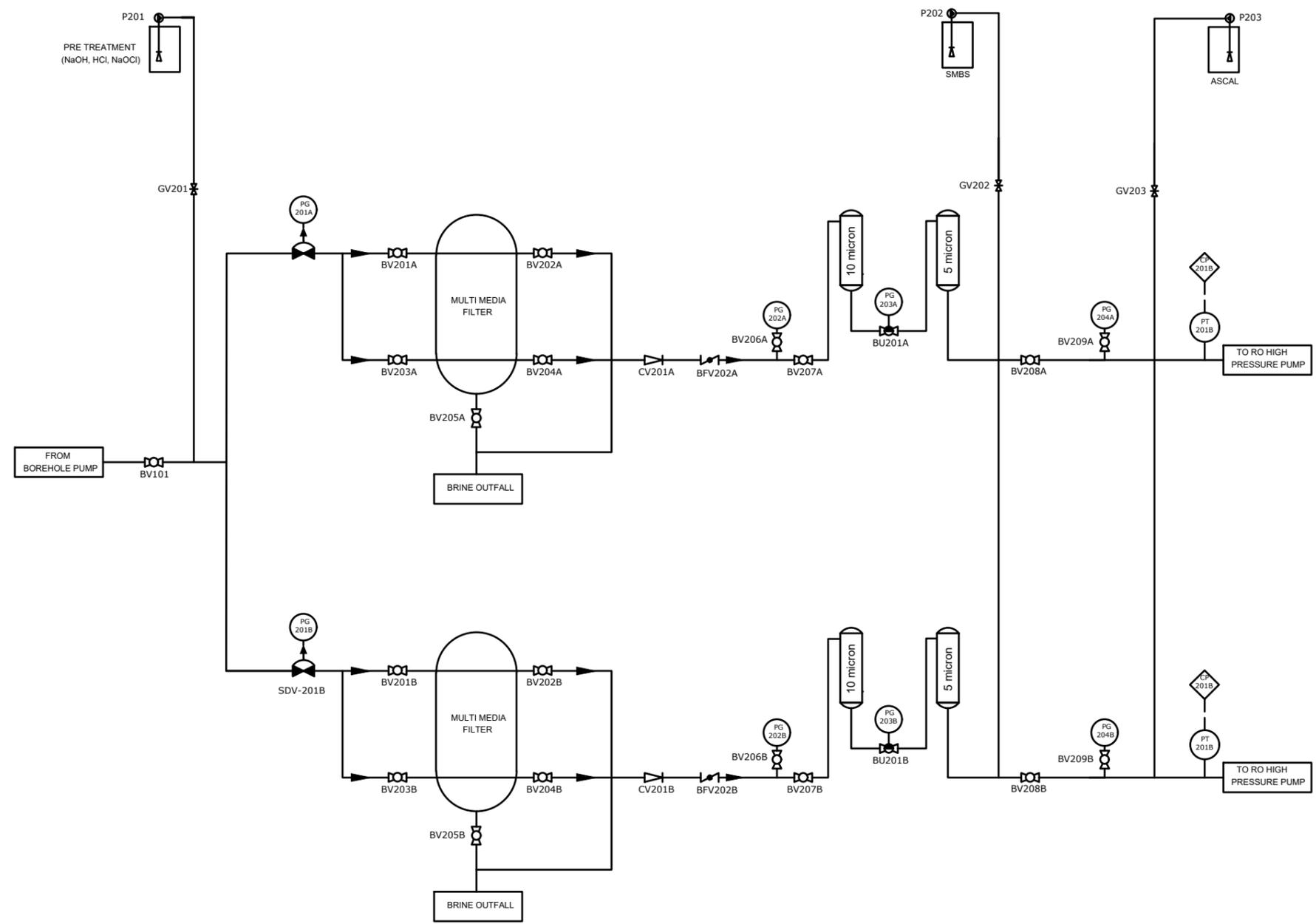
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<p>T: +960 333 3528 E: info@epoch.associates W: www.epoch.associates A: G. Rosary West, Husnuheena Magu, Male', Maldives</p>			
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Date: Aug 2020	SCALE (A3): 1:20	Project No: EP-WS/2019/06	Page: R-01
			W-06



DETAIL B

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

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.

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

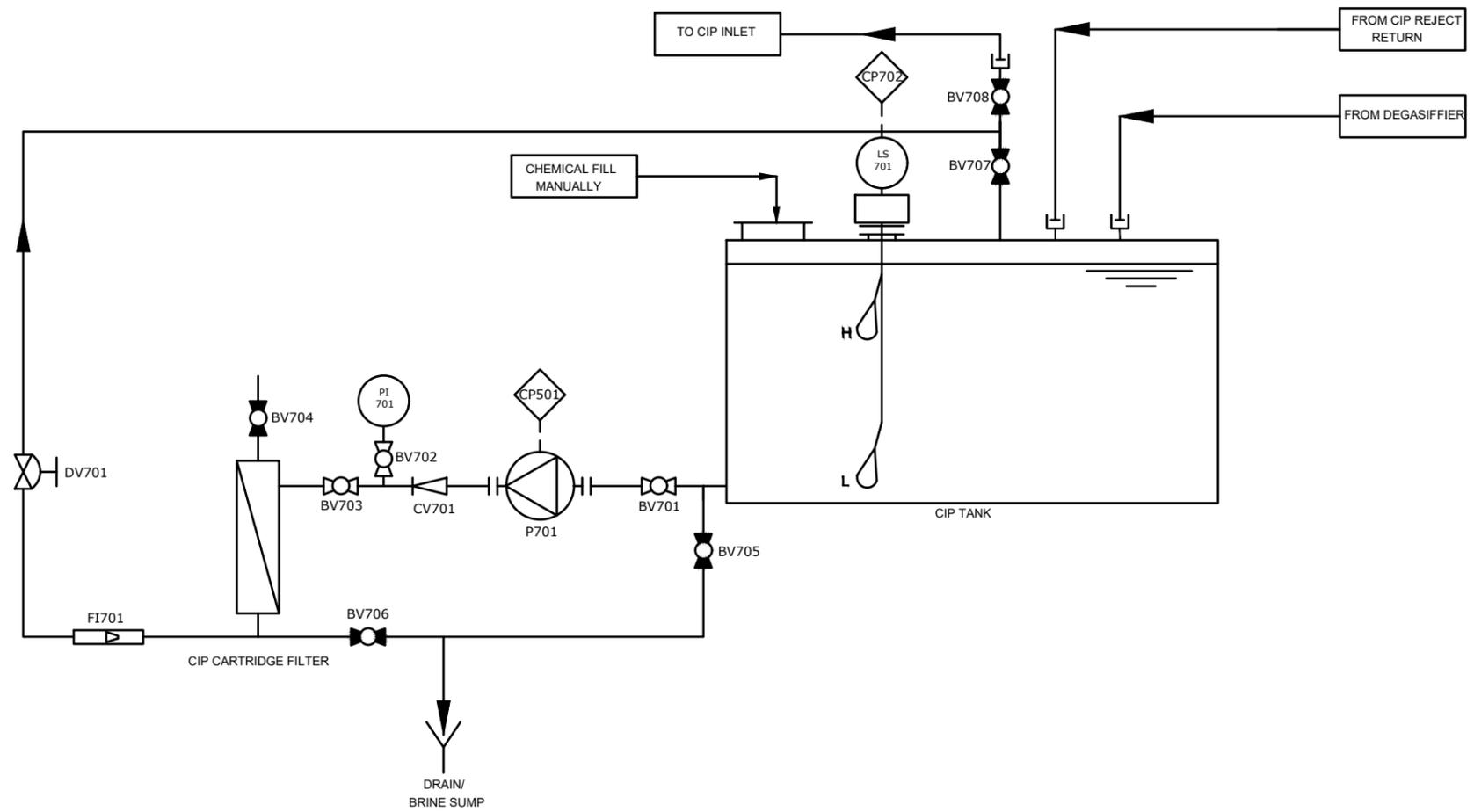
Sub Title:
Water Supply System in L.Hithadhoo

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

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Project No: EP-WS/2019/06	
Rev: R-01	Page: W-07

IWRM PLANT P&I DETAIL B

NTS



DETAIL C

Legend

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

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

LEGEND

ACTUATION	VALVES	FEATURES	CONDITION	ABBREVIATIONS
<p>MANUALLY OPERATED</p> <p>PNEUMATIC DIAPHRAGM - SINGLE ACTING</p> <p>PNEUMATIC DIAPHRAGM - DOUBLE ACTING</p> <p>PNEUMATIC PISTON</p>	<p>BUTTERFLY</p> <p>BALL</p> <p>DIAPHRAGM</p> <p>3-WAY</p> <p>SLUICE</p>	<p>MOTORIZED BALL</p> <p>TORTALIZER</p> <p>GATE</p> <p>CHECK VALVE</p> <p>MOTORIZED 3 WAY</p>	<p>FLANGED CONNECTION</p> <p>TRAP</p> <p>DISCHARGE TO ATMOSPHERE</p> <p>SAMPLING POINT</p> <p>FLOW INDICATOR</p>	<p>VALVE NORMALLY OPEN</p> <p>VALVE NORMALLY CLOSED</p> <p>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 CIT - CONDUCTIVITY INDICATOR PLC - PROGRAMMABLE LOGIC CONTROLLER</p>

IWRM PLANT P&I DETAIL C

NTS

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

Sub Title:
Water Supply System in L.Hithadhoo

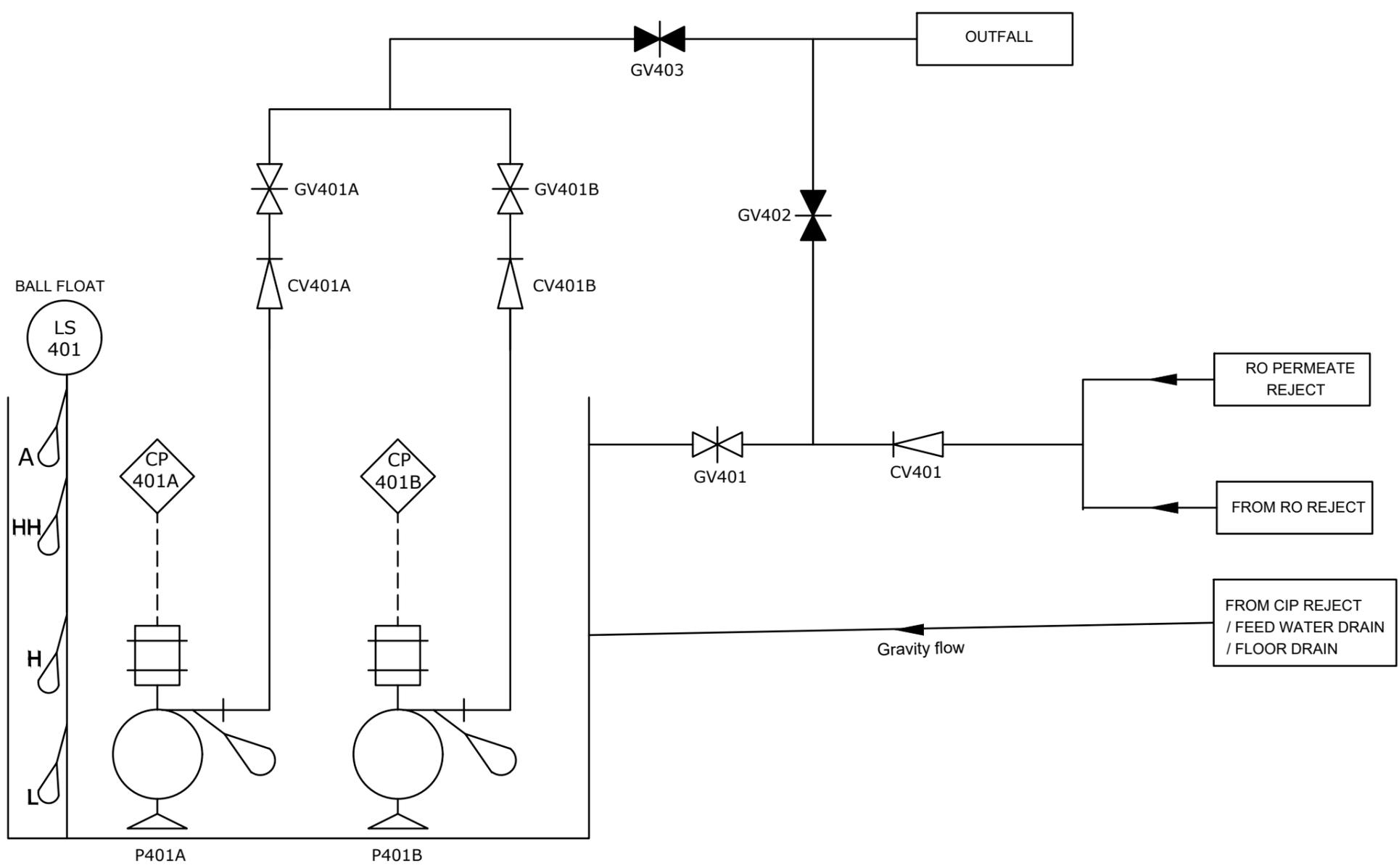
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Project No: EP-WS/2019/06	
Rev: R-01	Page: W-08



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.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

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	

IWRM PLANT P&I DETAIL D

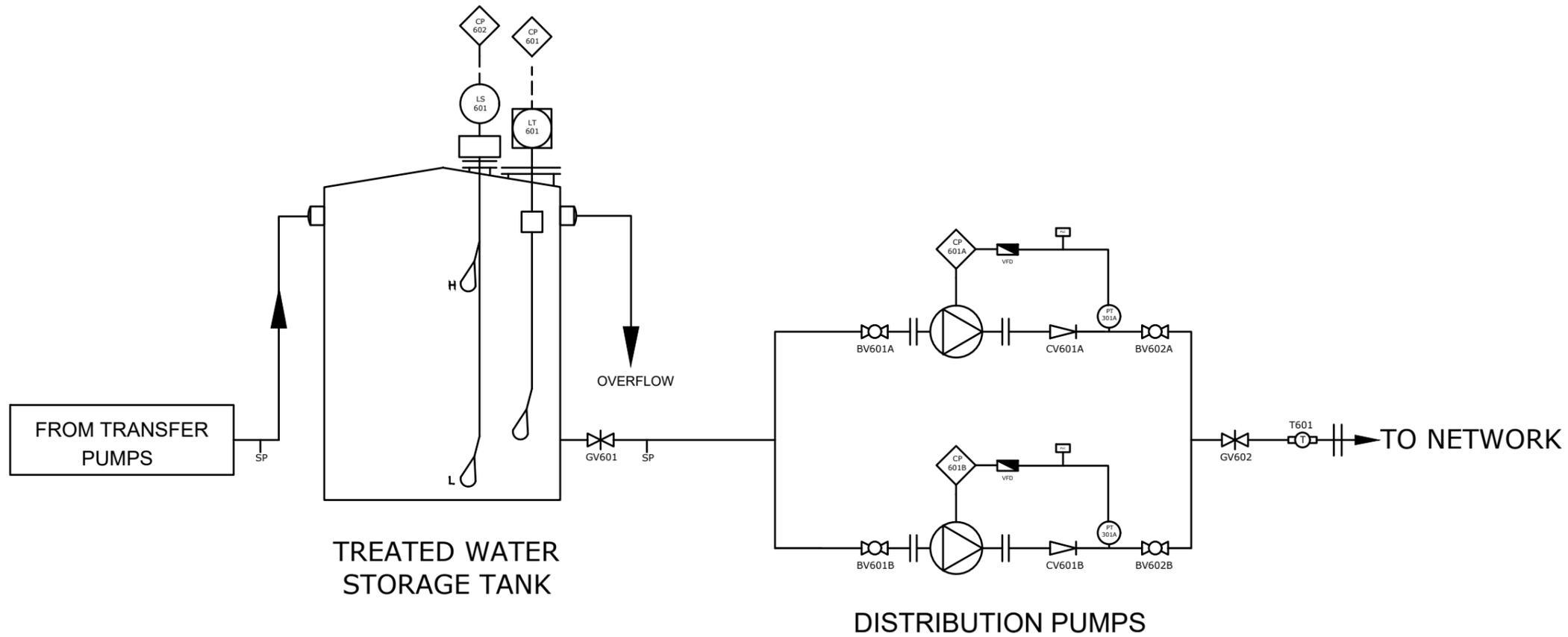
NTS

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6
 Sub Title:
Water Supply System in L.Hithadhoo
 Client:
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	W-09



DETAIL F

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	

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 5 islands, Maldives - Package 6

Sub Title:
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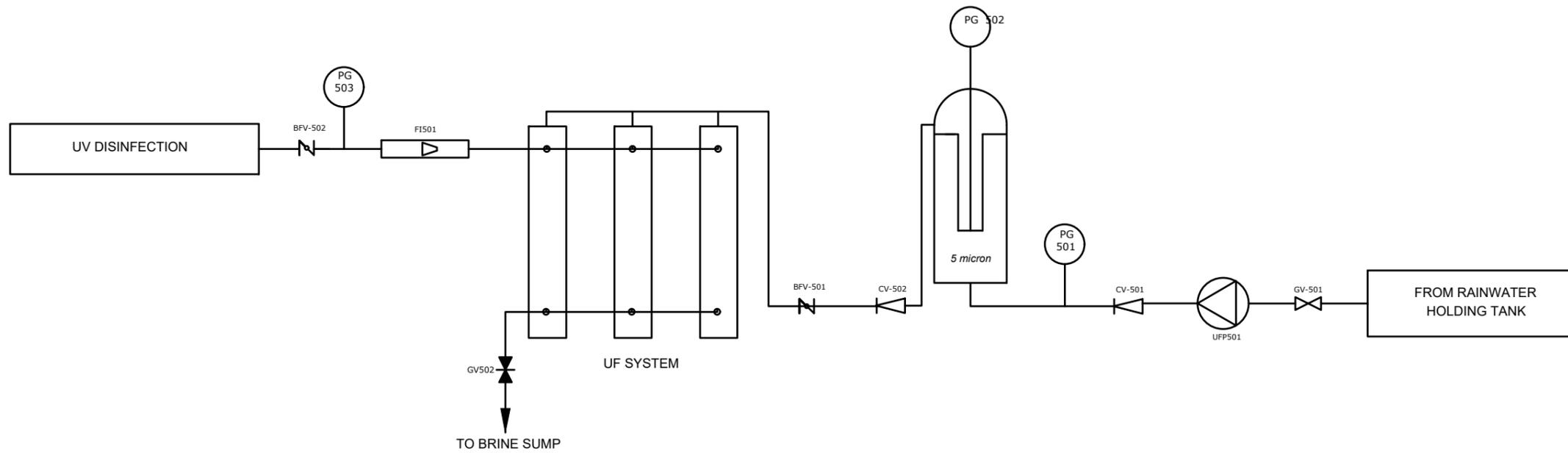
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UV DISINFECTION



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
		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	

IWRM PLANT P&I DETAIL G

NTS

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

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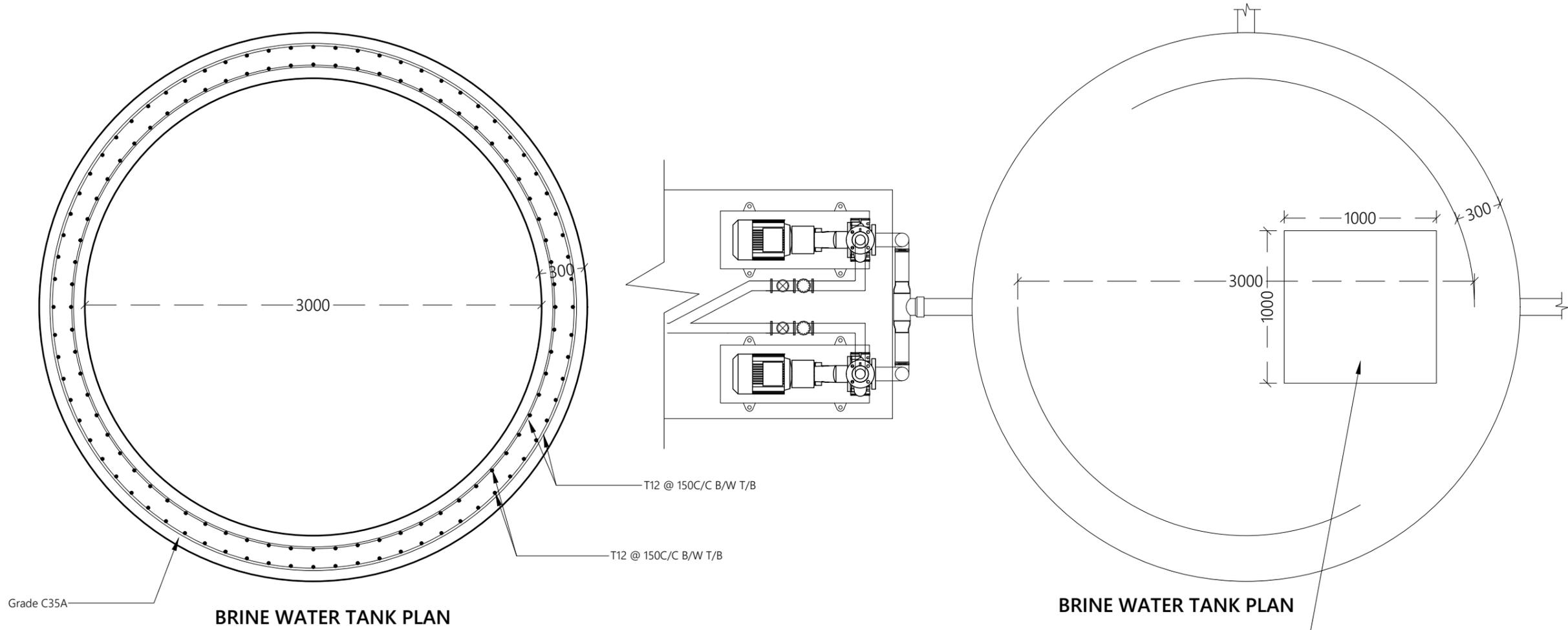
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Project No: EP-WS/2019/06

Rev: R-01 Page: W-12



BRINE WATER TANK PLAN

BRINE WATER TANK PLAN

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

Sub Title:
Water Supply System in L.Hithadhoo

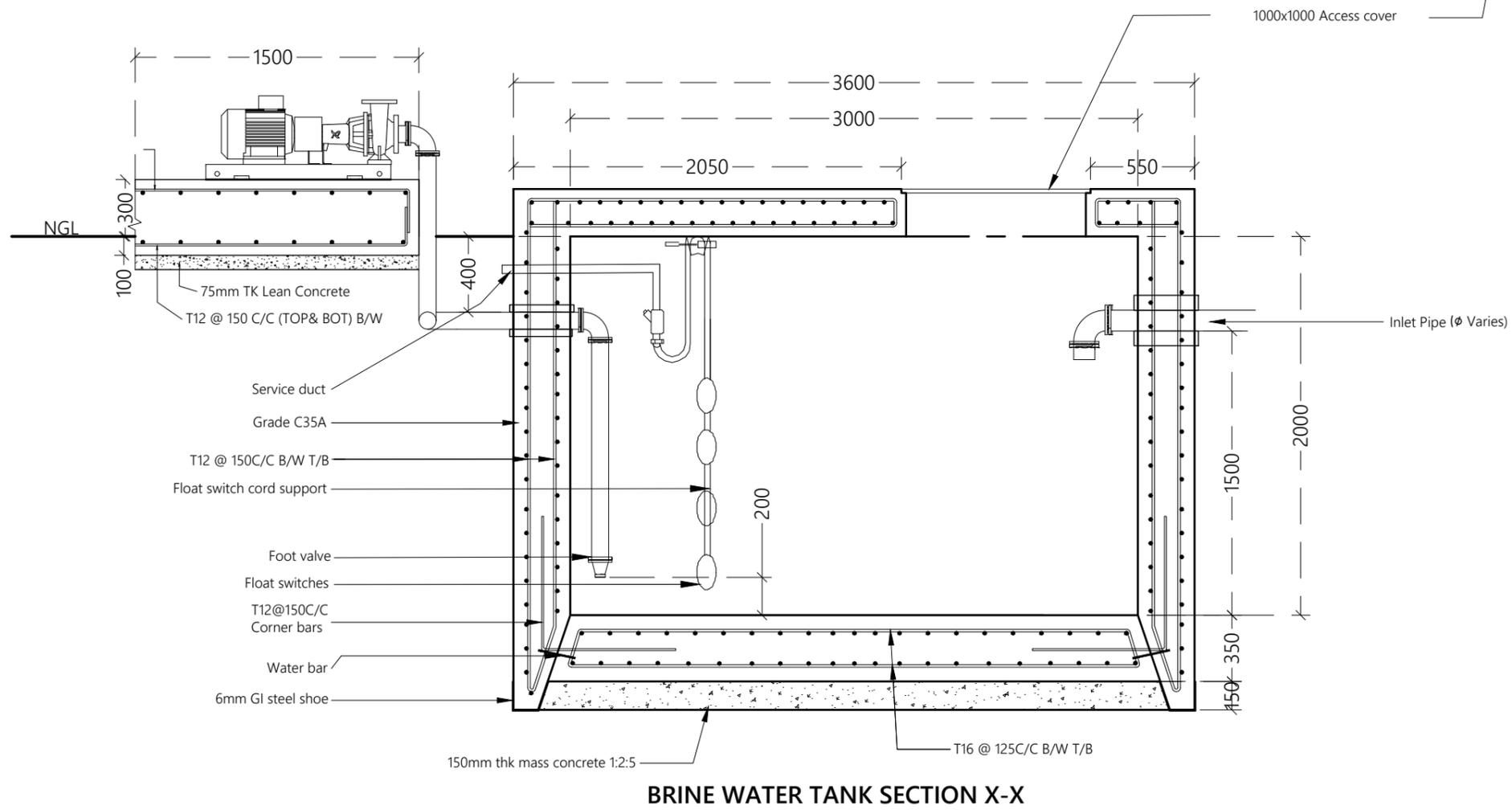
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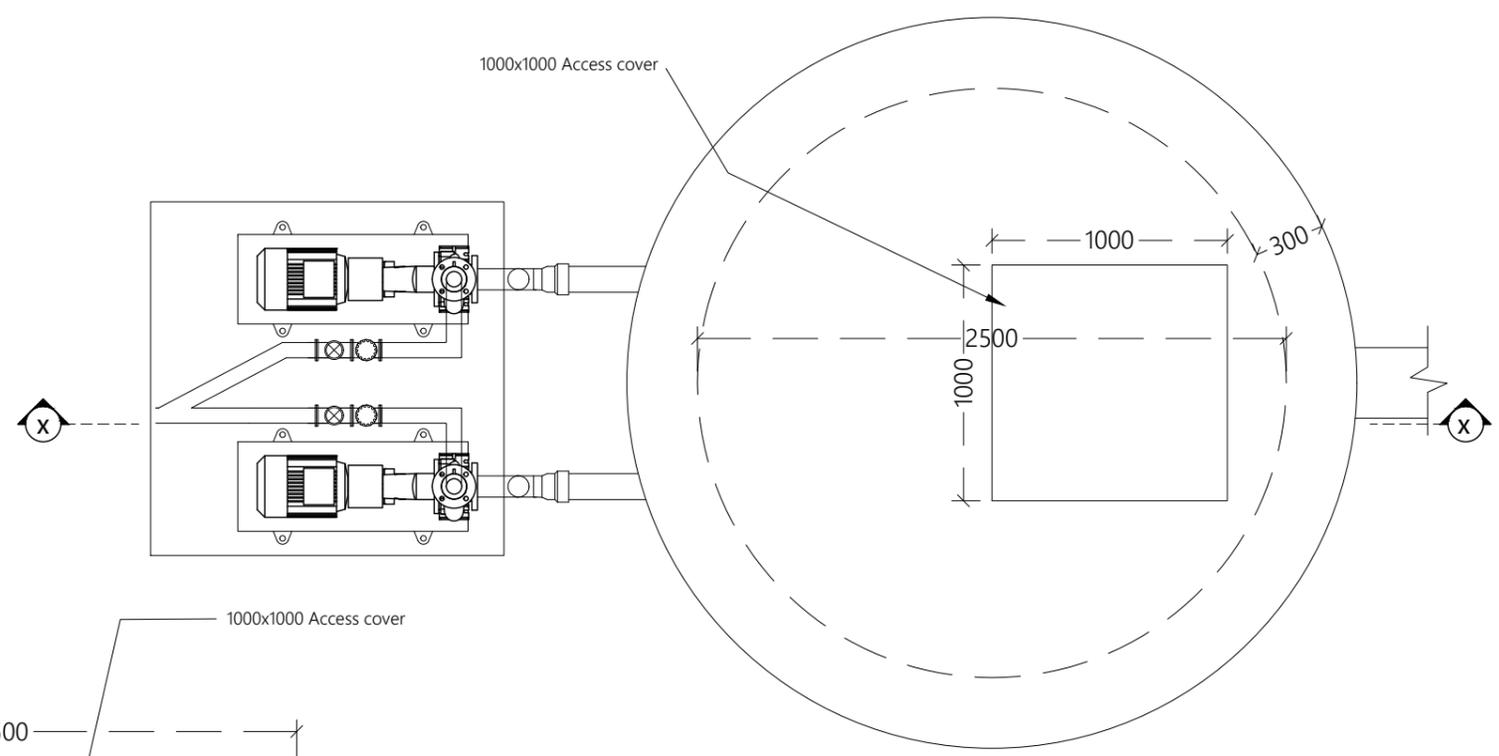
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Rev: R-01	Page: W-14

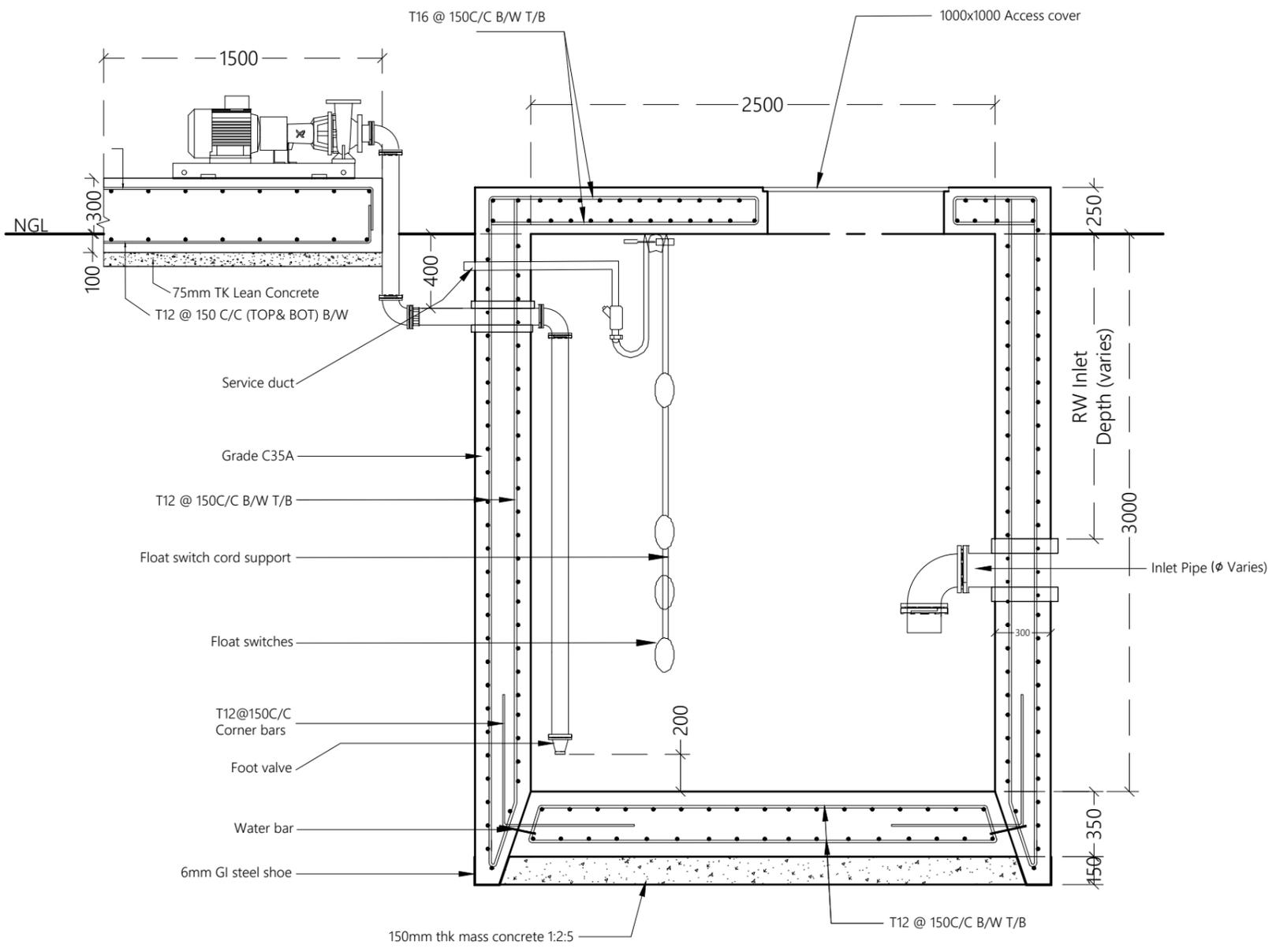


BRINE WATER TANK SECTION X-X

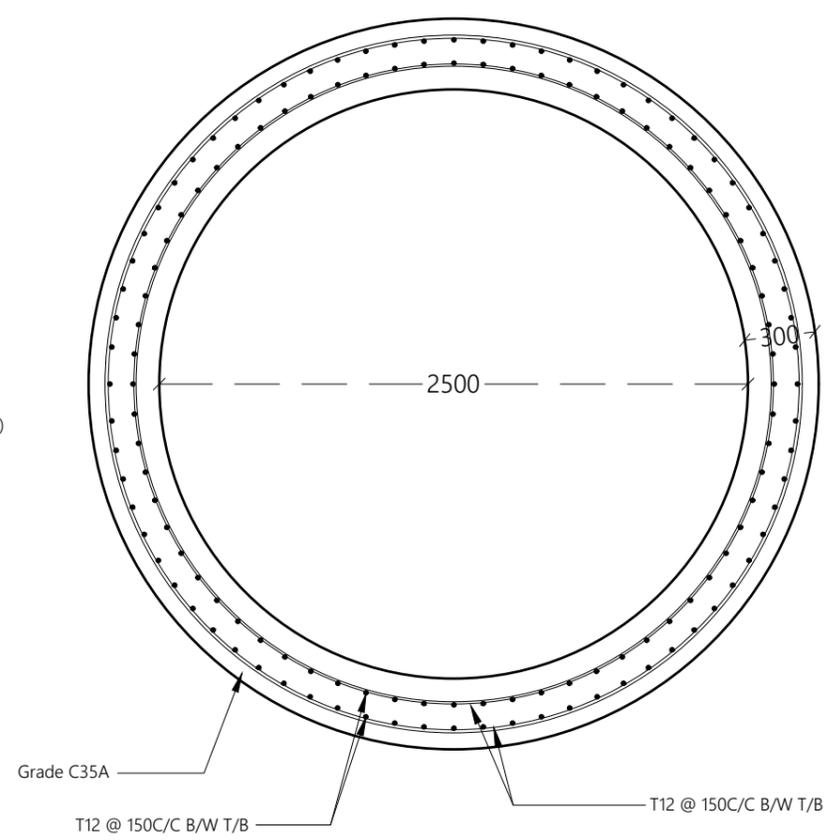
BRINE TANK DETAILS



RAIN WATER LIFT WELL PLAN



RAIN WATER LIFT WELL SECTION X-X



RAIN WATER LIFT WELL PLAN - STRUCTURAL

RAINWATER LIFT WELL 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.
 - The rainwater lift well will have a filter to prevent entry of debris and dirt.

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 5 islands, Maldives - Package 6

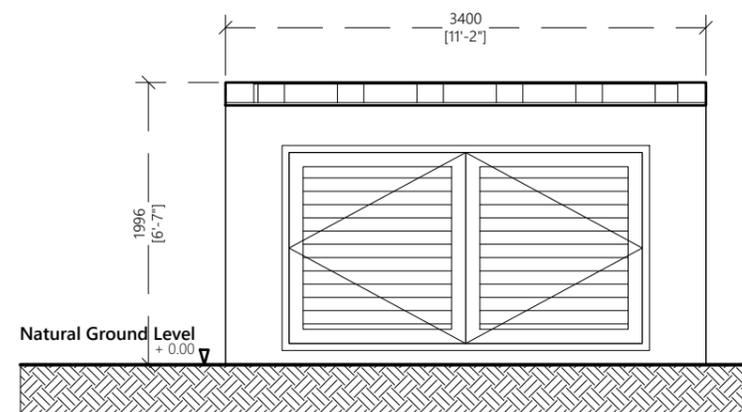
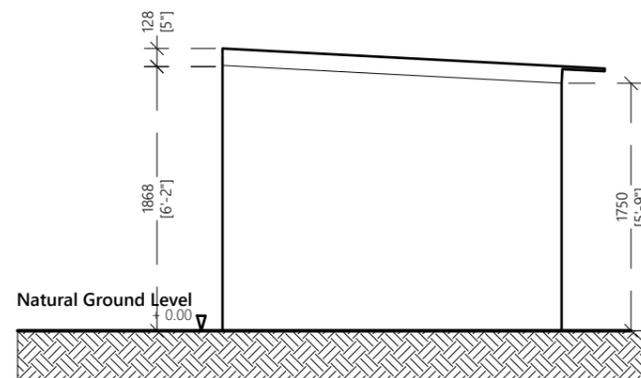
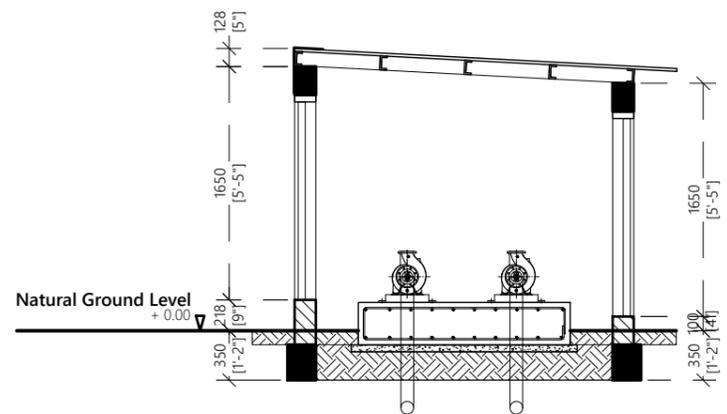
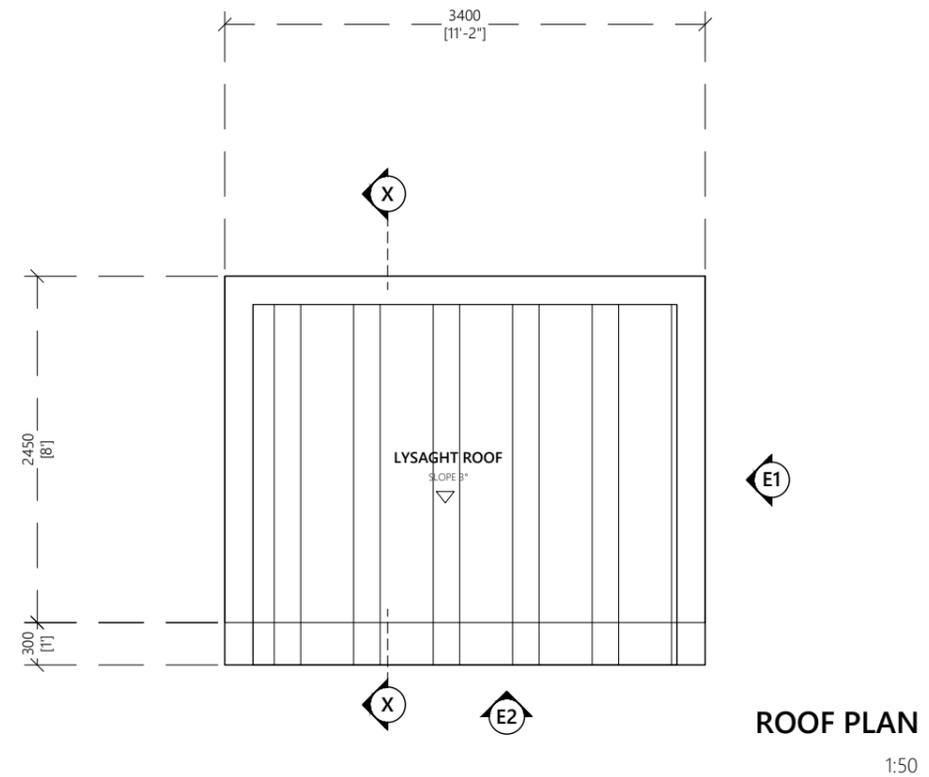
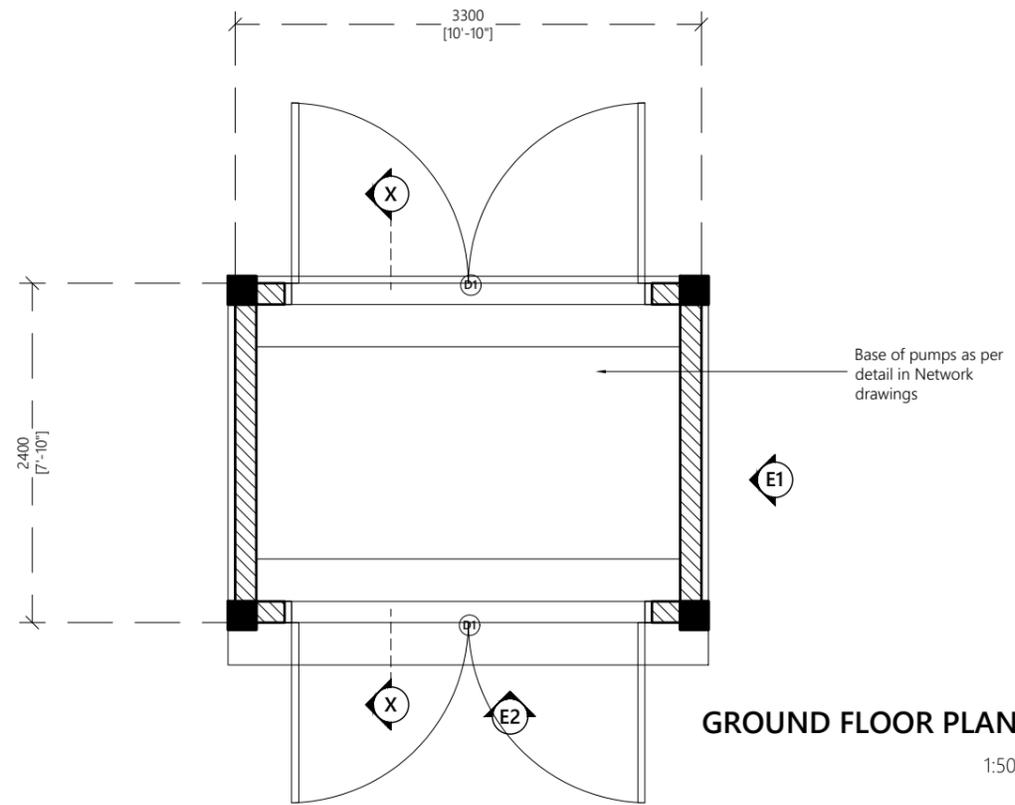
Sub Title:
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Project No: EP-WS/2019/06	Page: W-15
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PUMP SHED DETAILS



Legend

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

Sub Title:
Water Supply System in L.Hithadhoo

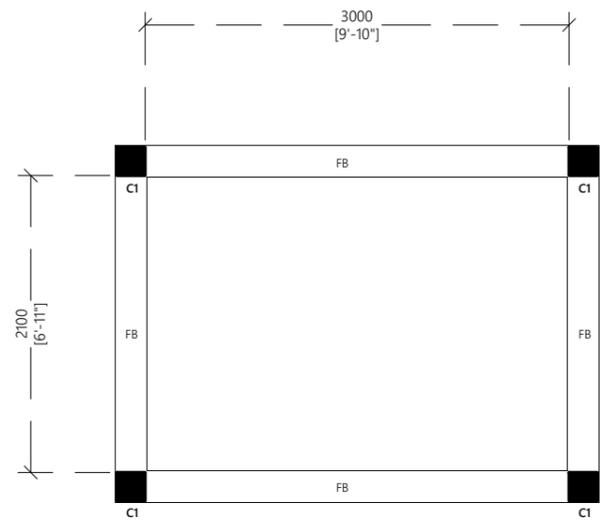
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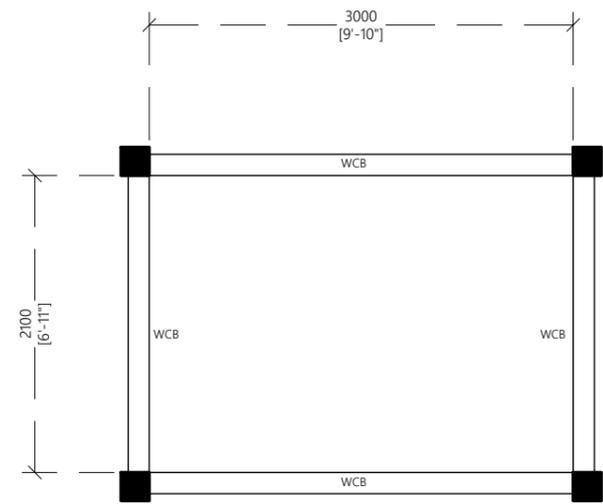
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Project No: EP-WS/2019/06	Page: R-01



GROUND FLOOR PLAN

1:100



ROOF PLAN

1:100

Legend

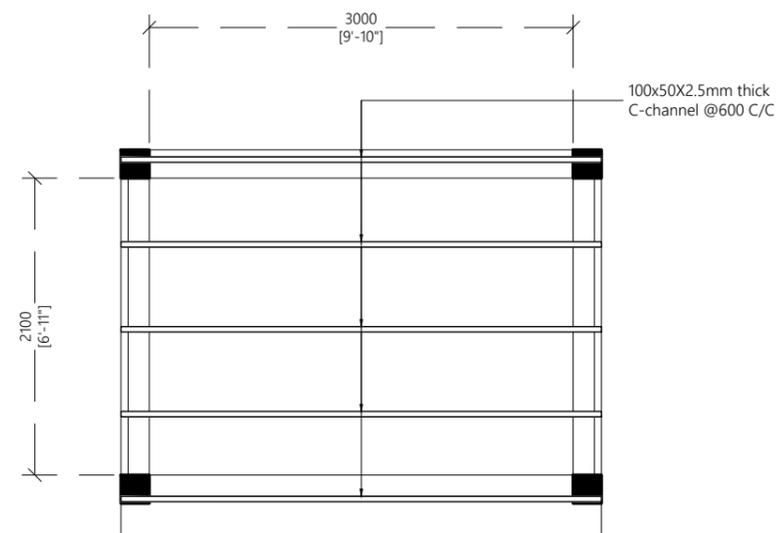
Notes:

- 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

Door ID		
Plan view		<p>General Door Notes:</p> <p>Dimensions shown on DWG indicate effective openings of frame</p> <p>All frame depths are 100mm All door panel thicknesses are 35mm All window panel thickness are 25mm All frame edges shall be trimmed 3mm</p> <p>All wooden 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 all functions of the units</p> <p>Hinges shall conform to</p> <ol style="list-style-type: none"> 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 <p>Locks shall be cylindrical with master key sets</p> <p>Door knobs shall be 1000mm above FFL</p>
Elevation view		
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

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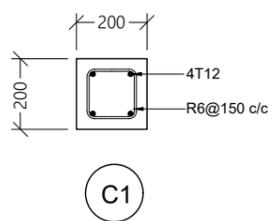
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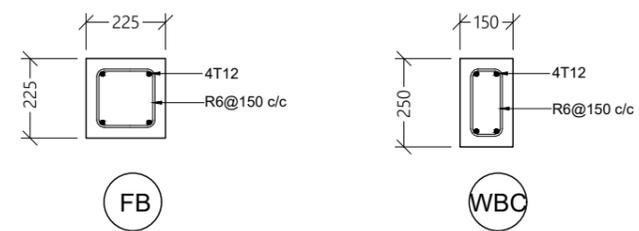
Project No: EP-WS/2019/06

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COLUMN DETAIL

1:20



BEAM DETAILS

1:20

Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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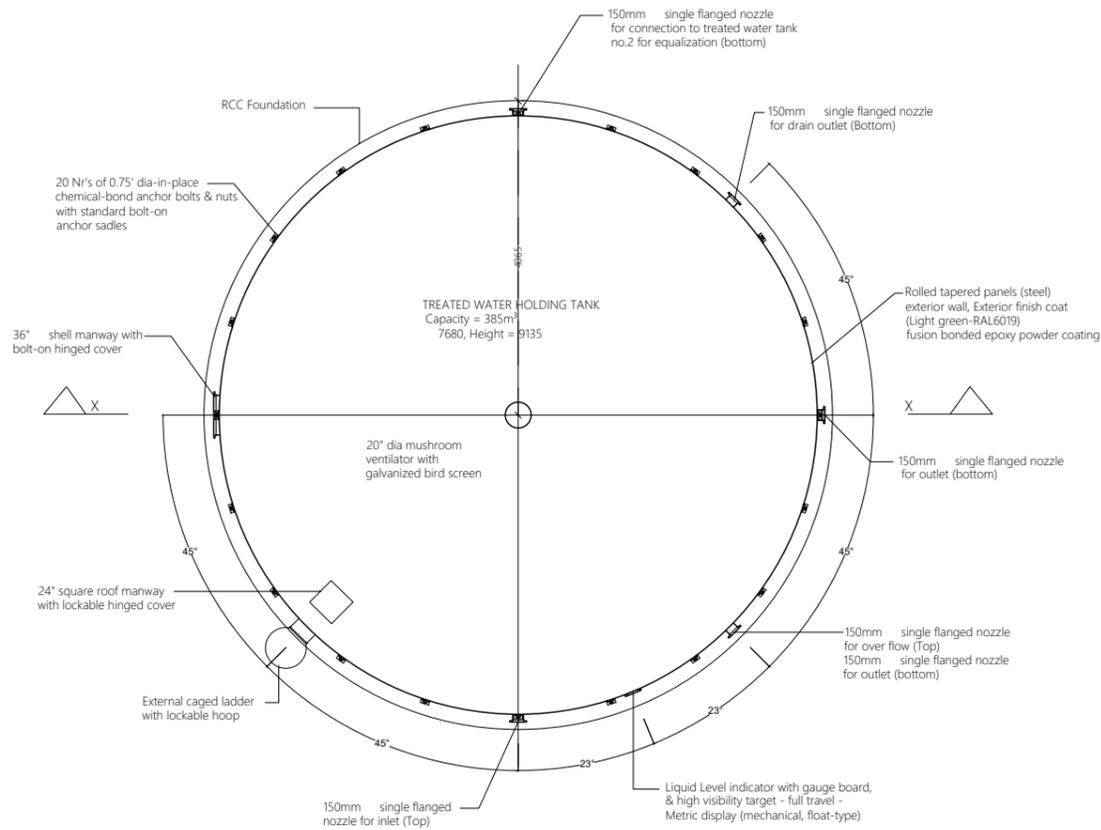
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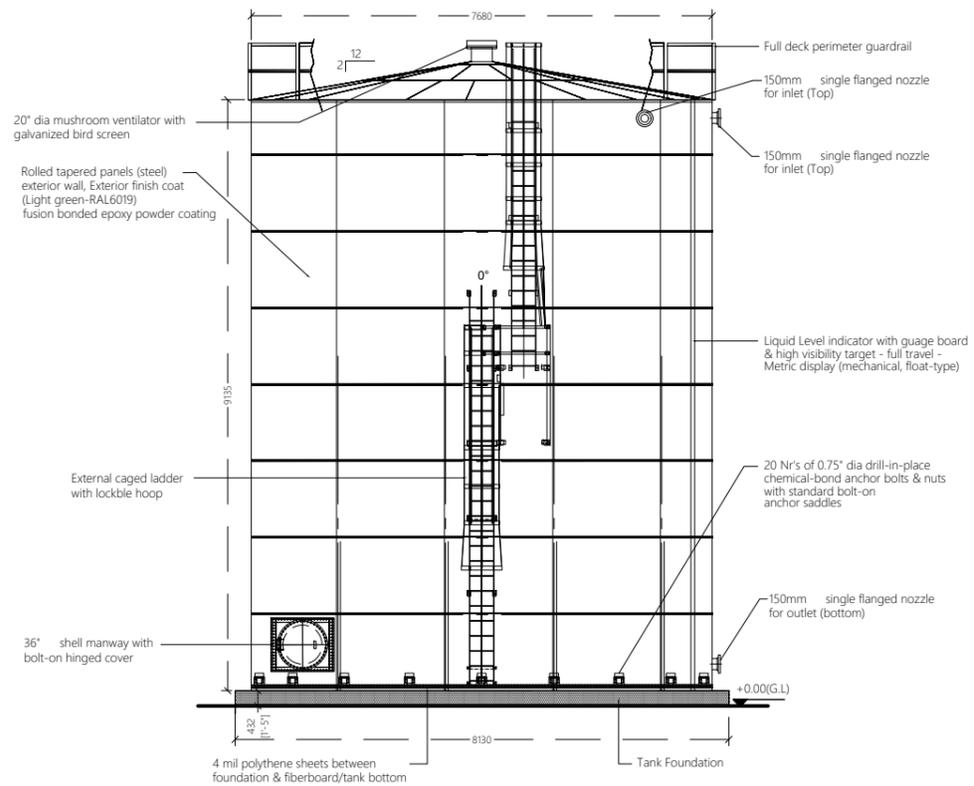
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Project No: EP-WS/2019/06	
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PUMP SHED DETAILS

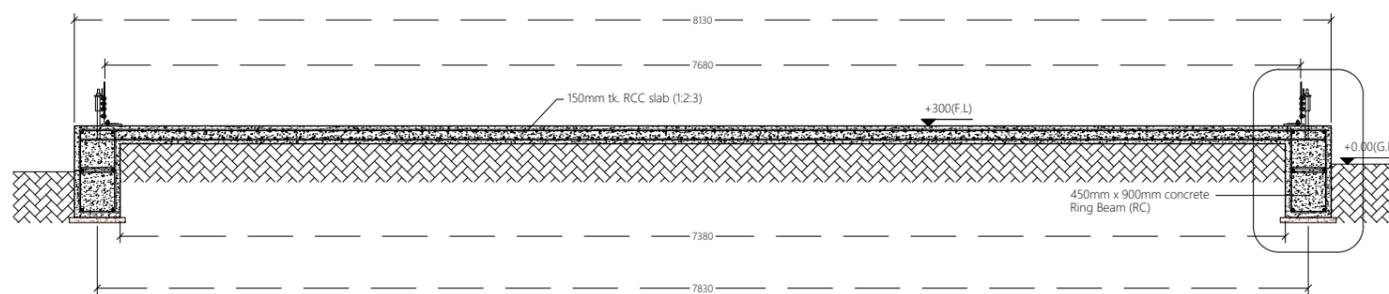
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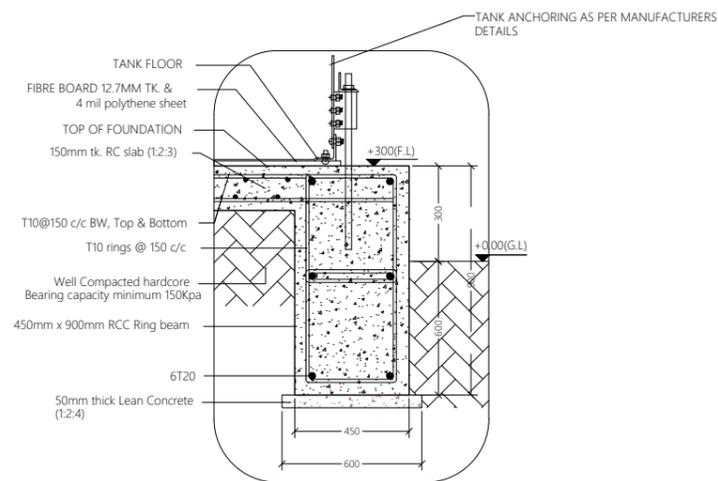
TREATED WATER HOLDING TANK AND FOUNDATION- PLAN



TREATED WATER HOLDING TANK AND FOUNDATION- ELEVATION



SECTION X-X



DETAIL

Note:-
Cover = 50mm
Lap length 50

TREATED WATER TANK DETAILS

NTS

Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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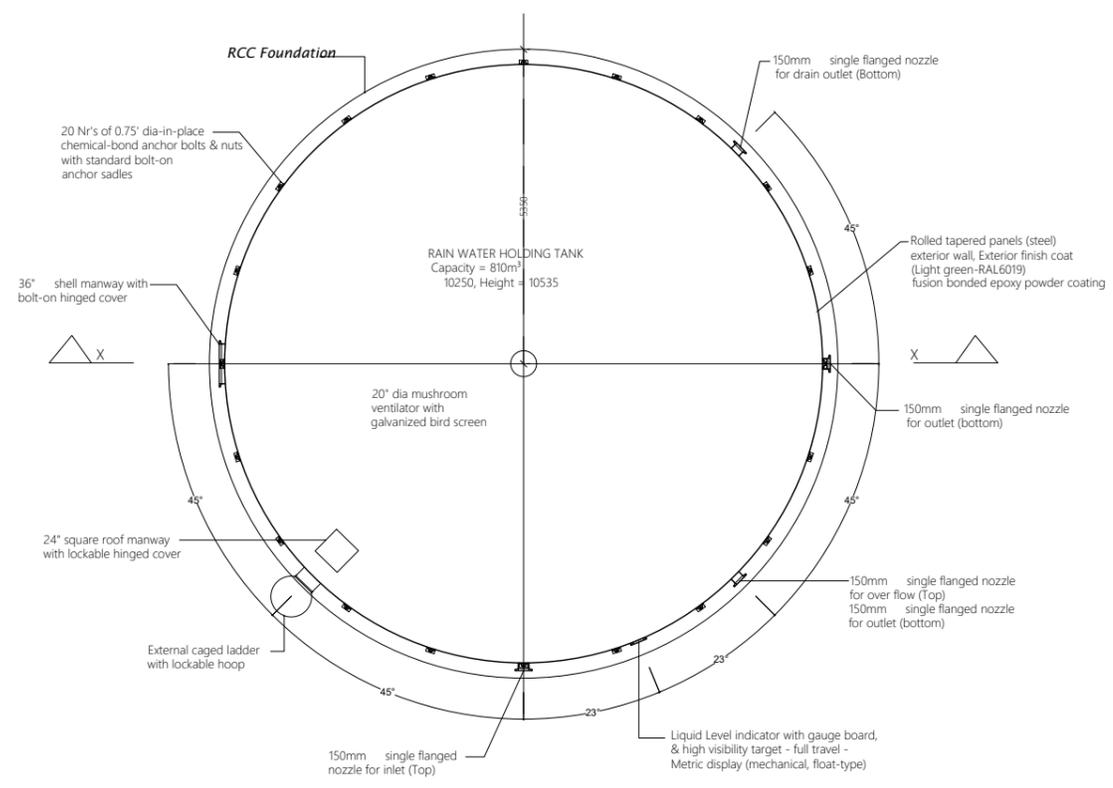
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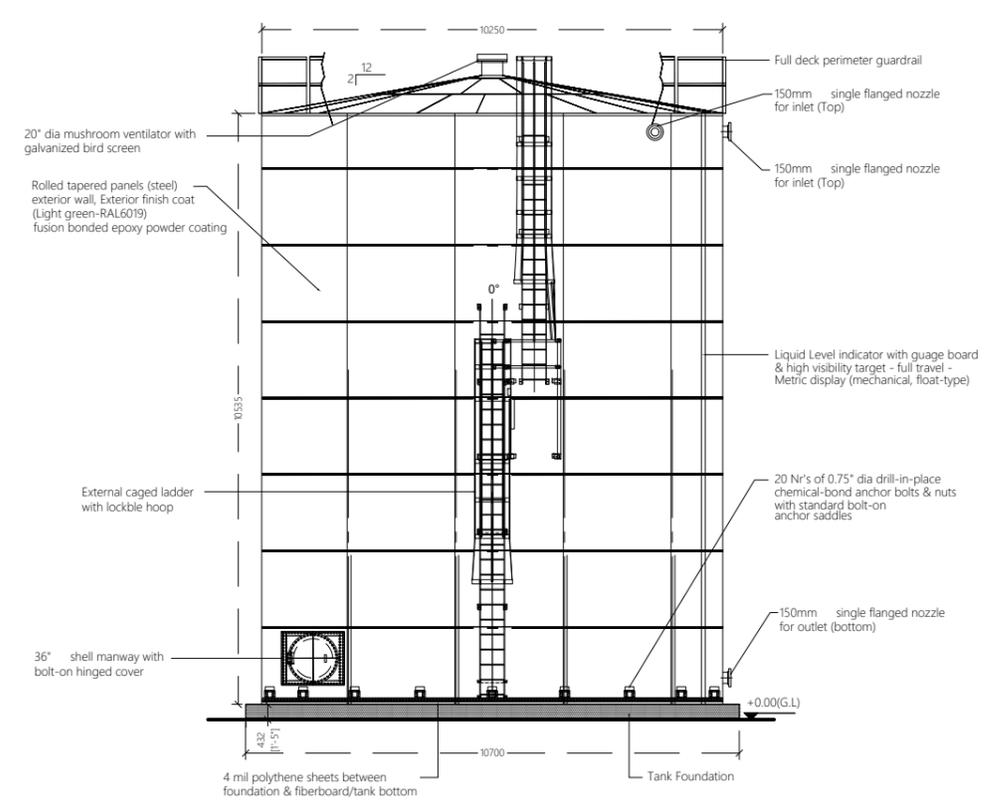
Date: Aug 2020 SCALE (A3): 1:20

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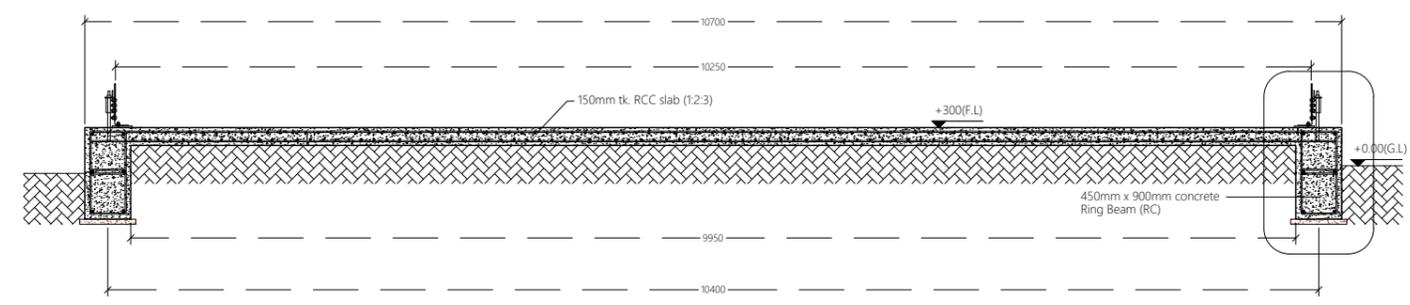
Rev: R-01 Page: W-19



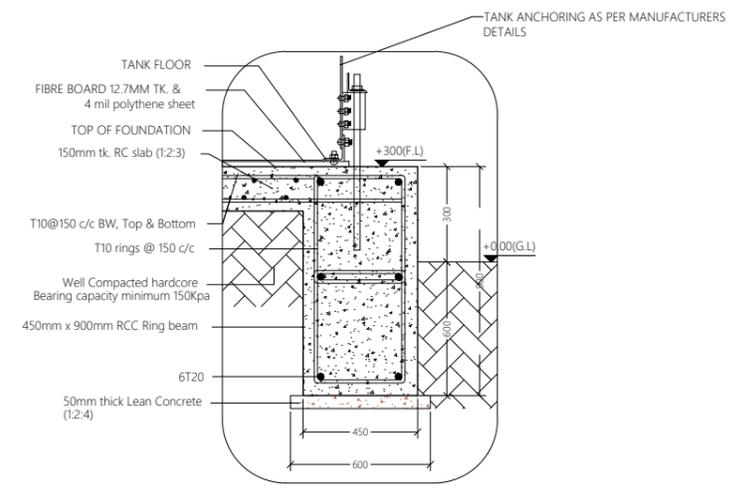
RAINWATER HOLDING TANK AND FOUNDATION- PLAN



RAINWATER HOLDING TANK AND FOUNDATION- ELEVATION



SECTION X-X



DETAIL

Note:-
Cover = 50mm
Lap length 50

RAINWATER HOLDING TANK DETAILS

Legend

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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 5 islands, Maldives - Package 6

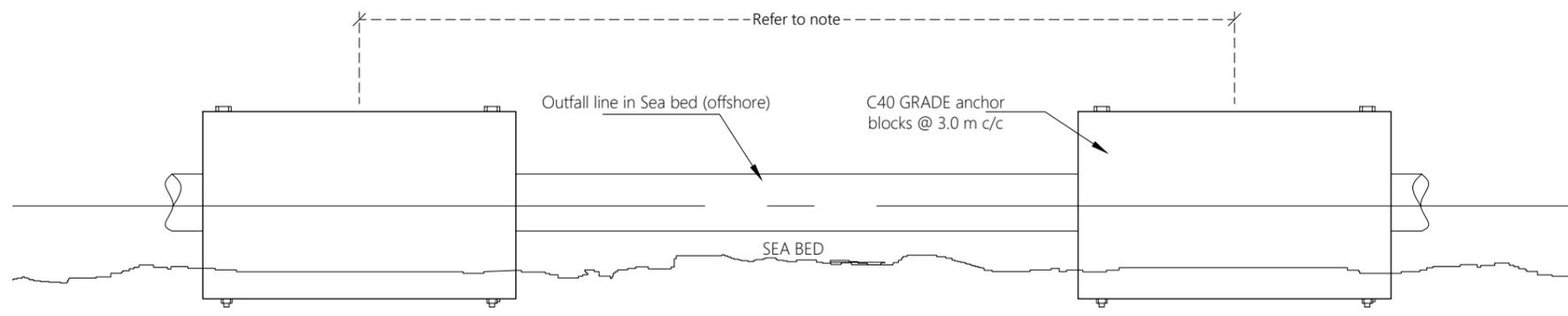
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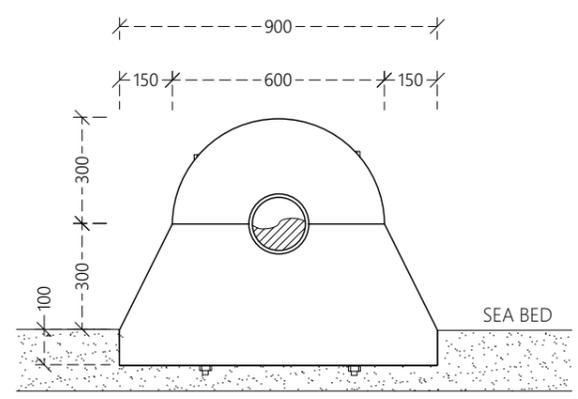
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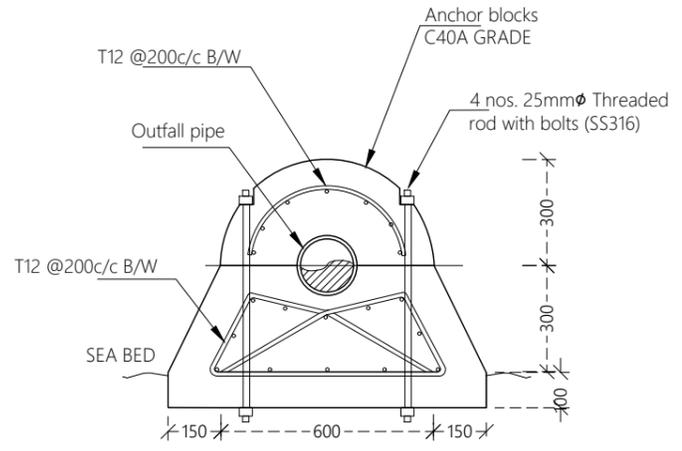
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Date: Aug 2020	SCALE (A3): 1:20
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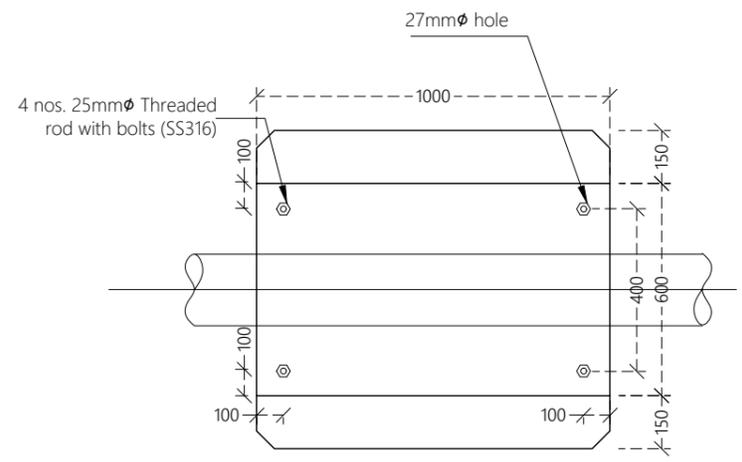
BALLAST BLOCK SIDE ELEVATION



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.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

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

Sub Title:
Water Supply System in L.Hithadhoo

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



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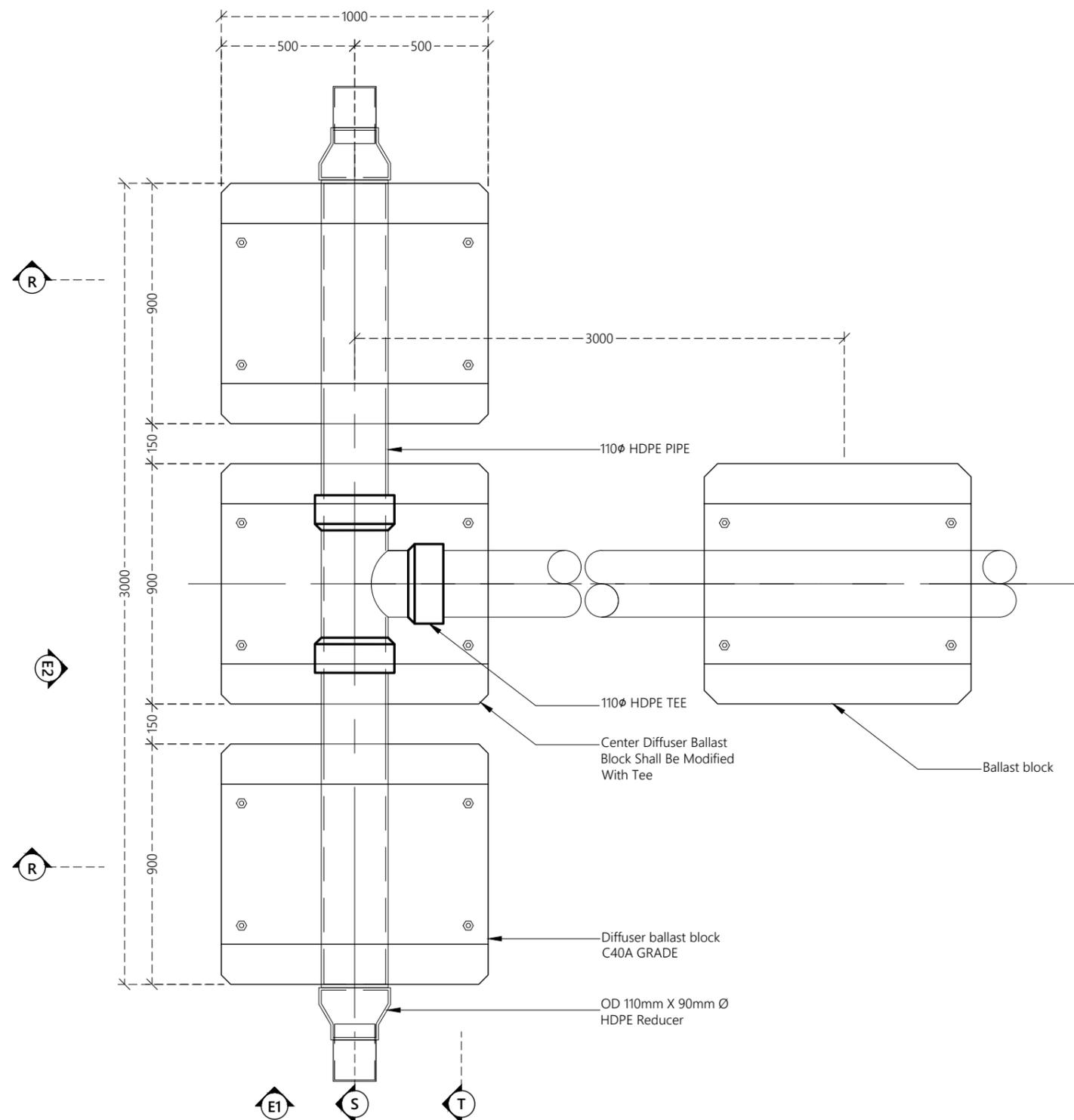


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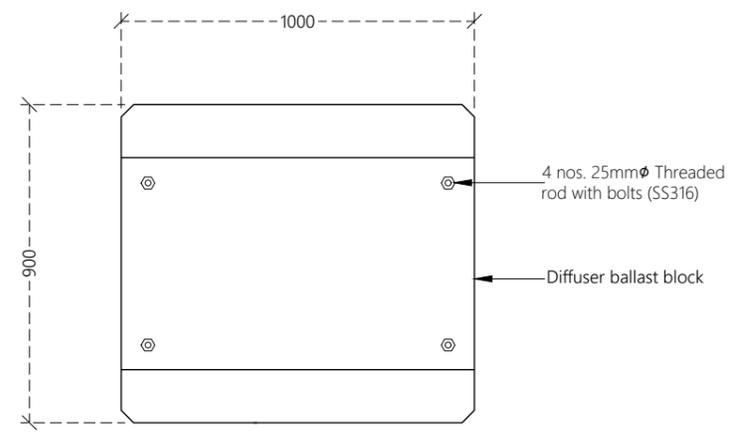
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BALLAST BLOCK DETAILS

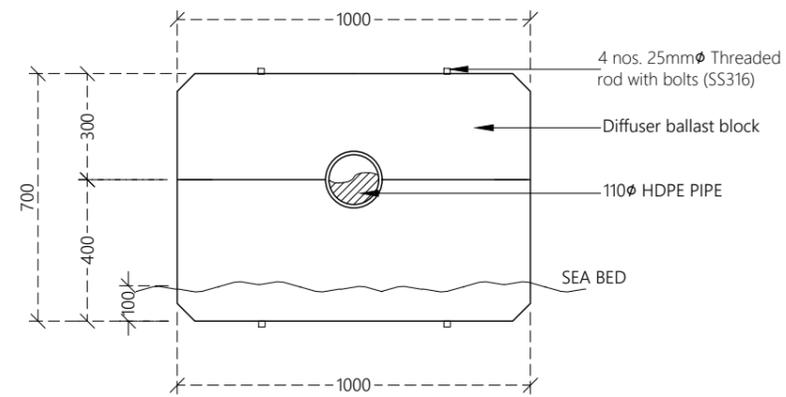
NTS



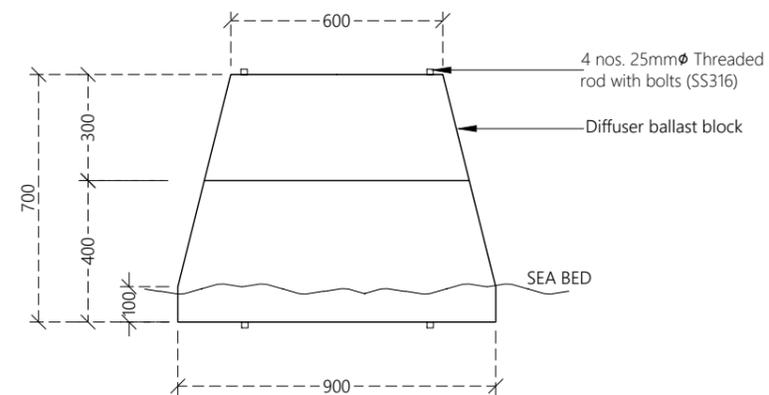
DIFFUSER BALLAST BLOCK SECTION - R



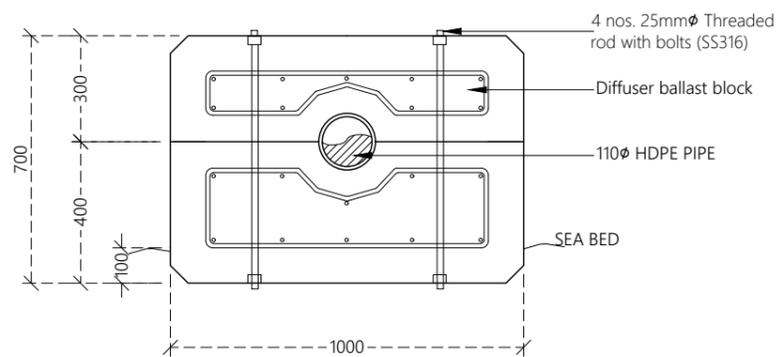
DIFFUSER BALLAST BLOCK PLAN



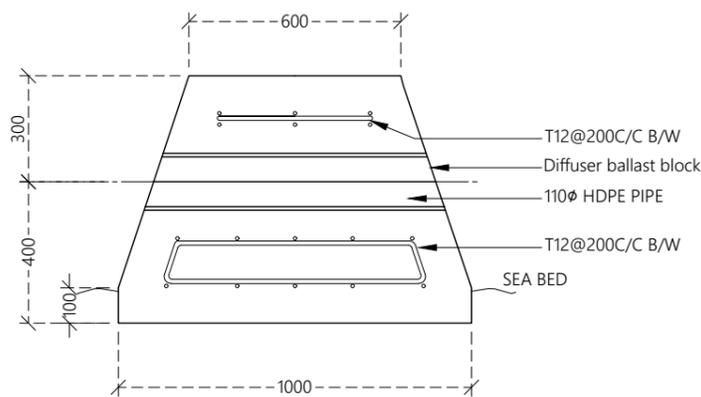
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E1



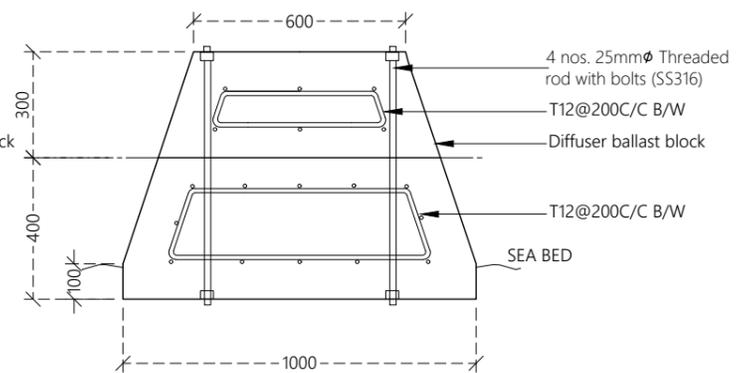
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E2



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.

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Sub Title:
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Client:
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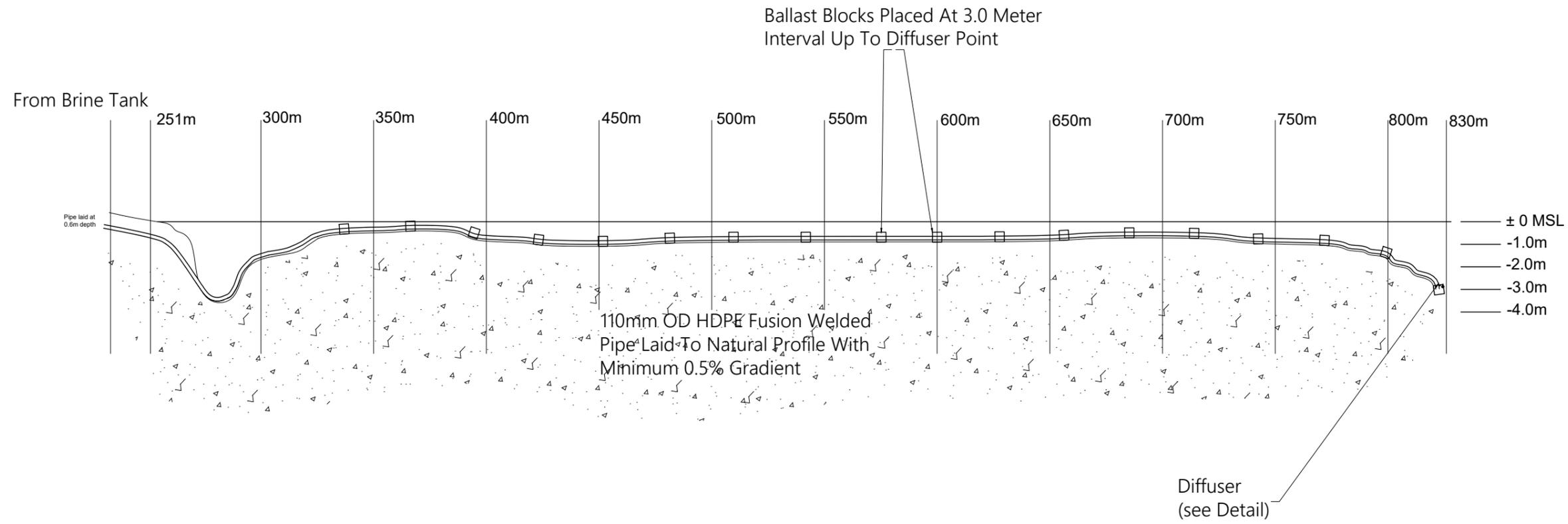
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Project No: EP-WS/2019/06

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Legend

Notes:

- Contractor should carry out a detailed bathymetric survey for the proposed area, revise and present a shop drawing for the outfall layout prior to commencement of outfall works.
- 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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Sub Title:
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Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives

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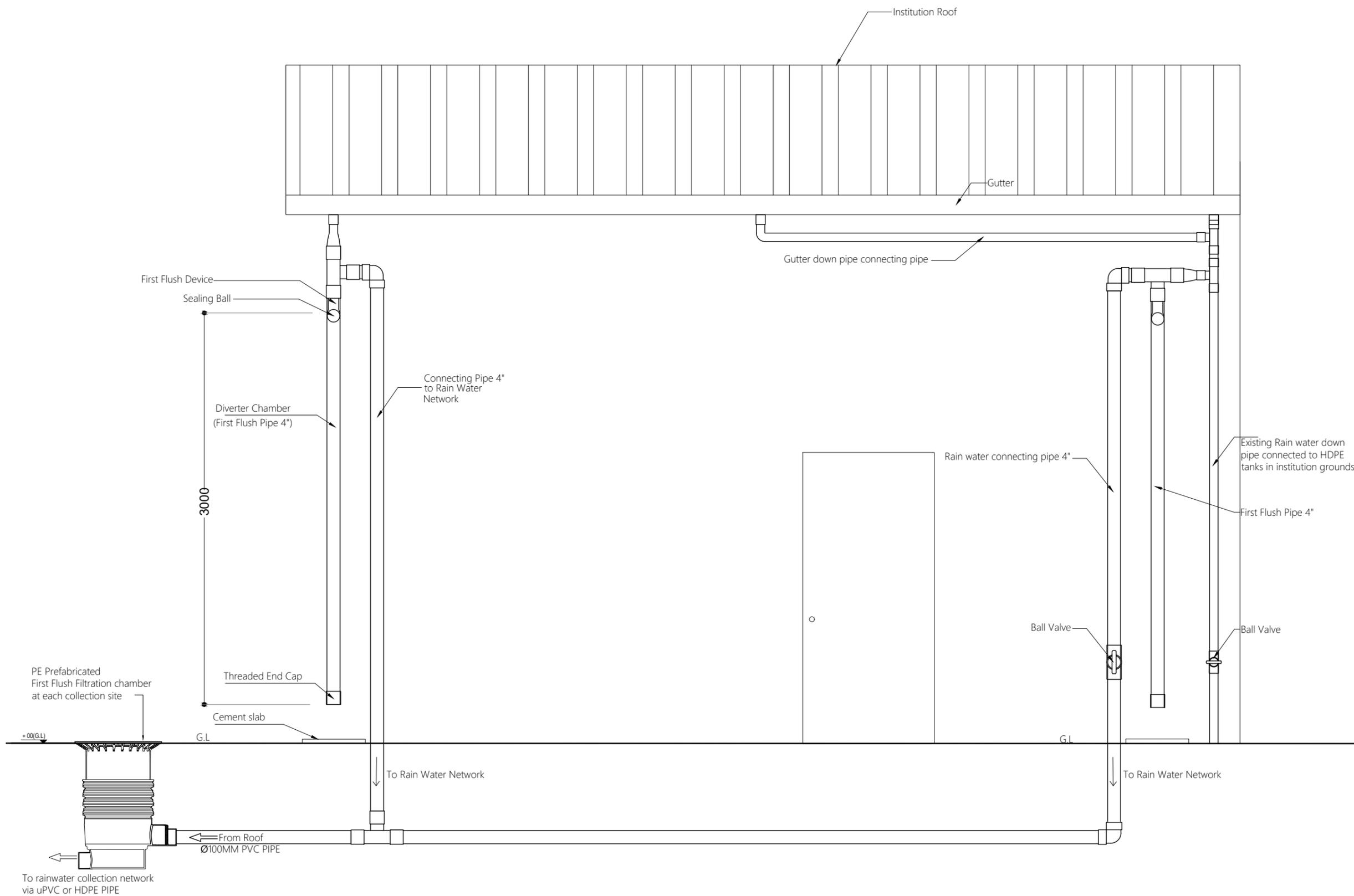
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BRINE SEA OUTFALL DETAIL

NTS



Legend

- Notes:**
- Prefab filtration chambers will be used as first flush mechanism.
 - Filtration chambers suppliers to be approved by engineer.
 - Number of chambers will be based on approved manufacturers roof area recommendations.
 - Overflow mechanism will be installed on only corner down pipes or where necessary.
 - All down pipes are 3 inch dia PVC pipes.
 - The filtration chamber will have a screen to prevent entry of debris and dirt.

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Water Supply System in L.Hithadhoo

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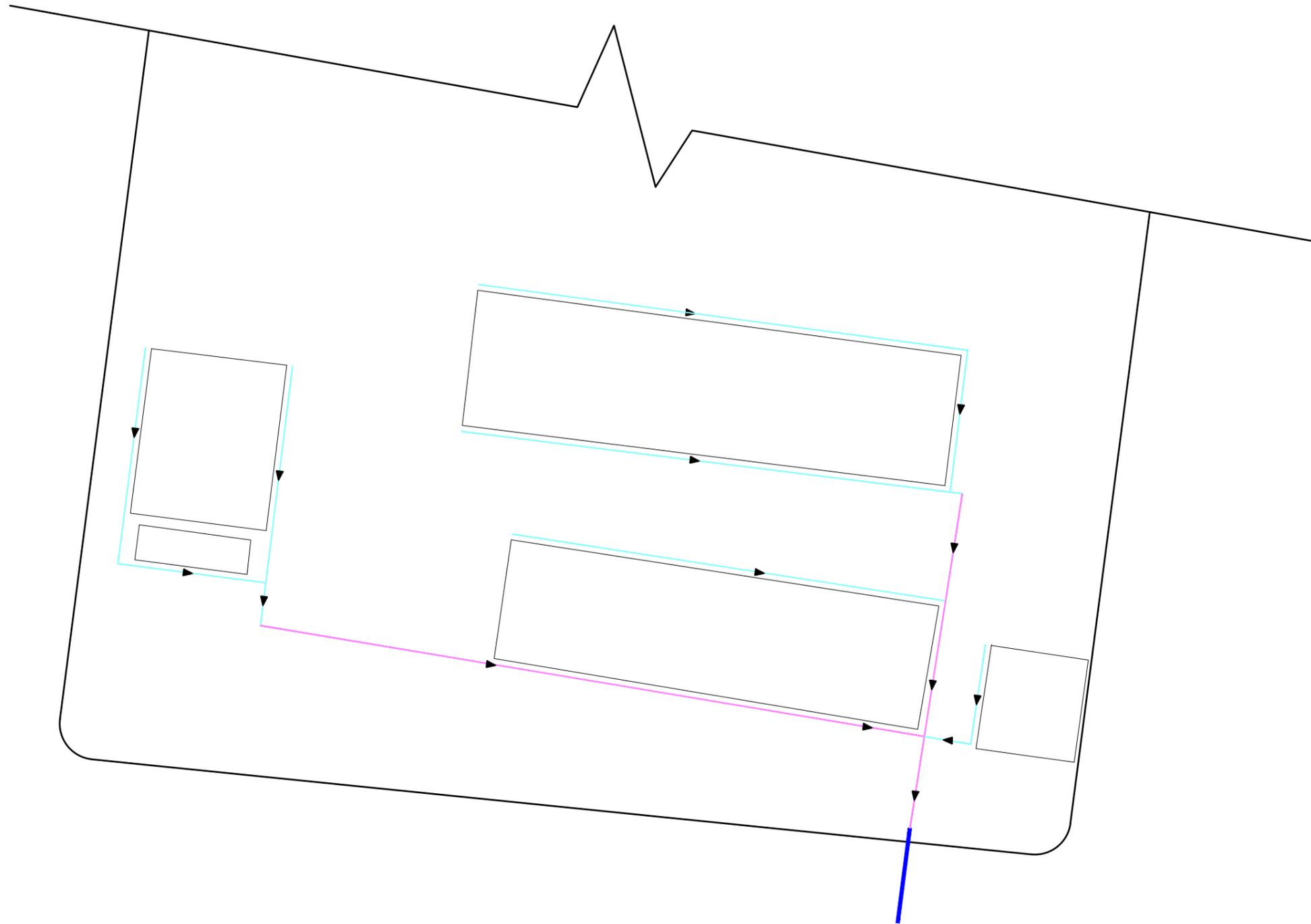
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Project No: EP-WS/2019/06	
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RAINWATER FIRST FLUSH MECHANISM

NTS



Legend

— = PVC PIPES Ø160mm

— = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 282.8m

APPROXIMATE GUTTER LENGTH = 200.9m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 84.9m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 197.9m

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Sub Title:
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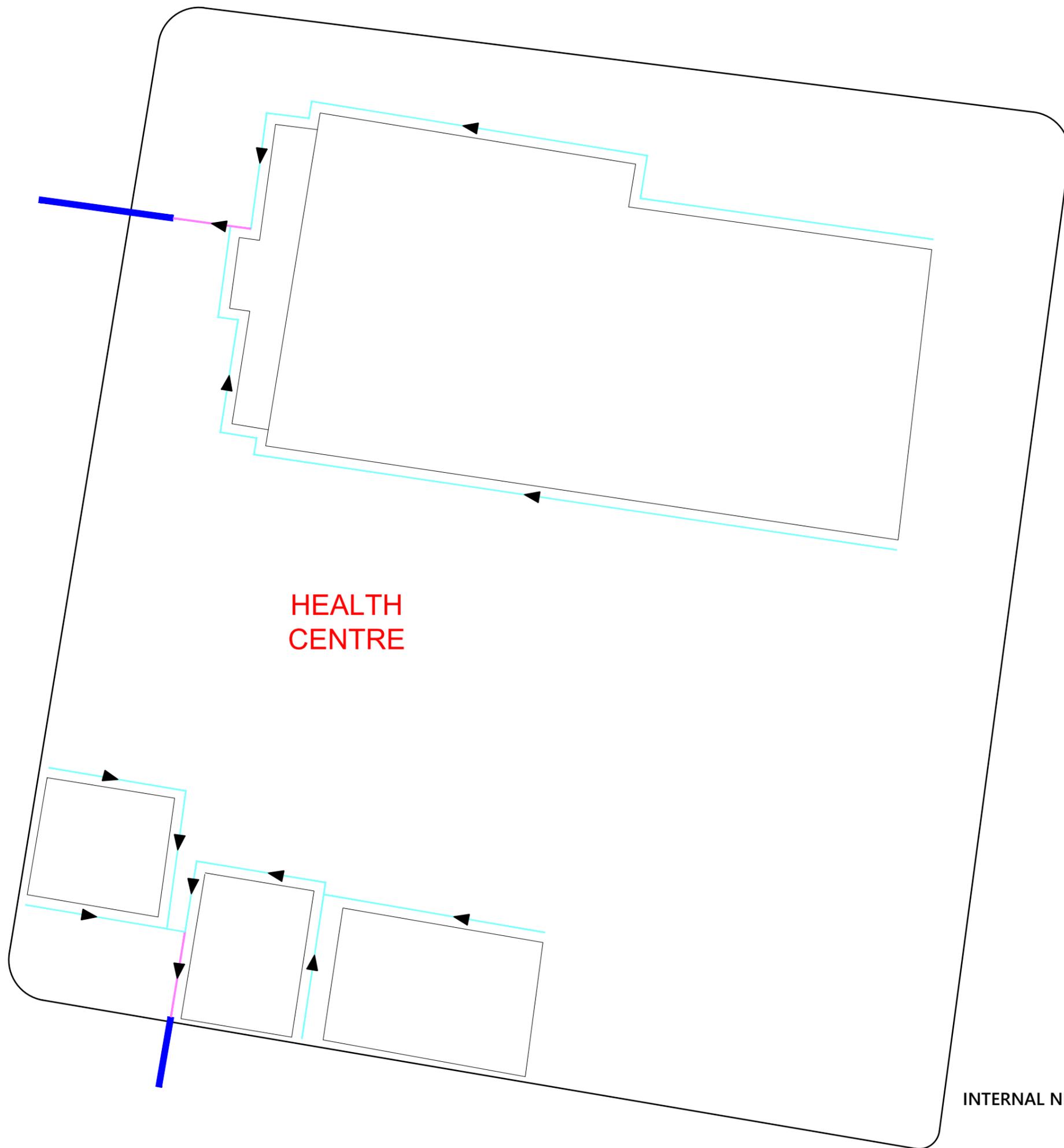
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INTERNAL NETWORK LAYOUT- HITHADHOO SCHOOL

1:400



HEALTH CENTRE

INTERNAL NETWORK LAYOUT-HEALTH CENTRE

1:200



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 141.6m

APPROXIMATE GUTTER LENGTH = 98.3m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 4m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 137.6m

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 5 islands, Maldives - Package 6

Sub Title:
Water Supply System in L.Hithadhoo

Client:
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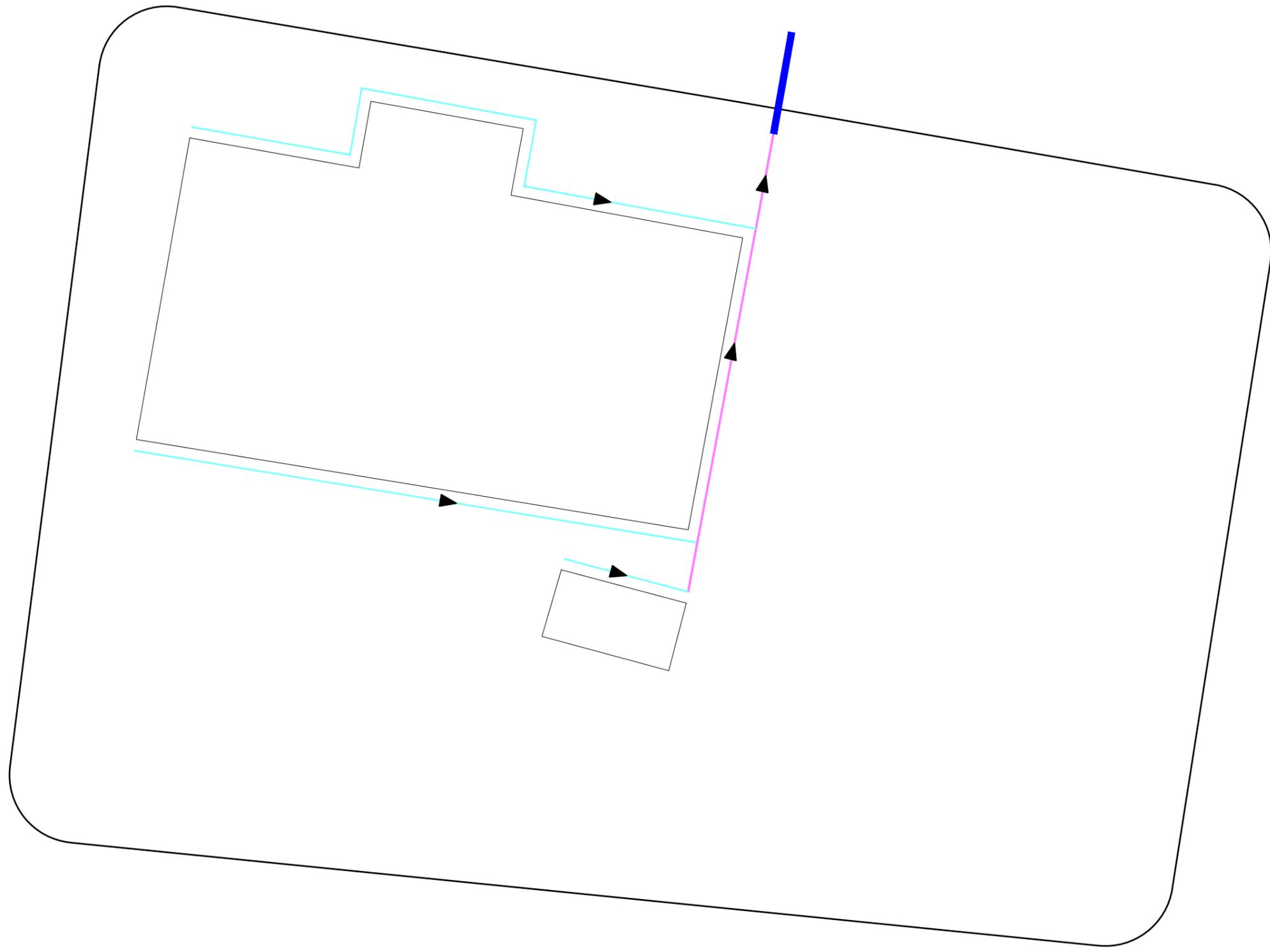
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Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 83m
 APPROXIMATE GUTTER LENGTH = 54.5m
 APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 20.6m
 APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 62.4m

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 5 islands, Maldives - Package 6

Sub Title:
Water Supply System in L.Hithadhoo

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



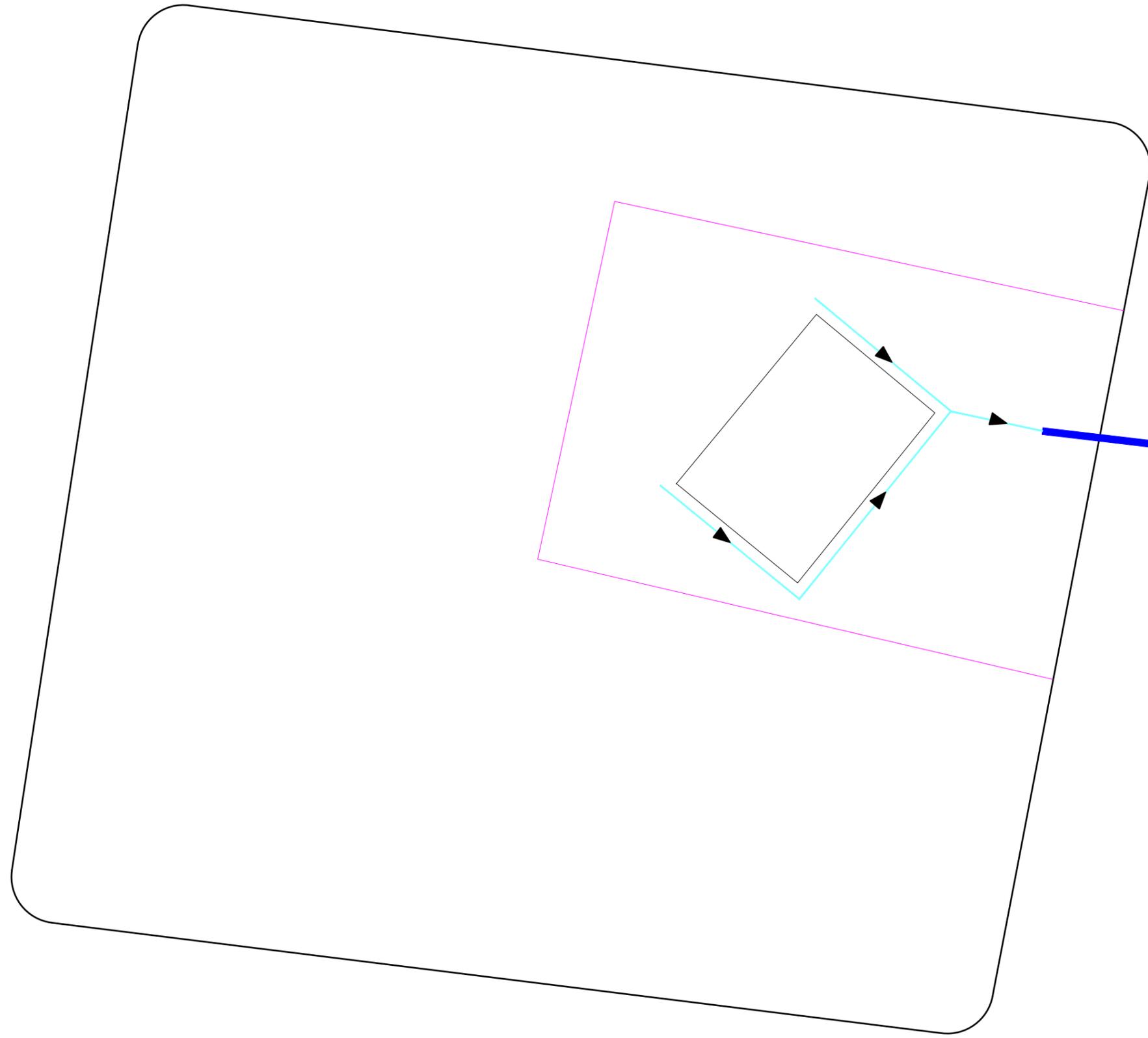
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INTERNAL NETWORK LAYOUT-ISLAND COUNCIL OFFICE
 1:200



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 30.1m
 APPROXIMATE GUTTER LENGTH = 32.6m
 APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 0m
 APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 30.1m

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 5 islands, Maldives - Package 6
 Sub Title:
Water Supply System in L.Hithadhoo
 Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives



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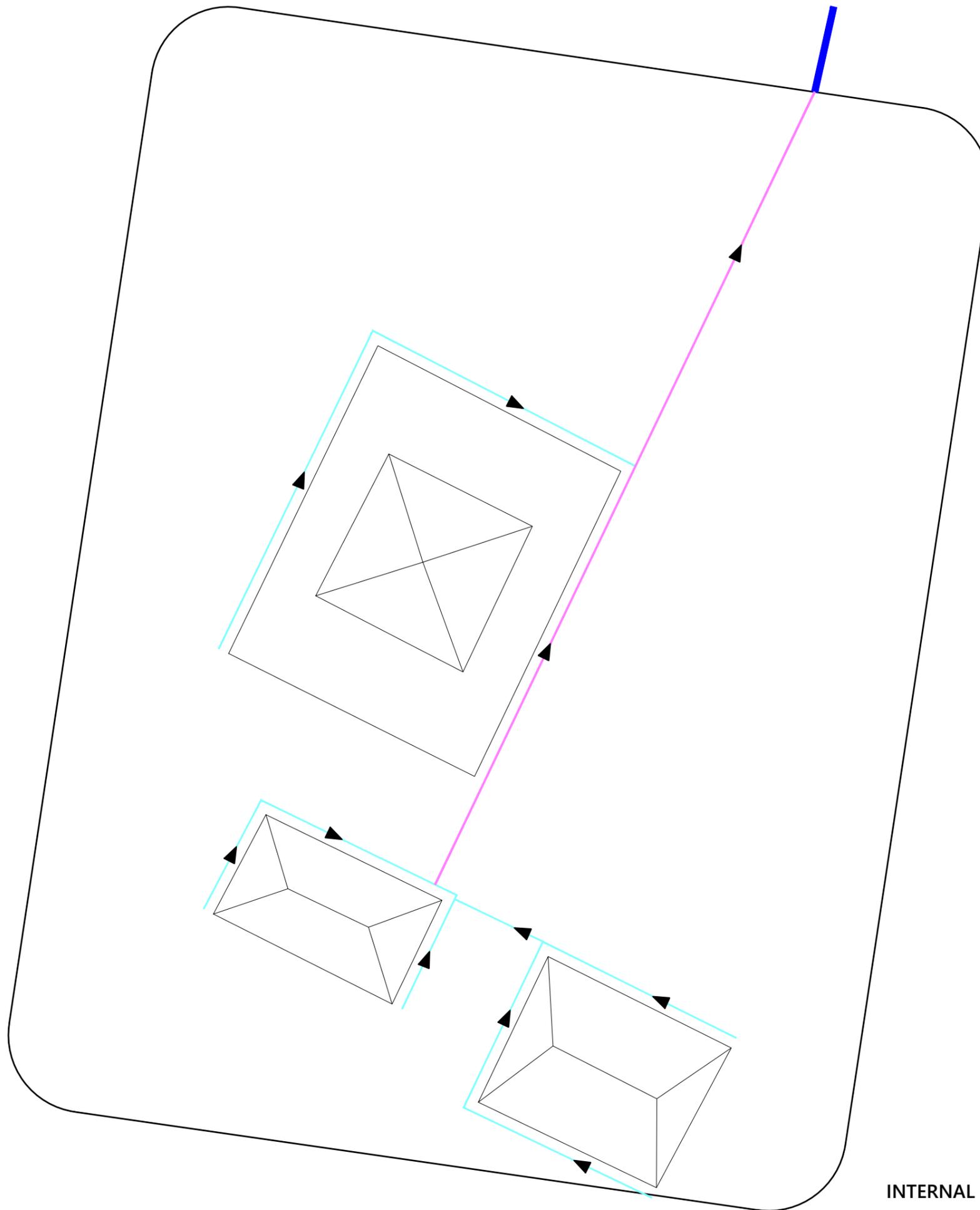


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INTERNAL NETWORK LAYOUT-KUDA MISKIY

1:200



INTERNAL NETWORK LAYOUT-CEMETRY

1:200



Legend

— = PVC PIPES Ø160mm

— = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 122.1m

APPROXIMATE GUTTER LENGTH = 116.5m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 39.7m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 82.4m

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

Sub Title:
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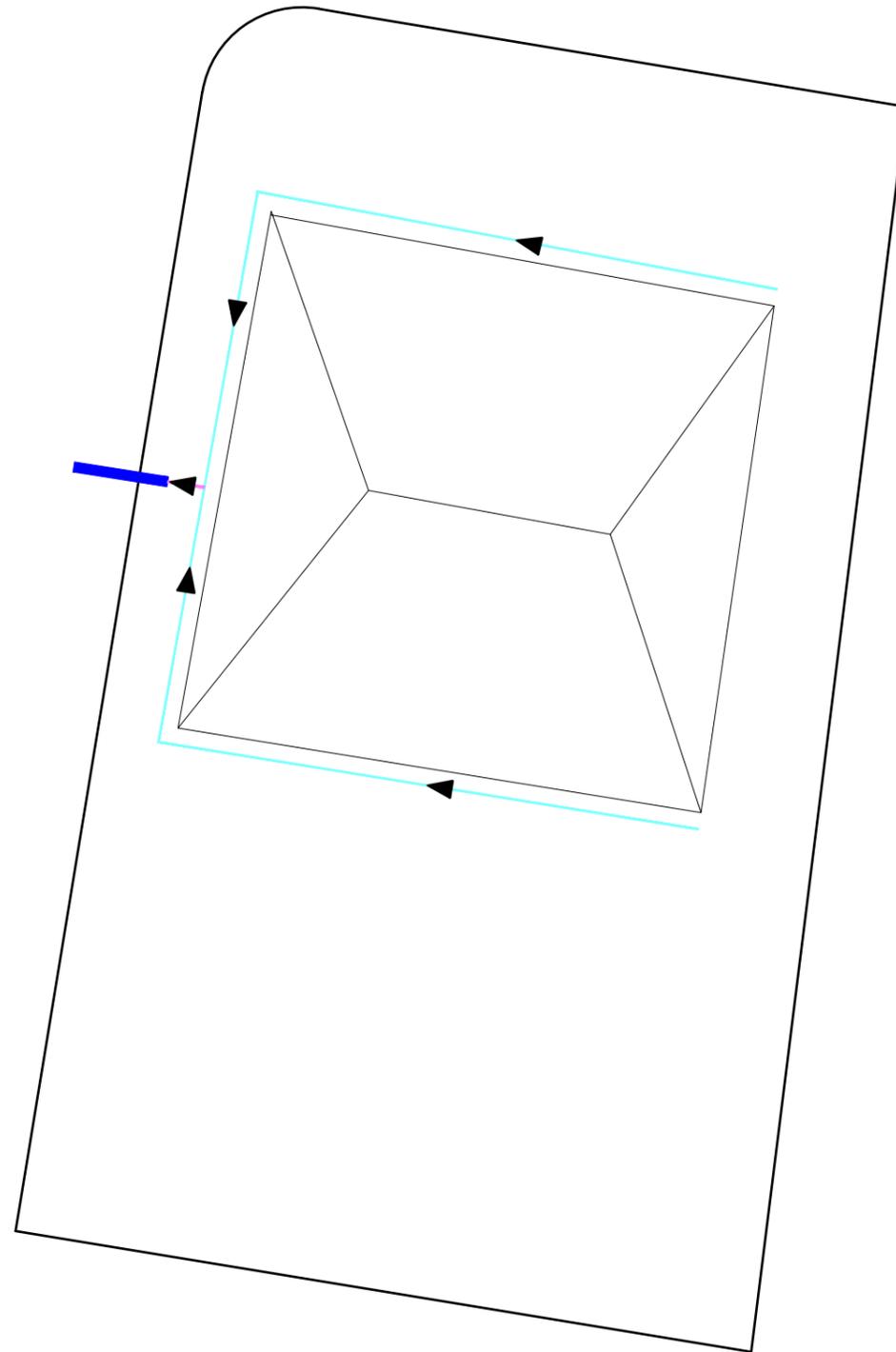
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Date: Aug 2020 SCALE (A3): 1:20

Project No: EP-WS/2019/06

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INTERNAL NETWORK LAYOUT-HITHADHOO COURT

1:200



Legend

— = PVC PIPES Ø160mm

— = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 50.1m

APPROXIMATE GUTTER LENGTH = 61.8m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 1.5m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 48.6m

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

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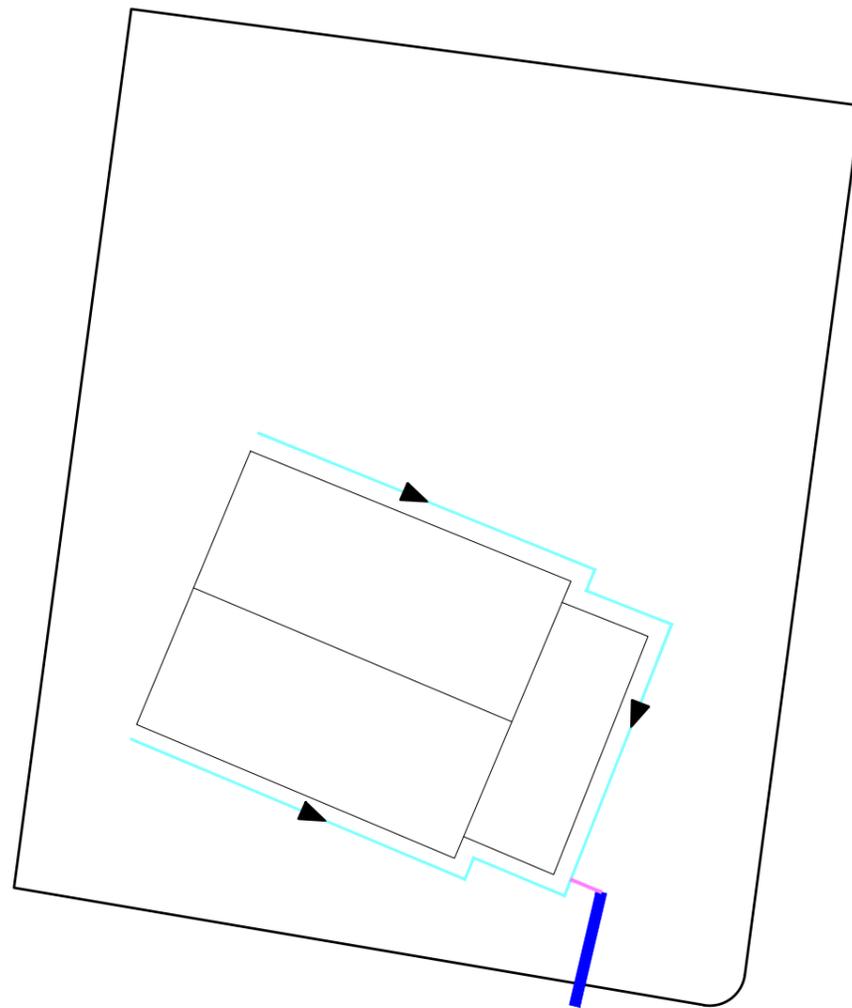
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Project No: EP-WS/2019/06

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Legend

— = PVC PIPES Ø160mm

— = PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 36.5m

APPROXIMATE GUTTER LENGTH = 26.8m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 1m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 35.5m

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Sub Title:
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Client:
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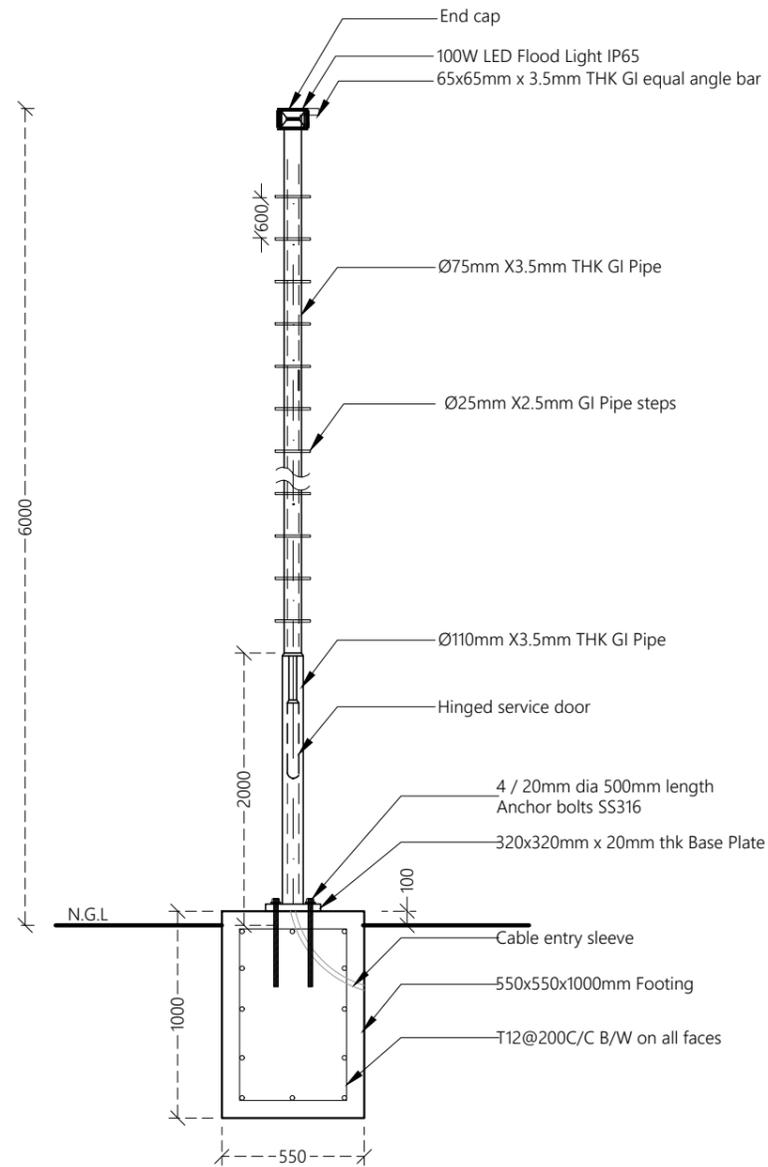
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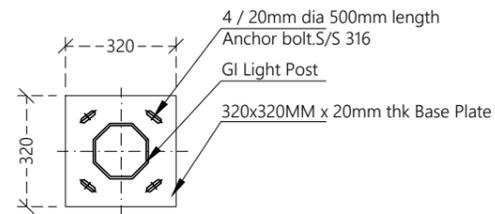
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INTERNAL NETWORK LAYOUT-AA MISKIY

1:200



LIGHT POST DETAILS FOR STP COMPOUND (LP1)



BASE PLATE (LP1)

NOTE:
 - CONCRETE COVER :50mm
 - All steel members and GI SHS to be applied with 2 coats of anti-corrosive paint with epoxy finishing paint

LIGHT POST DETAILS

NTS



Legend

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ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

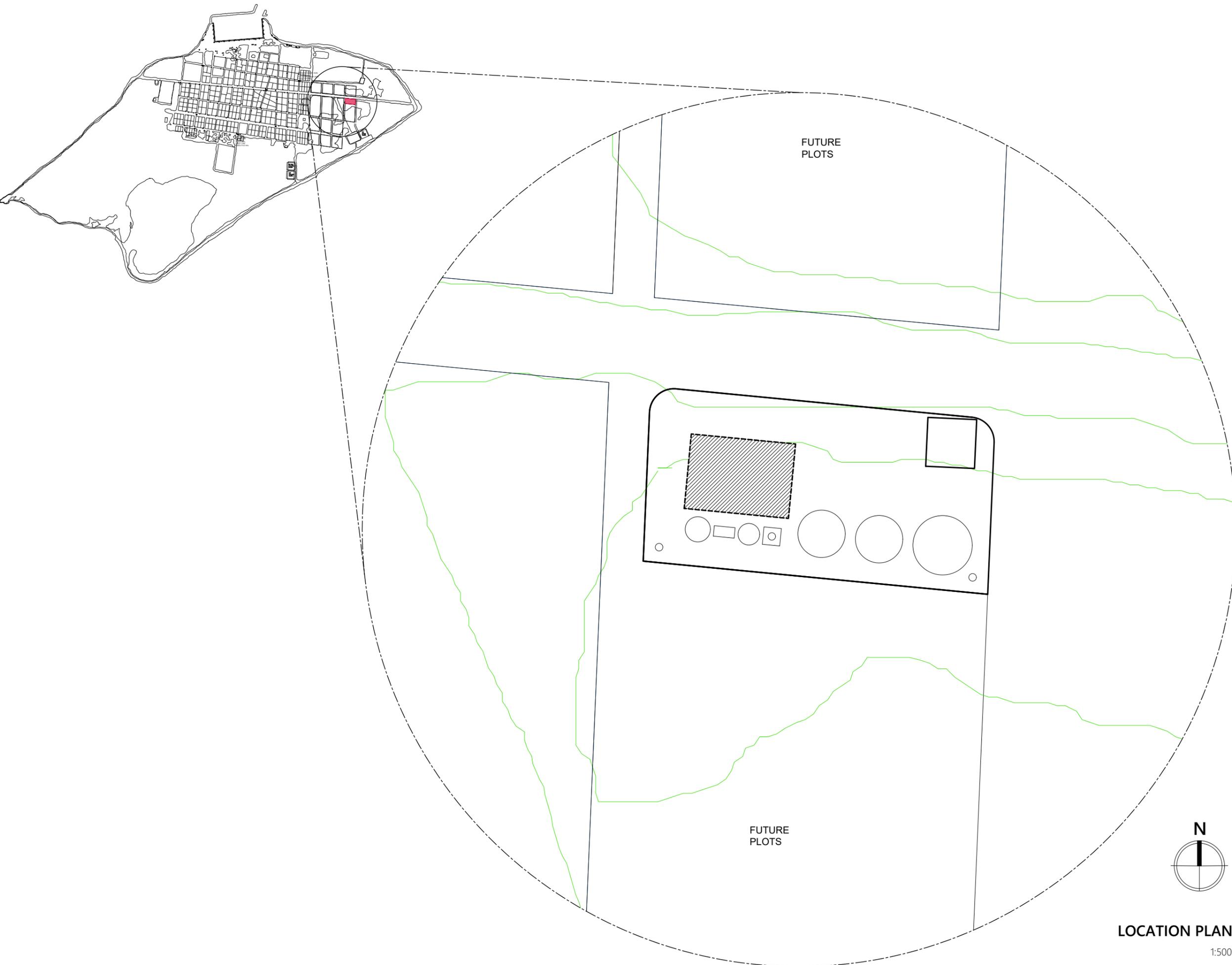
PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING & VEHICLE SHED, L.HITHADHOO

For Ministry of National Planning, Housing and Infrastructure

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Legend

Note:

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Title:
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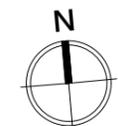
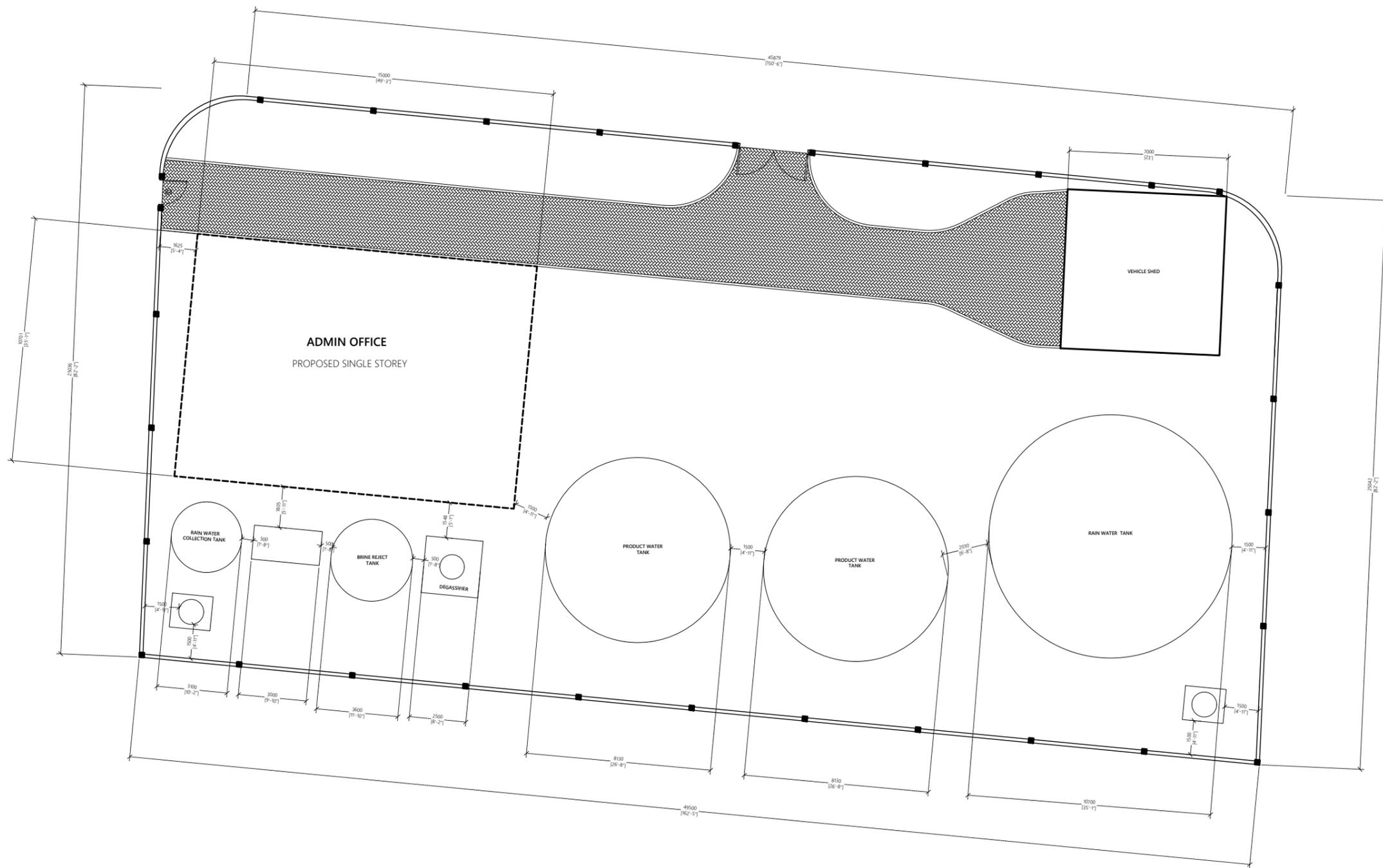
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LOCATION PLAN

1:500





SITE PLAN

1:200

Legend

Note:

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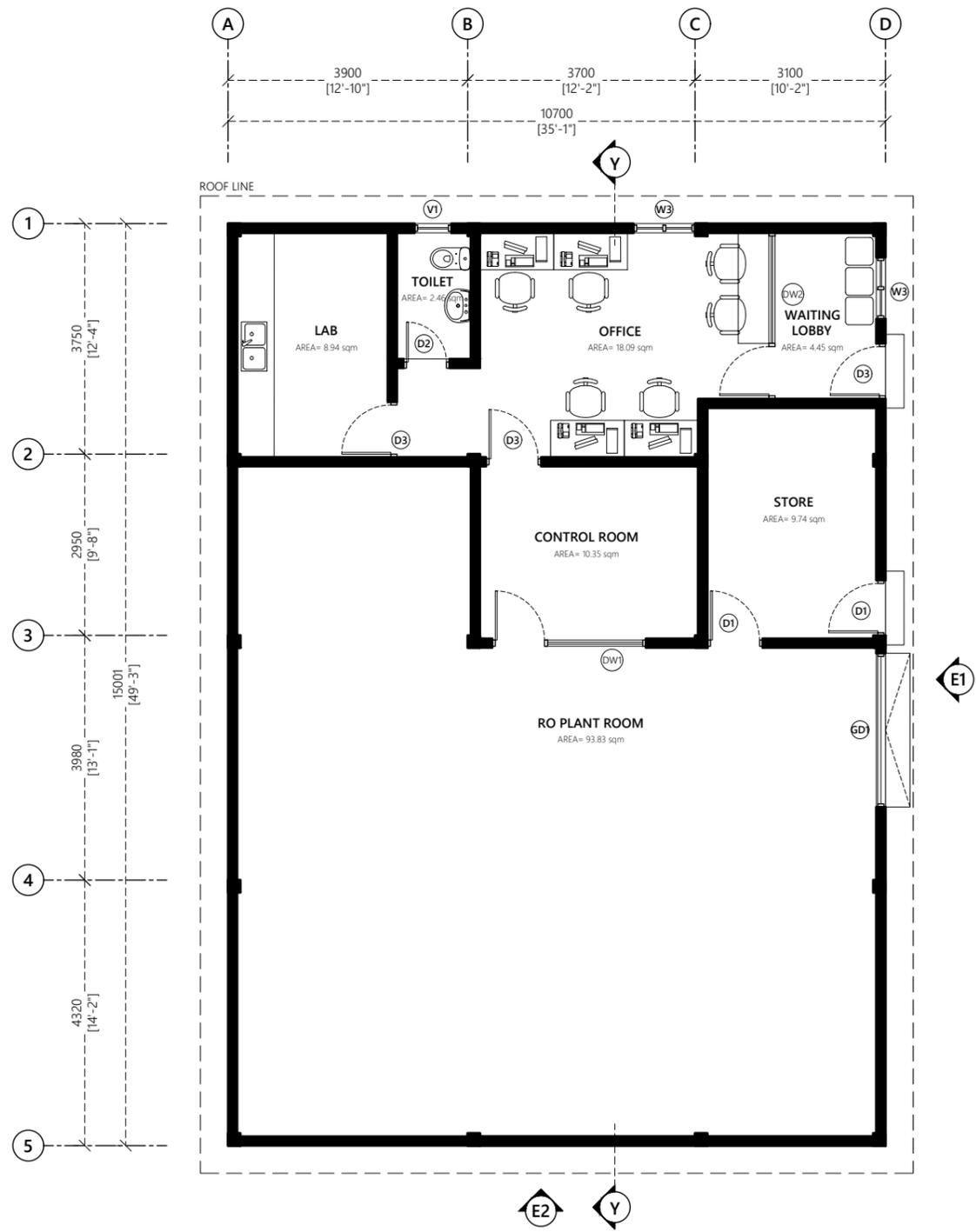
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ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING, L.HITHADHOO



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

Note:

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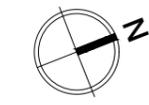
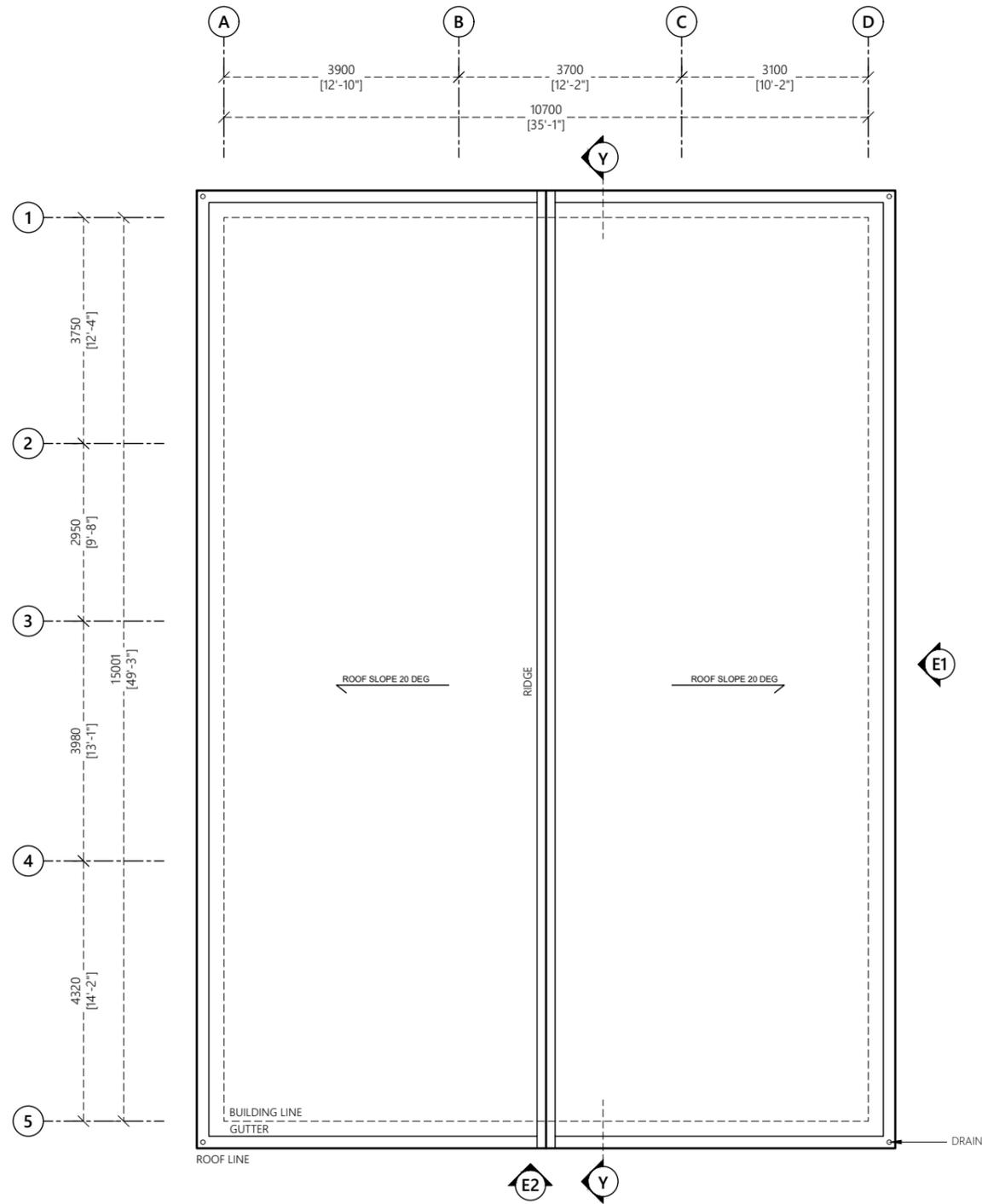
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Water Supply System in L.Hithadhoo

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ROOF PLAN

1:100

Legend

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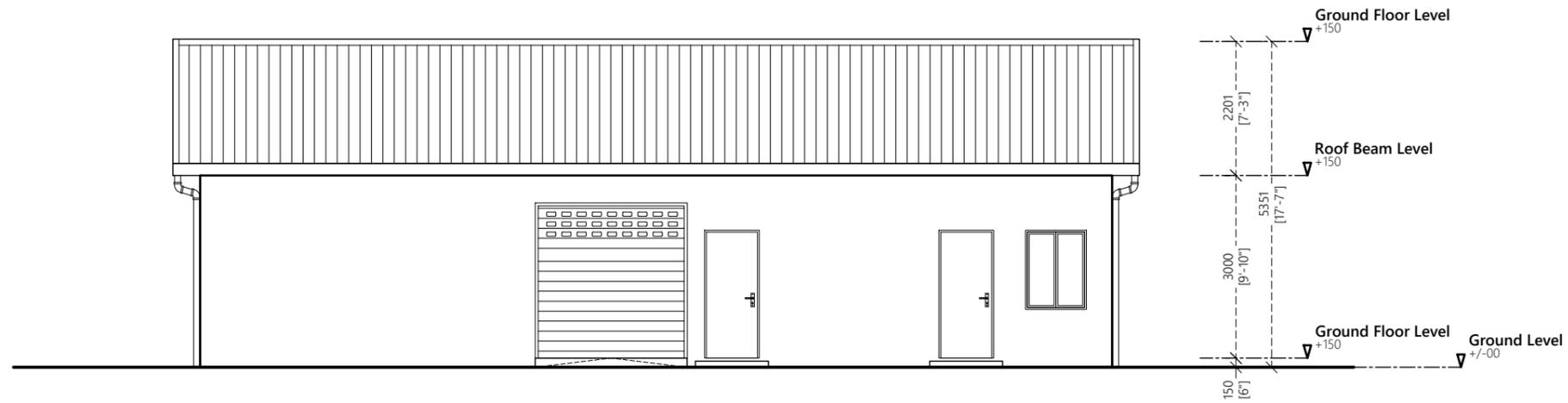
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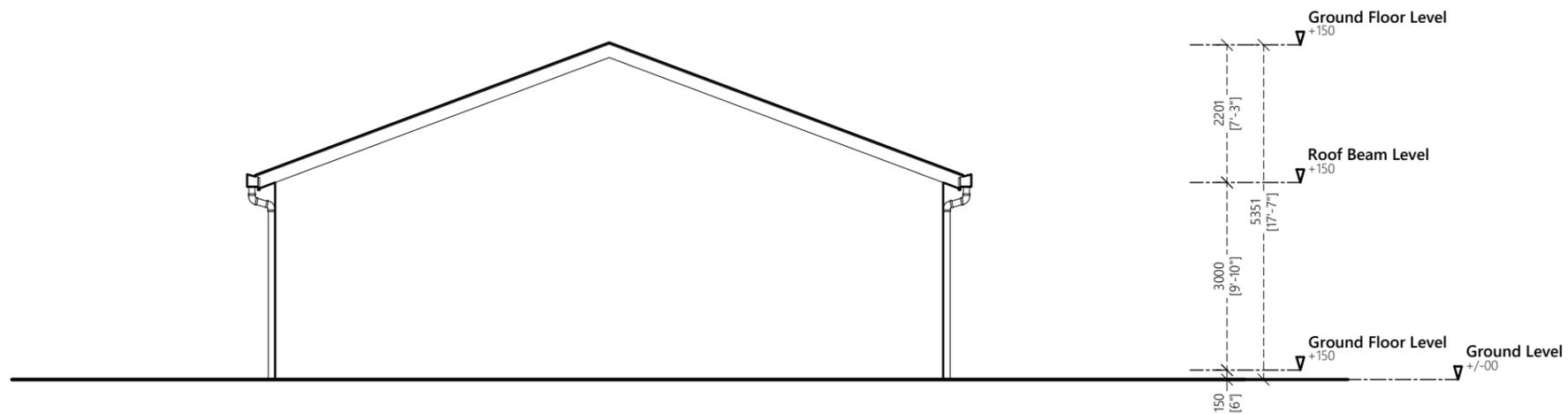
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ELEVATION E1

1:100



ELEVATION E2

1:100

Legend

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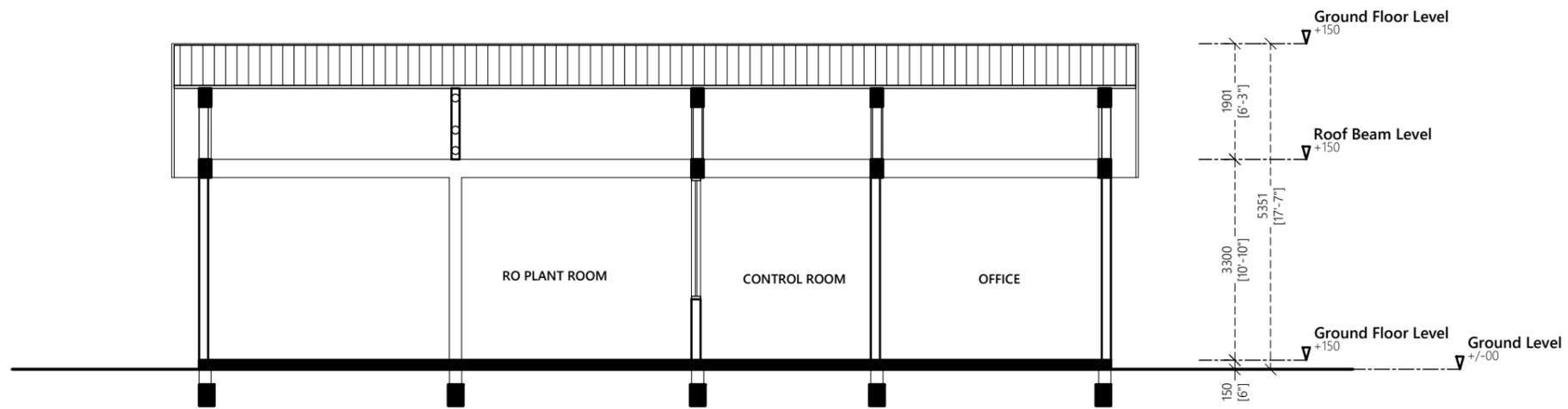
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ELEVATIONS

1:100



SECTION XX

1:100

Legend

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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
 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 be 1000mm above FFL

DOOR & WINDOW SCHEDULE -1

1:50

Legend

Note:

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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 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
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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 conform 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

DOOR & WINDOW SCHEDULE -2

1:50

Legend

Note:

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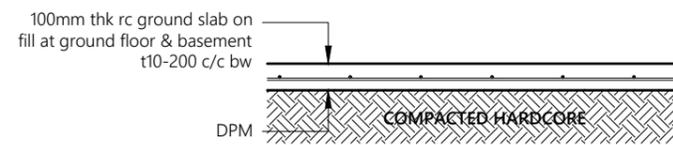
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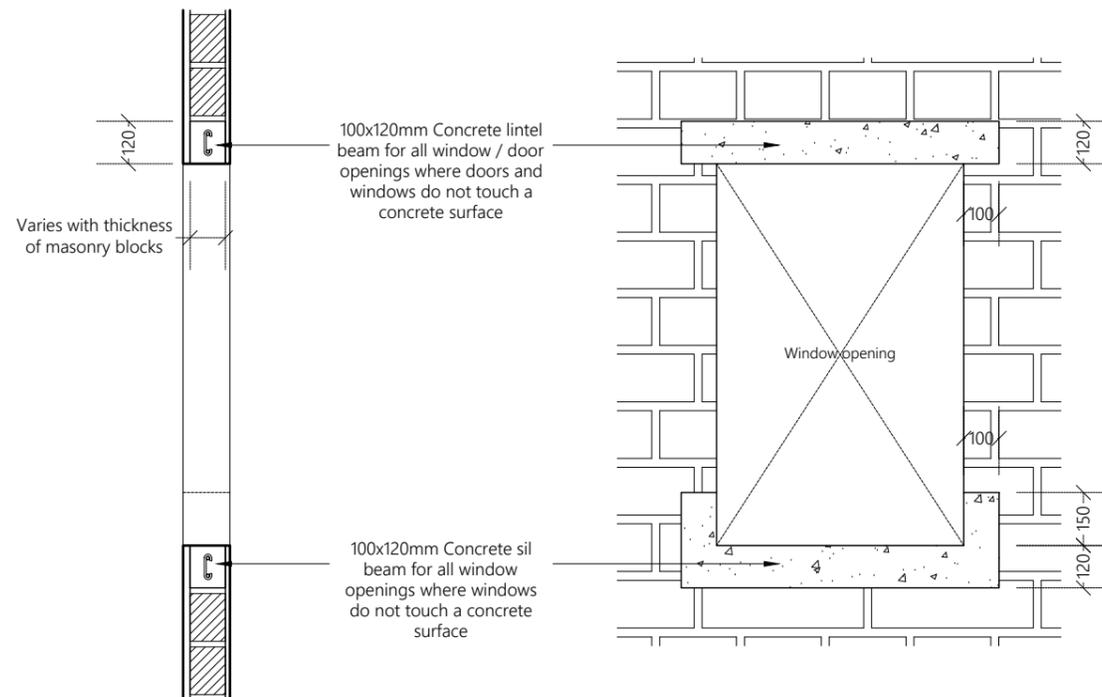


Note:

- 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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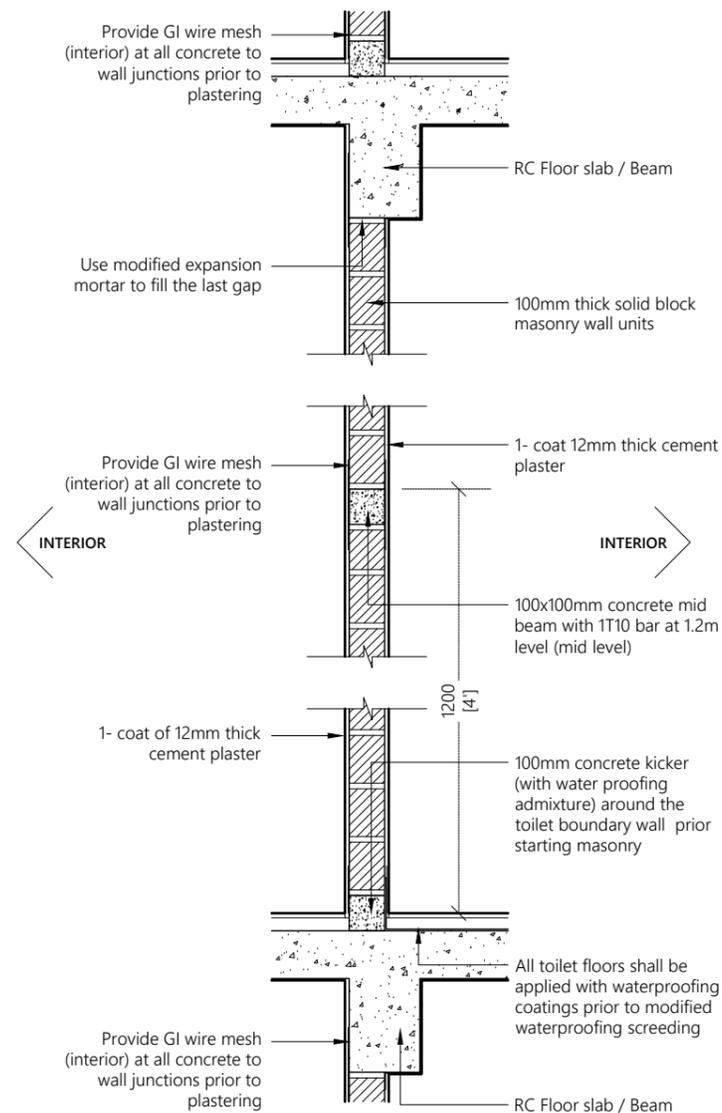
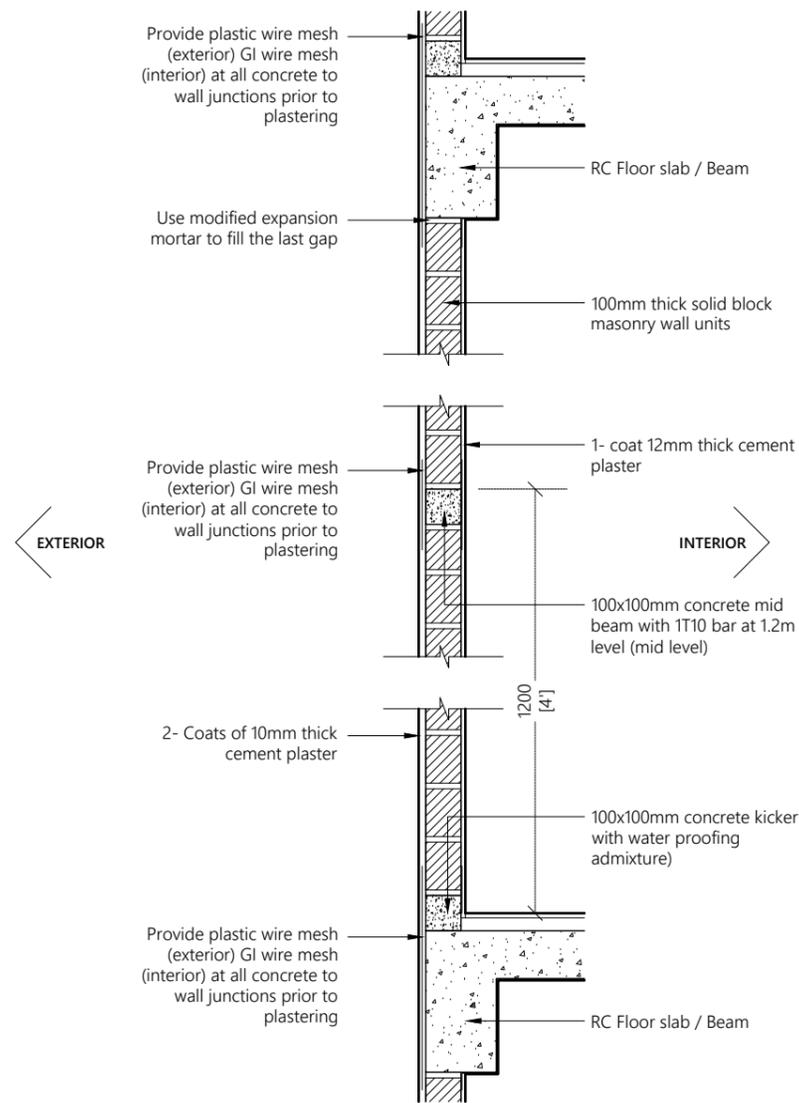
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Note:

- 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.

TYPICAL WALL CONSTRUCTION DETAIL

1:20

Legend

Note:

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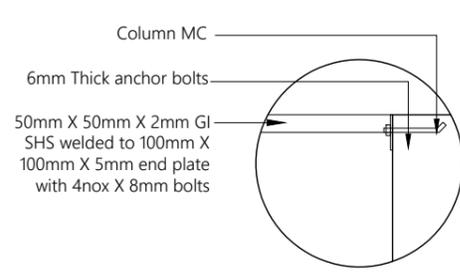
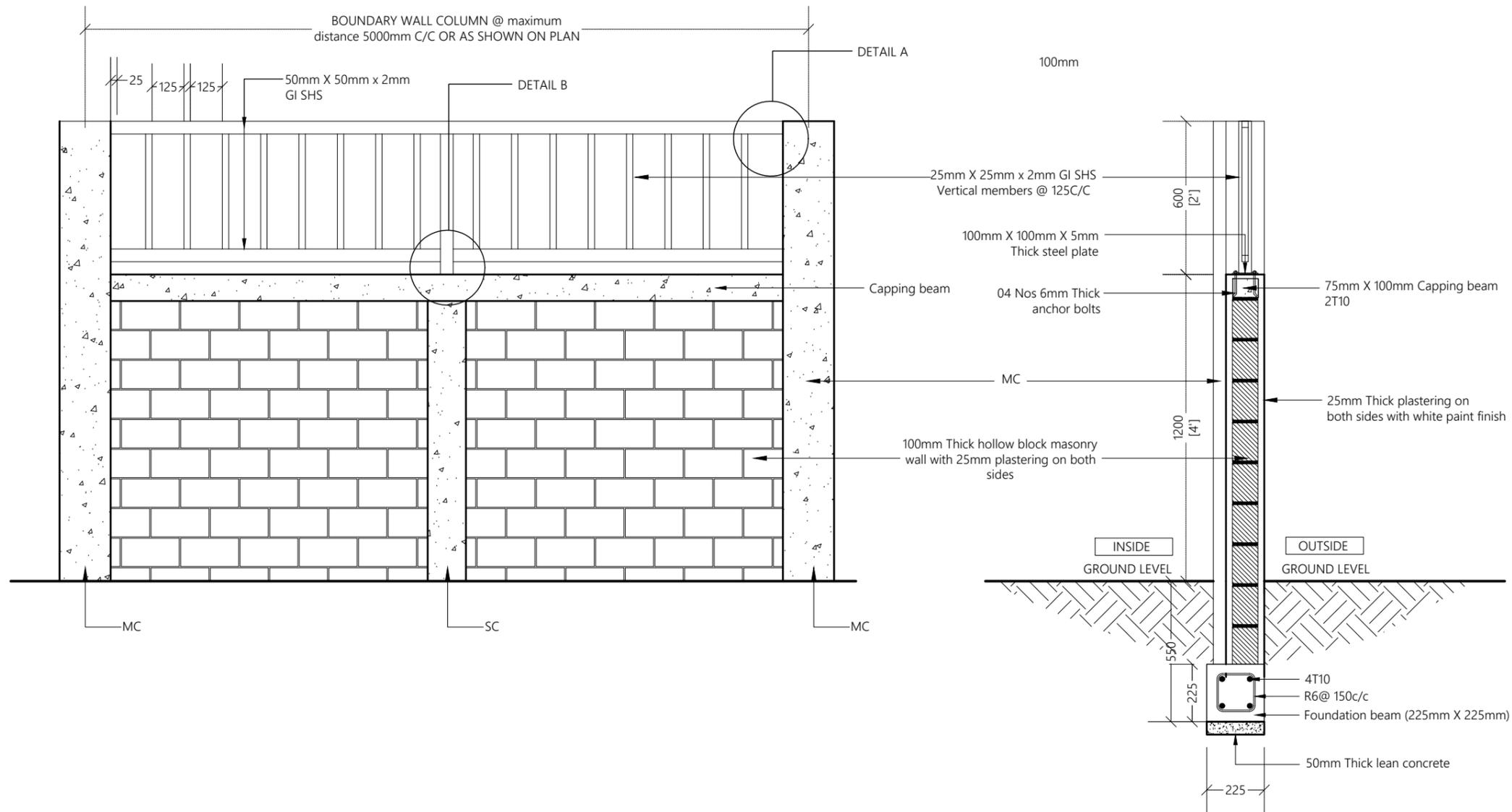
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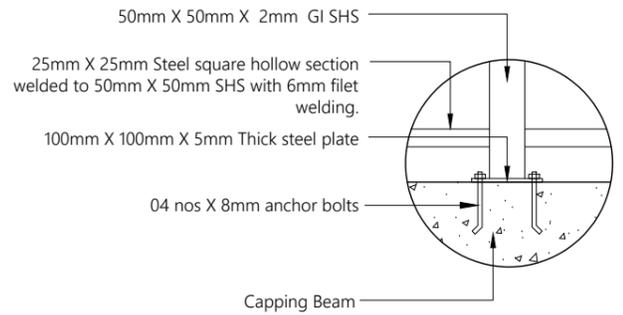
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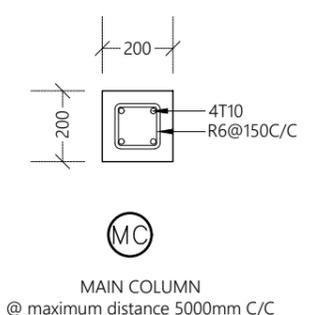
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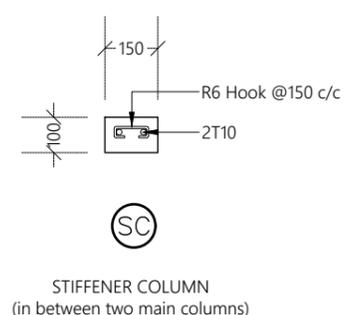
DETAIL A
1:10



DETAIL B
1:10



MC
MAIN COLUMN
@ maximum distance 5000mm C/C



SC
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:

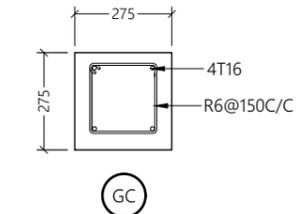
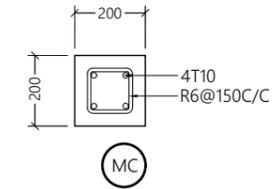
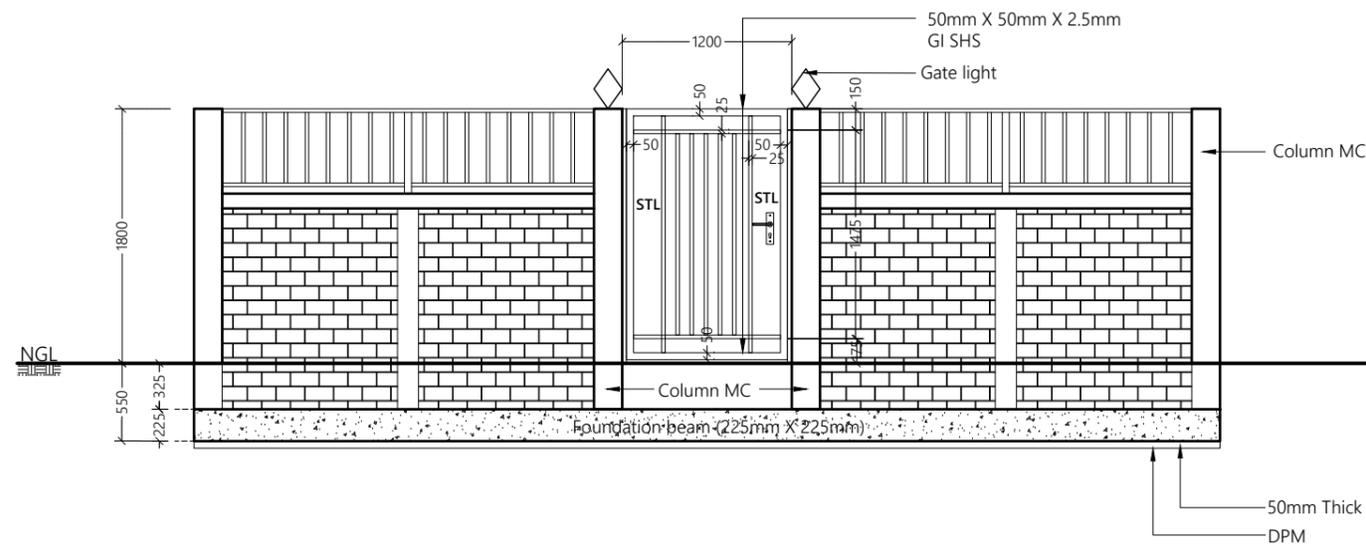
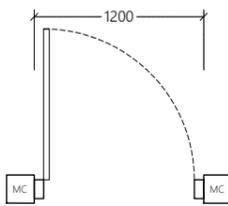
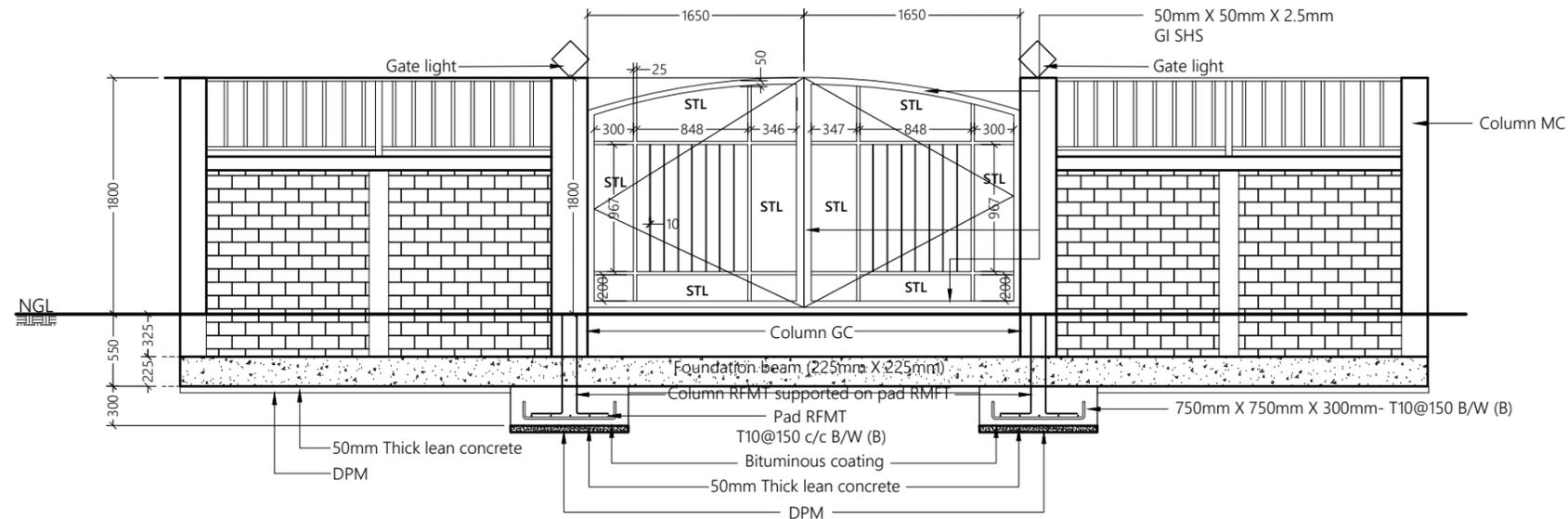
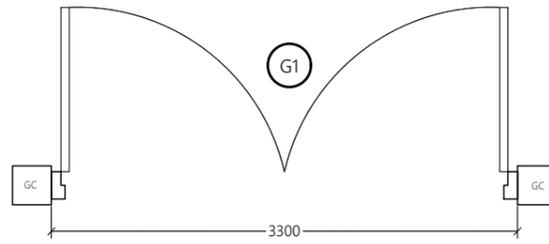
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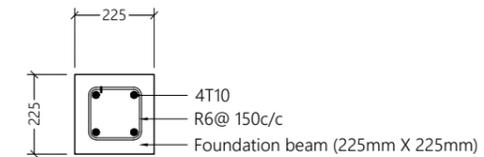
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COLUMN DETAILS
1:20



FOUNDATION BEAM DETAIL
1:20

GATE DETAILS

1:50

Legend

Note:

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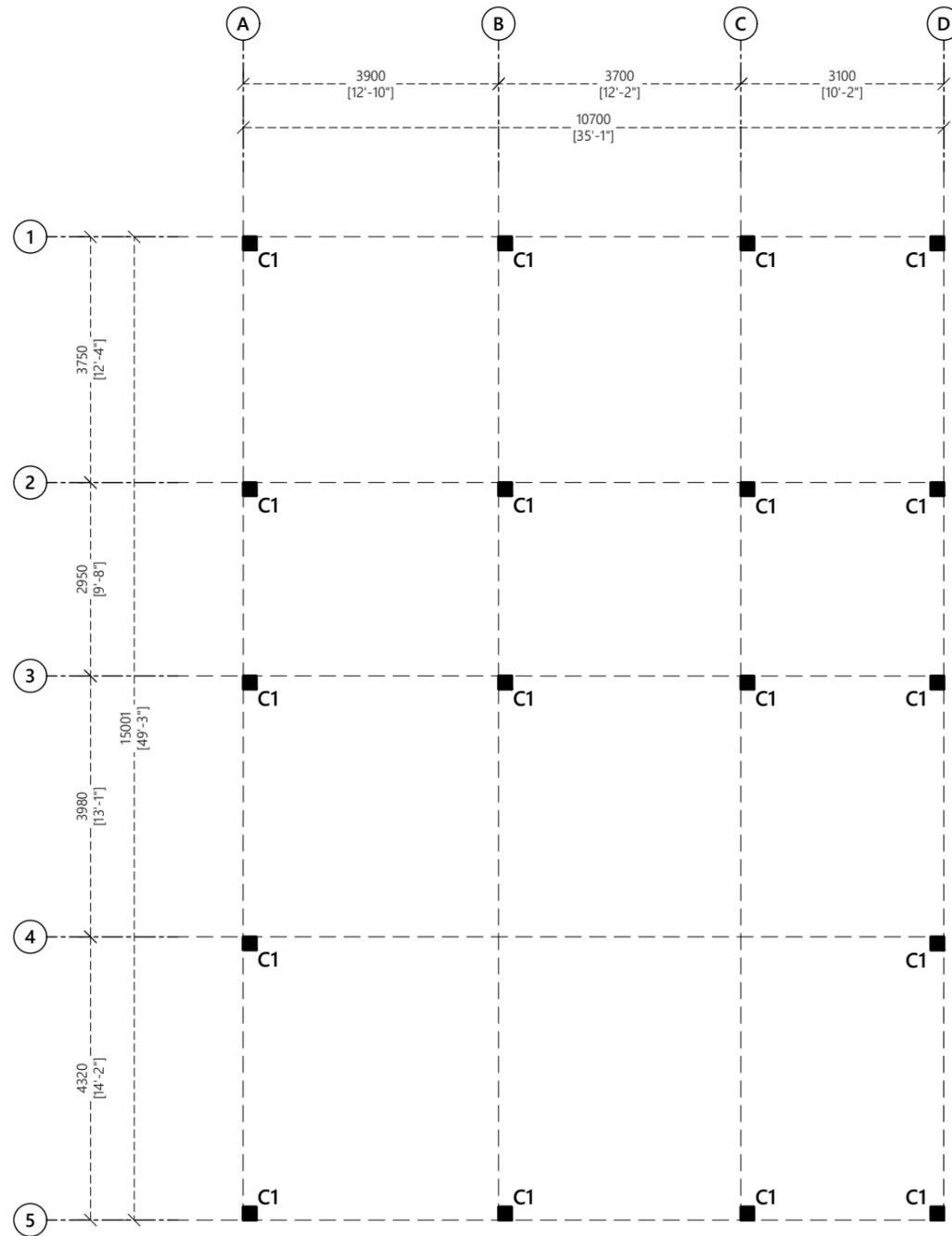


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Building Self-Constructive People

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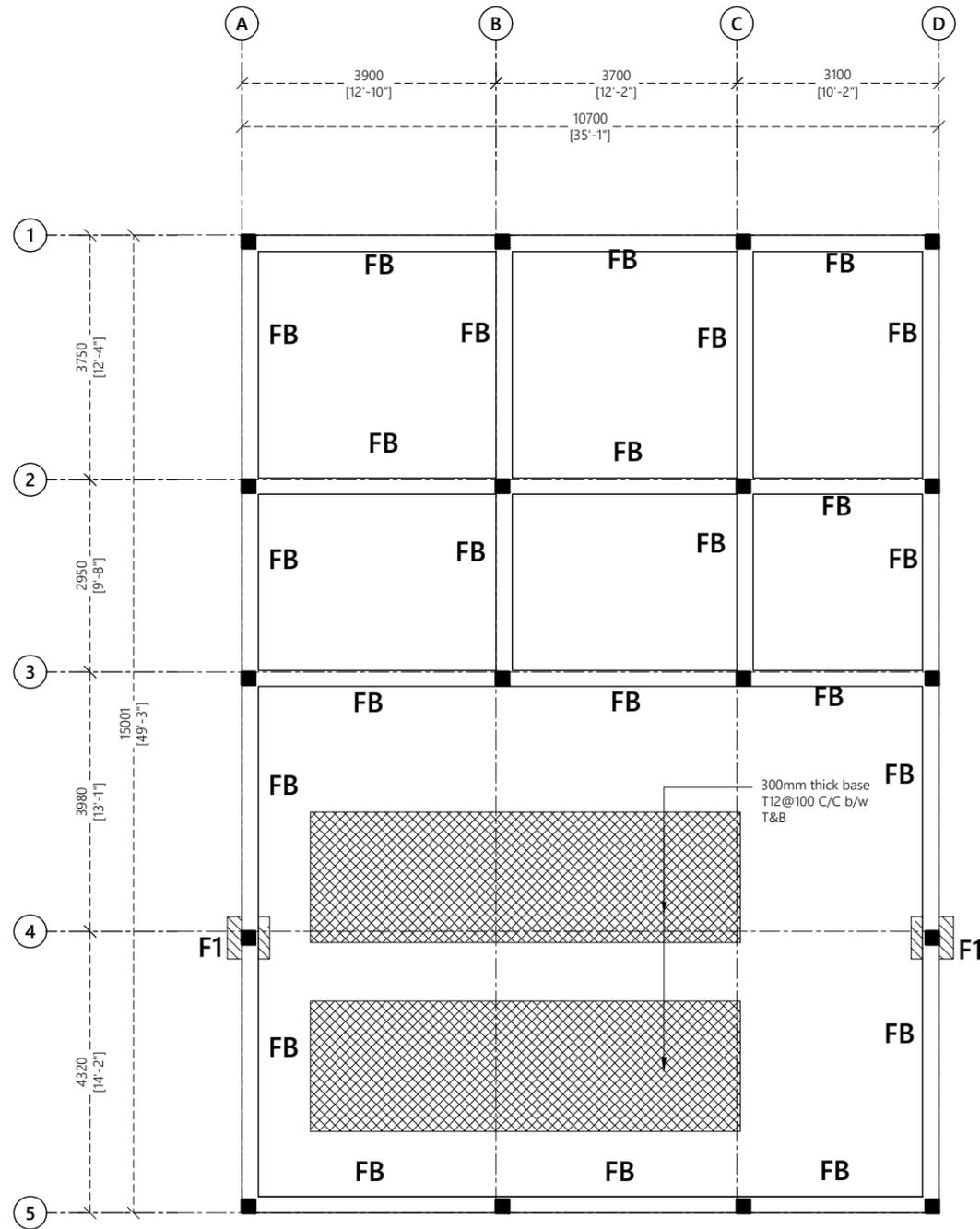


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COLUMN LAYOUT PLAN

1:100



Notes:

Foundation Depth: 600mm

FOUNDATION PLAN

1:100

Legend

Note:

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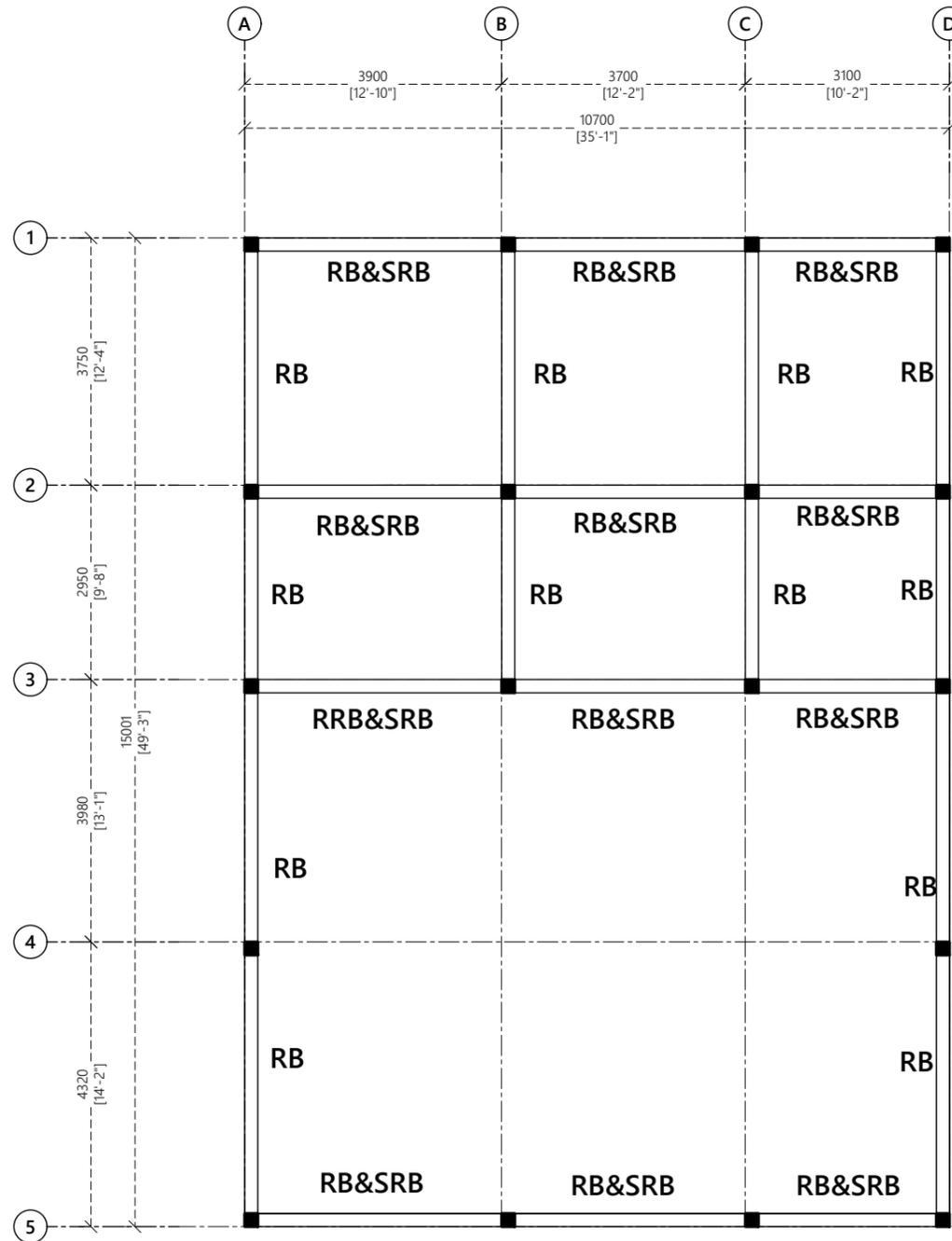
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ROOF BEAM PLAN

1:100

Legend

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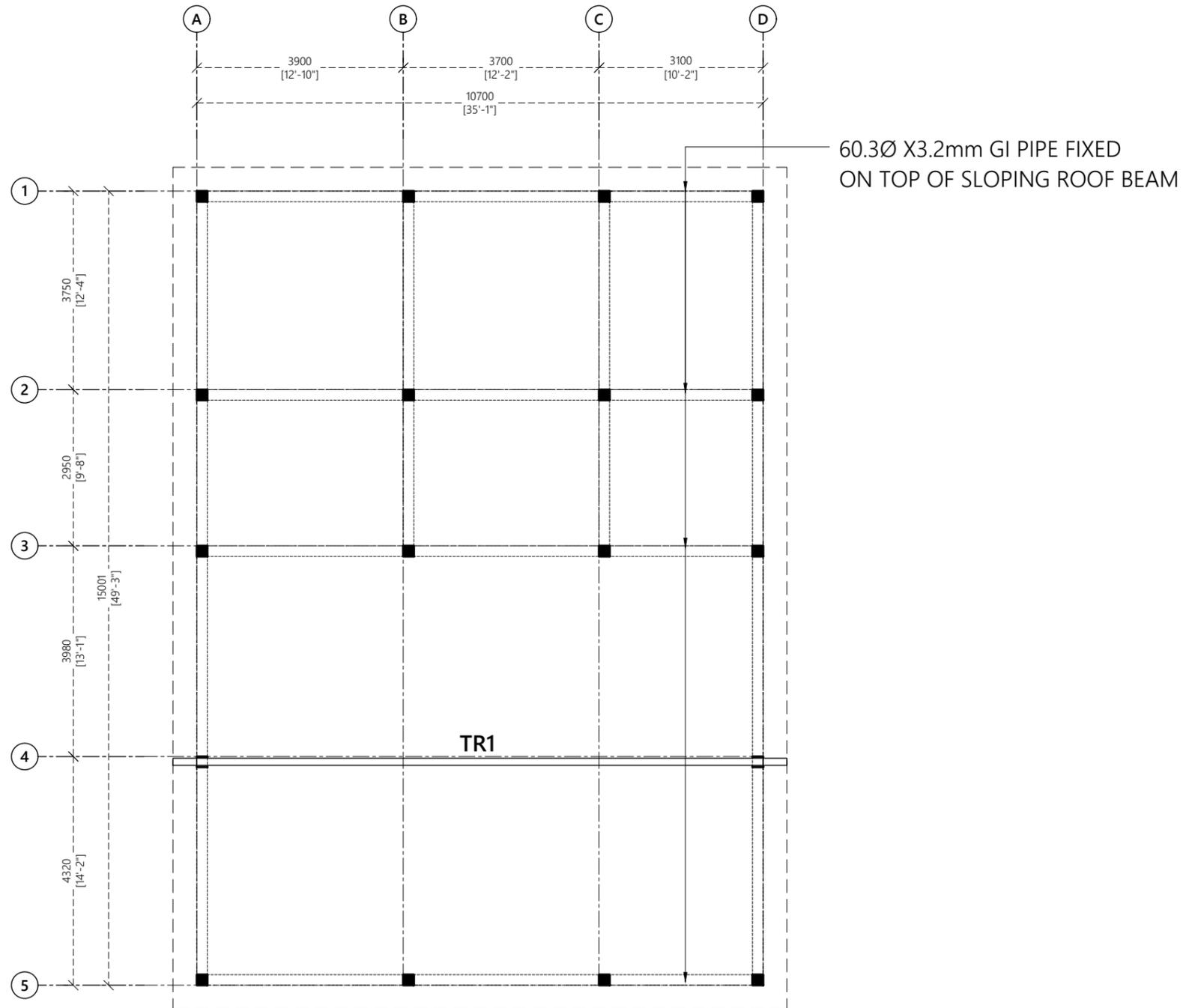
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INFRA
INFRASTRUCTURE

Makana Sufi Construction - Maldives

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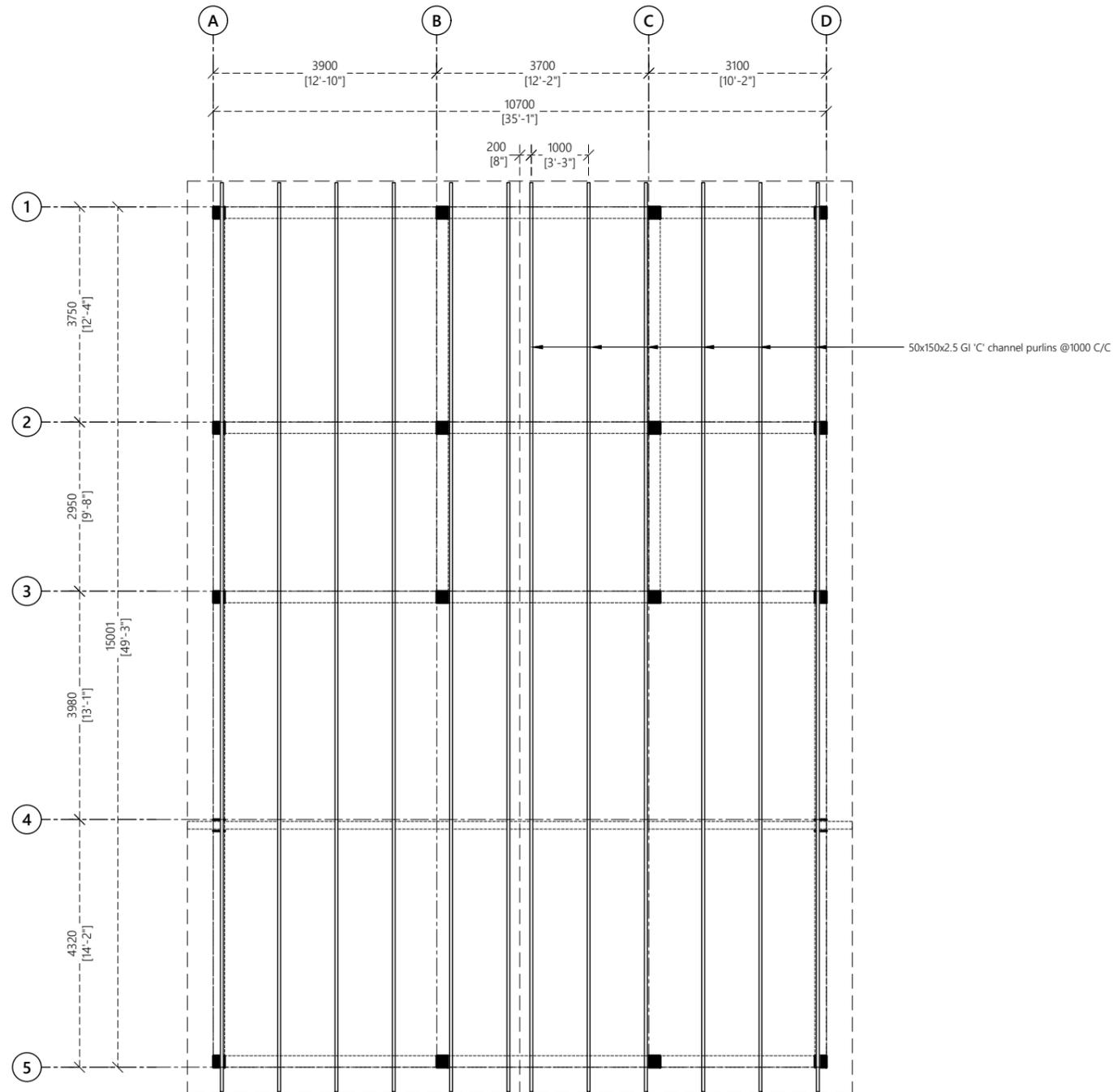


Building Self construction - Maldives

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ROOF TRUSS PLAN

1:100



ROOF FRAMING PLAN

1:100

Legend

Note:

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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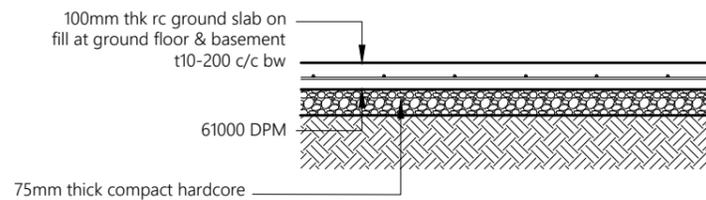
Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 Islands, Maldives – Package 6
 Sub Title:
Water Supply System in L.Hithadhoo

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

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FEEDBACK INFRA
 Making Self construction happen

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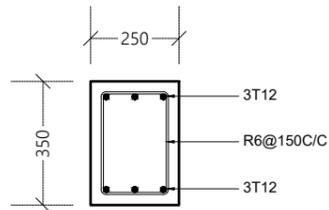


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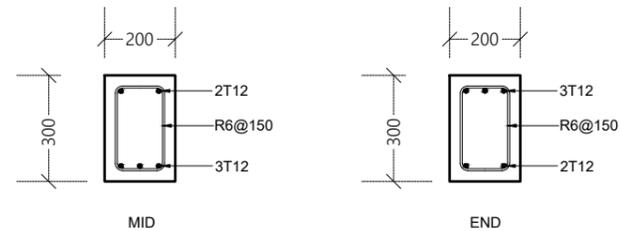
- All cover blocks shall be casted using grade C25/30 concrete with 5-10mm aggregates
- For slab, rebar spacer chairs spacing shall be minimum 1m spacing or 1 no. per 1 sqm

TYPICAL GROUND SLAB DETAIL

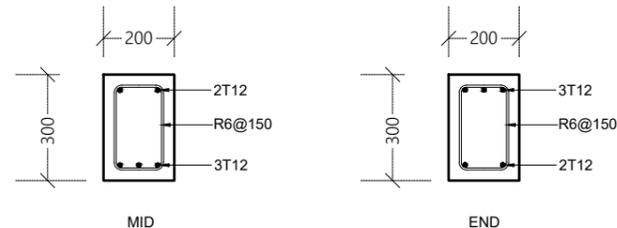
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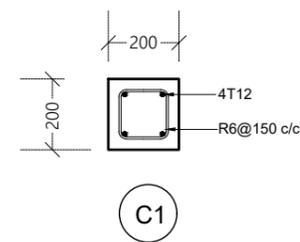
FOUNDATION BEAM (FB)



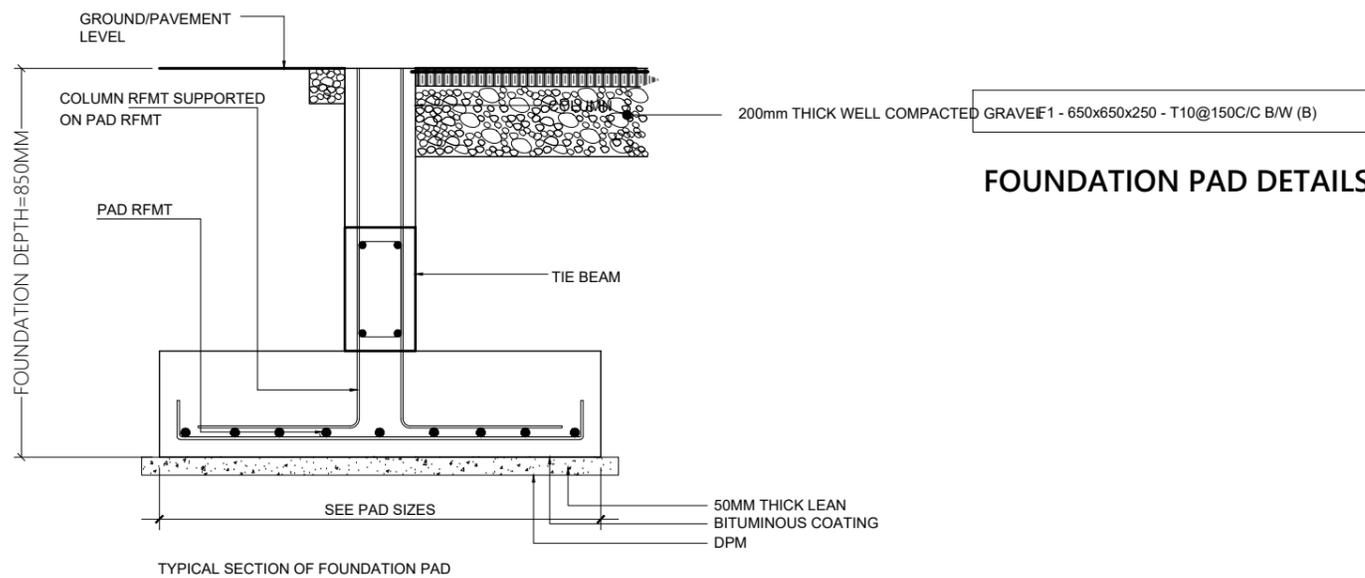
ROOF BEAM (RB)



SLOPING ROOF BEAM (SRB)

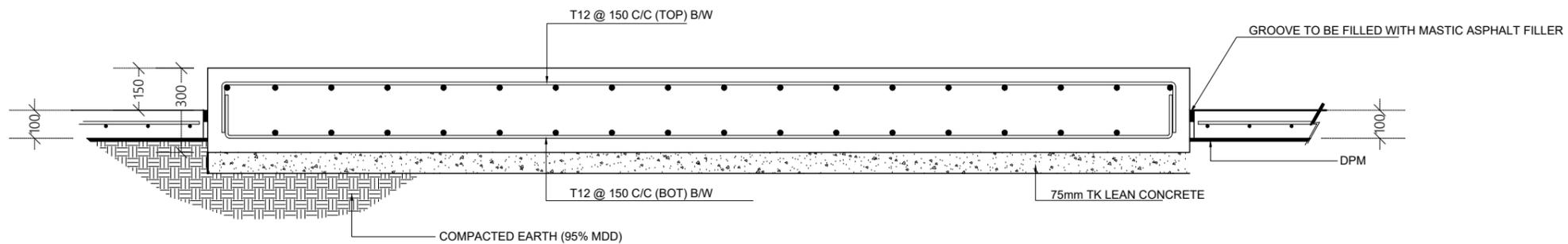


COLUMN DETAIL



FOUNDATION PAD DETAILS

TYPICAL COLUMN SECTION



RO PLANT BASE DETAIL

Legend

Note:

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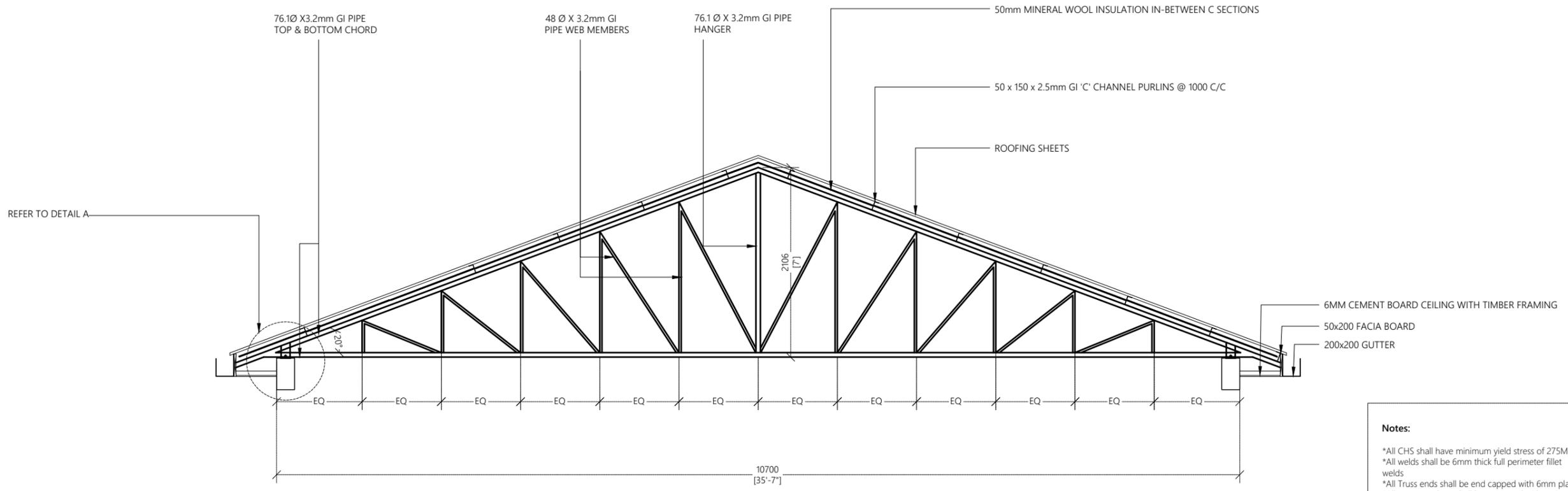
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STRUCTURAL DETAILS

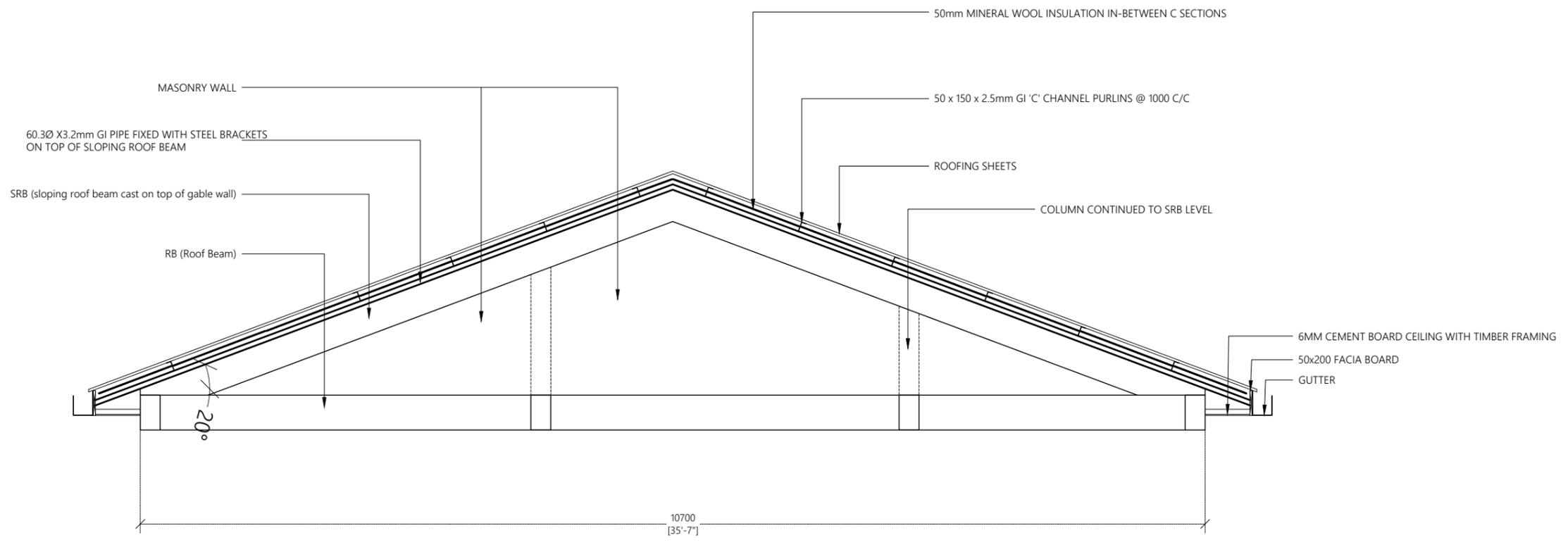
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TRUSS DETAIL TR1 @ GRID 2

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:

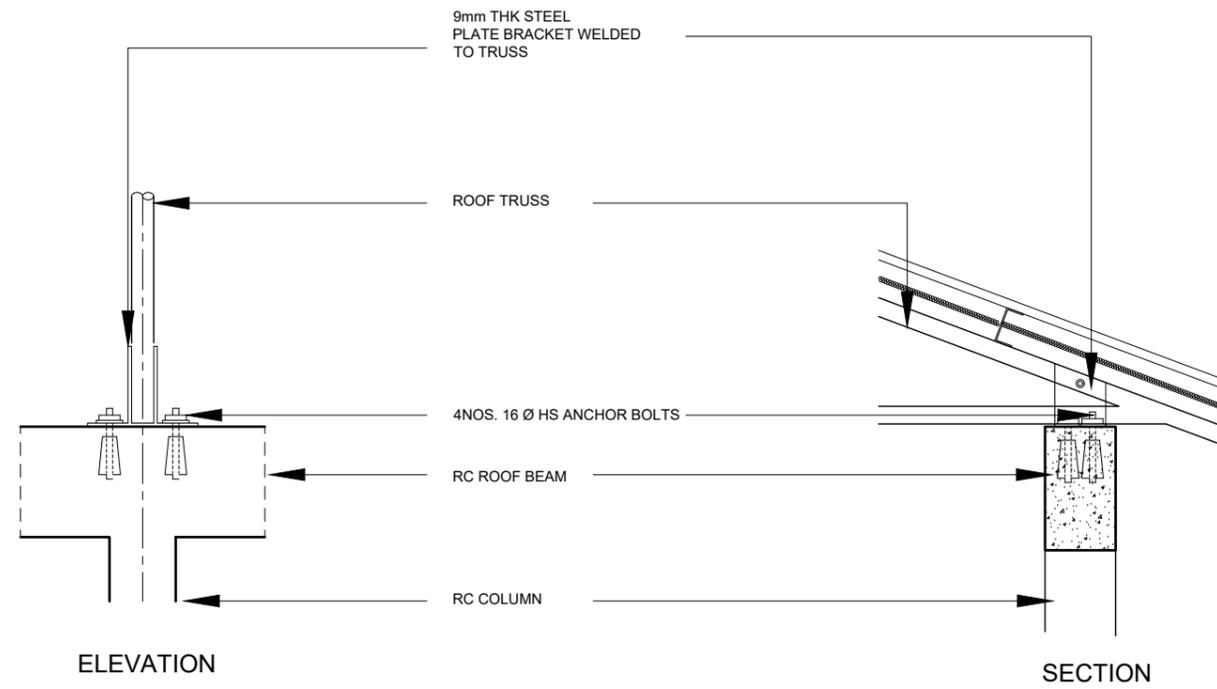
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ELEVATION

SECTION

Legend

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DETAIL A

1:20

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT VEHICLE SHED, L.HITHADHOO

Legend

Note:

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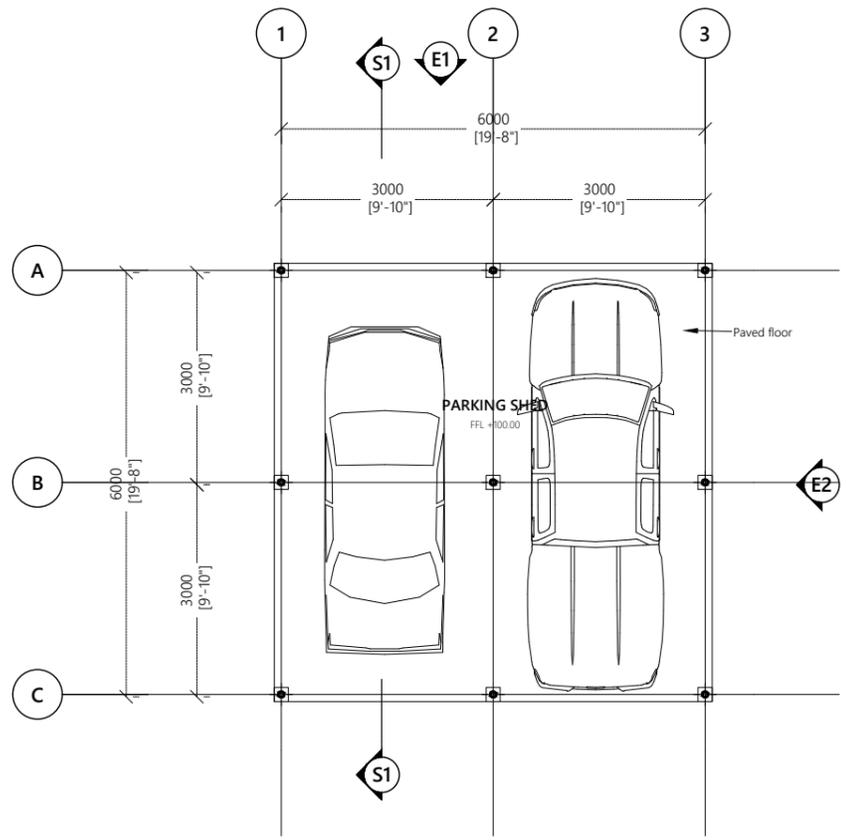


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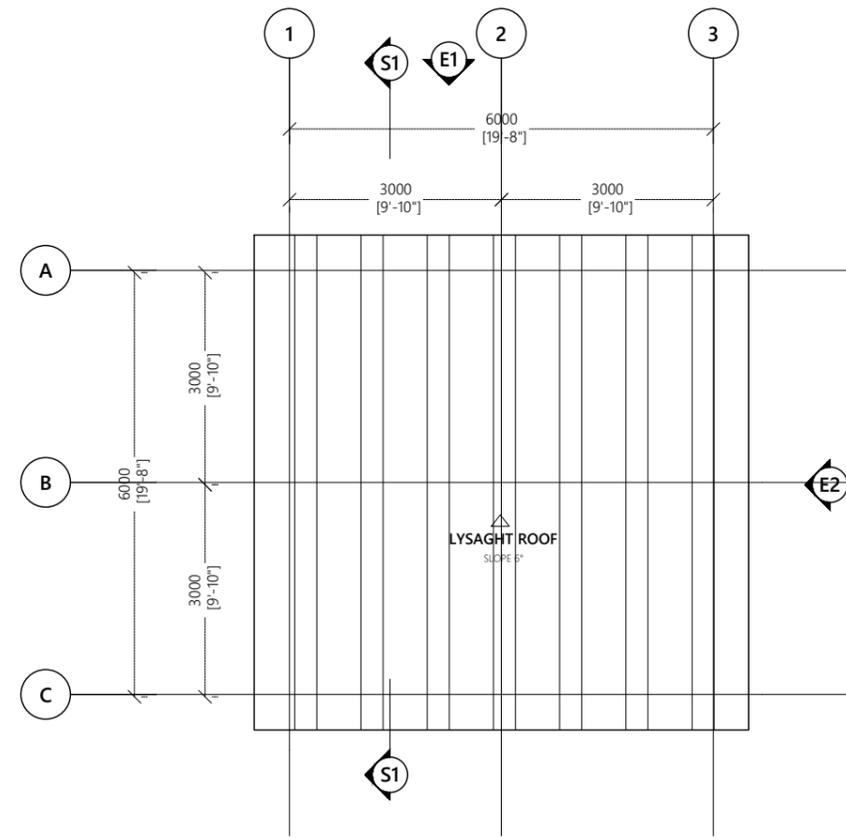
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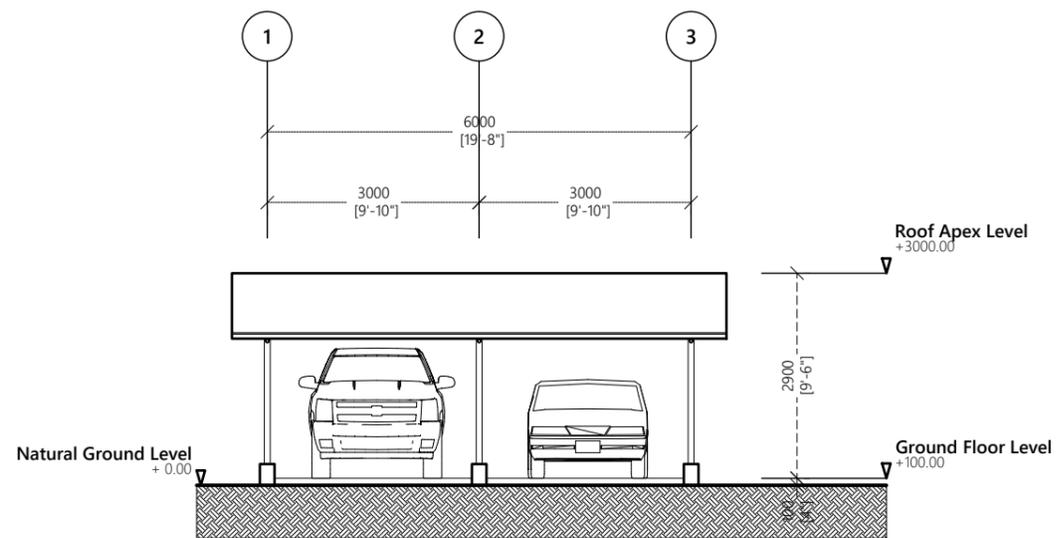
GROUND FLOOR PLAN

1:100



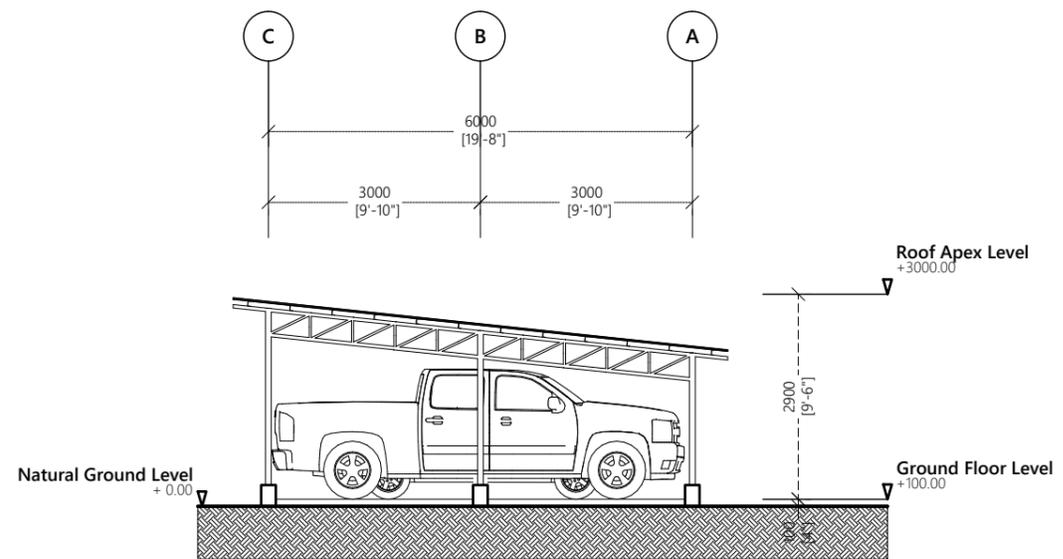
ROOF PLAN

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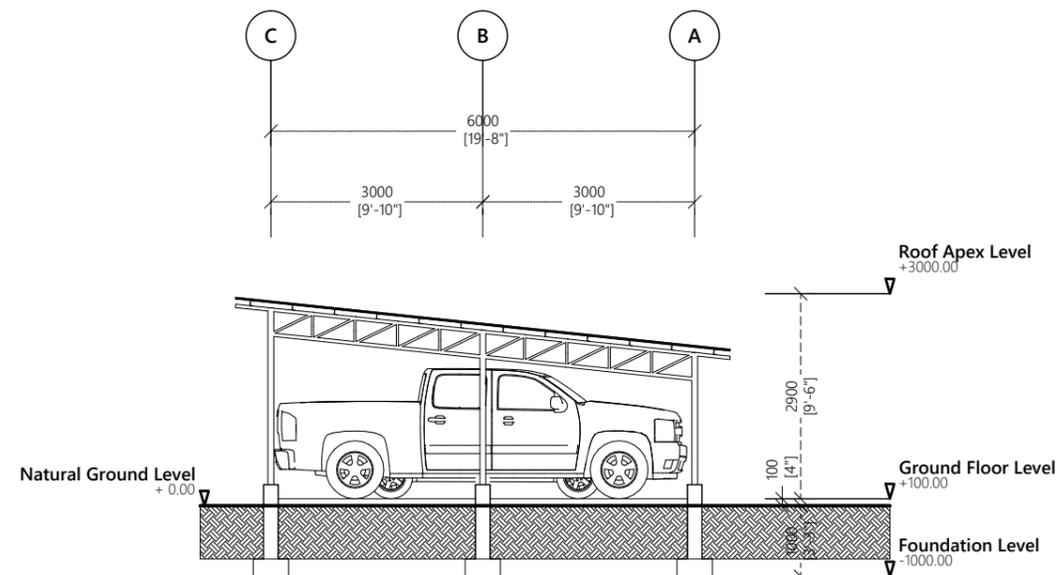
ELEVATION E1

1:100



ELEVATION E2

1:100



SECTION S1

1:100

Legend

Note:

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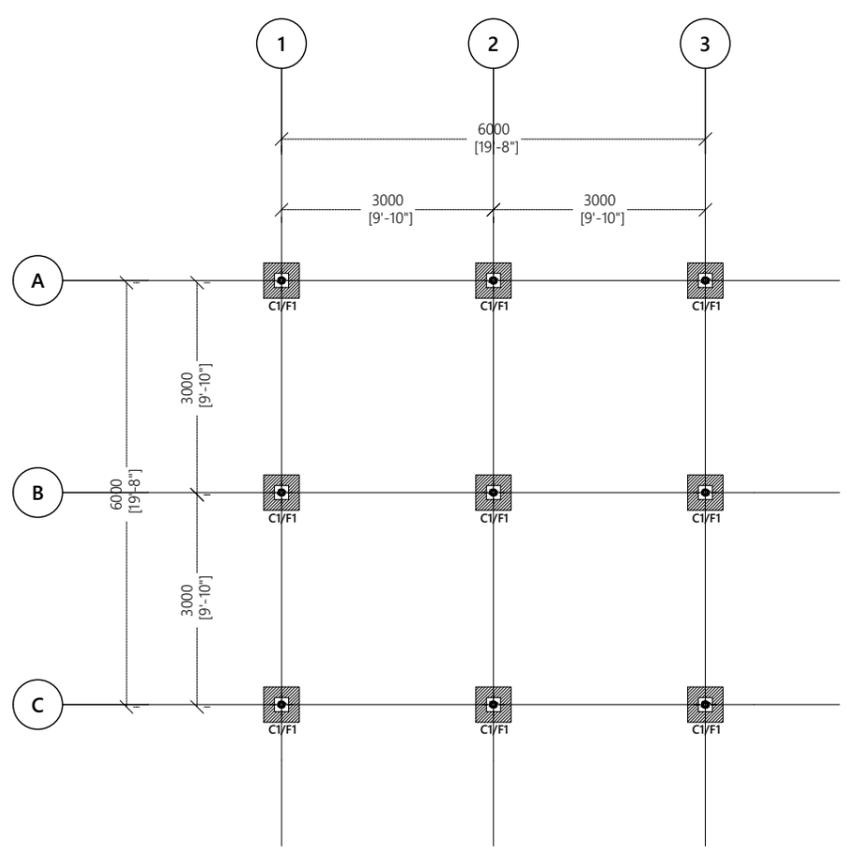
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Maldiviye Sufiyeenaa Hoppo

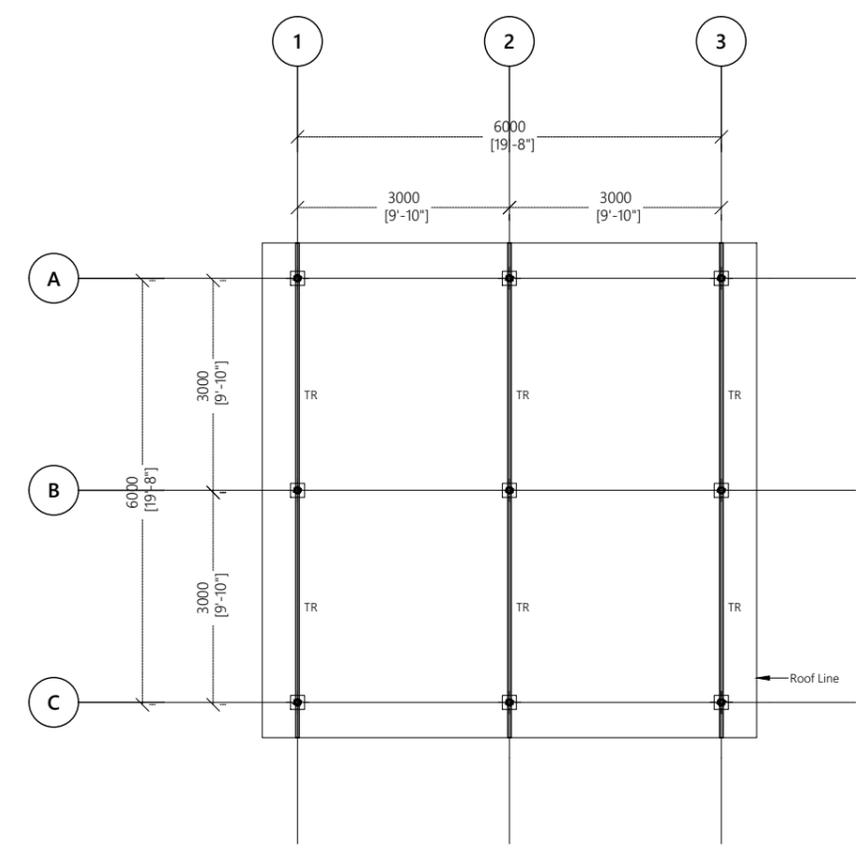
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Legend



FOUNDATION PLAN

1:100



ROOF TRUSS PLAN

1:100

Note:

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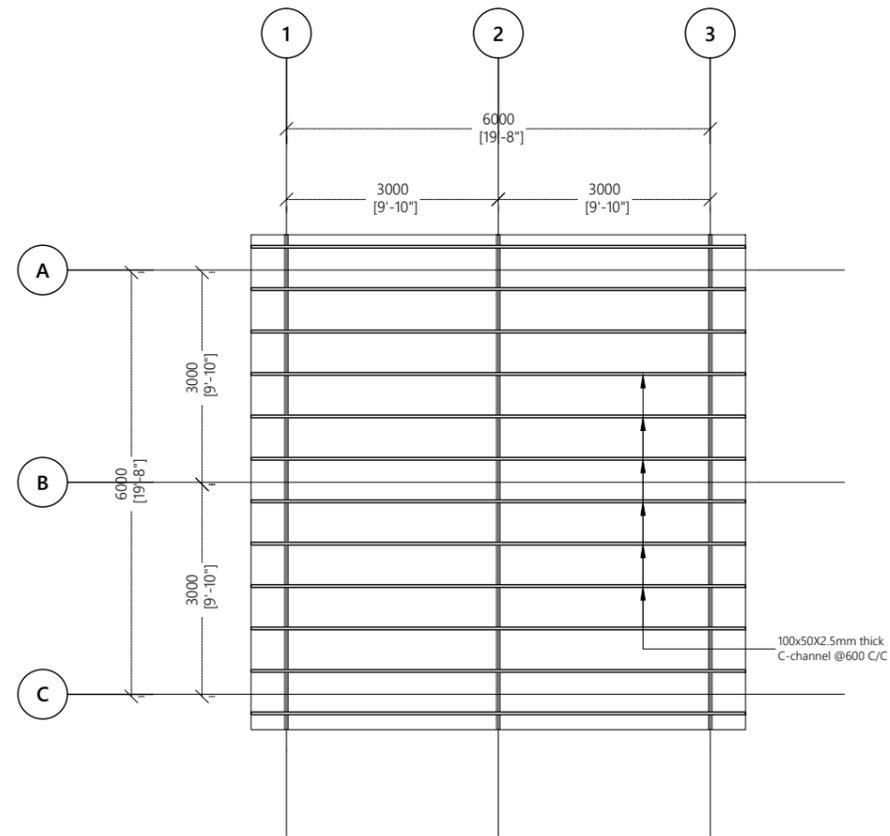
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ROOF FRAMING PLAN

1:100

Legend

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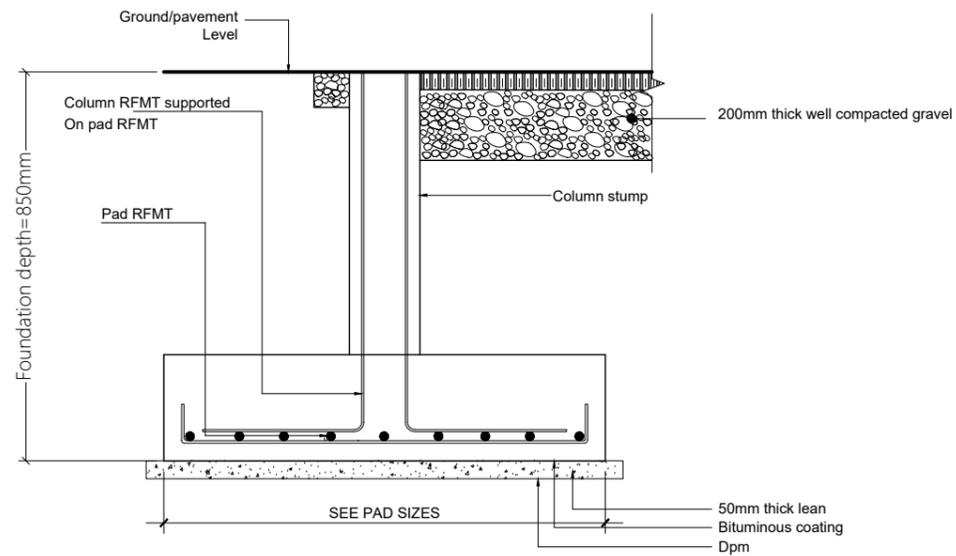


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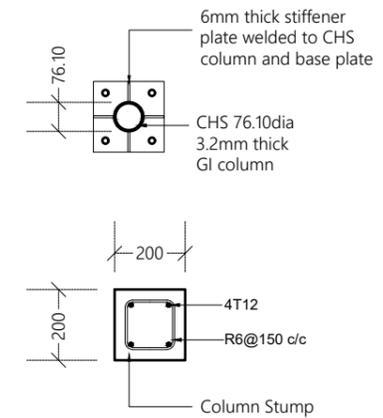
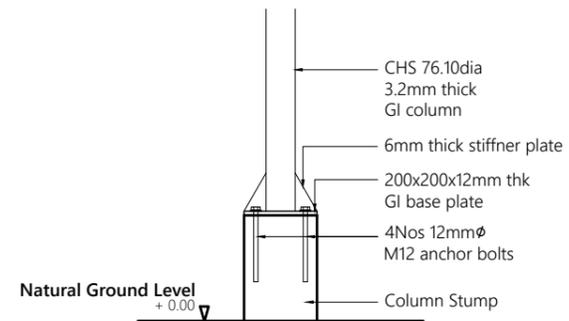
Building Self construction - together

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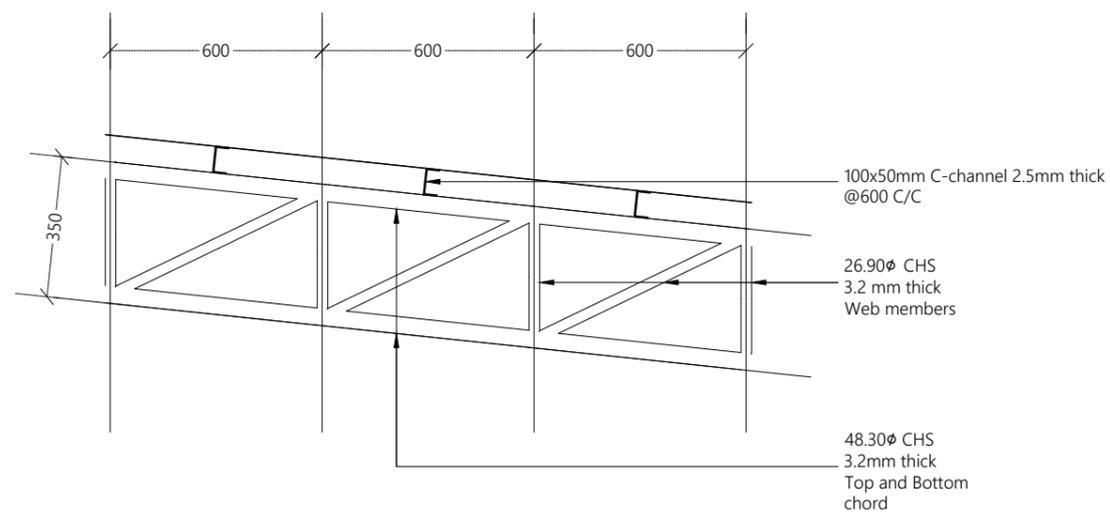
TYPICAL FOOTING DETAIL

1:20



COLUMN DETAIL

1:20



TRUSS DETAIL

1:20

Legend

Note:

- Foundation Pad Detail.**
 * F1 - 500x500x250 - T10@150C/C B/W (B)
- *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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Date: Aug 2020	SCALE (A3): 1:50
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BUILDING SERVICES DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING, L.HITHADHOO

For Ministry of National Planning, Housing and Infrastructure

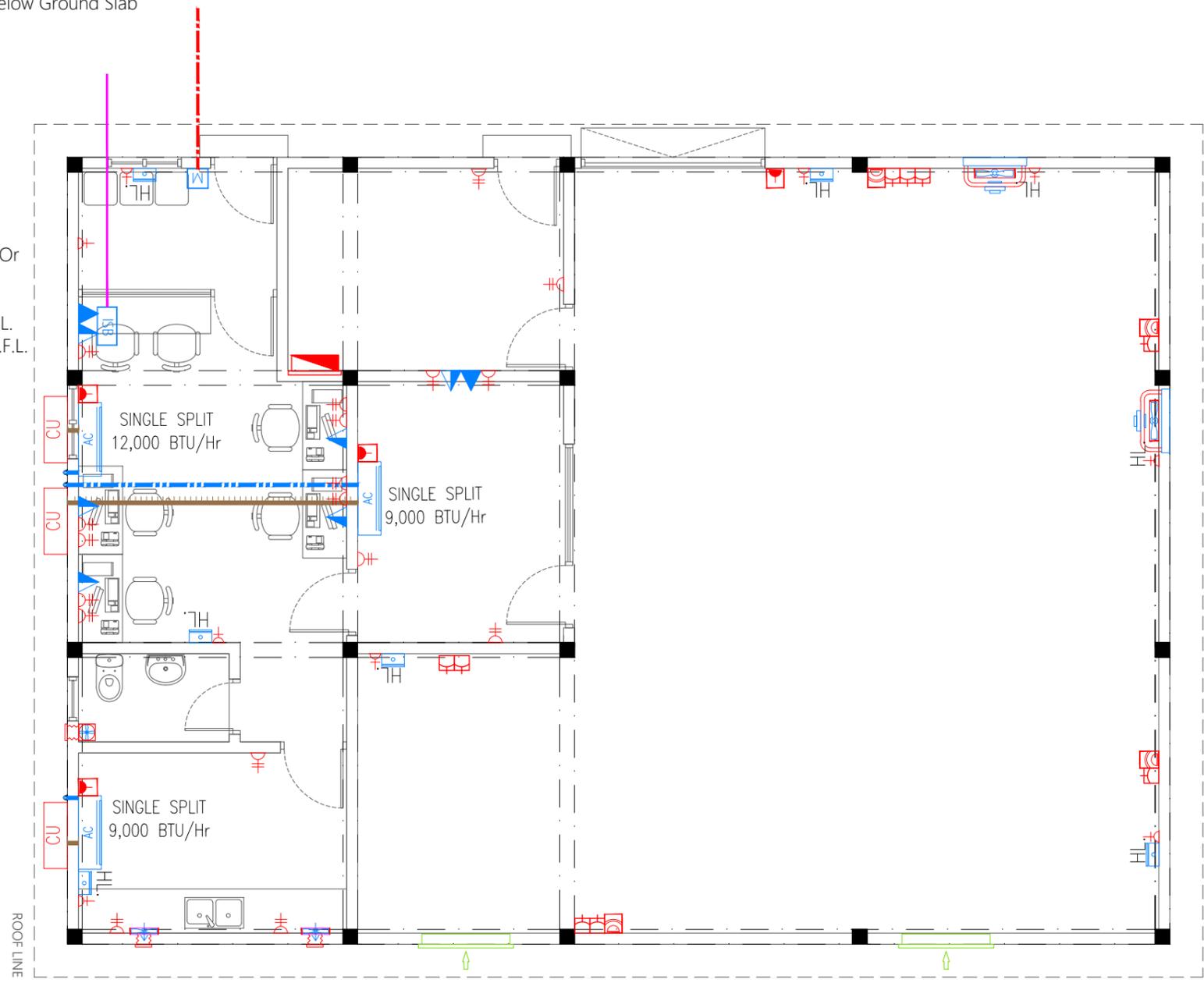
CONTENTS

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

-  Refrigerator
-  250mm Duct
-  400mm Duct
-  AC Wall Mounted
-  CU Outdoor Unit
-  Ceiling Fan
-  Wall Switch
-  Single Motor
-  Fresh Air

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.
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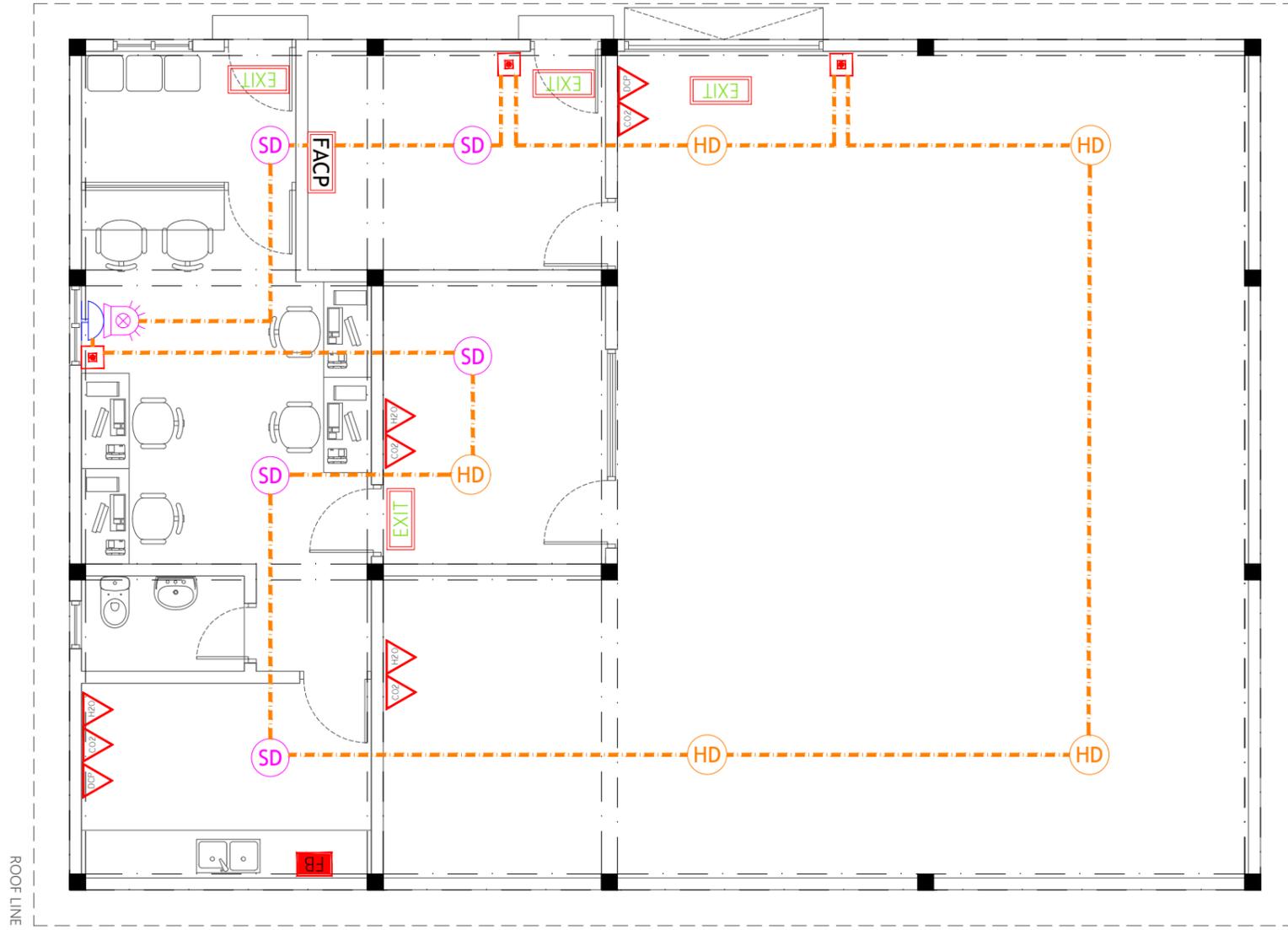
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GROUND FLOOR POWER



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:

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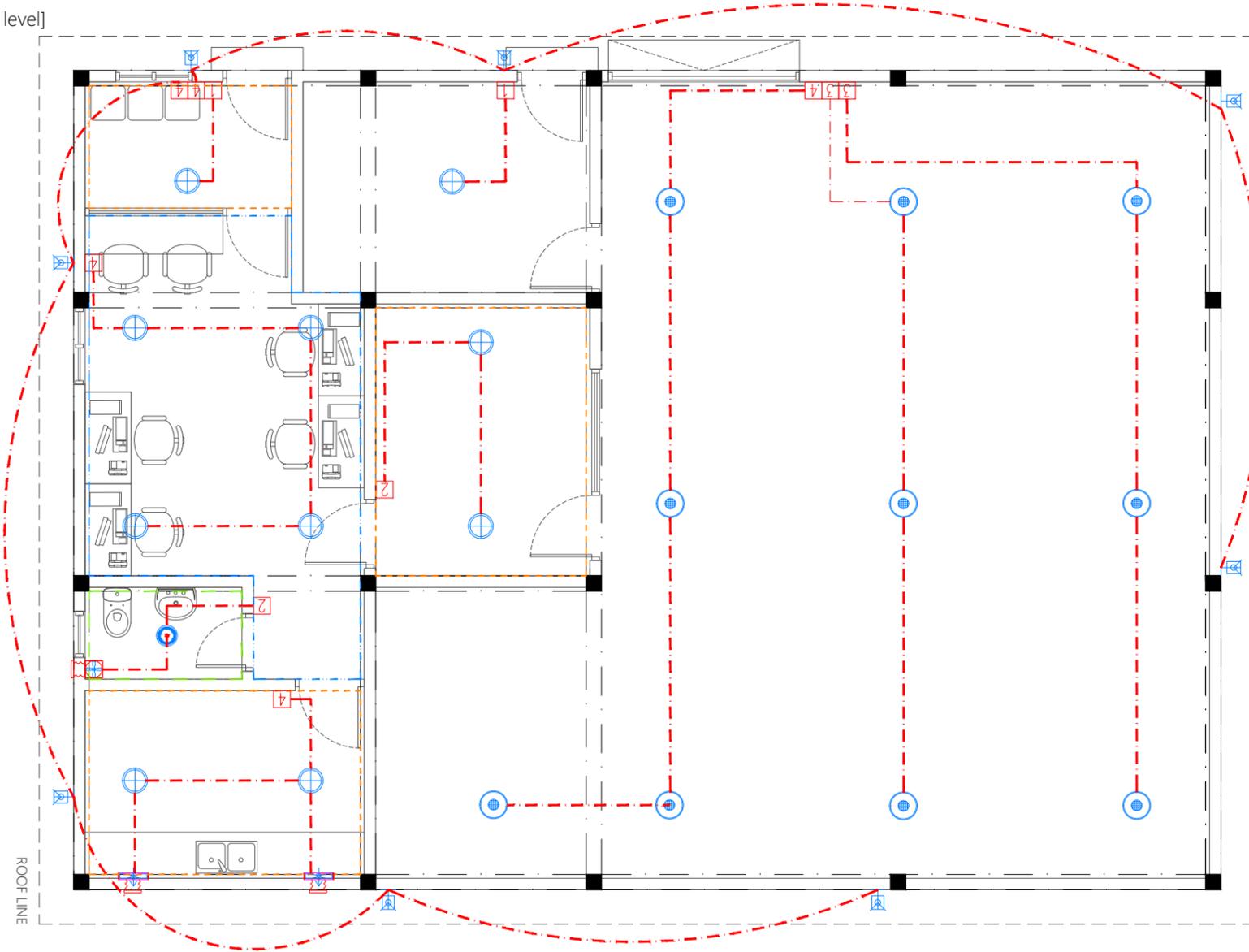
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GROUND FLOOR



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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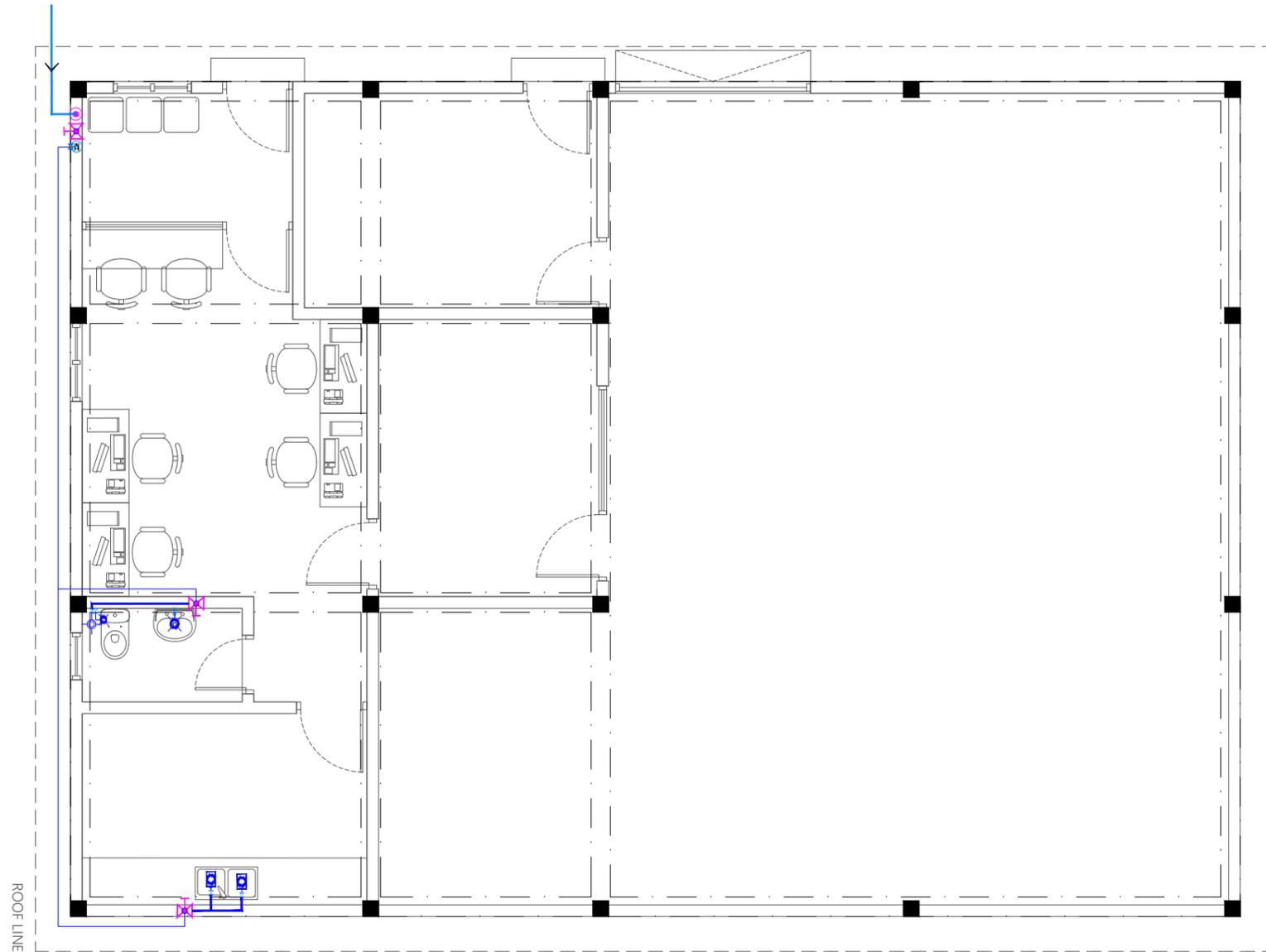
GROUND FLOOR LI



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



ROOF LINE

Legend

Note:

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GROUND FLOOR PLU

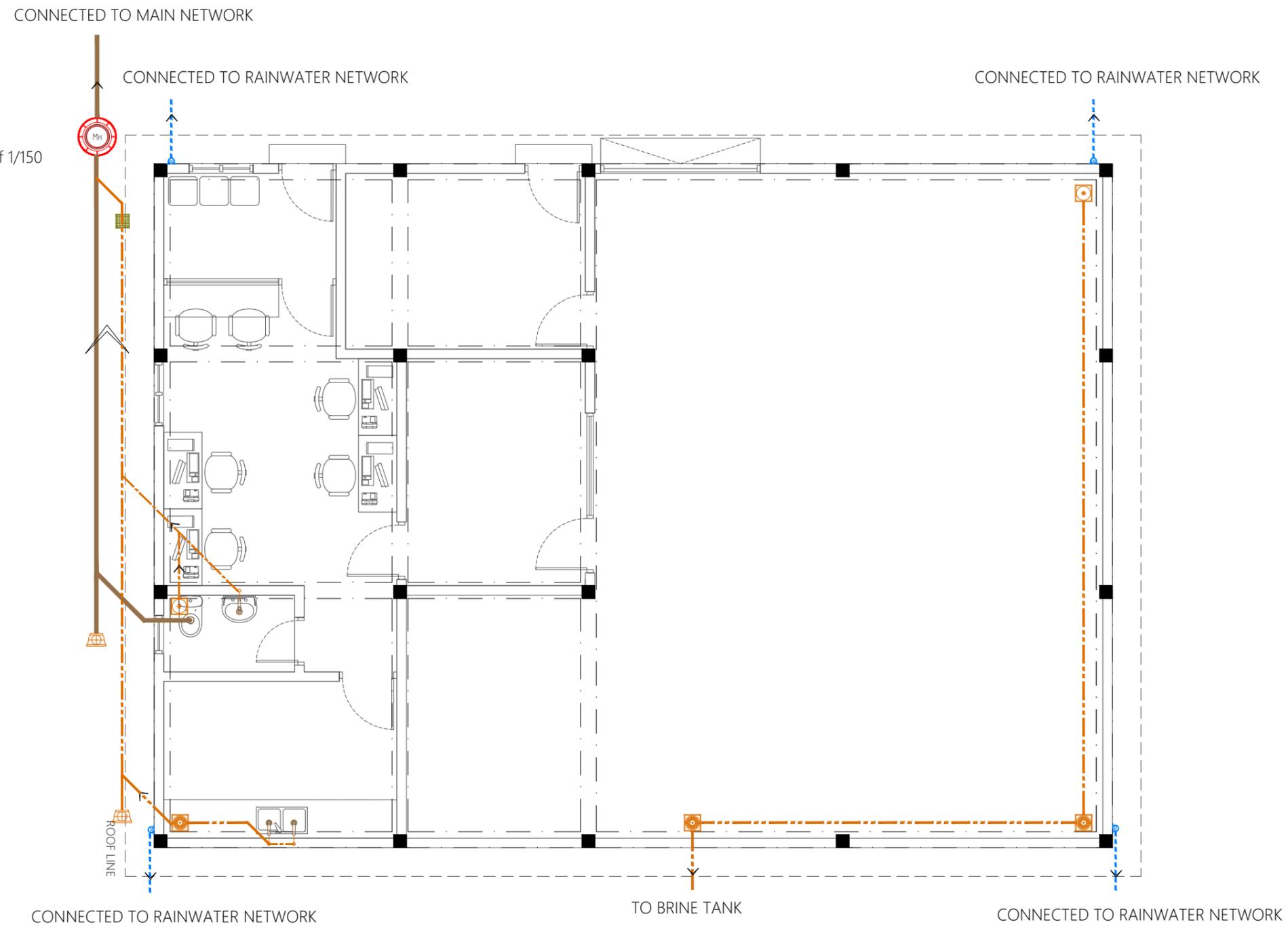


Legend

-  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 DR

Legend

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

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 L.Hithadhoo

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



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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



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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FEEDBACK INFRA
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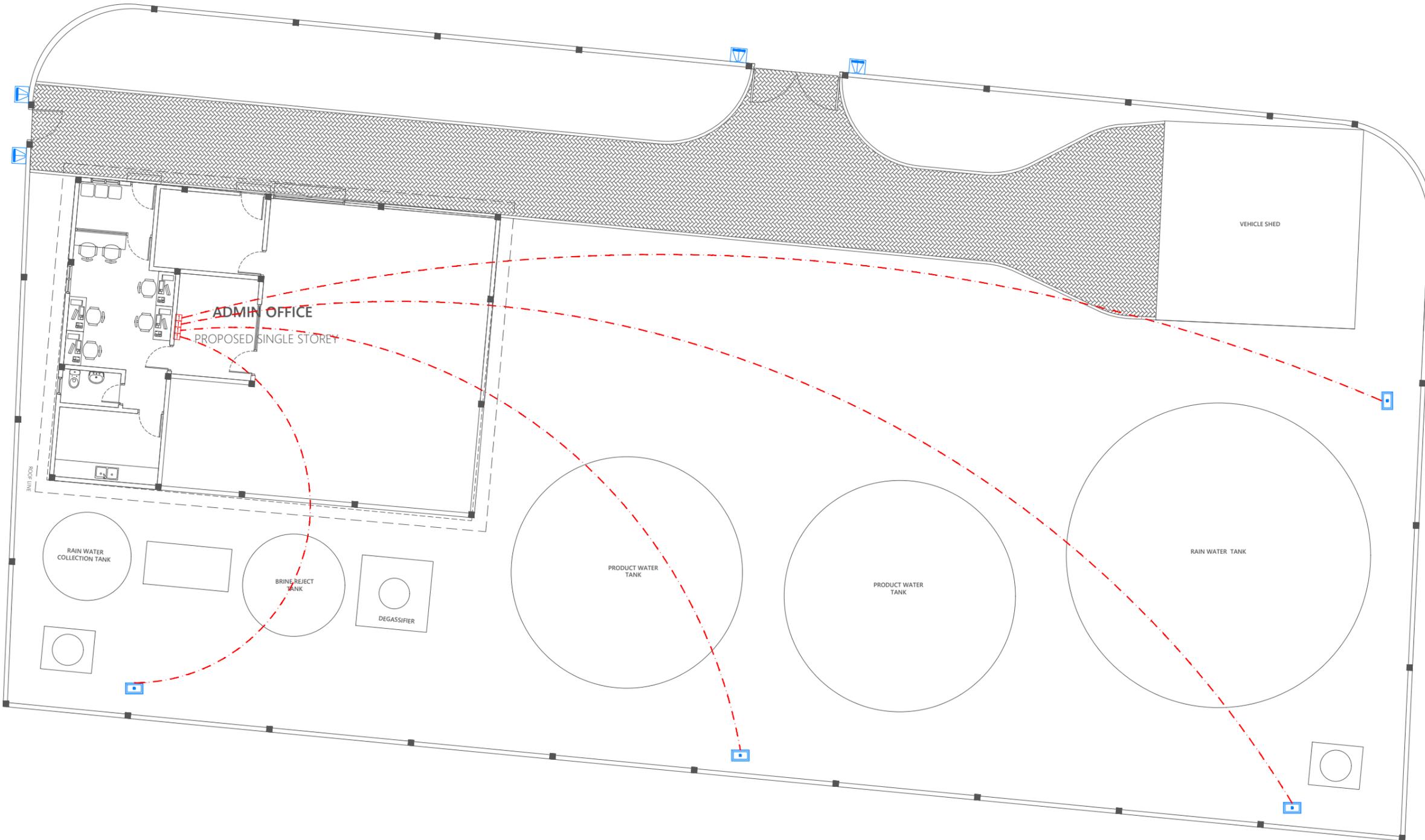
Drawn: H.R.	Checked: M.R.
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Project No: EP-WS/2019/06	
Rev: R-00	Page: DR-02

ROOF D



Legend

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



Legend

Note:

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FIDBACK INFRA
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Drawn: H.R.	Checked: M.R.
Designed: H.R.	Approved: M.R.
Date: Aug 2020	SCALE (A3): 1:150
Project No: EP-WS/2019/06	
Rev: R-00	Page: EL-02

SITE LIGHTING LAYOUT
 1:150