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

PACKAGE 3

WATER SUPPLY SYSTEM OF K. HIMMAFUSHI,MALDIVES

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

EPOCH ASSOCIATES

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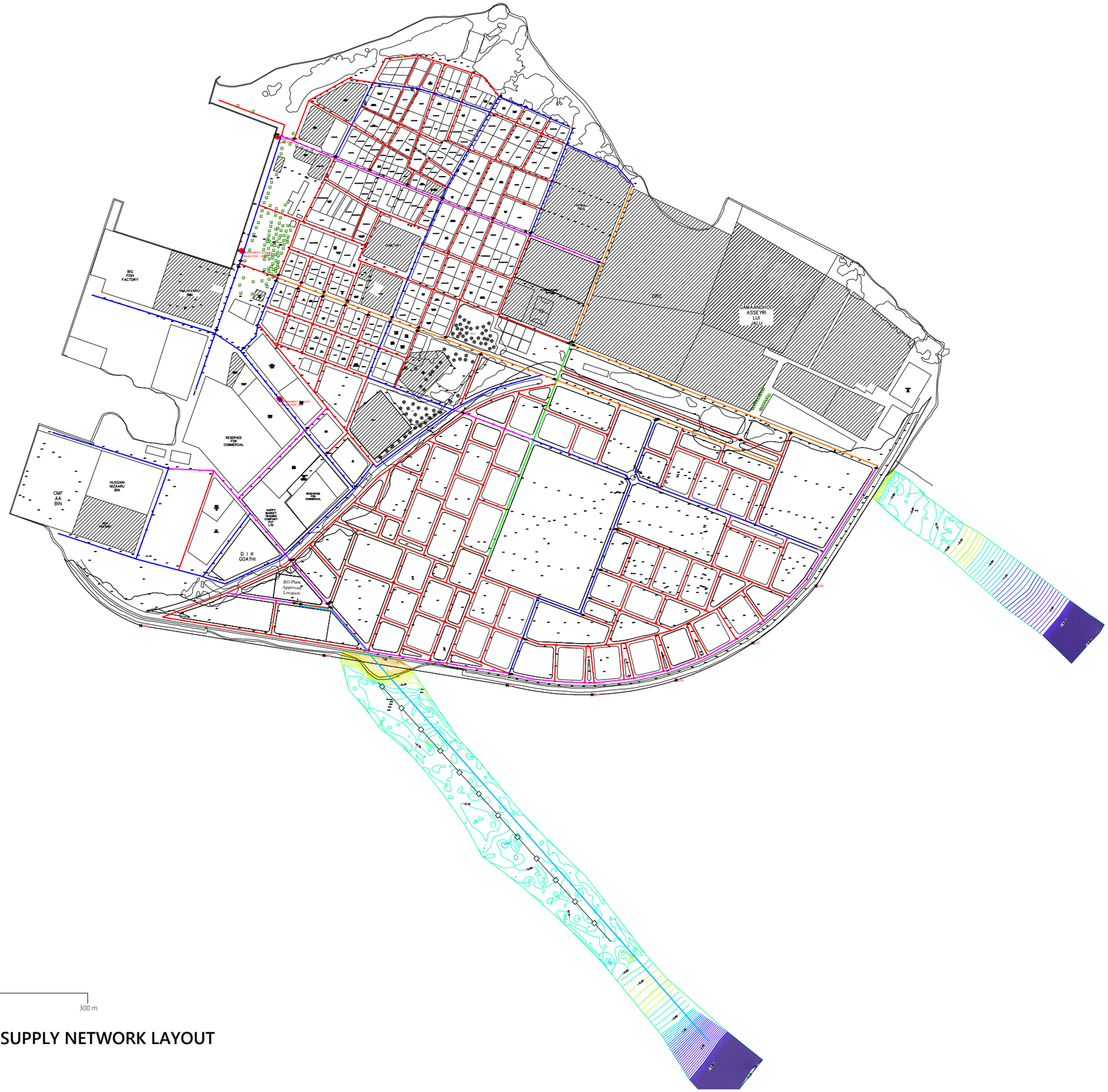

K. HIMMAFUSHI WATER SUPPLY NETWORK LAYOUT

1:5000

Legend

- Ø63 HDPE Water Main Distribution Pipe
- Ø75 HDPE Water Main Distribution Pipe
- Ø90 HDPE Water Main Distribution Pipe
- Ø110 HDPE Water Main Distribution Pipe
- Ø160 HDPE Water Main Distribution Pipe
- Ø160 HDPE Brine Outfall Pipe
- Ø200 HDPE Water Main Distribution Pipe
- Washout Valves
- Junction
- Gate Valves

Notes:

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DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	11170	HDPE (PE100,PN10,SDR17)
75	3858	
90	1906	
110	1300	
160	286	
200	344	
Total	18864	
Gate Valves	- 54 nos	
Washout Valves	- 05 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
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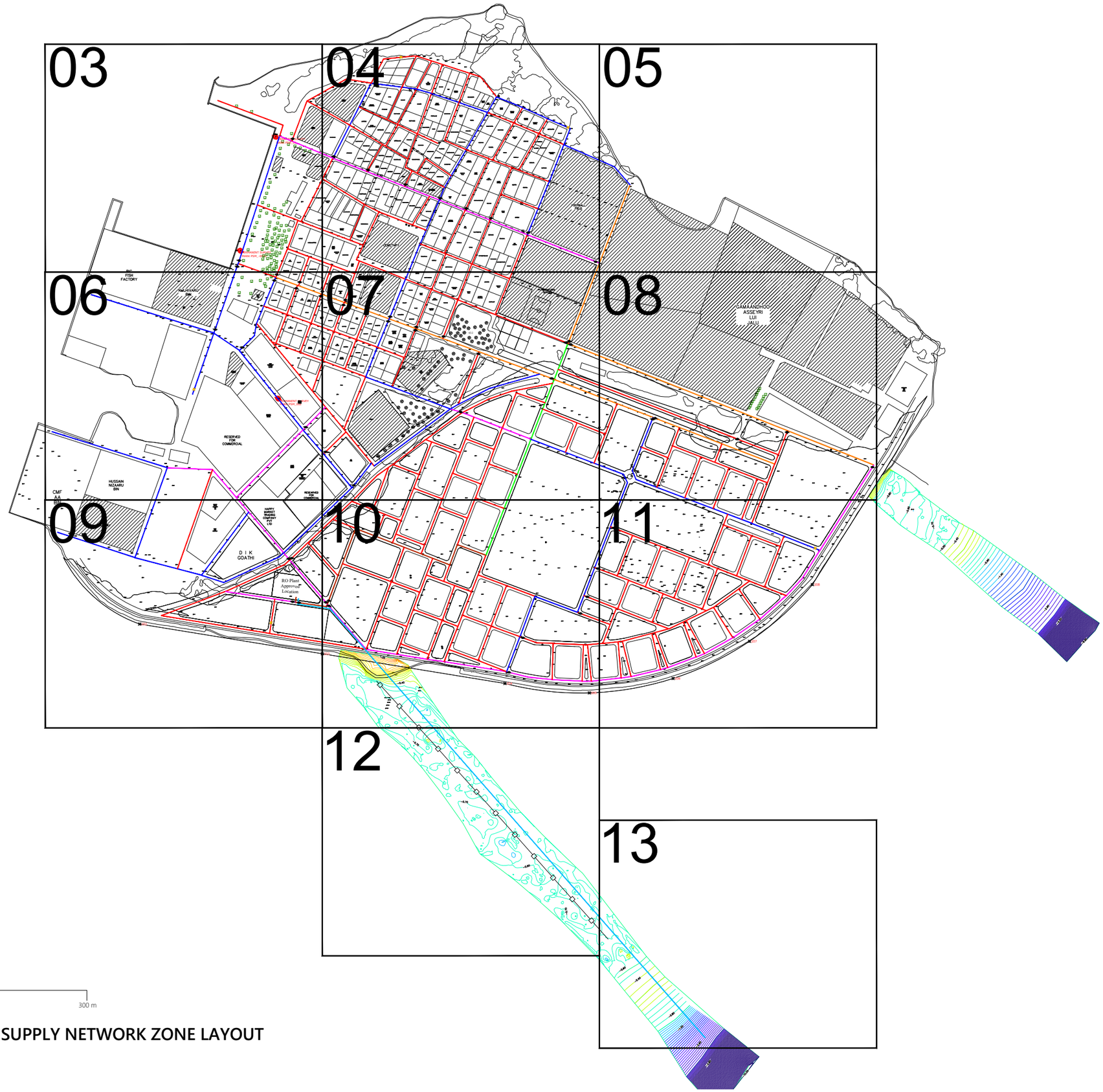

K. HIMMAFUSHI WATER SUPPLY NETWORK ZONE LAYOUT

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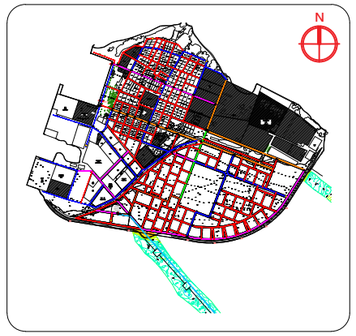

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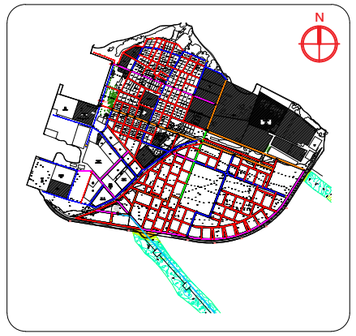

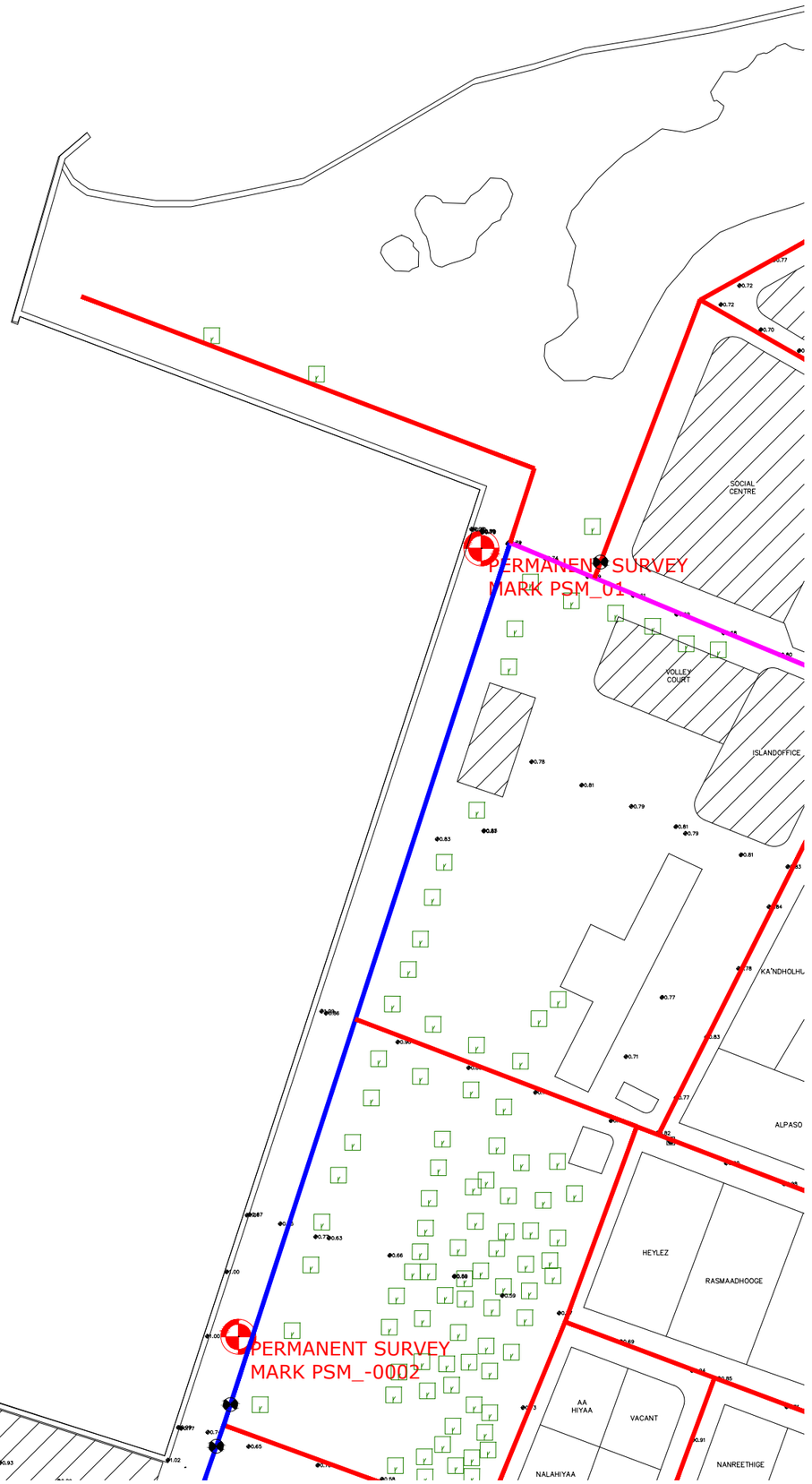

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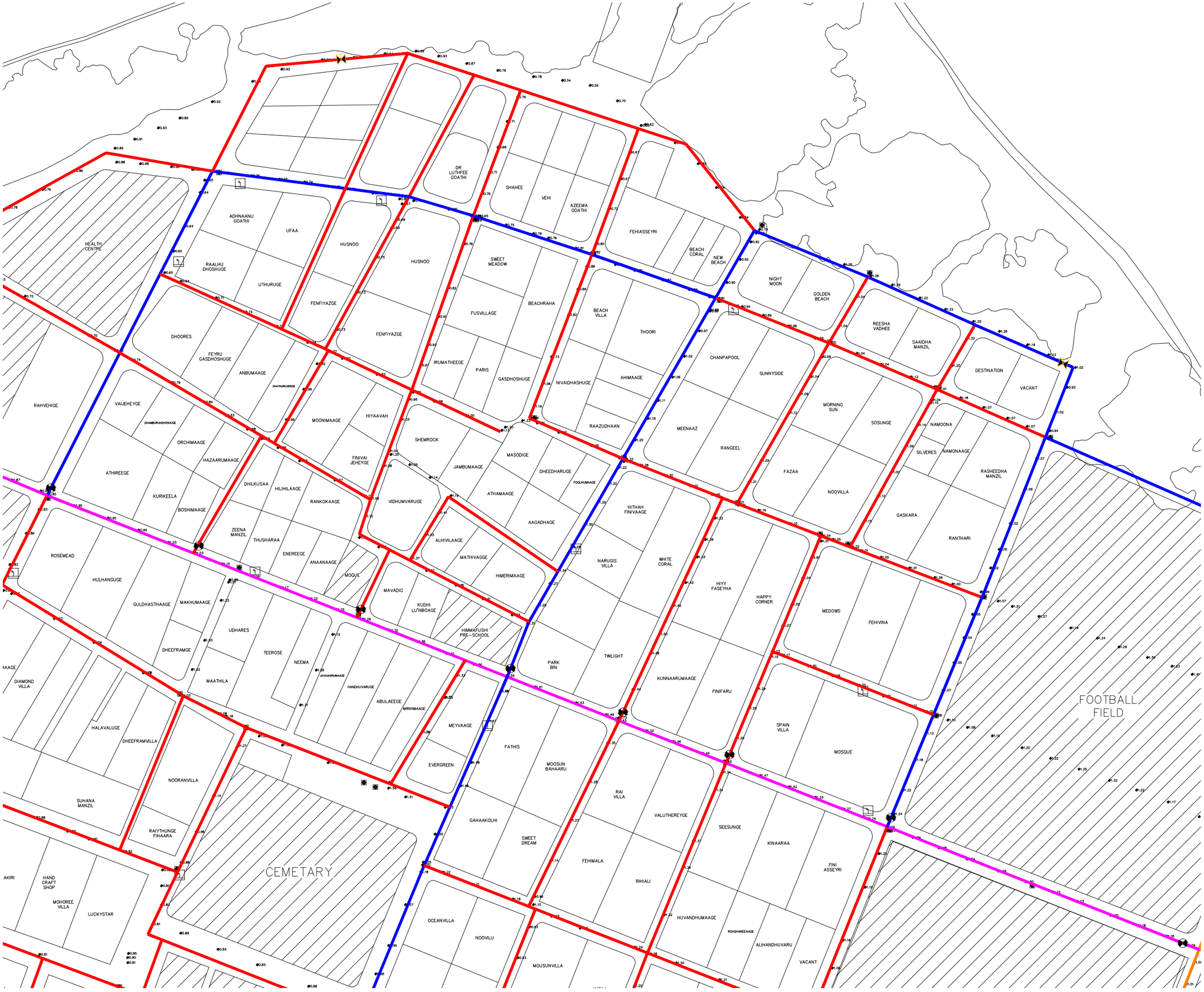

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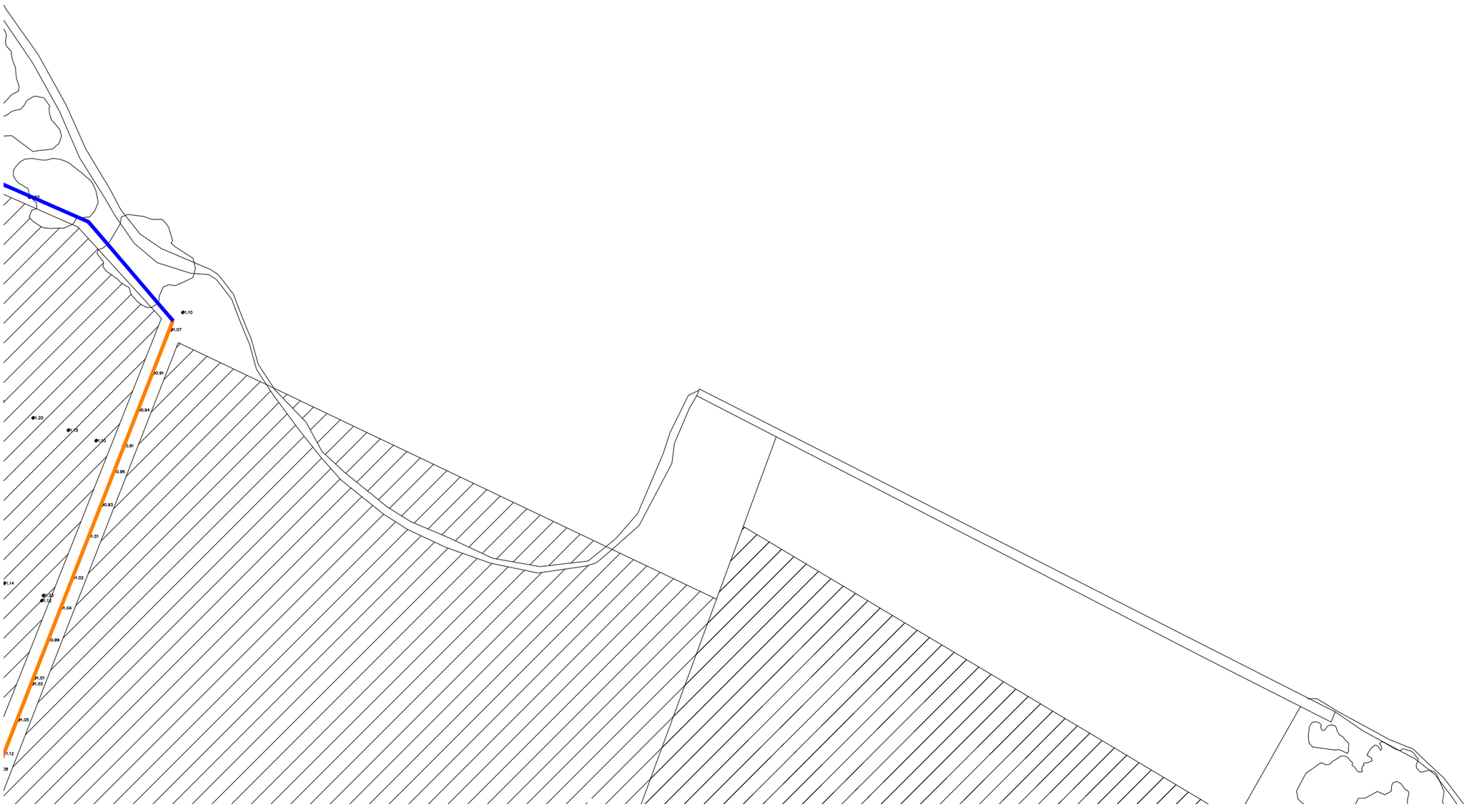

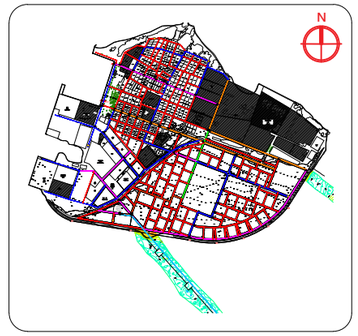

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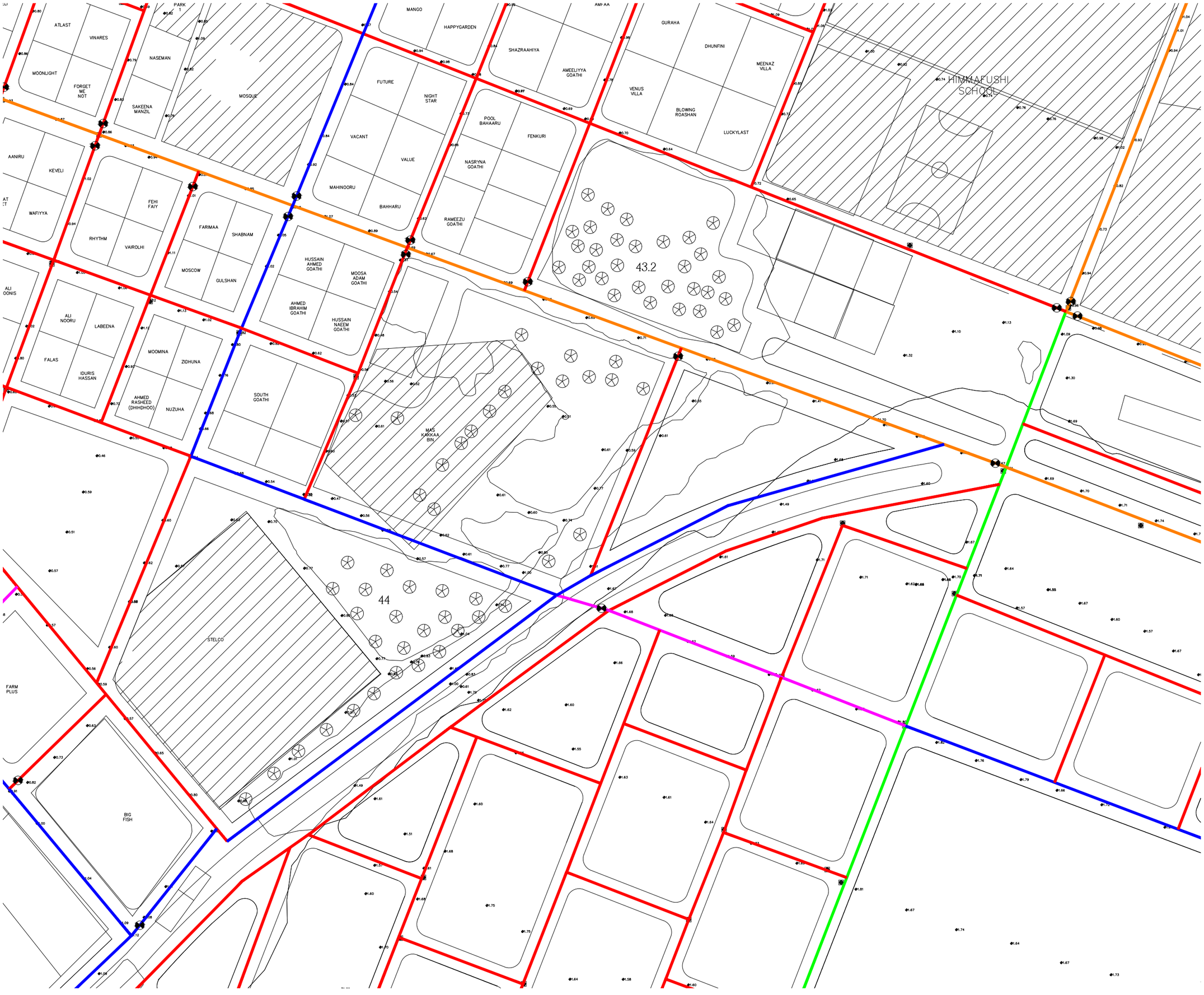

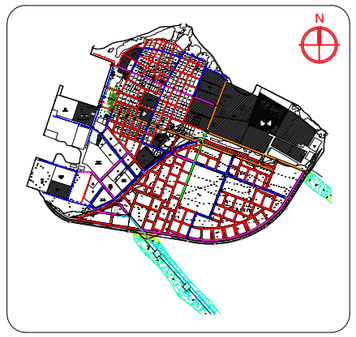

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OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
160	- 123m (on land), 643m (offshore)	HDPE (PE100,PN16,SDR11)

PSM BENCHMARKS

PERMANENT SURVEY MARK PSM_01
341183.0450E, 476643.4700N
0.789m From MSL

PERMANENT SURVEY MARK PSM_-0002
341138.8373E, 476499.9737N
0.756m From MSL

PERMANENT SURVEY MARK PSM_002
341186.4038E, 476313.8108N
0.745m 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 6 islands, Maldives - Package 3

Sub Title:

Water Supply System in K. Himmafushi

Client:

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

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

FEEDBACK INFRA
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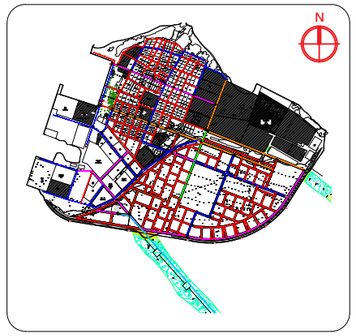
Drawn:	M.A	Checked:	M.S.S.
Designed:	M.A	Approved:	I.W.
Date:	Sep 2020	SCALE (A3):	1:1000
Project No:	EP-WS/2019/03		
Rev:	R-01	Page:	07

DRC

GAMAANDHOO
ASSEYRI
LUI
JALU



Legend

- Ø63 HDPE Water Main Distribution Pipe
- Ø90 HDPE Water Main Distribution Pipe
- Ø160 HDPE Water Main Distribution Pipe
- Ø200 HDPE Water Main Distribution Pipe
- Junction
- Ø75 HDPE Water Main Distribution Pipe
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MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	11170	HDPE (PE100,PN10,SDR17)
75	3858	
90	1906	
110	1300	
160	286	
200	344	
Total	18864	
Gate Valves	- 54 nos	
Washout Valves	- 05 nos	

OUTFALL

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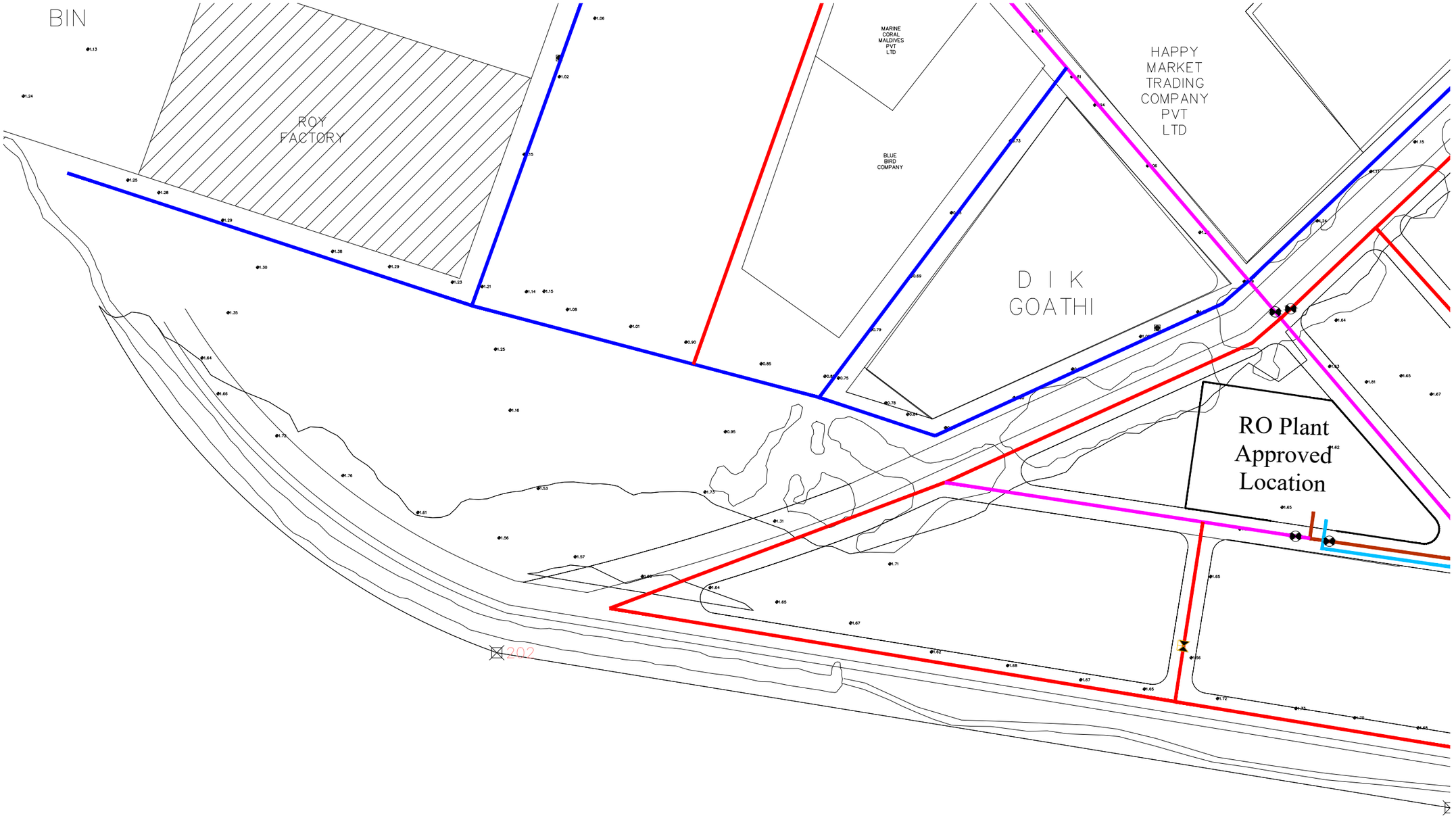
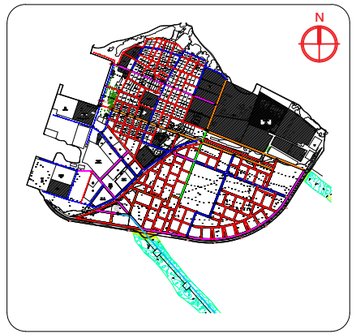
Rev: R-01	Page: 08





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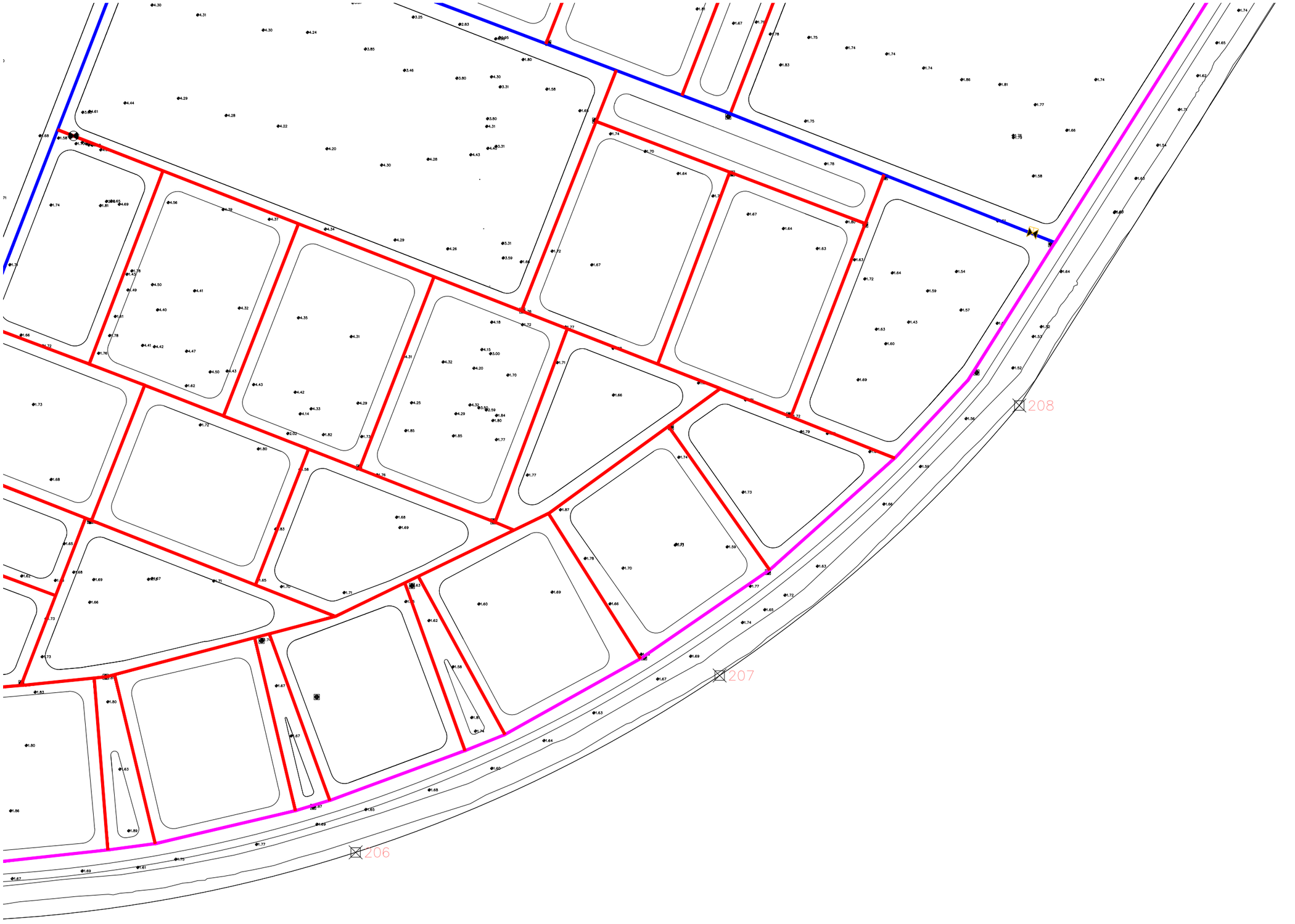

Legend

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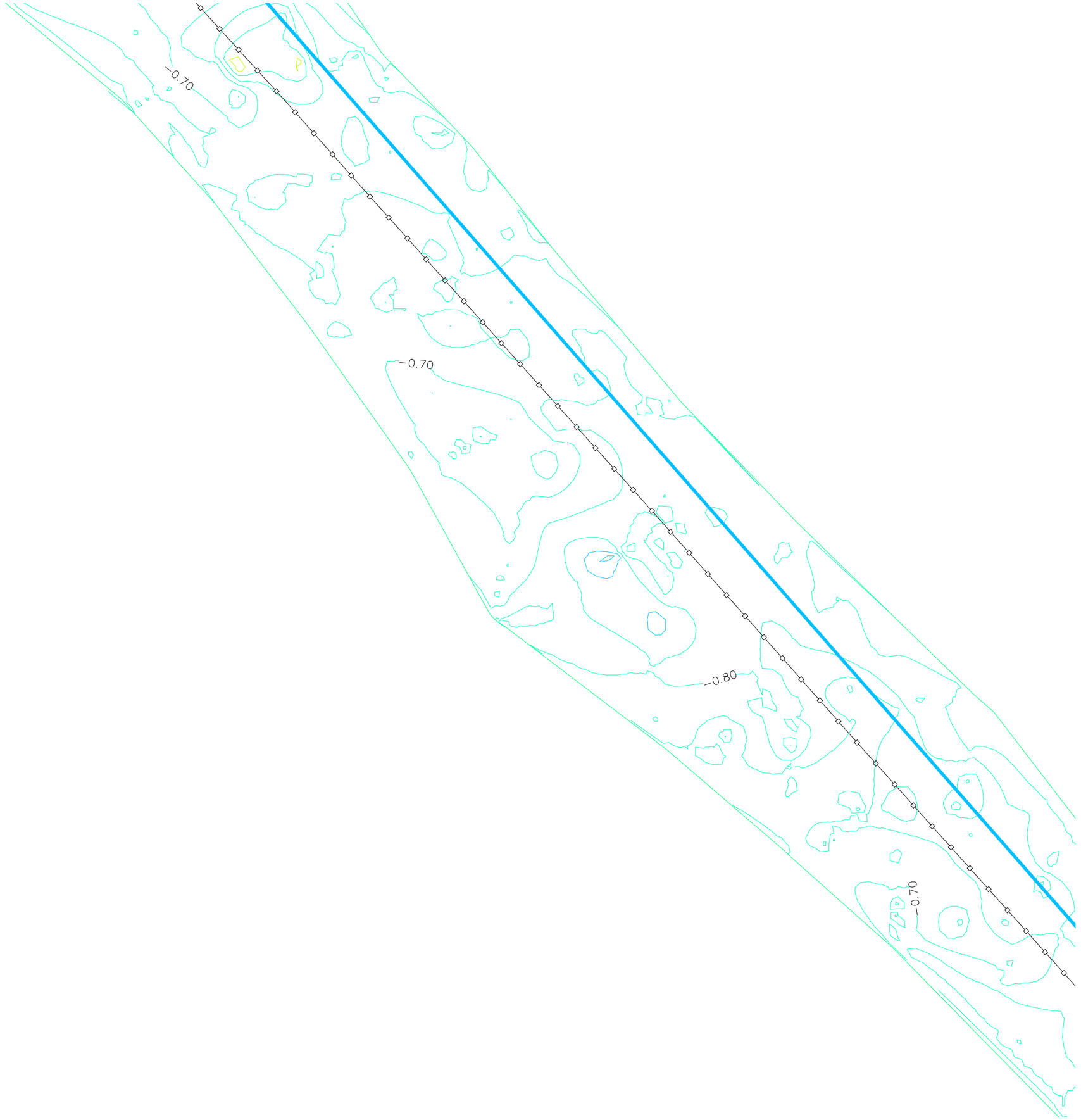

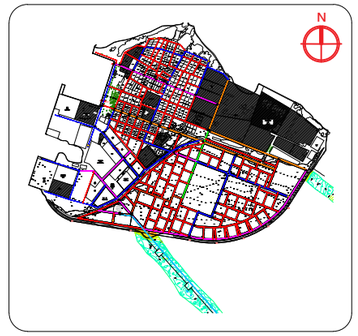

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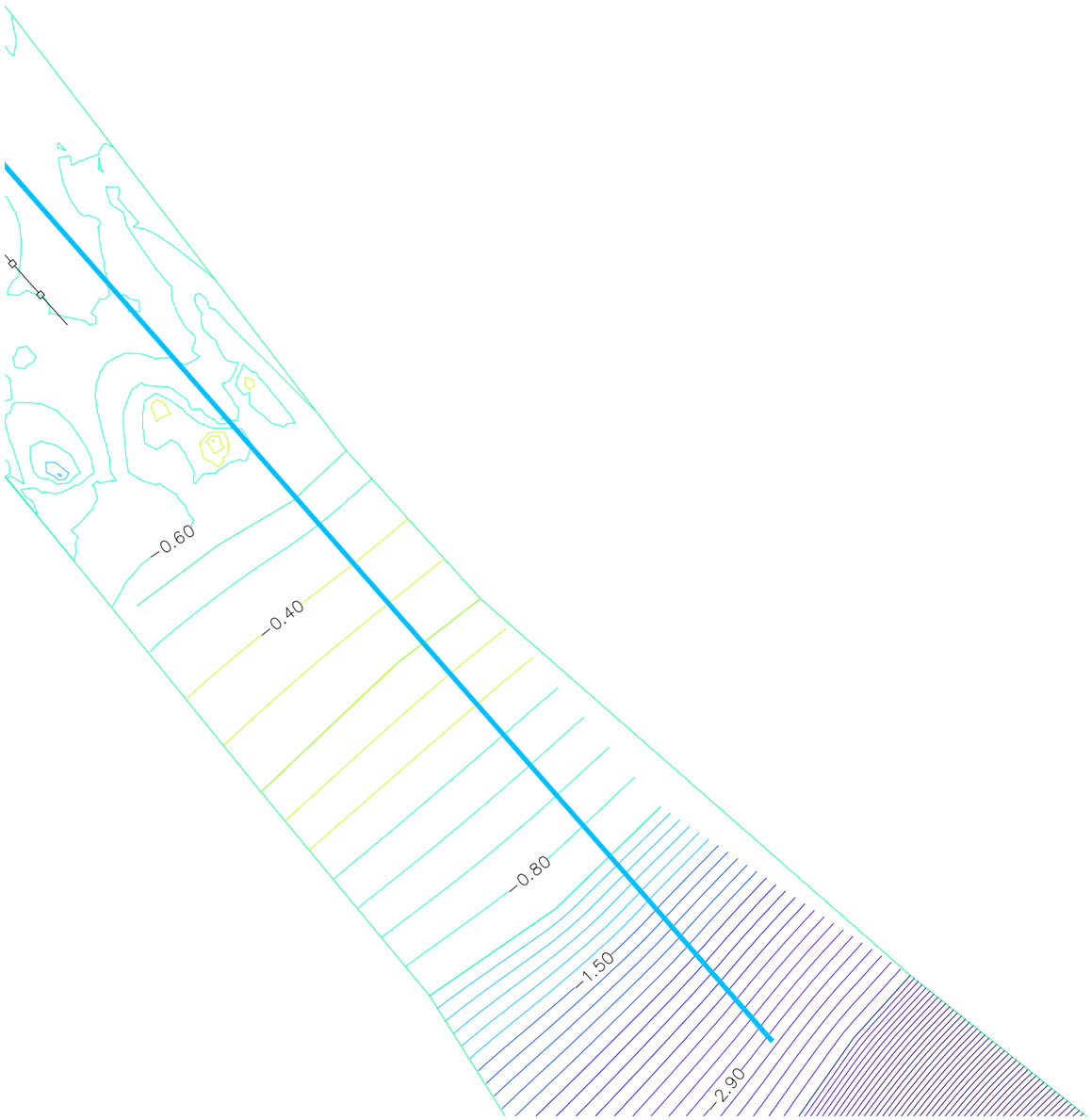

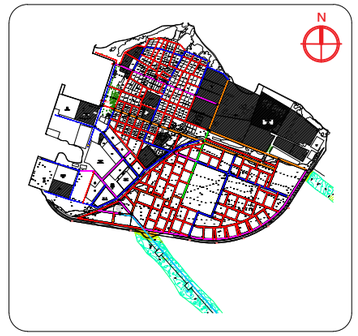

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BIG FISH FACTORY
RESERVED FOR COMMERCIAL
CMF AA BIN
HUSSAIN NIZAARU BIN
D I K GOATHI
RO Plant Approved Location
LAMA ENDHOO ASSERI LUI JALU
DRC
IL =-0.31m
IL =-0.35m
IL =-0.37m
IL =-0.39m
IL =-0.41m
IL =-0.43m
IL =-0.45m
IL =-0.47m
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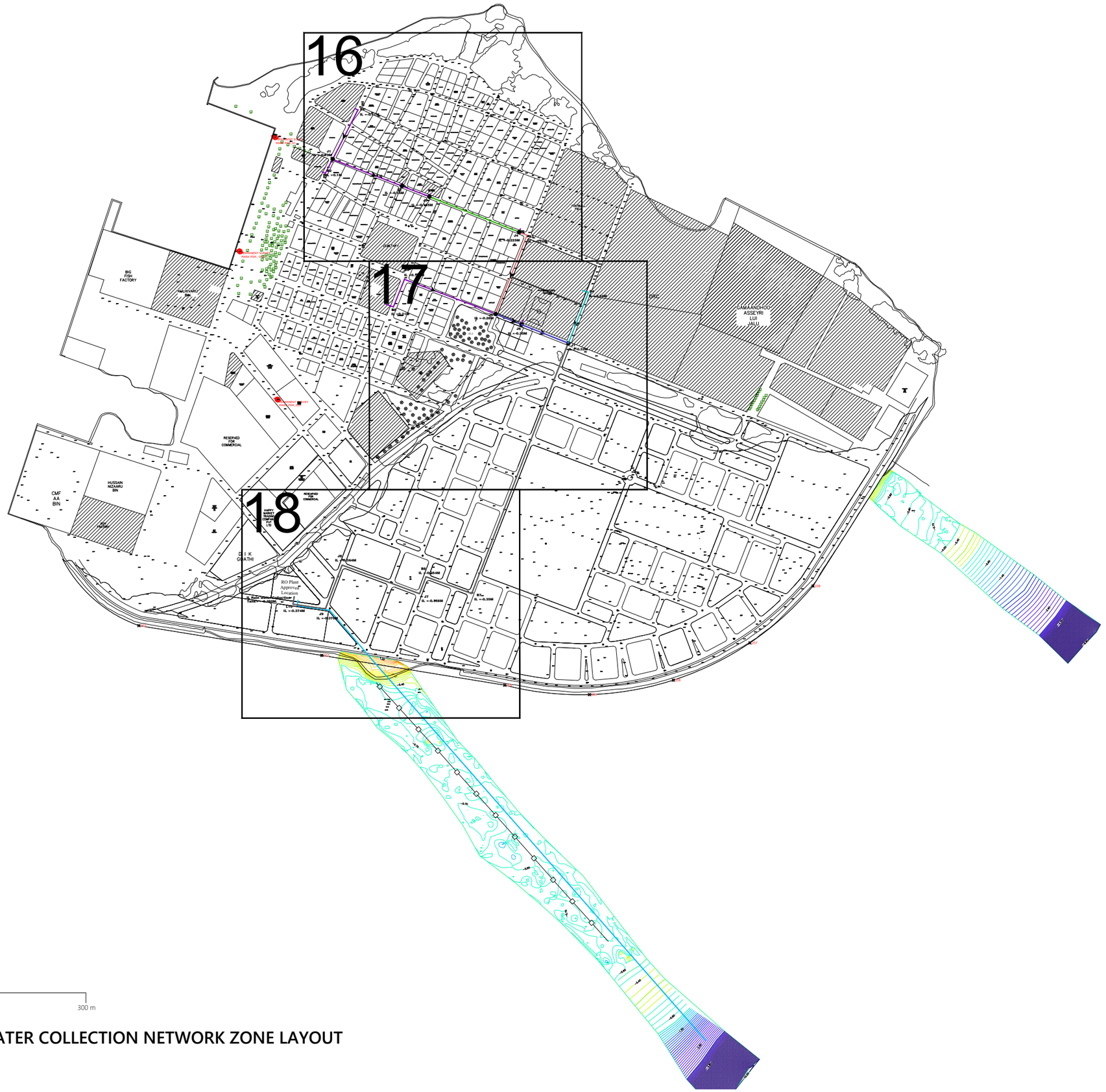
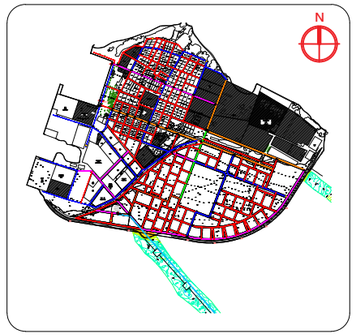


K. HIMMAFUSHI RAINWATER COLLECTION NETWORK ZONE LAYOUT

1:5000



Legend

- Ø160 HDPE Rainwater Flow Pipe
- Ø180 HDPE Rainwater Flow Pipe
- Ø200 HDPE Rainwater Flow Pipe
- Ø225 HDPE Rainwater Flow Pipe
- Ø280 HDPE Rainwater Flow Pipe
- Ø400 HDPE Rainwater Flow Pipe
- Junction

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RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
160	417	HDPE (PE100,PN6,SDR26)
180	77	
200	121	
225	117	
280	99	
400	640	
Total	1471	

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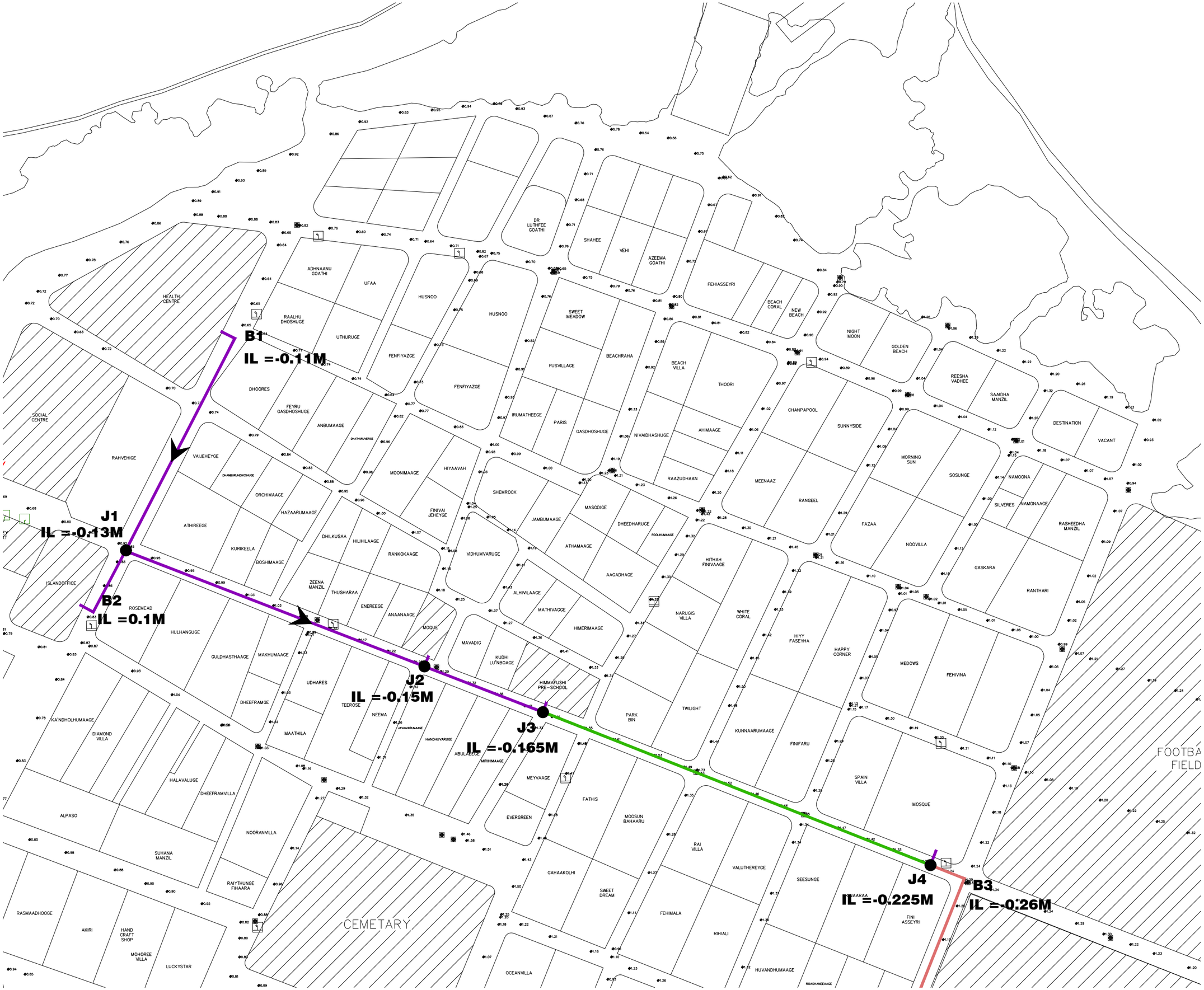
Project No: EP-WS/2019/03	
Rev: R-01	Page: 15



Legend

- Ø160 HDPE Rainwater Flow Pipe
- Ø180 HDPE Rainwater Flow Pipe
- Ø200 HDPE Rainwater Flow Pipe
- Ø225 HDPE Rainwater Flow Pipe
- Ø280 HDPE Rainwater Flow Pipe
- Ø400 HDPE Rainwater Flow Pipe
- Junction

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.

RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
160	417	HDPE (PE100,PN6,SDR26)
180	77	
200	121	
225	117	
280	99	
400	640	
Total	1471	

PSM BENCHMARKS

PERMANENT SURVEY MARK PSM_01
341183.0450E, 476643.4700N
0.789m From MSL

PERMANENT SURVEY MARK PSM_-0002
341138.8373E, 476499.9737N
0.756m From MSL

PERMANENT SURVEY MARK PSM_002
341186.4038E, 476313.8108N
0.745m 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 6 islands, Maldives - Package 3

Sub Title:
Water Supply System in K. Himmafushi

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

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

FEEDBACK INFRA
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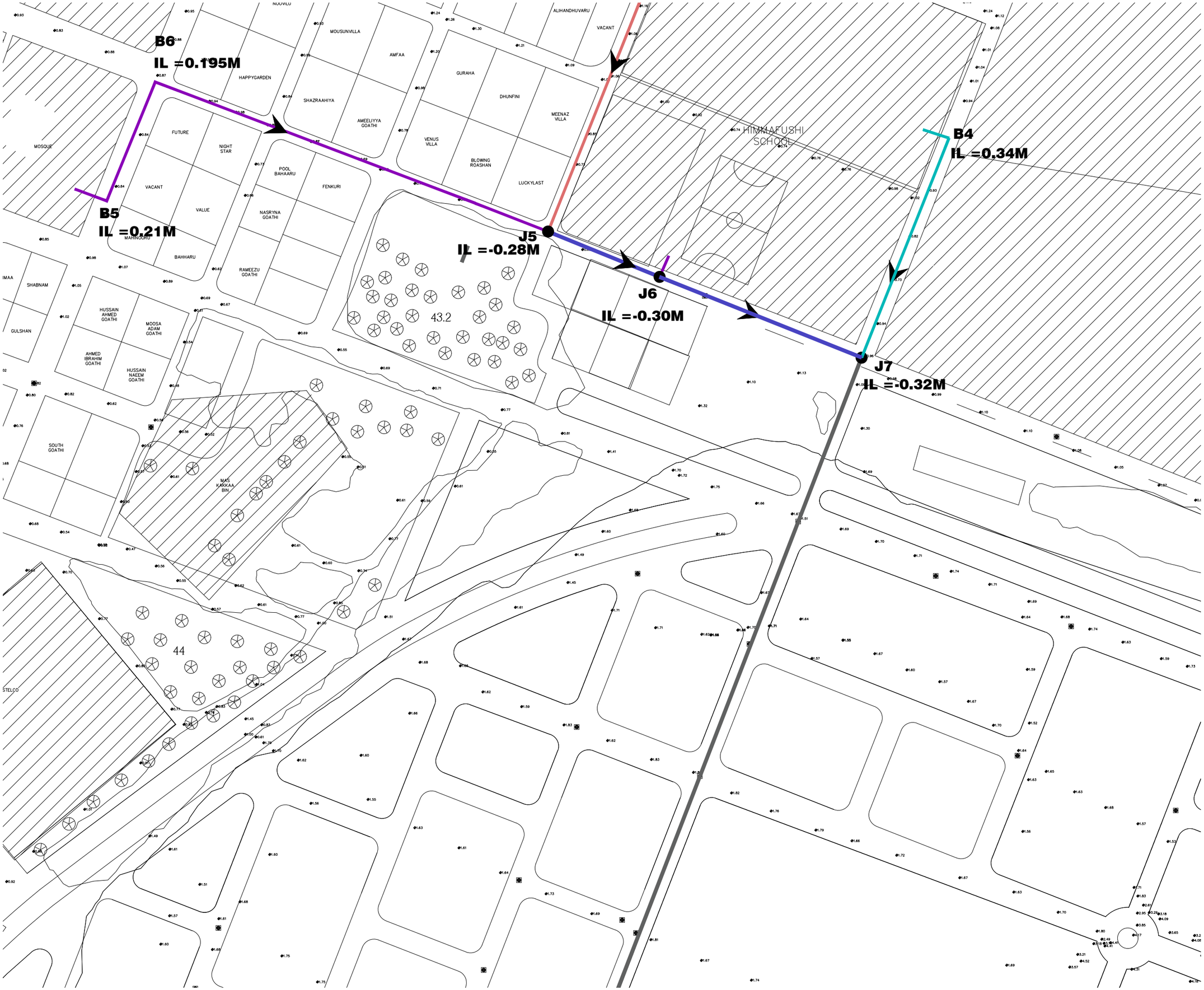
Drawn: M.A	Checked: M.S.S.
Designed: M.A	Approved: I.W.
Date: Sep 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/03	
Rev: R-01	Page: 16



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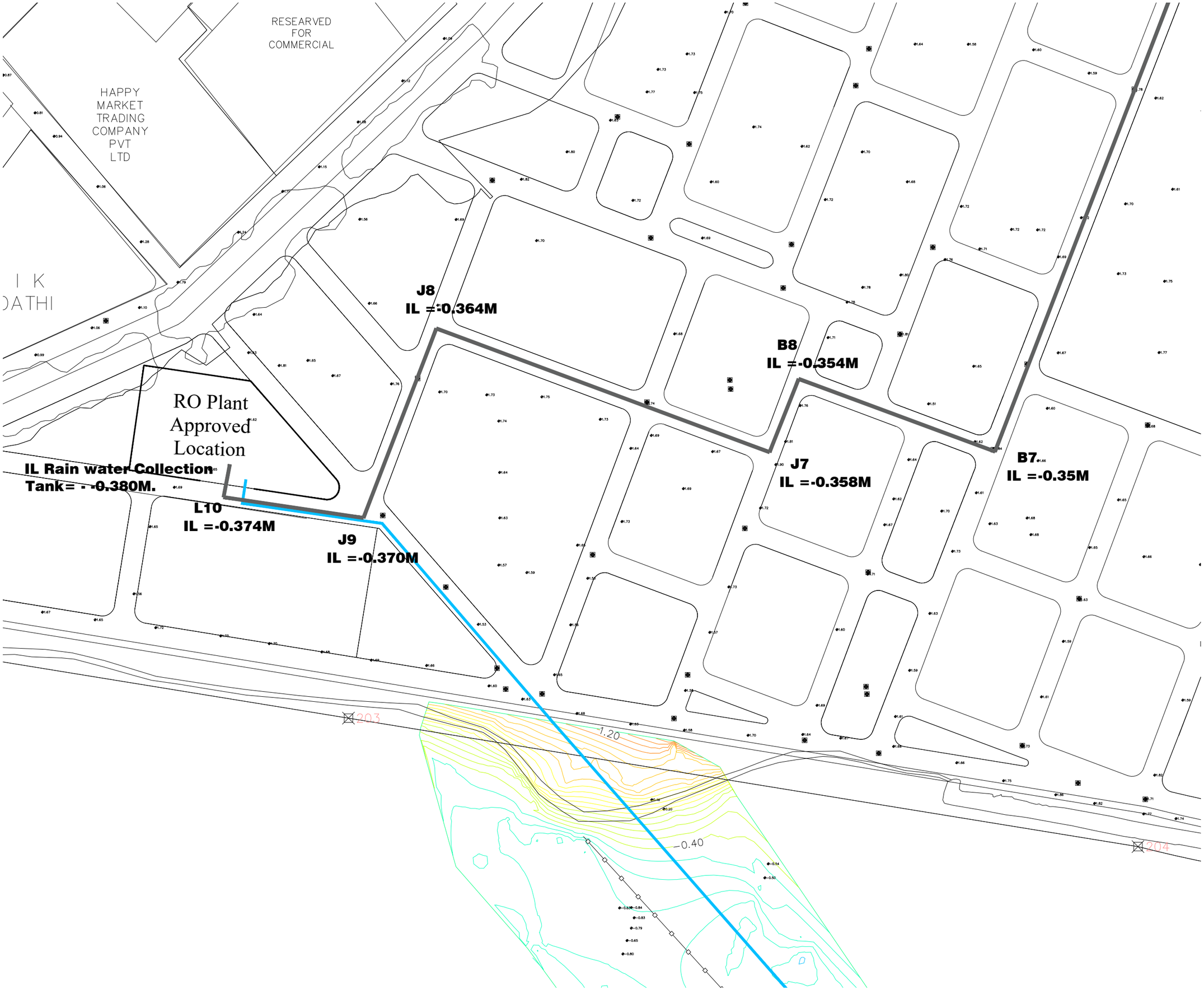

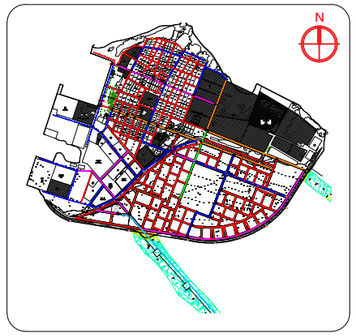

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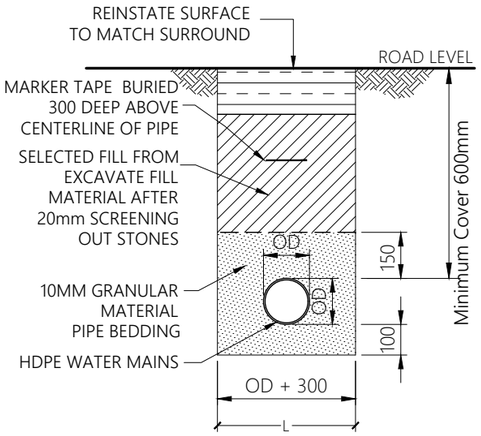
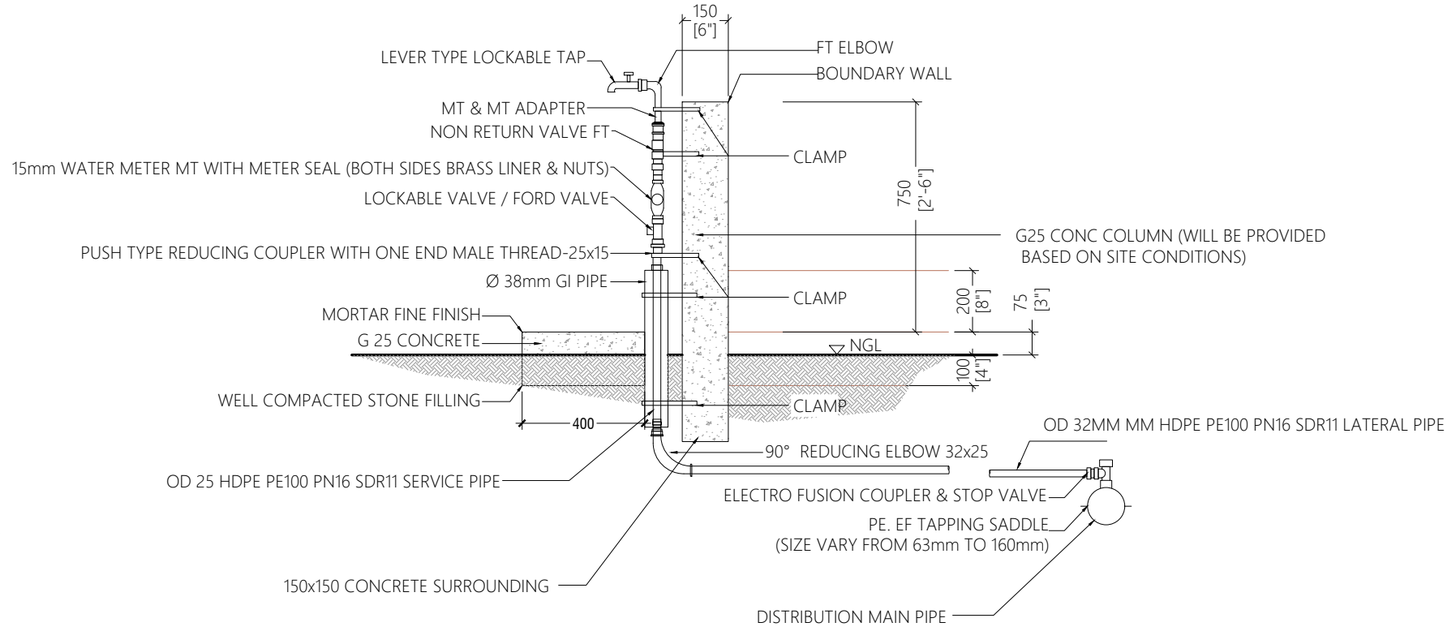
Rev: **R-01**

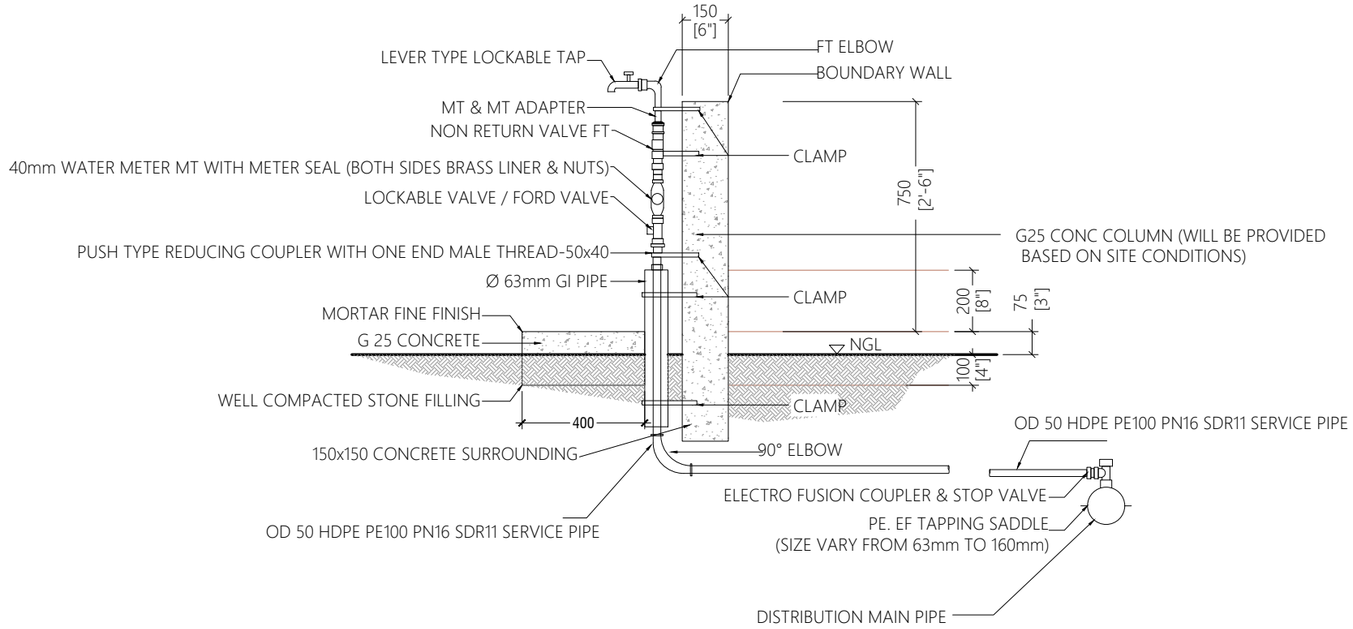
Page: **18**



TRENCH & BEDDING DETAILS



WATER SUPPLY HOUSE CONNECTION DETAILS



WATER SUPPLY COMMERCIAL/INSTITUTIONAL CONNECTION DETAILS

WATER SUPPLY HOUSE AND COMMERCIAL/INSTITUTIONAL CONNECTIONS

1:20

N

Legend

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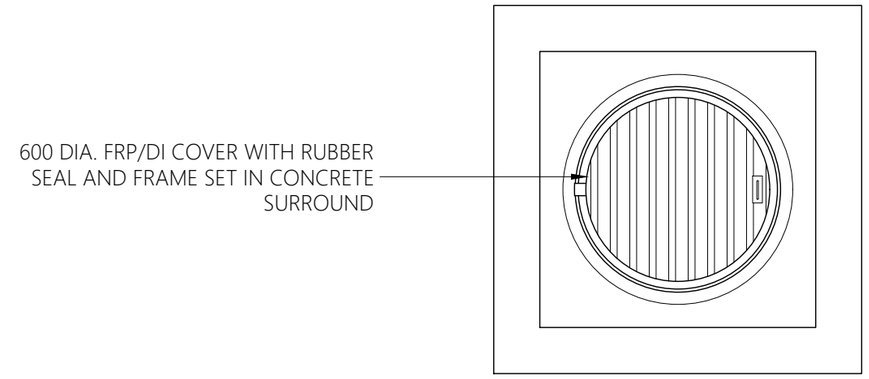
Rev: R-01	Page: W-01



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

SECTION - VALVE CHAMBER

VALVE CHAMBER DETAILS

1:20

N

Legend

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

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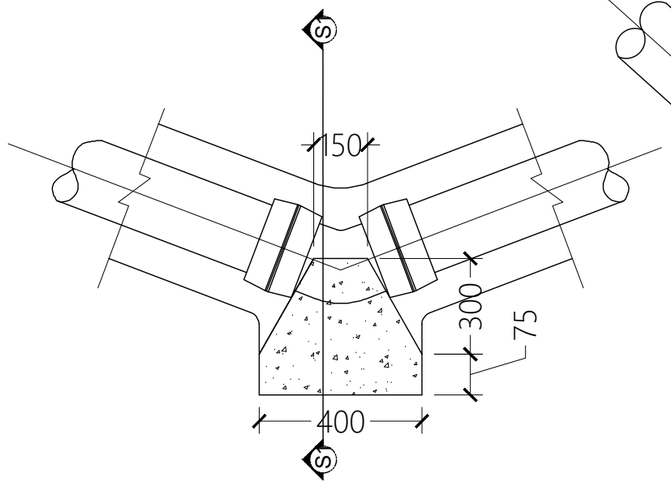
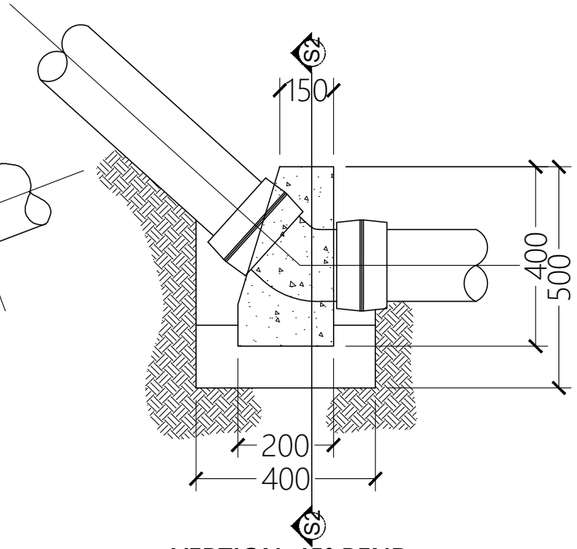
Rev: **R-01**	Page: **W-02**



HORIZONTAL 45° BEND
NTS



VERTICAL 45° BEND
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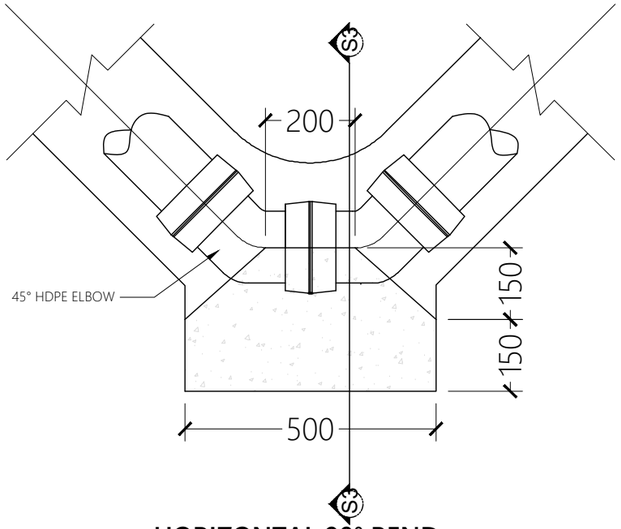

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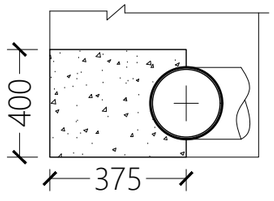
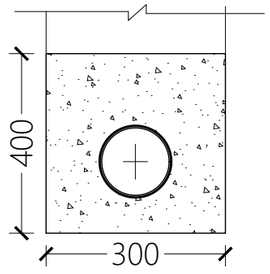


SECTION S1-S1
NTS



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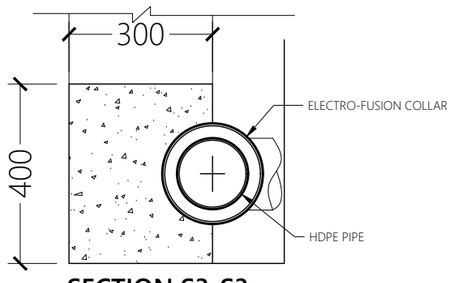

SECTION S3-S3
NTS

THRUST BLOCK DETAILS
NTS

N

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 6 islands, Maldives - Package 3

Sub Title:
Water Supply System in K. Himmafushi

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

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Project No: EP-WS/2019/03

Rev: **R-01**

Page: **W-03**

PUMP DETAILS

Borehole Pump : 2 Nos
- Flow (Q) = 35.19 m3/hr
- Head (H) = 50 m

High Pressure Pump : 2 Nos
- Flow (Q) = 17.59 m3/hr
- Pressure Range = 45-85 bar

Transfer Pump : 2 Nos
- Flow (Q) = 13.06 m3/hr
- Head (H) = 16m

Distribution Pump Set : 2 Nos
- Flow (Q) = 24.84 m3/hr
- Head (H) = 35 m

Brine Pump : 2 Nos
- Flow (Q) = 24.63 m3/hr
- Head (H) = 22 m

Rain Water lift Well Pump : 2 Nos
- Flow (Q) = 9154 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

SP — Sampling Point

Butterfly Valve

Ball Valve

N

INTERNAL PIPE LAYOUT

1:200

Legend

- Ø90 HDPE (PE100, PN10, SDR17)
- Ø63 HDPE (PE100, PN10, SDR17)
- Ø110 HDPE (PE100, PN10, SDR17)
- Ø 140 HDPE (PE100, P10, SDR17)
- Ø 200 HDPE (PE100, P10, SDR17)
- Ø160 HDPE (OUTFALL PE100, PN12, SDR11)
- Ø400 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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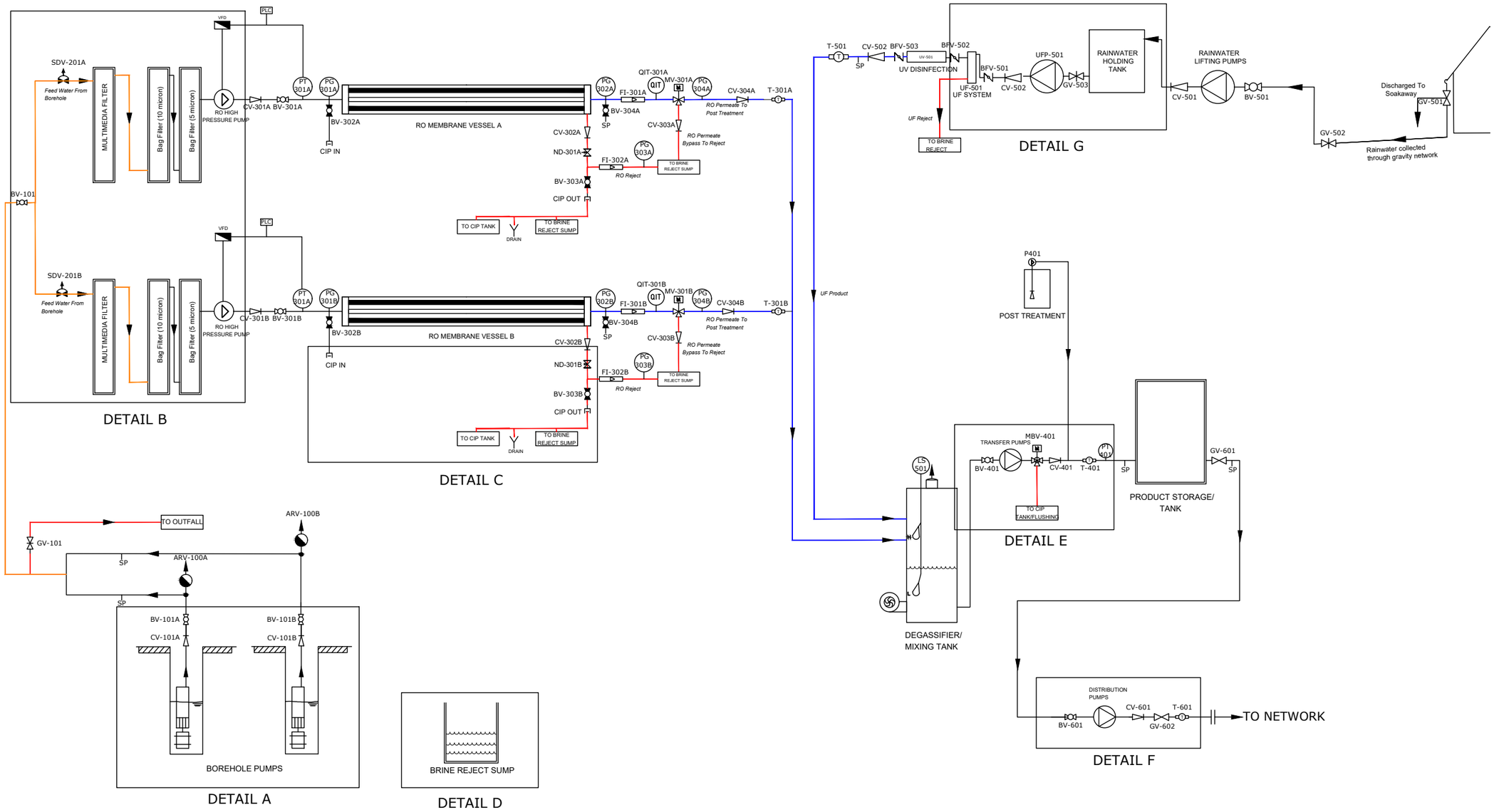
Project No: EP-WS/2019/03	
Rev: R-01	Page: W-04



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

IWRM PLANT P&I OVERVIEW

NTS

N

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)

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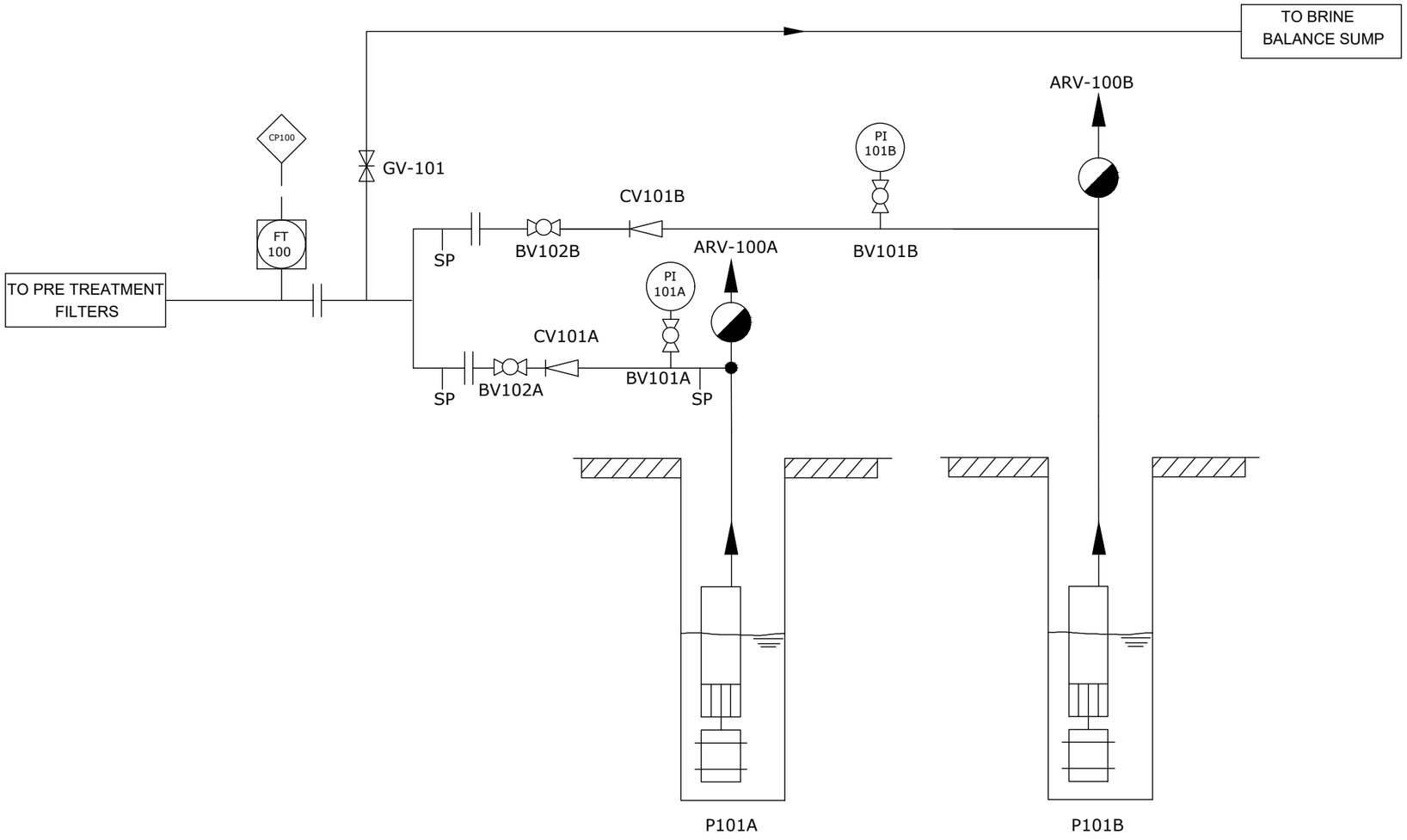
Page: **W-05**



BOREHOLE PUMPS

DETAIL A

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PNEUMATIC DIAPHRAGM - DOUBLE ACTING	DIAPHRAGM	DISCHARGE TO ATMOSPHERE		PI - PRESSURE INDICATOR
PNEUMATIC PISTON	3-WAY	SAMPLING POINT		SP - SAMPLING POINT
	SLUICE	FLOW INDICATOR		AR - AIR RELEASE
	MOTORIZED BALL			P - PUMP
	TORTALIZER			PG - PRESSURE GAUGE
	GATE			PS - PRESSURE SENSOR
	CHECK VALVE			CP - CONNECTION POINT
	MOTORIZED 3 WAY			LT - LEVEL TRANSMITTER
				QIT - CONDUCTIVITY INDICATOR
				PLC - PROGRAMMABLE LOGIC CONTROLLER

IWRM PLANT P&I DETAIL A

NTS

N

Legend

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

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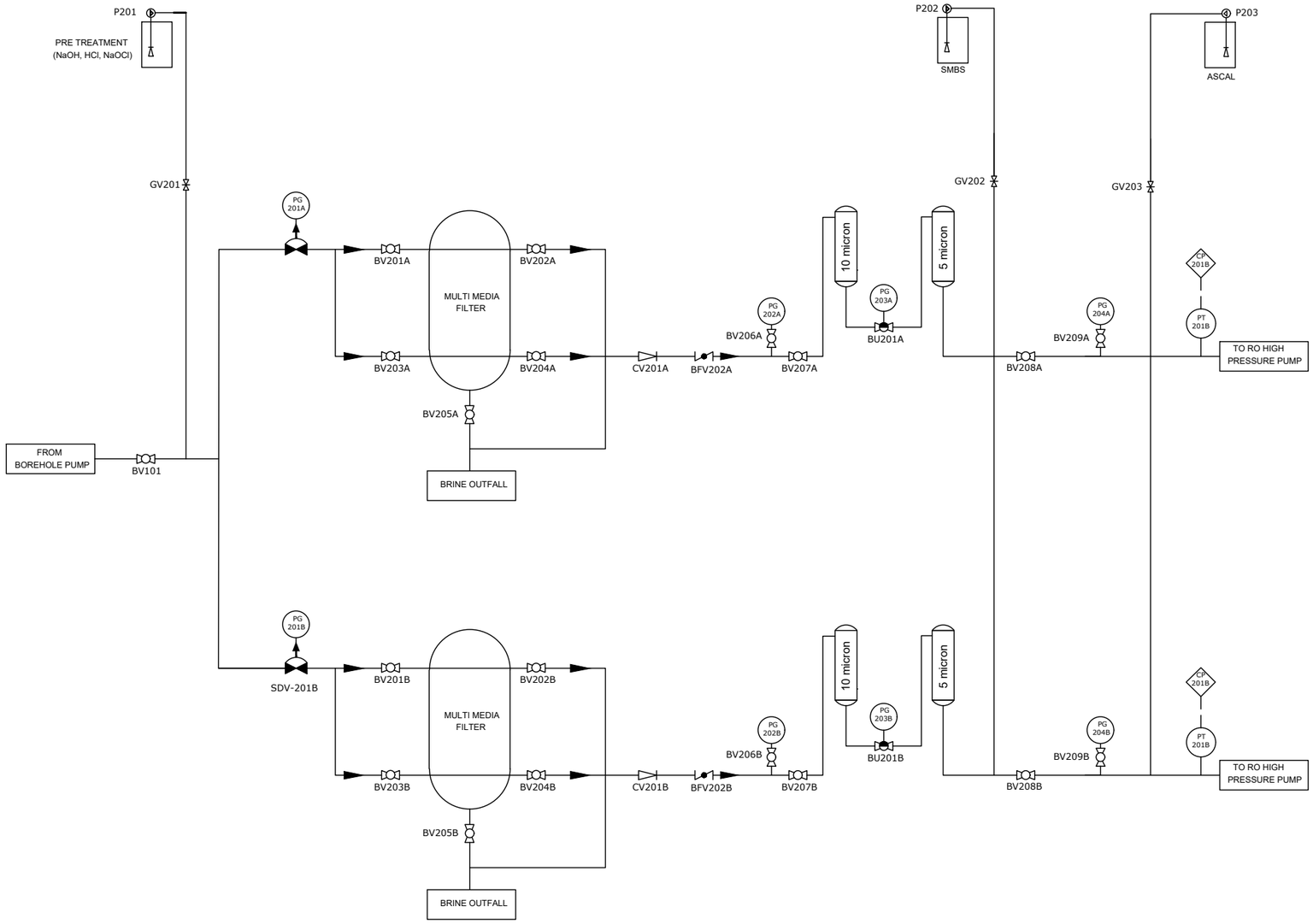
Rev: **R-01**

Page: **W-06**



DETAIL B

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

IWRM PLANT P&I DETAIL B

NTS

N

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.
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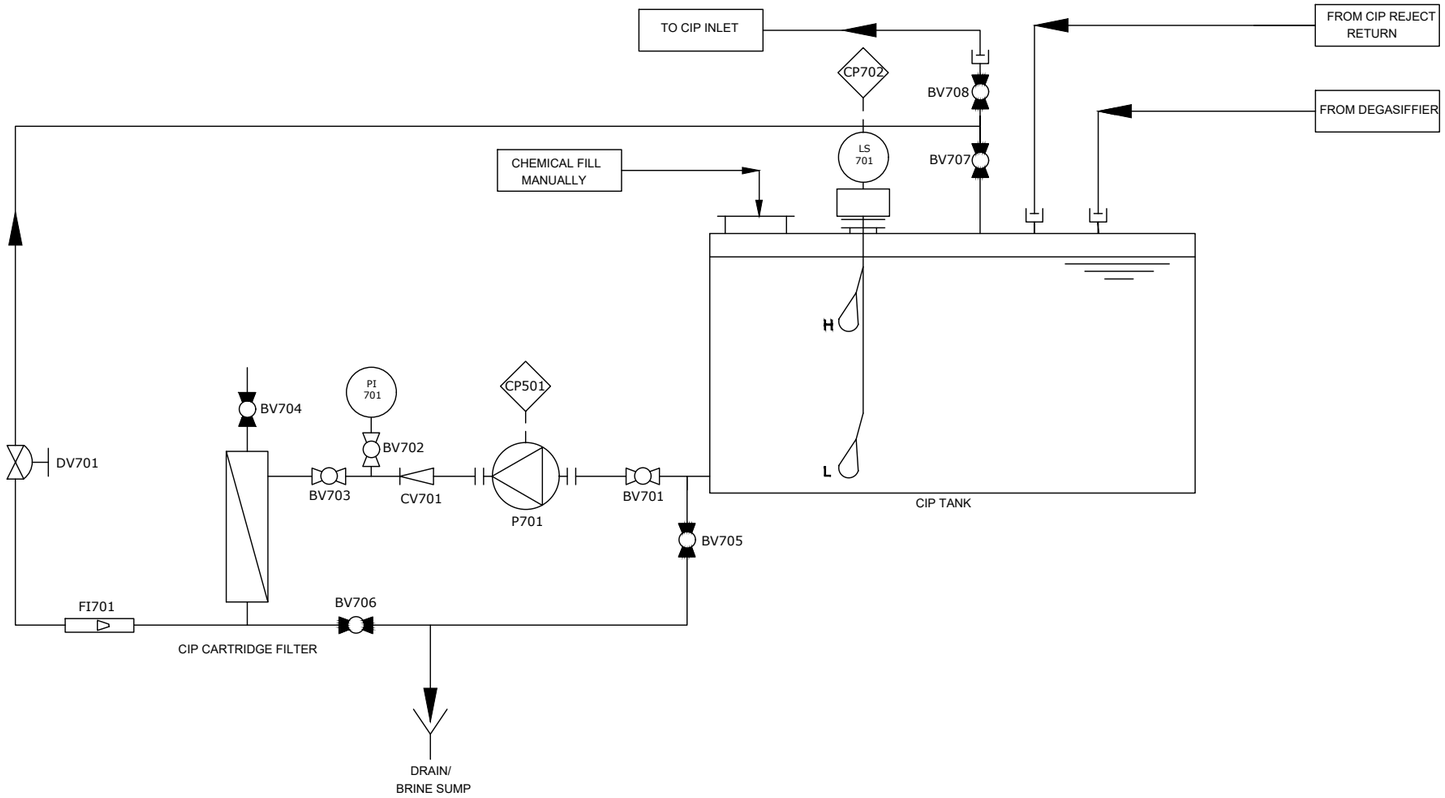
Designed:	M.A	Approved:	I.W.
Date:	Sep 2020	SCALE (A3):	NTS

Project No: EP-WS/2019/03

Rev: **R-01**

Page: **W-07**



DETAIL C

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

IWRM PLANT P&I DETAIL C

NTS

N

Legend

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

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

Title:

Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 3

Sub Title:

Water Supply System in K. Himmafushi

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. Rosary West,
Husnuheenaa Magu, Male', Maldives

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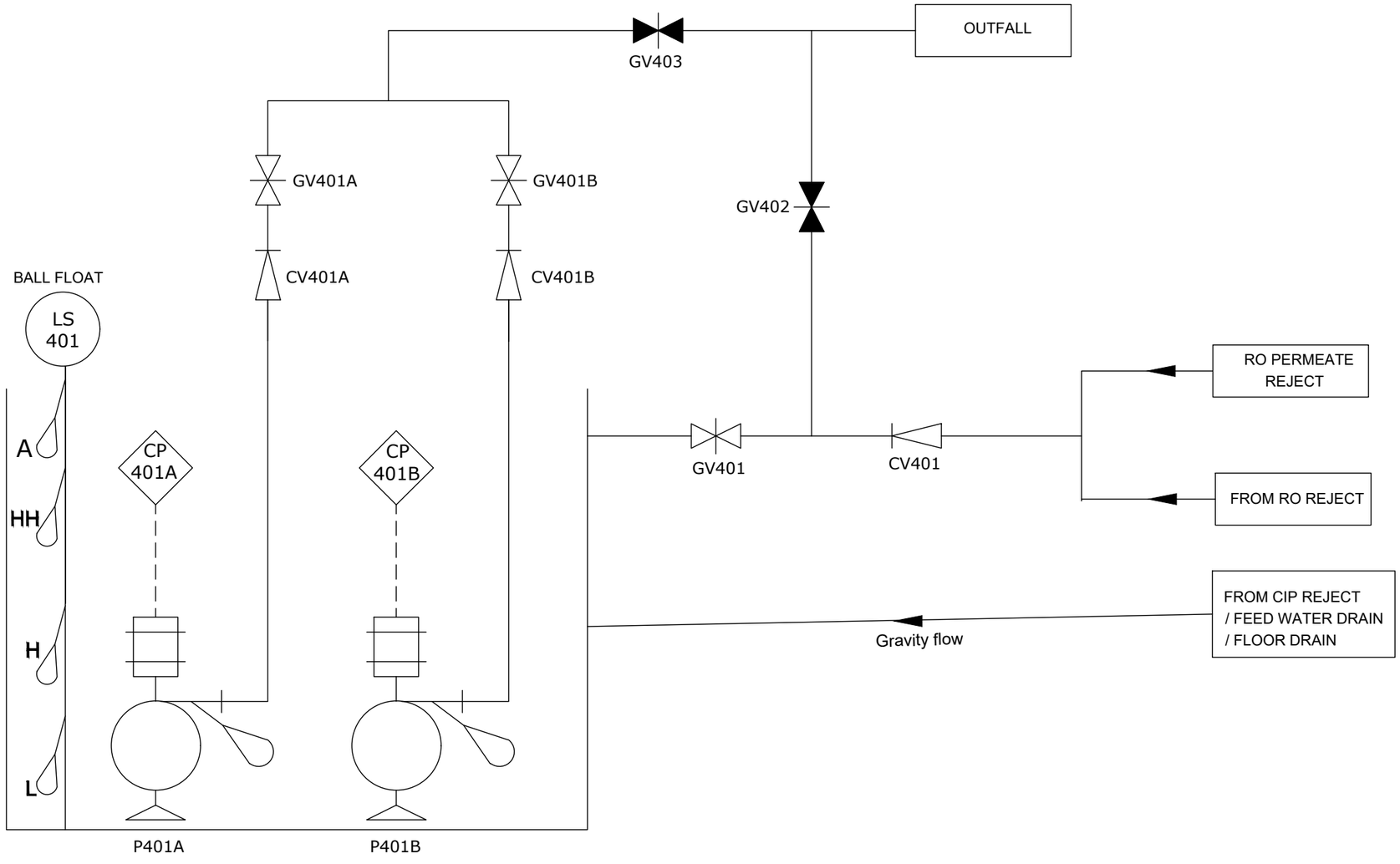
Drawn: M.A	Checked: M.S.S.
Designed: M.A	Approved: I.W.
Date: Sep 2020	SCALE (A3): NTS

Project No: EP-WS/2019/03

Rev: **R-01**

Page: **W-08**



BRINE BALANCE SUMPS

DETAIL D

LEGEND				
ACTUATION	VALVES	FEATURES	CONDITION	ABBREVIATIONS
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PNEUMATIC DIAPHRAGM - DOUBLE ACTING	DIAPHRAGM	DISCHARGE TO ATMOSPHERE		PI - PRESSURE INDICATOR
PNEUMATIC PISTON	3-WAY	SAMPLING POINT		SP - SAMPLING POINT
	SLUICE	FLOW INDICATOR		AR - AIR RELEASE
	MOTORIZED BALL			P - PUMP
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	GATE			PS - PRESSURE SENSOR
	CHECK VALVE			CP - CONNECTION POINT
	MOTORIZED 3 WAY			LT - LEVEL TRANSMITTER
				QIT - CONDUCTIVITY INDICATOR
				PLC - PROGRAMMABLE LOGIC CONTROLLER

IWRM PLANT P&I DETAIL D

NTS

N

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.
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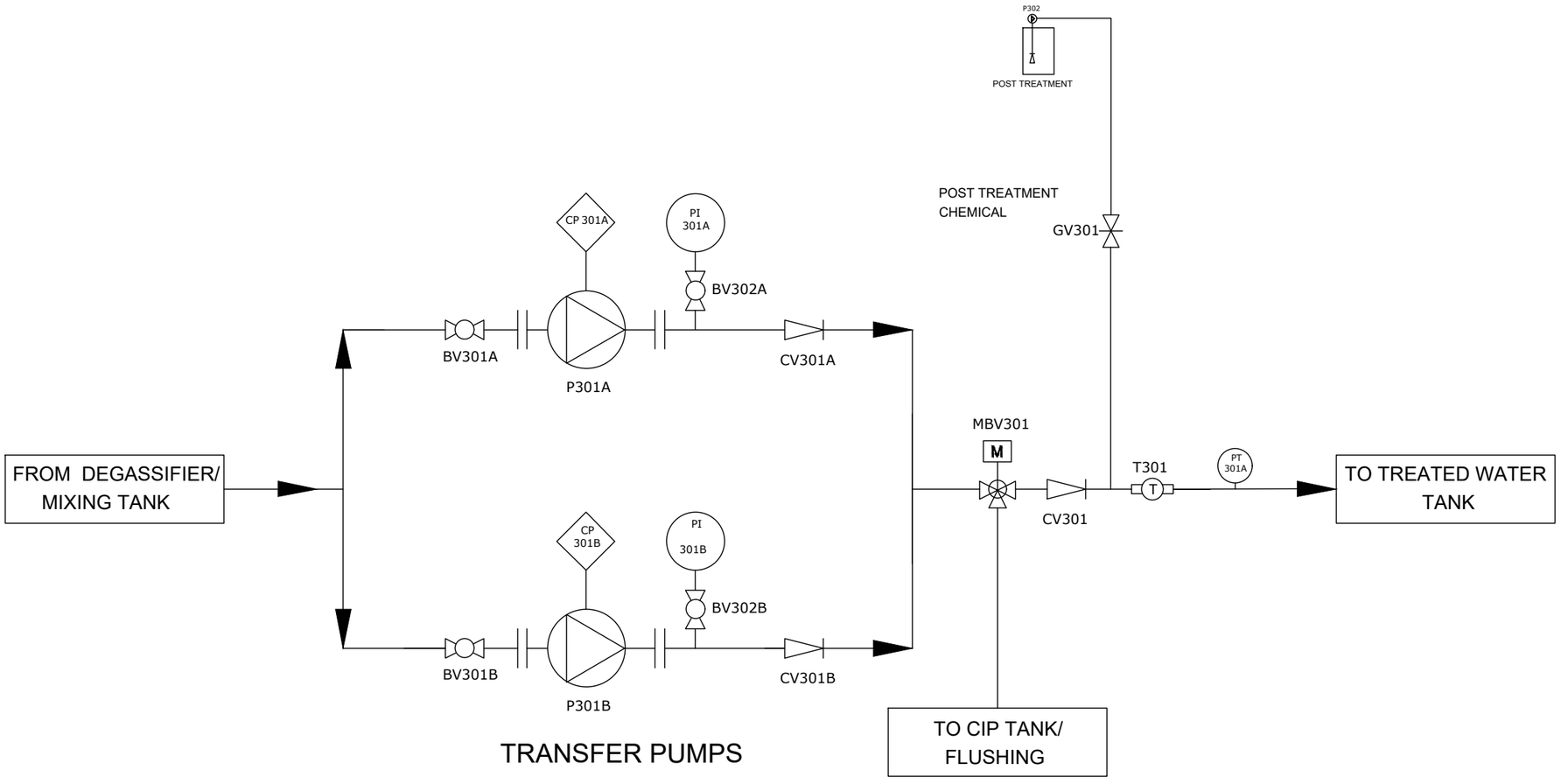
Project No: EP-WS/2019/03	
Rev: R-01	Page: W-09



TRANSFER PUMPS

DETAIL E

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

IWRM PLANT P&I DETAIL E

NTS

N

Legend

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Project No: EP-WS/2019/03

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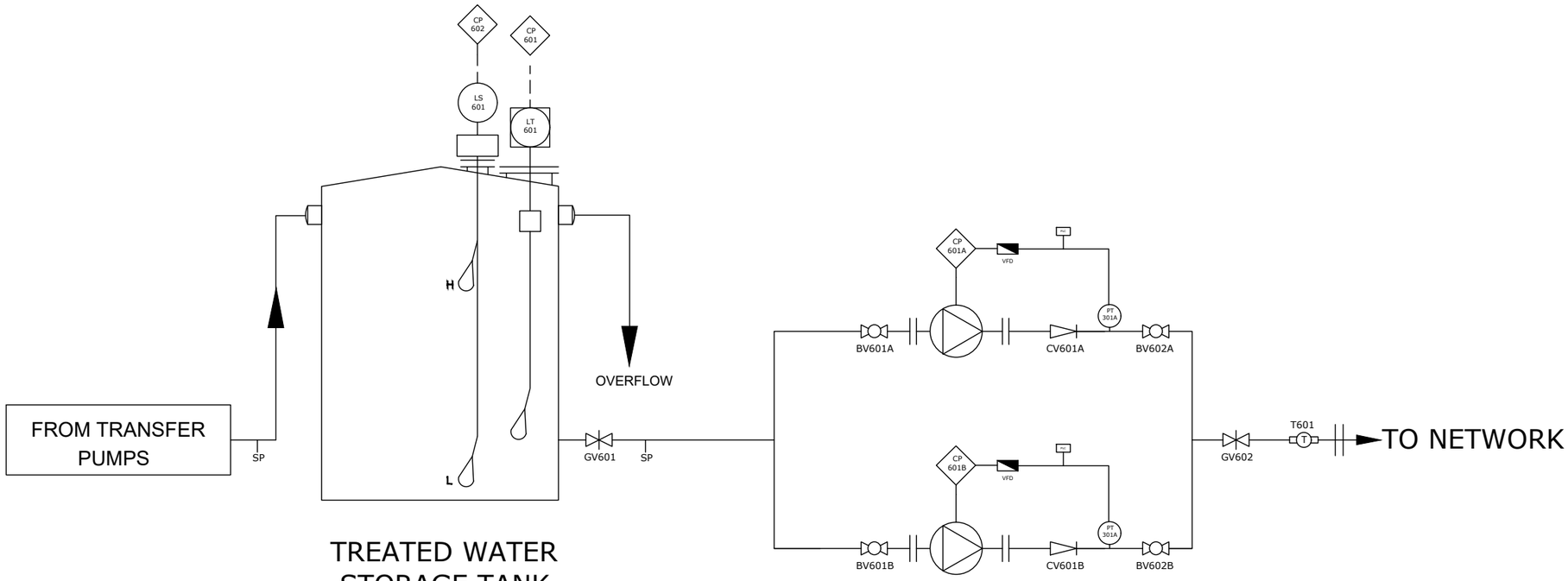

DETAIL F

LEGEND				
ACTUATION	VALVES	FEATURES	CONDITION	ABBREVIATIONS
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	SLUICE	FLOW INDICATOR		AR - AIR RELEASE
	MOTORIZED BALL			P - PUMP
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Legend

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Date:	Sep 2020	SCALE (A3):	NTS

Project No: EP-WS/2019/03

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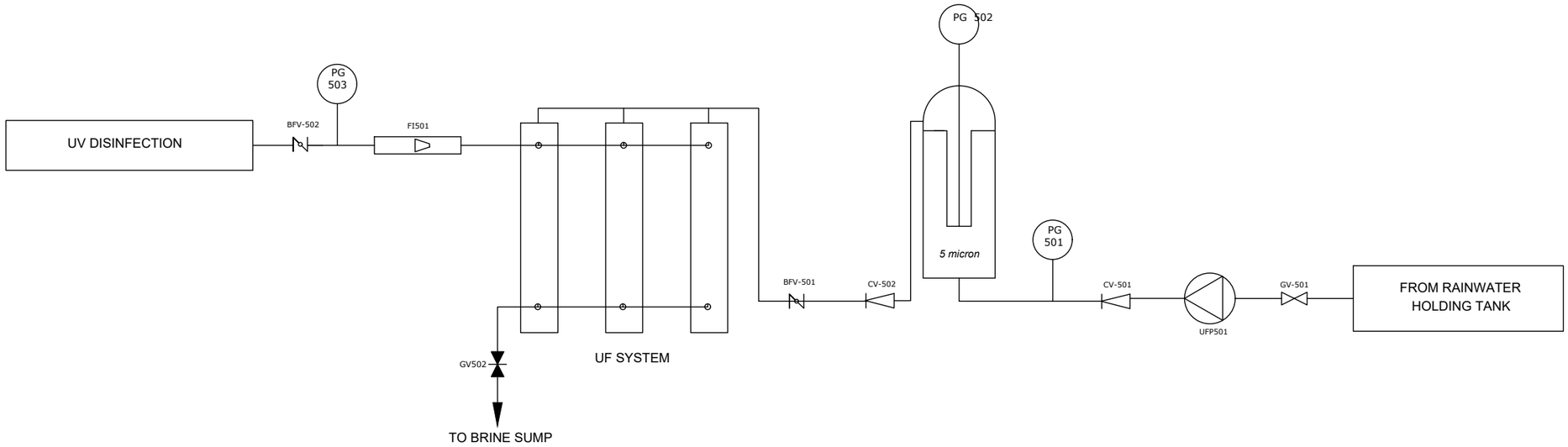
UV DISINFECTION



DETAIL G

LEGEND				
ACTUATION	VALVES	FEATURES	CONDITION	ABBREVIATIONS
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	GATE			PS - PRESSURE SENSOR
	CHECK VALVE			CP - CONNECTION POINT
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IWRM PLANT P&I DETAIL G

NTS

N

Legend

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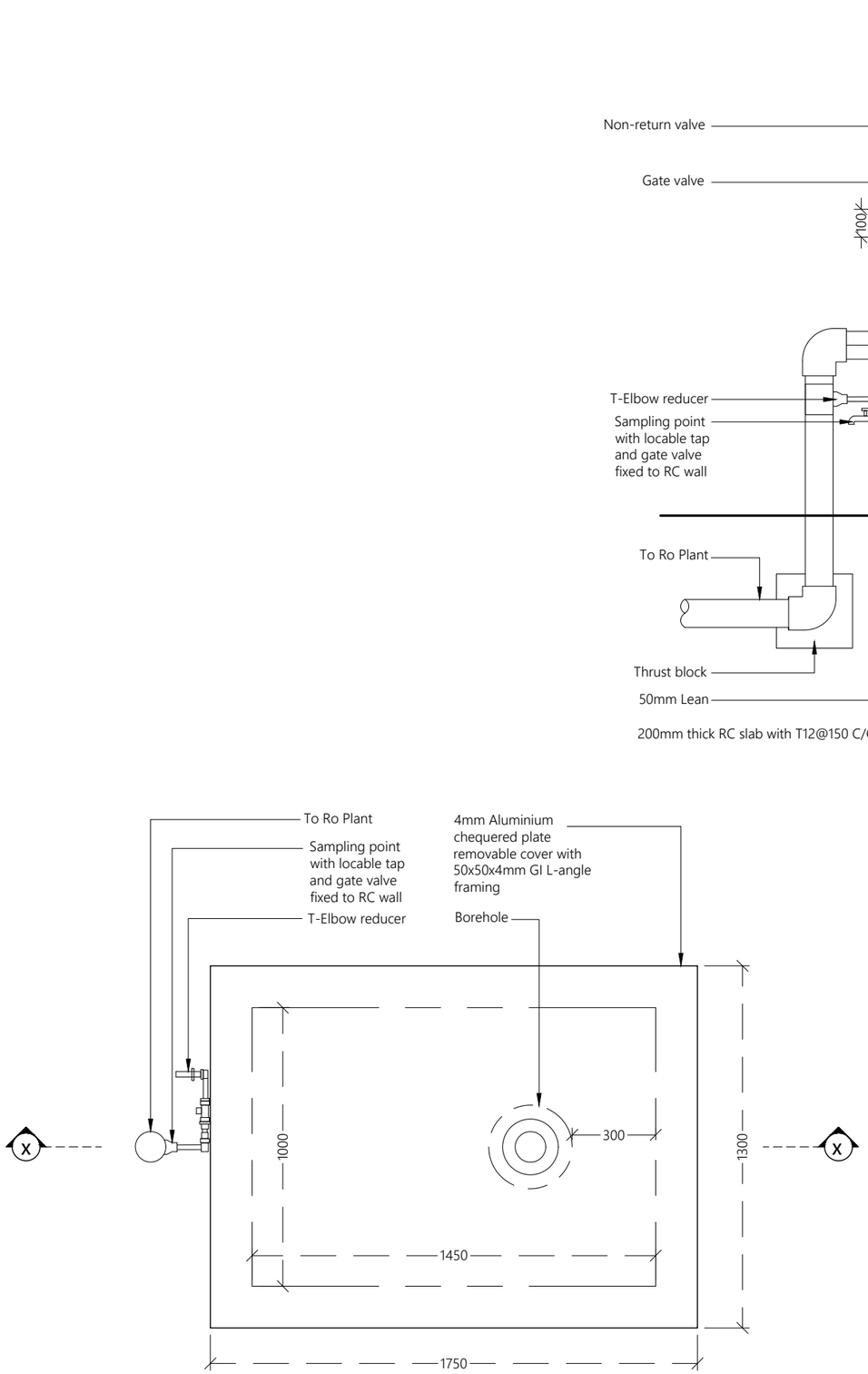

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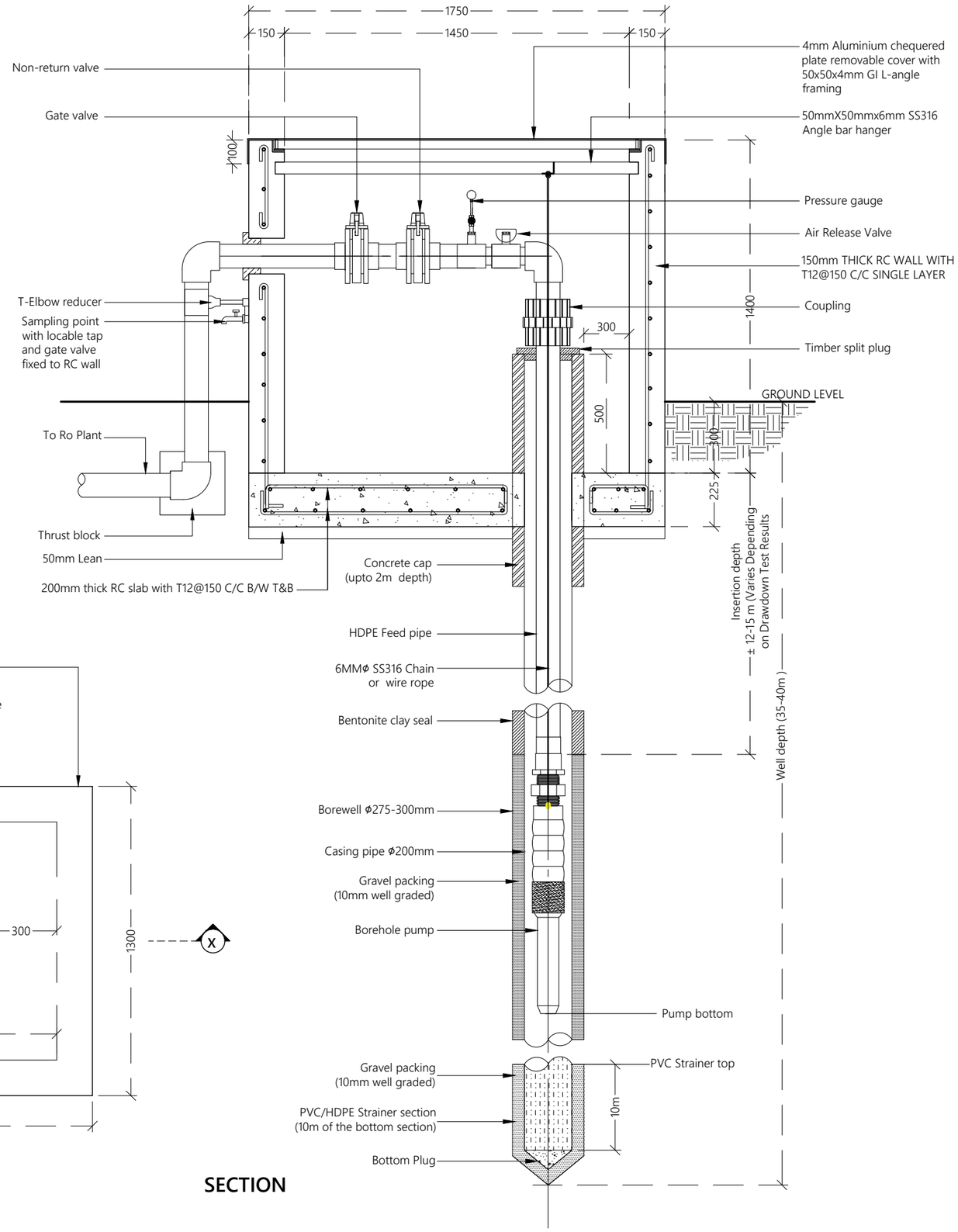

SECTION

BOREHOLE DETAILS

NTS

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Legend

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

Title:

Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 3

Sub Title:

Water Supply System in K. Himmafushi

Client:

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

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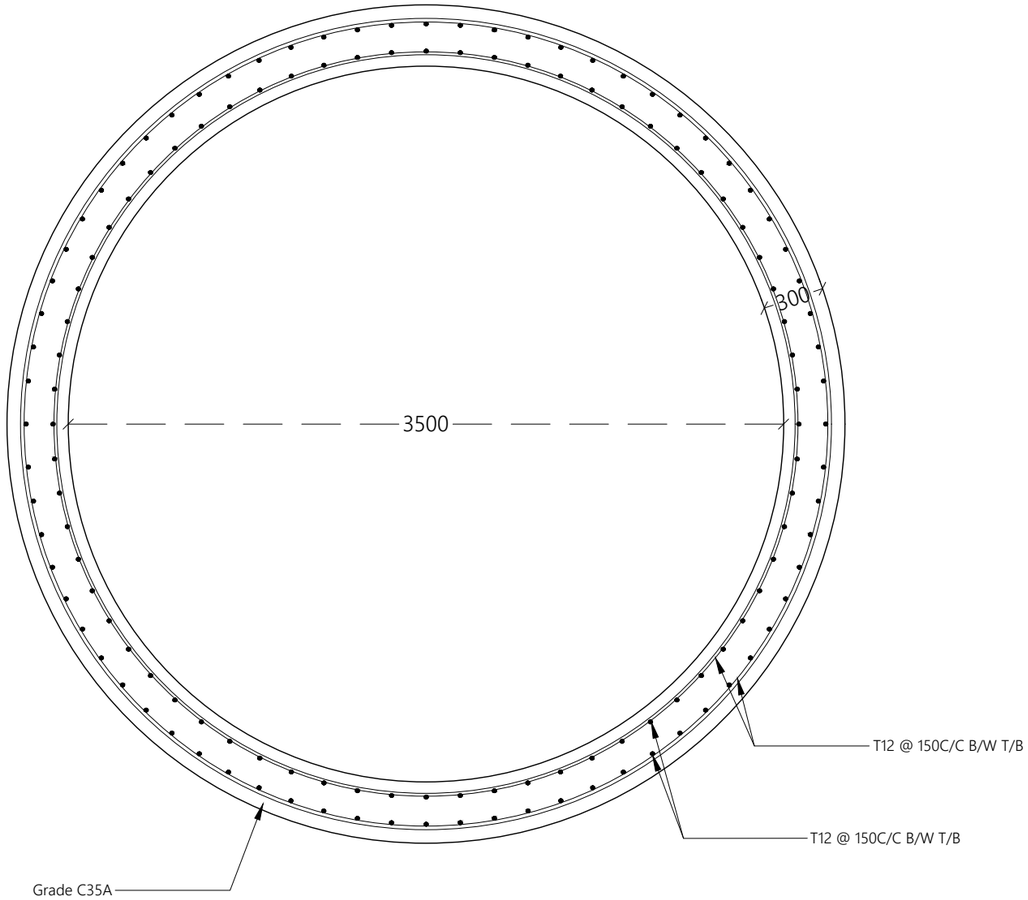
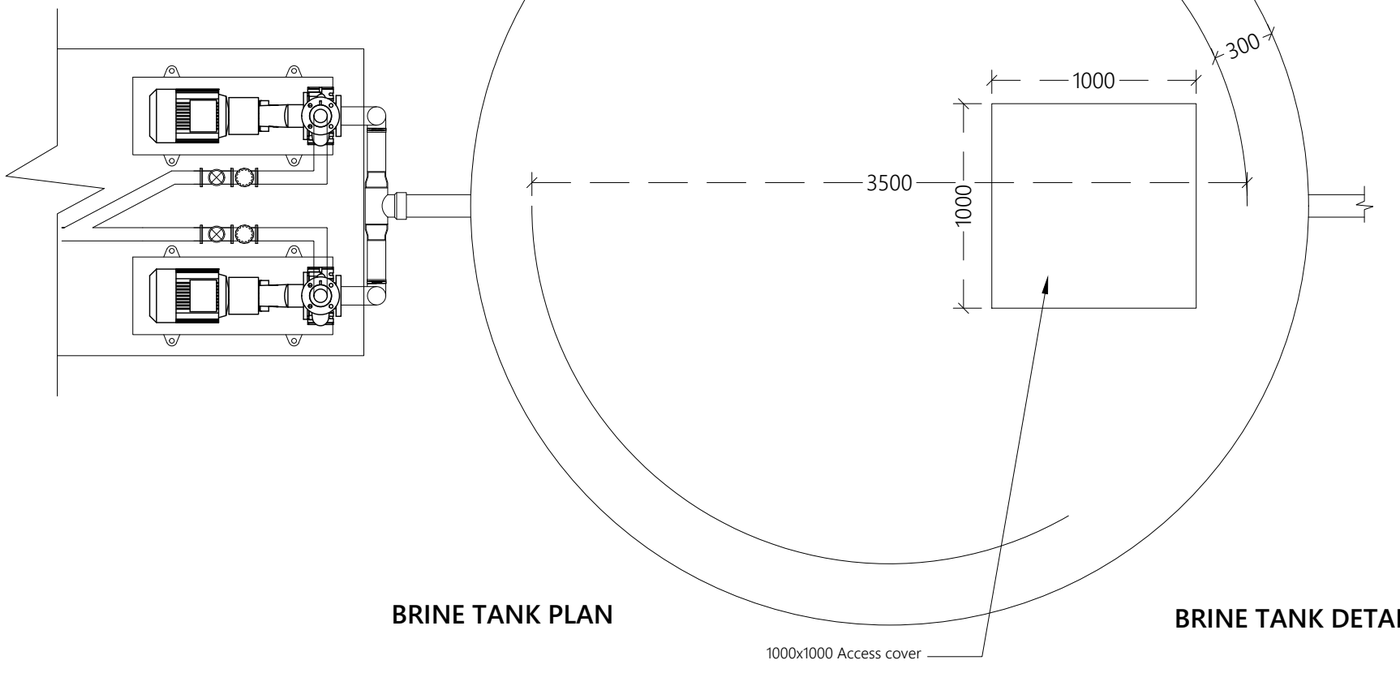


BRINE TANK PLAN



BRINE TANK PLAN

BRINE TANK DETAILS

1:30

N

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 6 islands, Maldives - Package 3

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Water Supply System in K. Himmafushi

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

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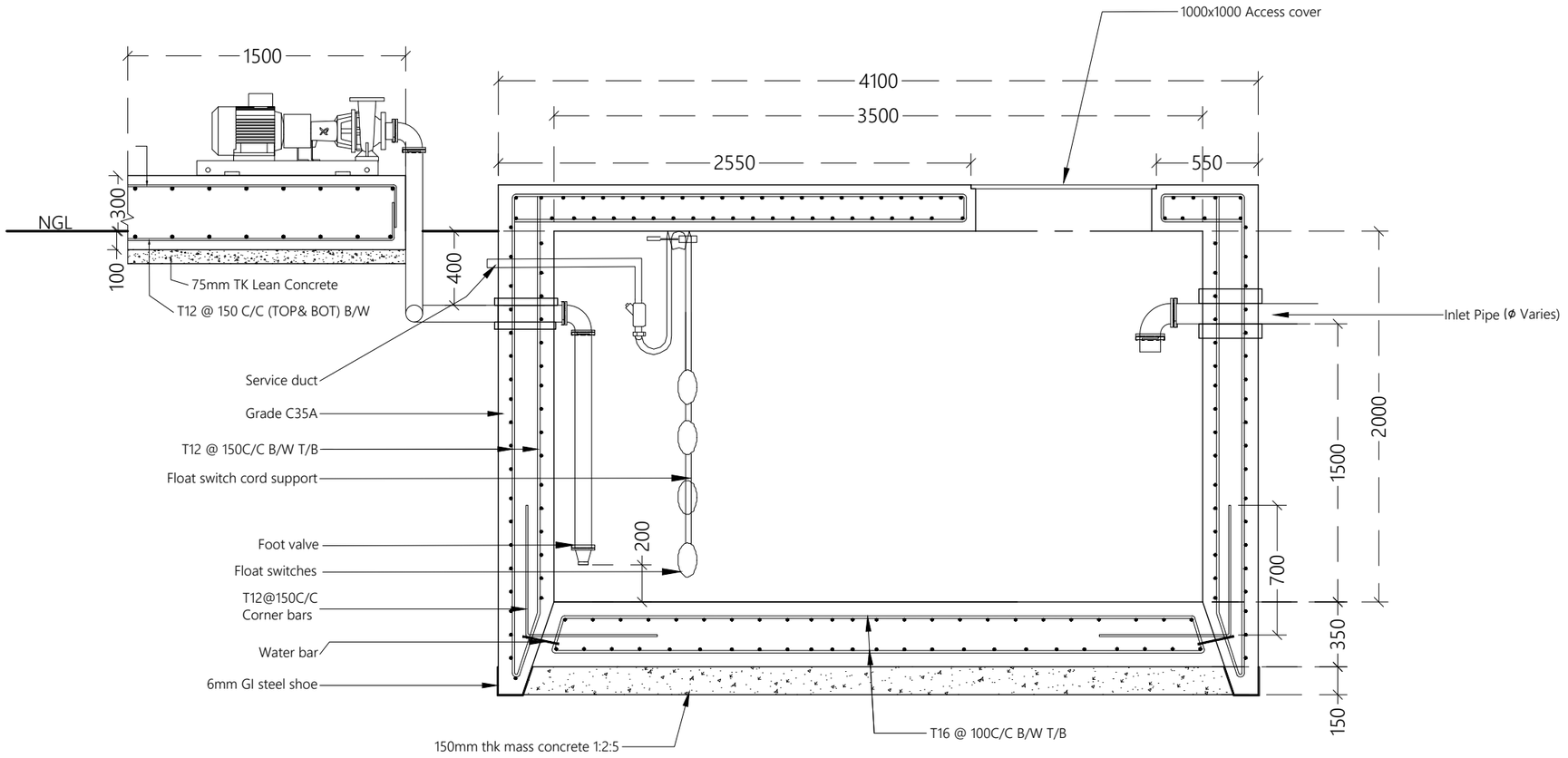

BRINE WATER TANK SECTION X-X

BRINE TANK DETAILS

1:30

N

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

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Project No: EP-WS/2019/03	
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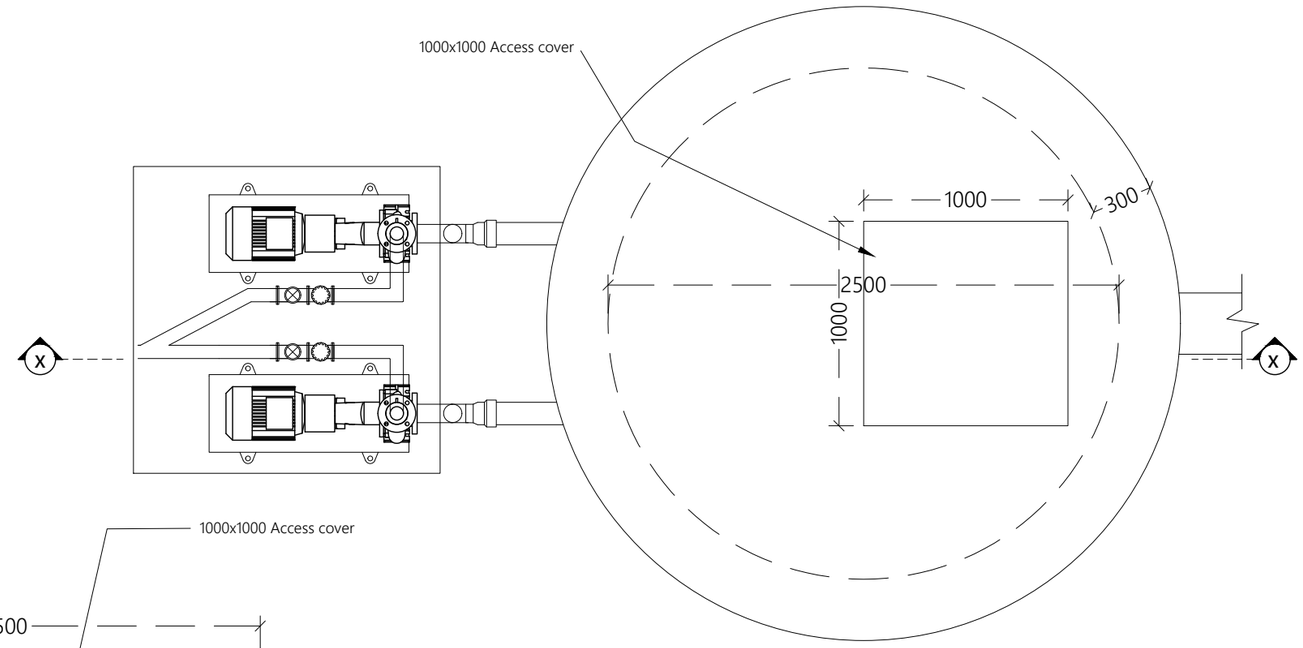
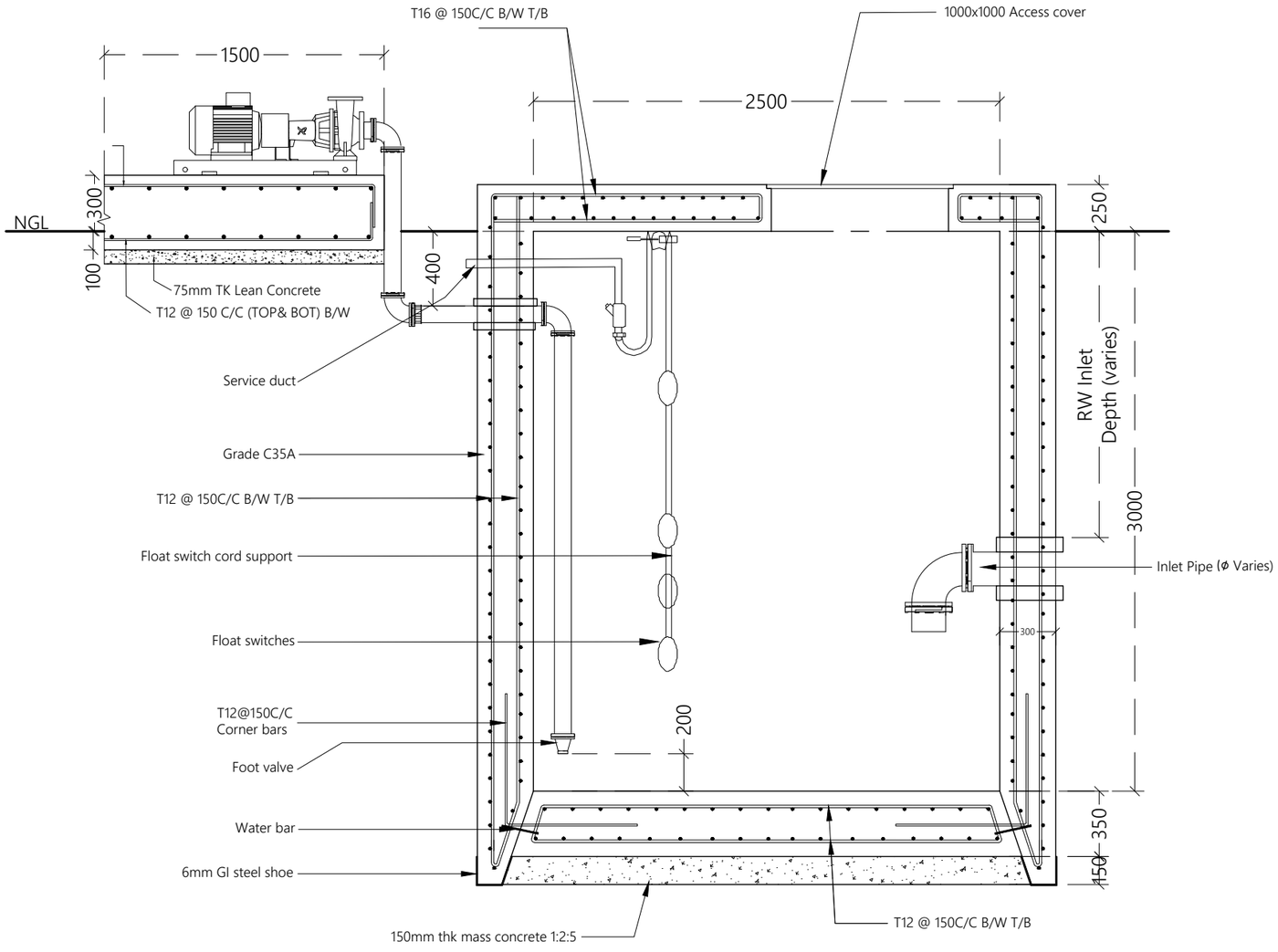
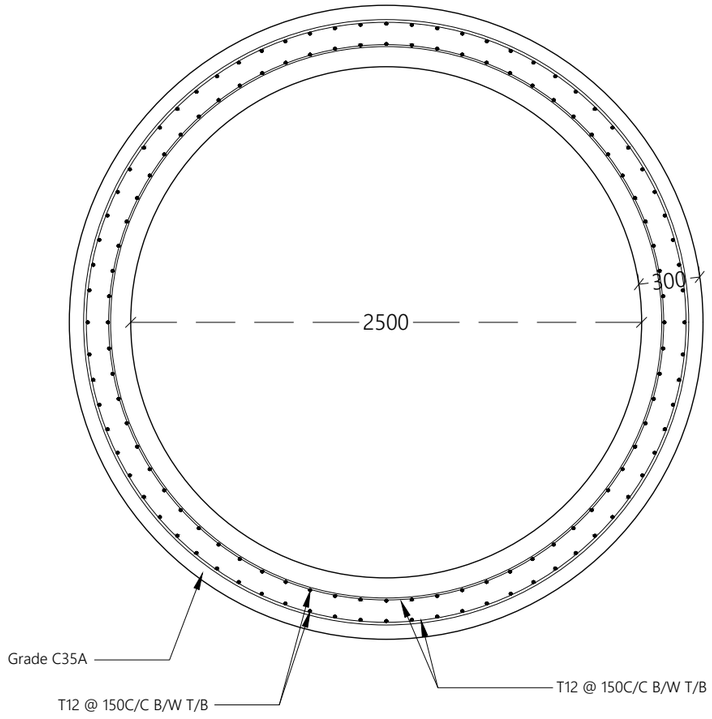


RAIN WATER LIFT WELL PLAN



RAIN WATER LIFT WELL SECTION X-X



RAIN WATER LIFT WELL PLAN - STRUCTURAL

RAINWATER LIFT WELL DETAILS

1:30

N

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.
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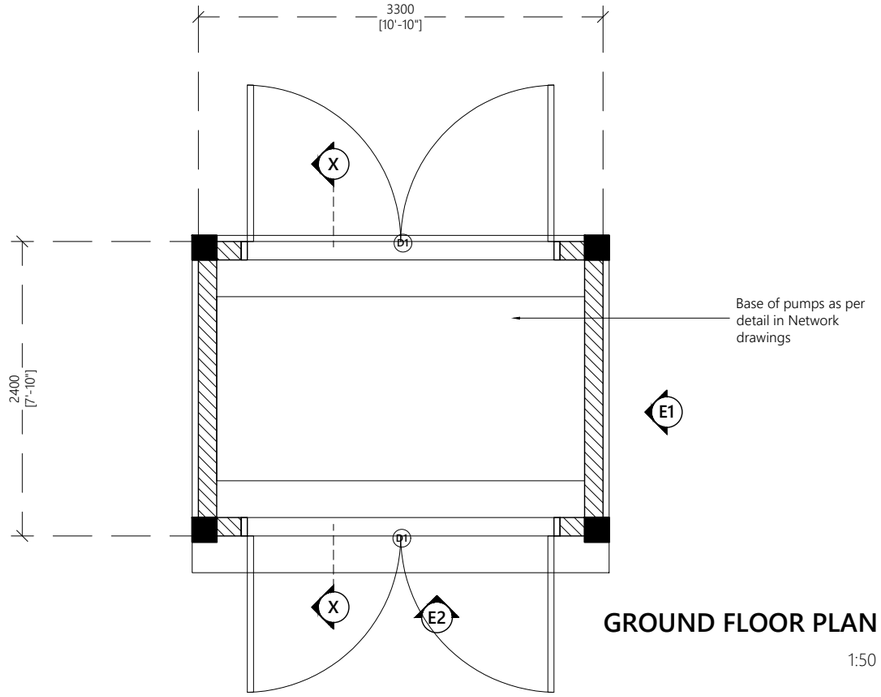

GROUND FLOOR PLAN

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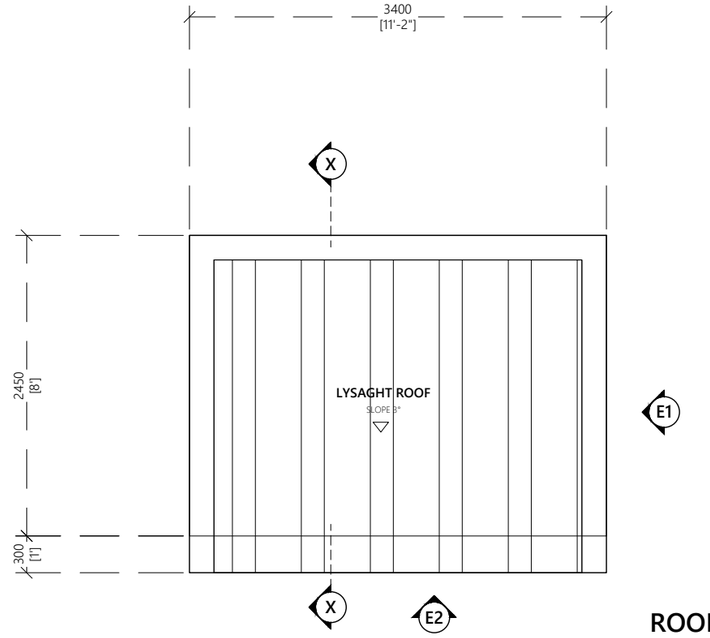
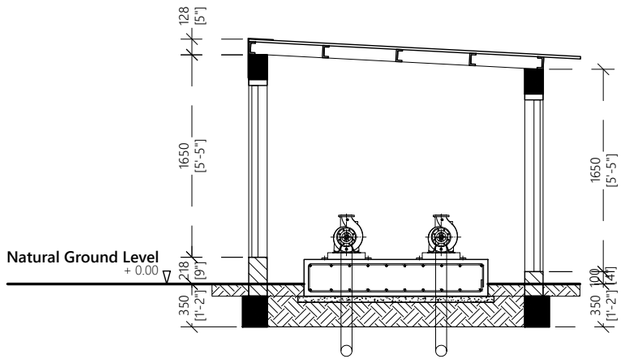


ROOF PLAN

1:50



SECTION X-X

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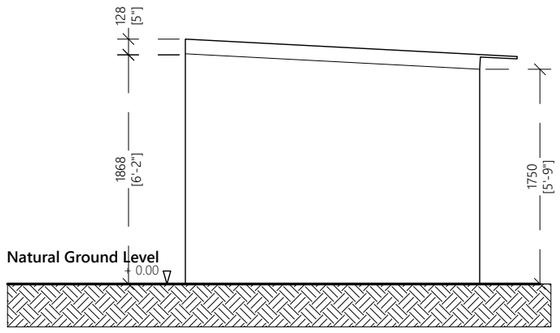

ELEVATION E1

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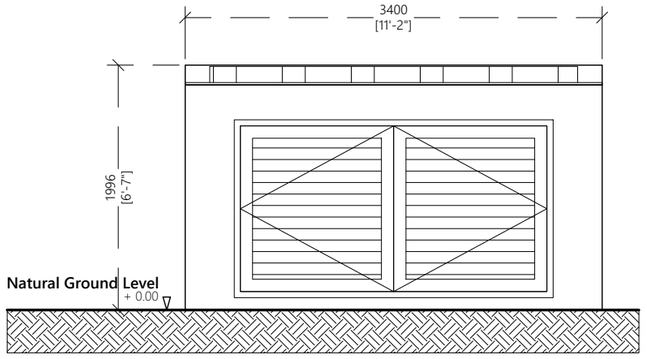

ELEVATION E2

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PUMP SHED DETAILS

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Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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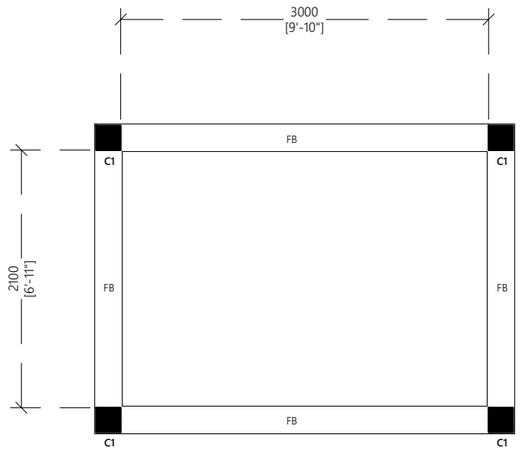
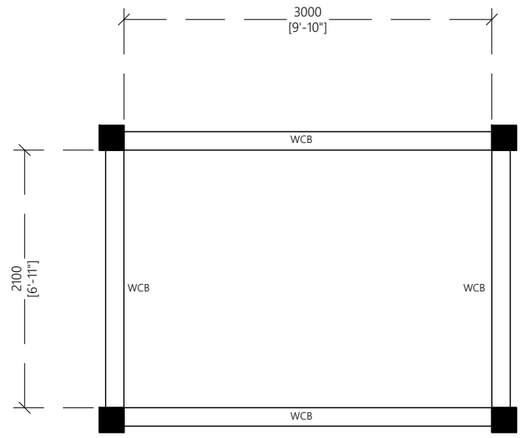
Rev: R-01	Page: W-17



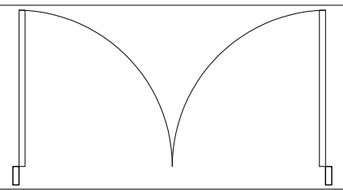
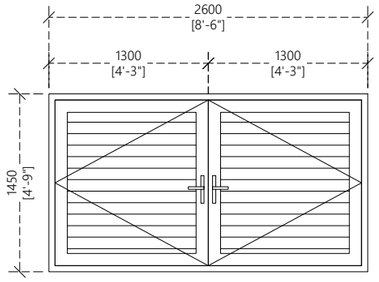
GROUND FLOOR PLAN

1:100



ROOF PLAN

1:100

Door ID	
Plan view	
Elevation view	
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	-

General Door 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

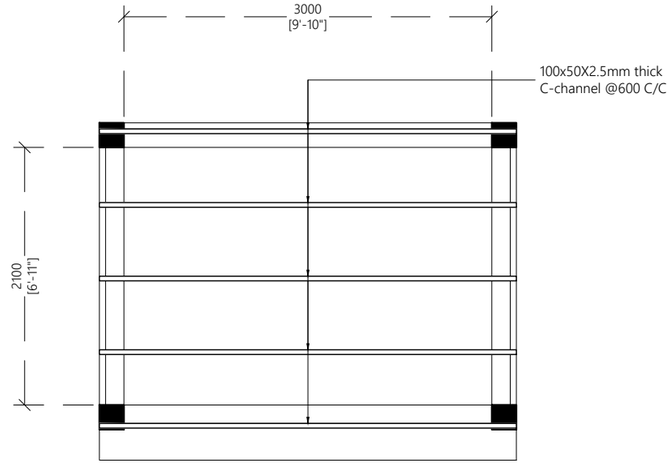
Hinges shall confirm to
1. Door size more than 700X1900mm
   WD: 125mm X2 sets
   SD: 150mm X3 sets
2. Door size less than 700X1900mm
   WD: 100mm X2 sets
   SD: 125mm X2 sets

Locks shall be cylinderical with master key sets

Door knobs shall be1000mm above FFL

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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Sub Title:

Water Supply System in K. Himmafushi

Client:

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

EPOCH
T: +960 333 3528
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W: wwww.epoch.associates
A: G. Rosary West,
Husnuheenaa Magu, Male', Maldives

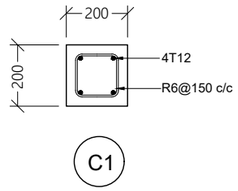
FEEDBACK INFRA
Making Infrastructure Happen

Drawn: M.A	Checked: M.S.S.
Designed: M.A	Approved: I.W.
Date: Sep 2020	SCALE (A3): 1:100

Project No: EP-WS/2019/03

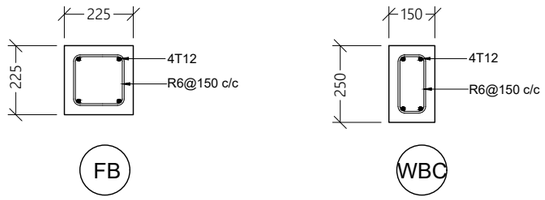
Rev: **R-01**

Page: **W-18**



COLUMN DETAIL

1:20



BEAM DETAILS

1:20

PUMP SHED DETAILS

1:20

N

Legend

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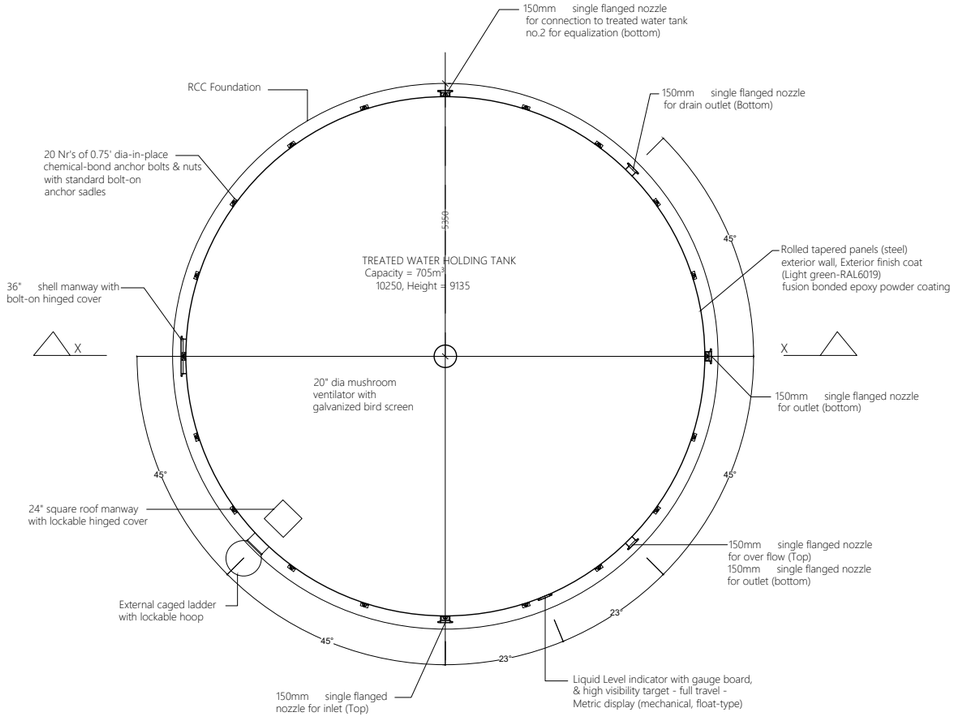
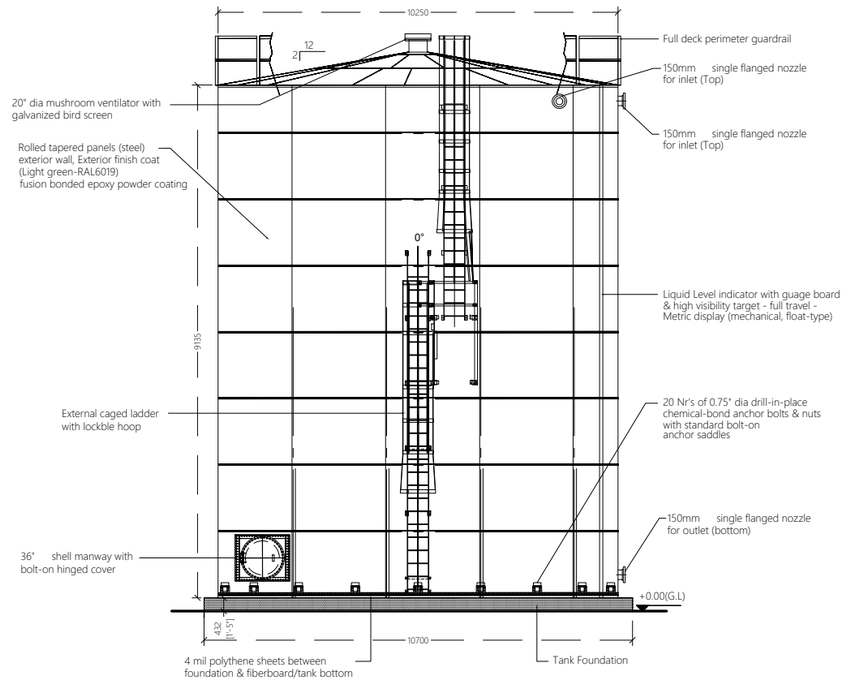
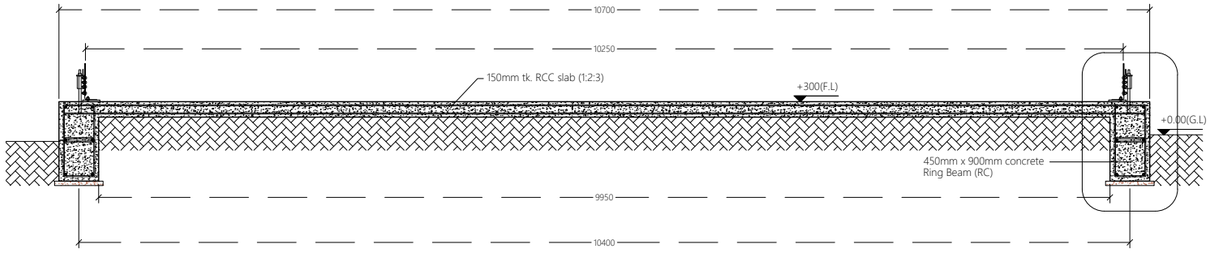


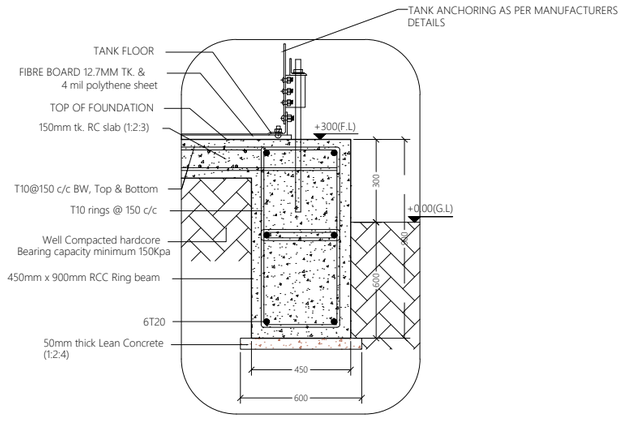
TREATED WATER HOLDING TANK AND FOUNDATION- PLAN



TREATED WATER HOLDING TANK AND FOUNDATION- ELEVATION



SECTION X-X



DETAIL

Note:-
Cover = 50mm
Lap length 50

TREATED WATER TANK DETAILS

NTS

N

Legend

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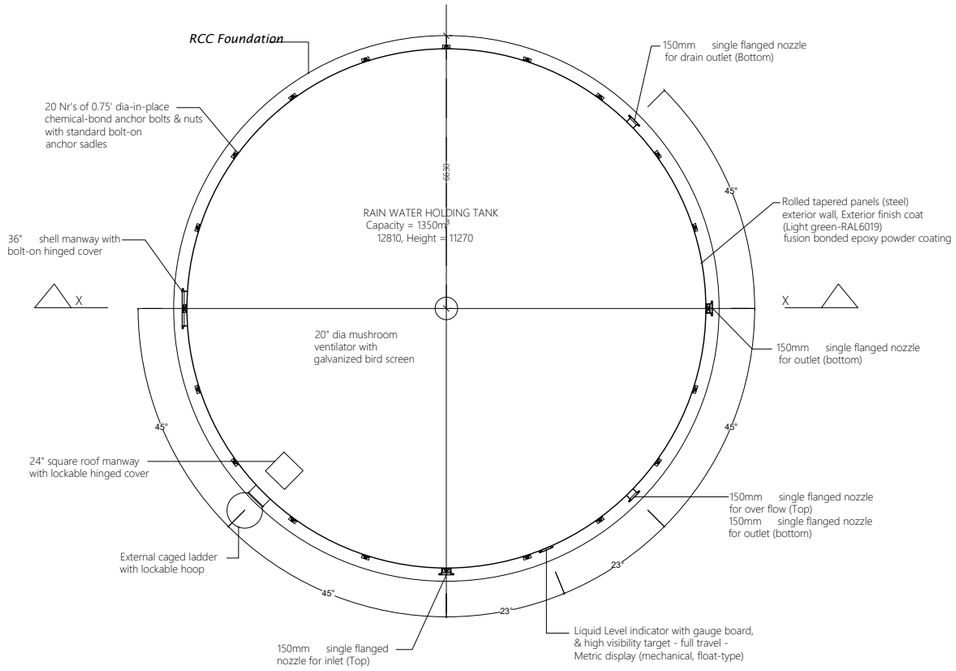
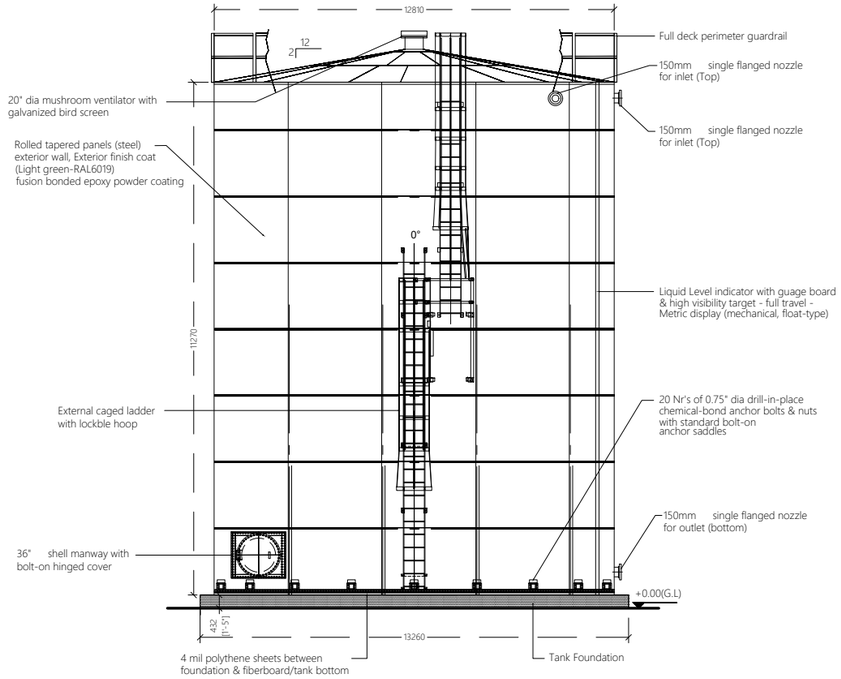
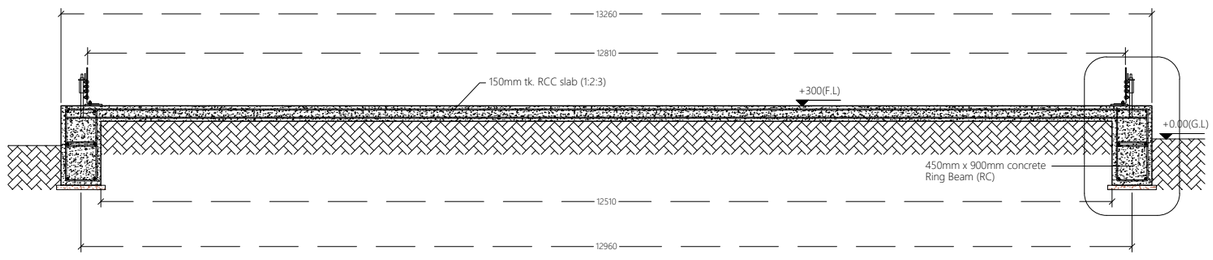


RAINWATER HOLDING TANK AND FOUNDATION- PLAN



RAINWATER HOLDING TANK AND FOUNDATION- ELEVATION



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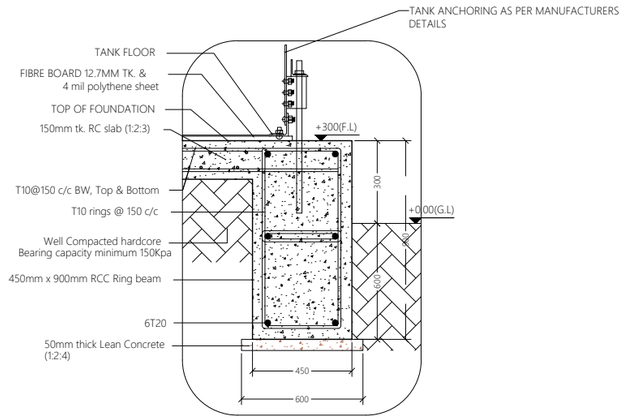

DETAIL

Note:-
Cover = 50mm
Lap length 50

RAINWATER HOLDING TANK DETAILS

NTS

Legend

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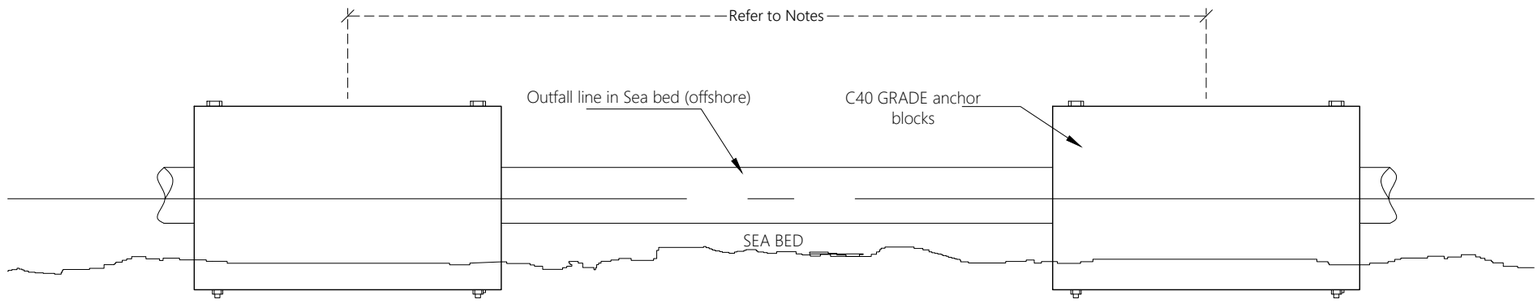
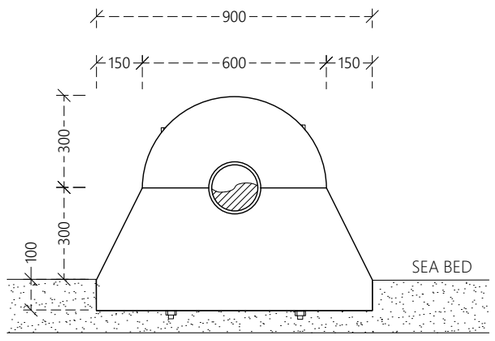
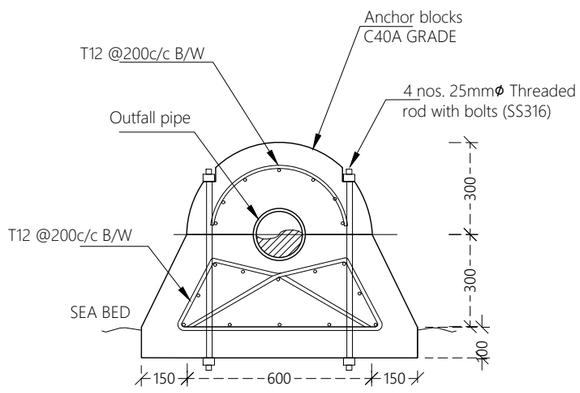


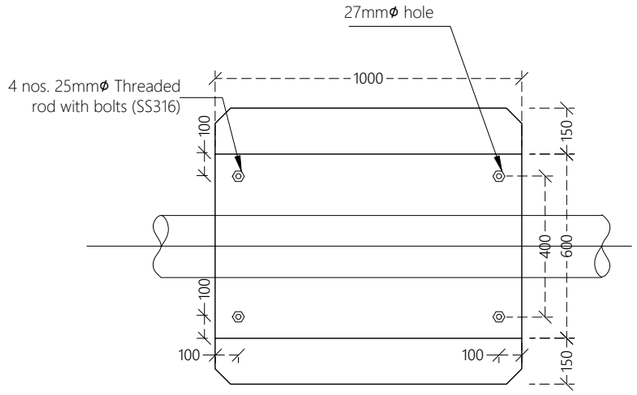
BALLAST BLOCK SIDE ELEVATION



BALLAST BLOCK FRONT ELEVATION



BALLAST BLOCK SECTION



BALLAST BLOCK PLAN

BALLAST BLOCK DETAILS

NTS

N

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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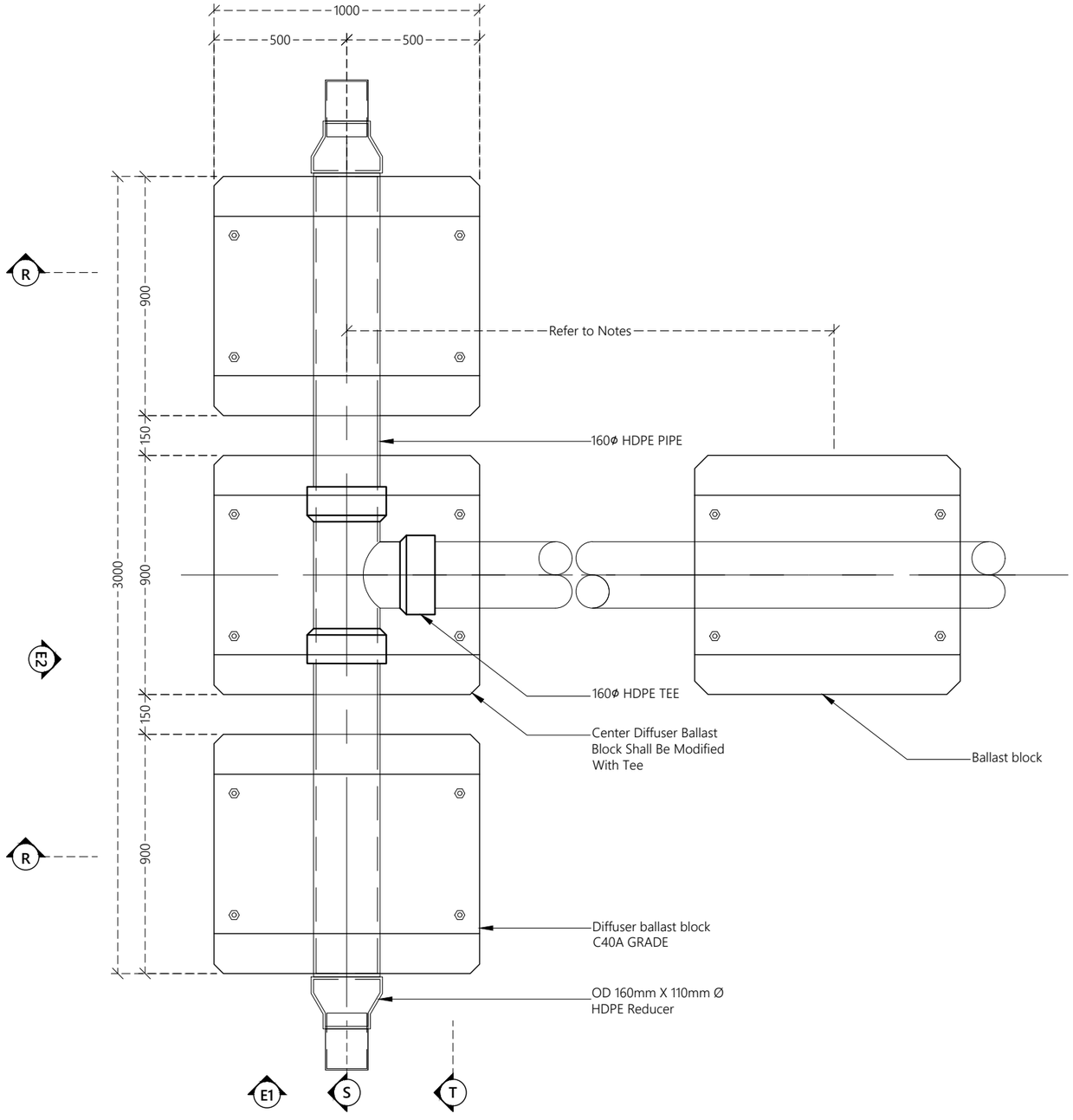
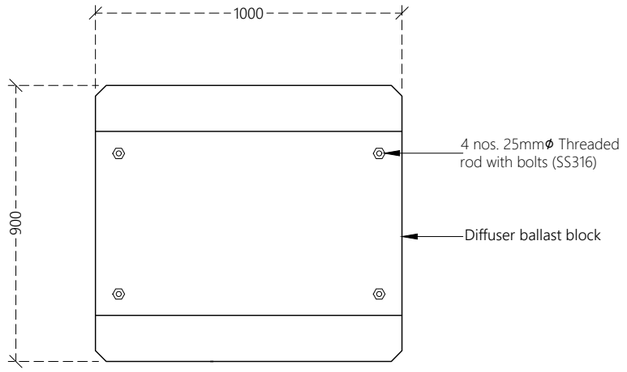
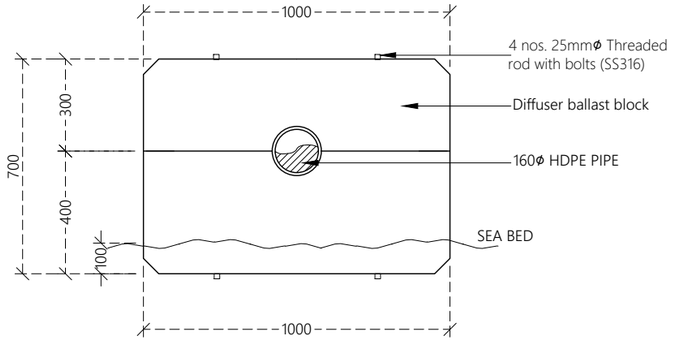
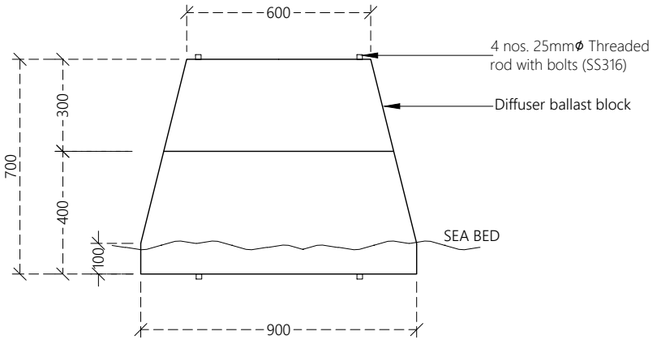




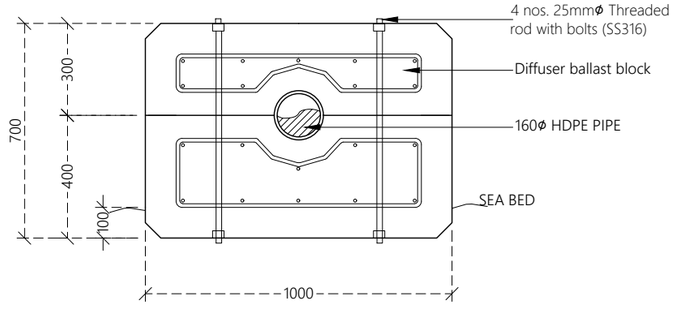
DIFFUSER BALLAST BLOCK PLAN



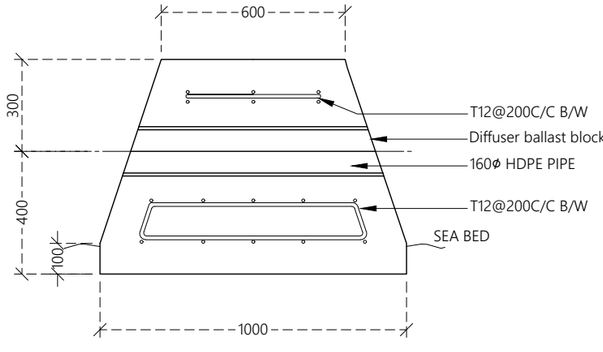
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E1



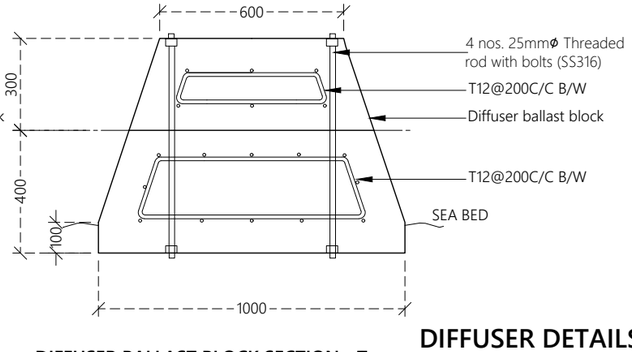
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E2



DIFFUSER BALLAST BLOCK SECTION - R



DIFFUSER BALLAST BLOCK SECTION - S



DIFFUSER BALLAST BLOCK SECTION - T

DIFFUSER DETAILS

NTS

N

Legend

Notes:

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- All pipe work shall be bedded on 10mm thick neoprene rubber seat in semicircular recess matching the O.D. the pipe.
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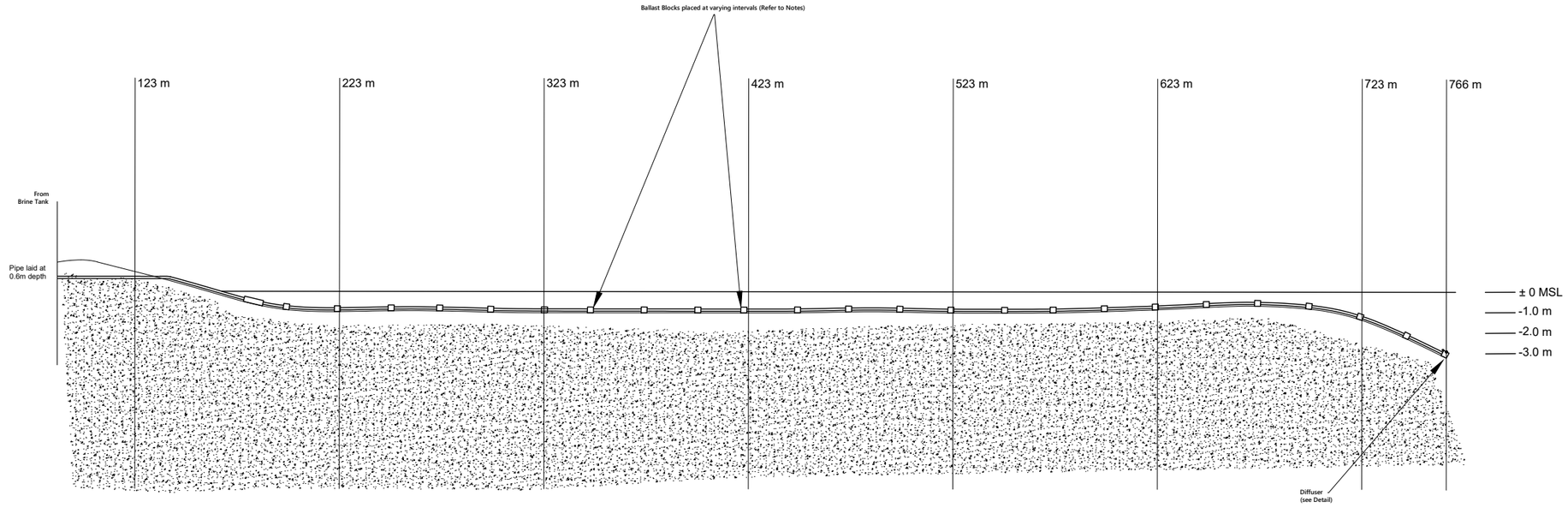

BRINE SEA OUTFALL DETAIL

NTS

N

Legend

Notes:

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

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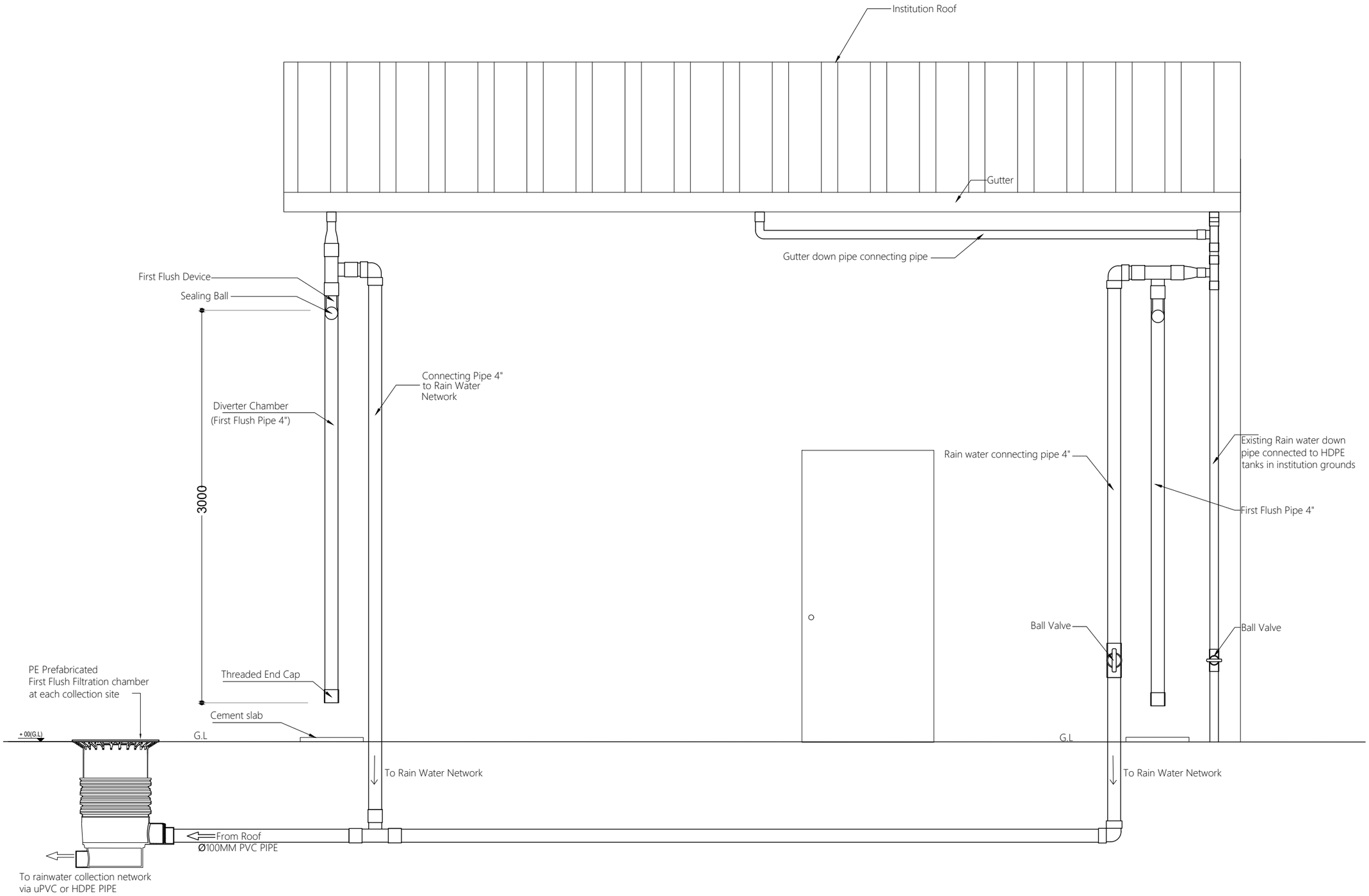
Rev: **R-01**		Page: **W-24**	



RAINWATER FIRST FLUSH MECHANISM

NTS

N

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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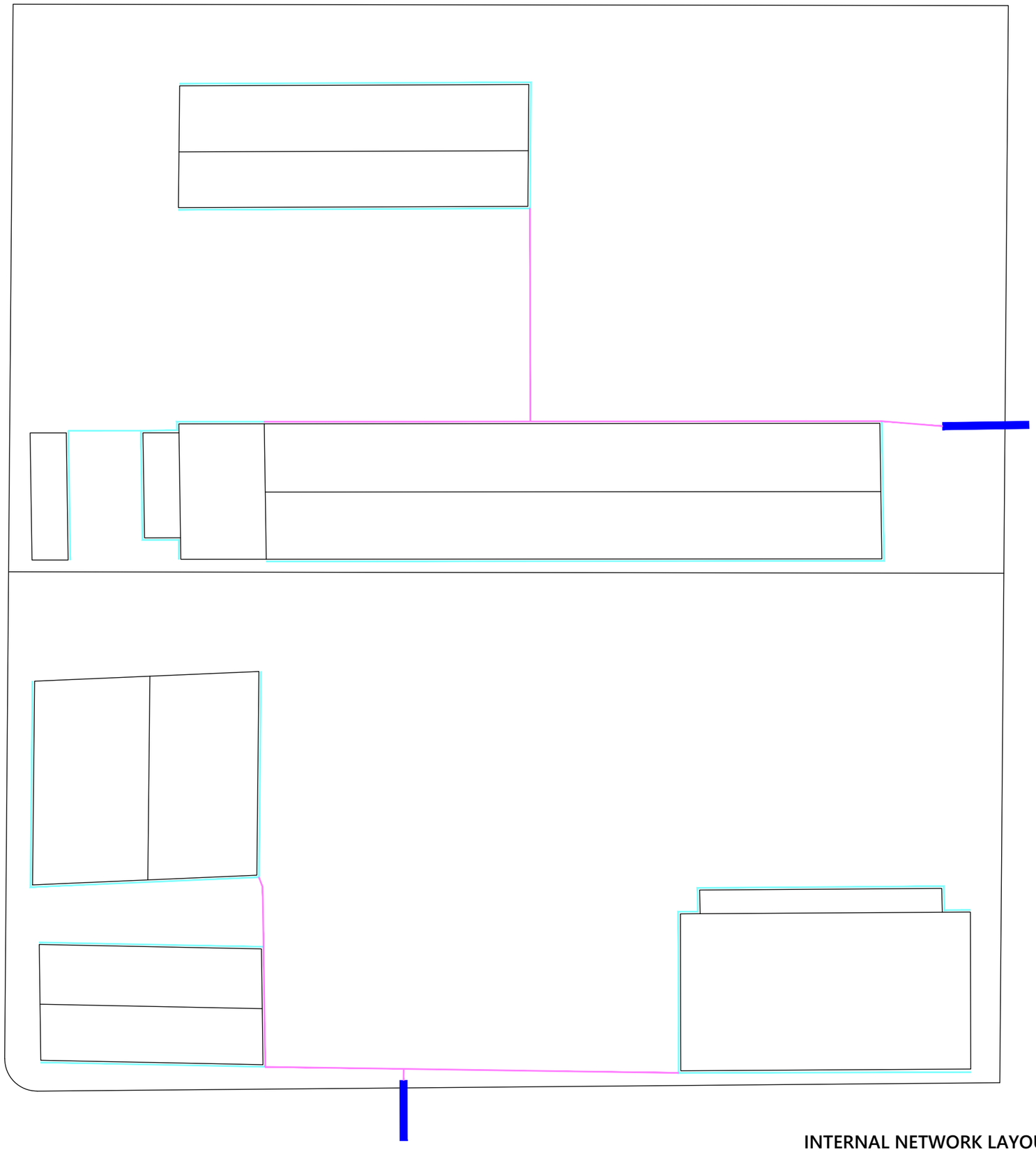

INTERNAL NETWORK LAYOUT- HIMMAFUSHI SCHOOL

1:400

N

Legend

= PVC PIPES Ø160mm

= PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 513m

APPROXIMATE GUTTER LENGTH =273m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 141m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 372m

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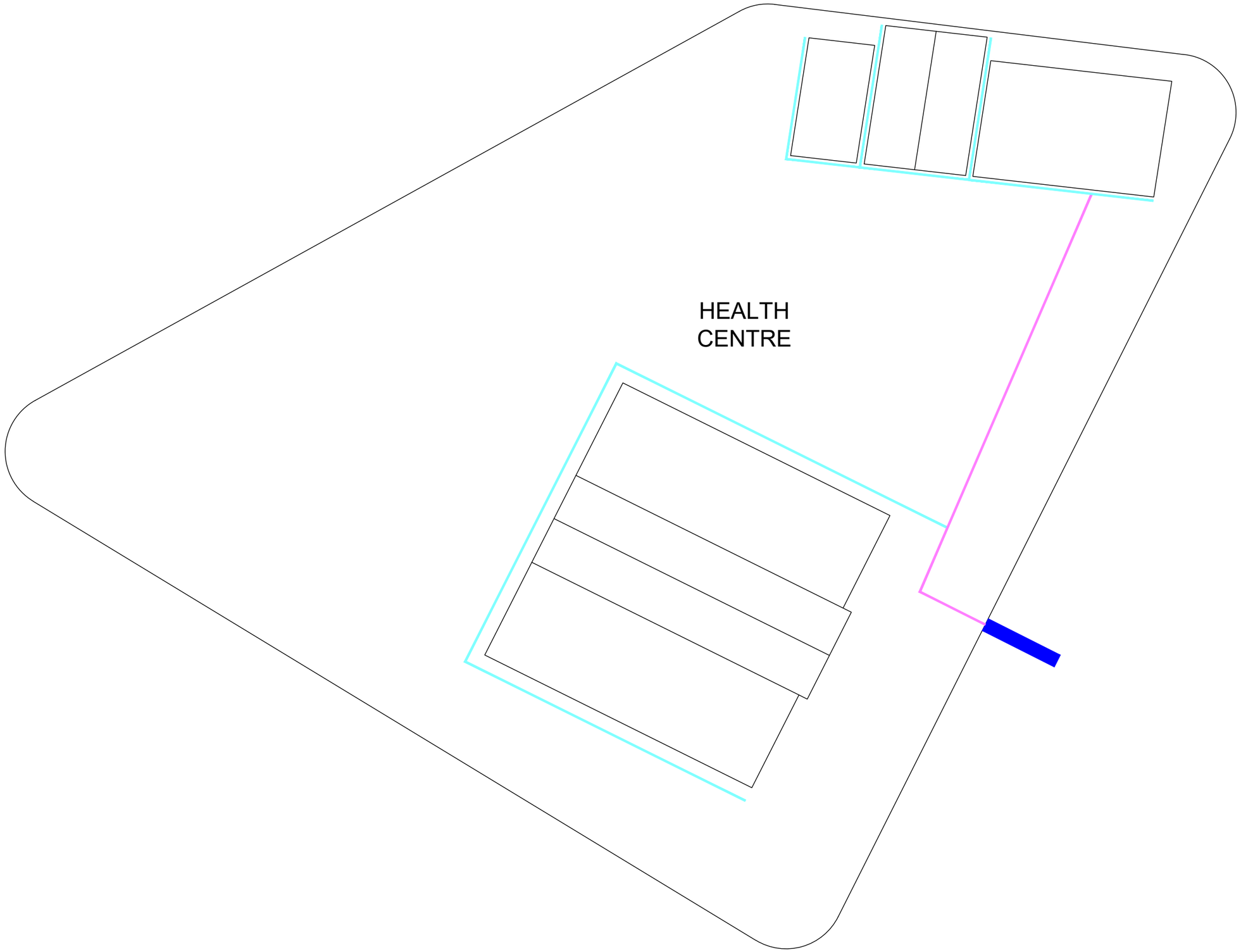

INTERNAL NETWORK LAYOUT- HEALTH CENTER

1:200

N

Legend

= PVC PIPES Ø160mm

= PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 119m

APPROXIMATE GUTTER LENGTH = 61m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 26m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 93m

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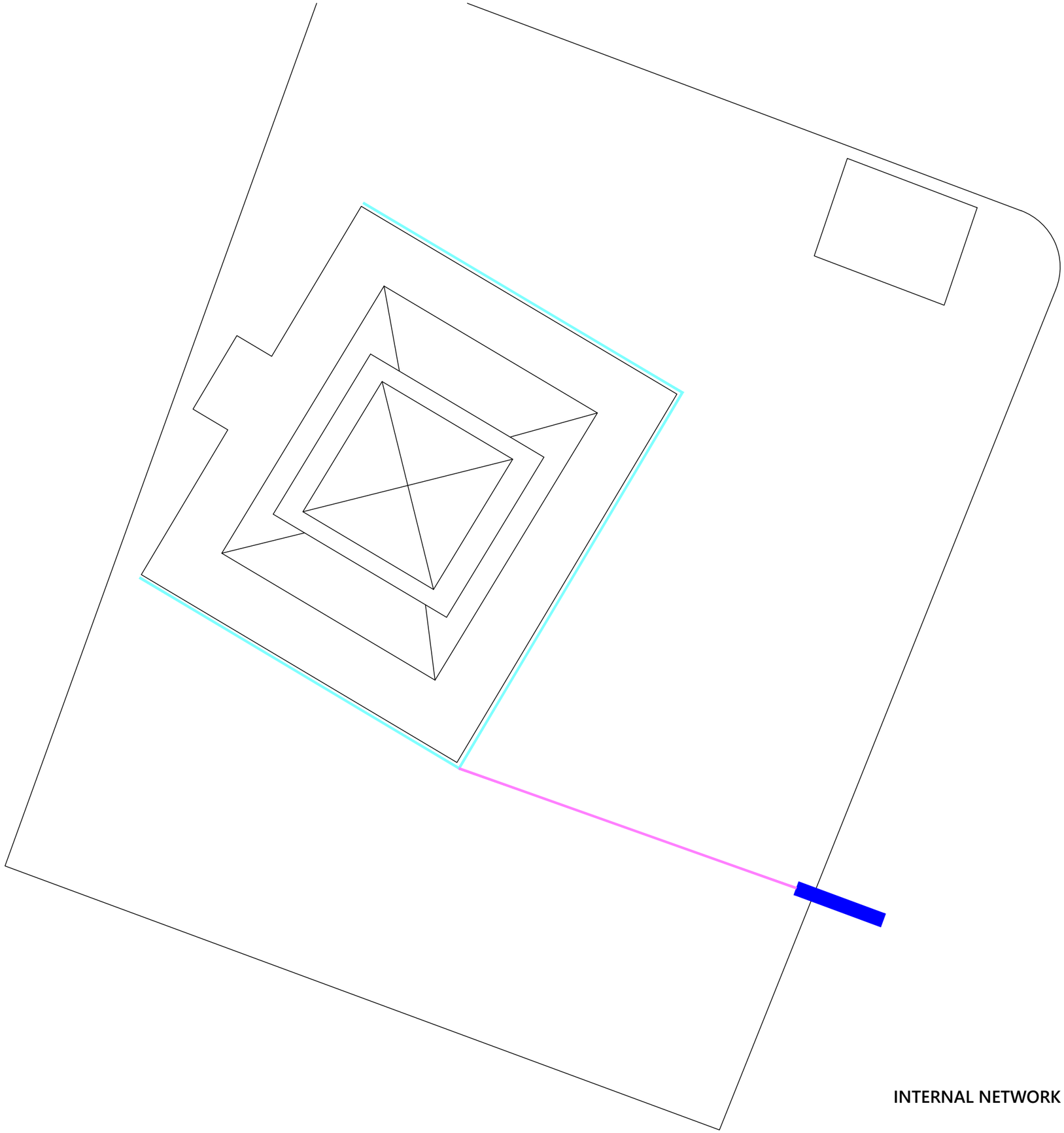

INTERNAL NETWORK LAYOUT-MOSQUE

1:200

N

Legend

= PVC PIPES Ø160mm

= PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 77m

APPROXIMATE GUTTER LENGTH = 58m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 160mm) = 18m

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) =59m

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

Title:

Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 islands, Maldives - Package 3

Sub Title:

Water Supply System in K. Himmafushi

Client:

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

EPOCH

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E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
Husnuheenaa Magu, Male', Maldives

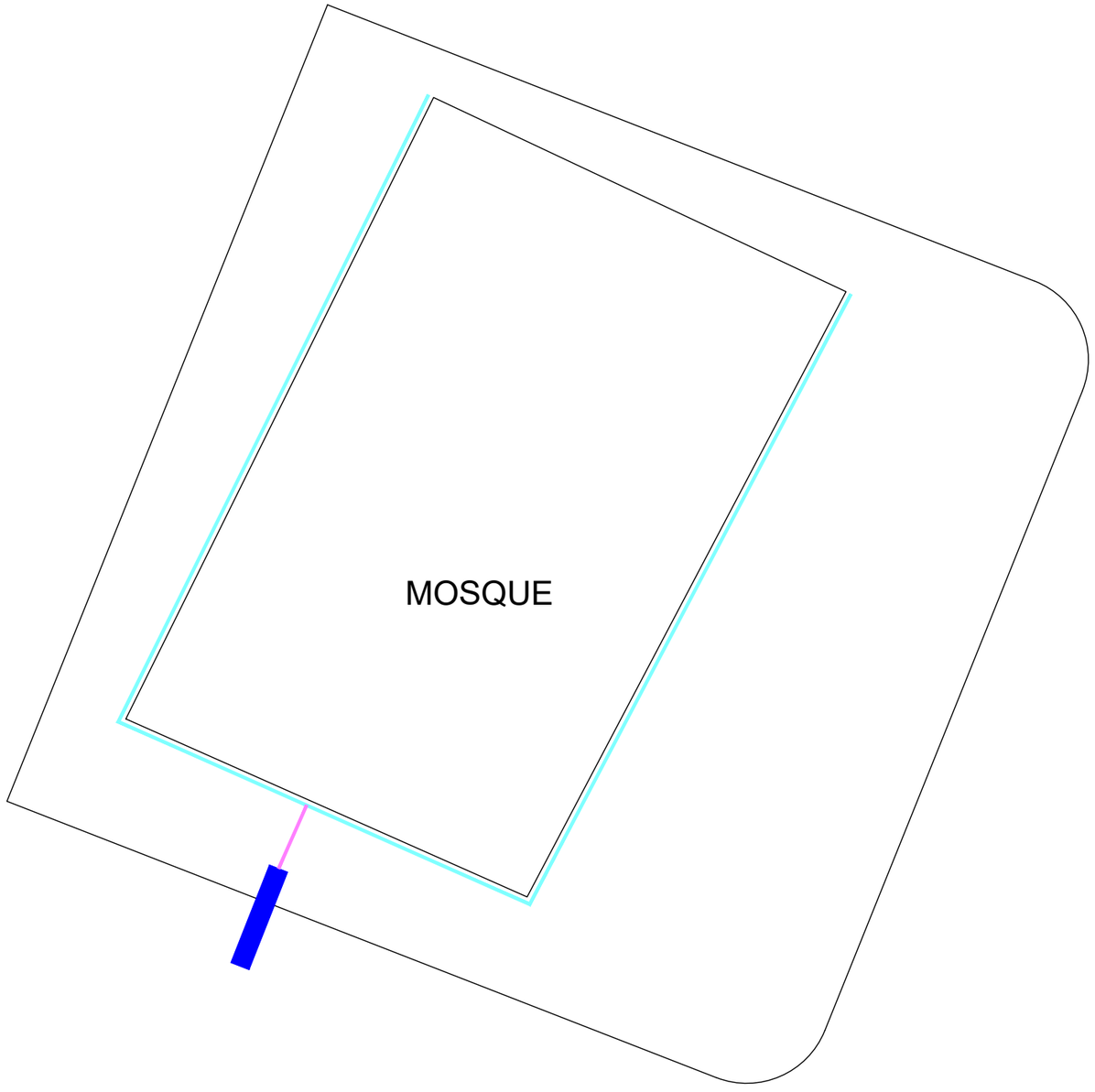
FEEDBACK INFRA

Drawn: M.A	Checked: M.S.S.
Designed: M.A	Approved: I.W.
Date: Sep 2020	SCALE (A3): 1:200

Project No: EP-WS/2019/03

Rev: **R-01**

Page: **W-28**



INTERNAL NETWORK LAYOUT- MOSQUE

1:200

N

Legend

= PVC PIPES Ø160mm

= PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 69m

APPROXIMATE GUTTER LENGTH = 49m

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

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 66m

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd
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Project No: EP-WS/2019/03

Rev: **R-01**

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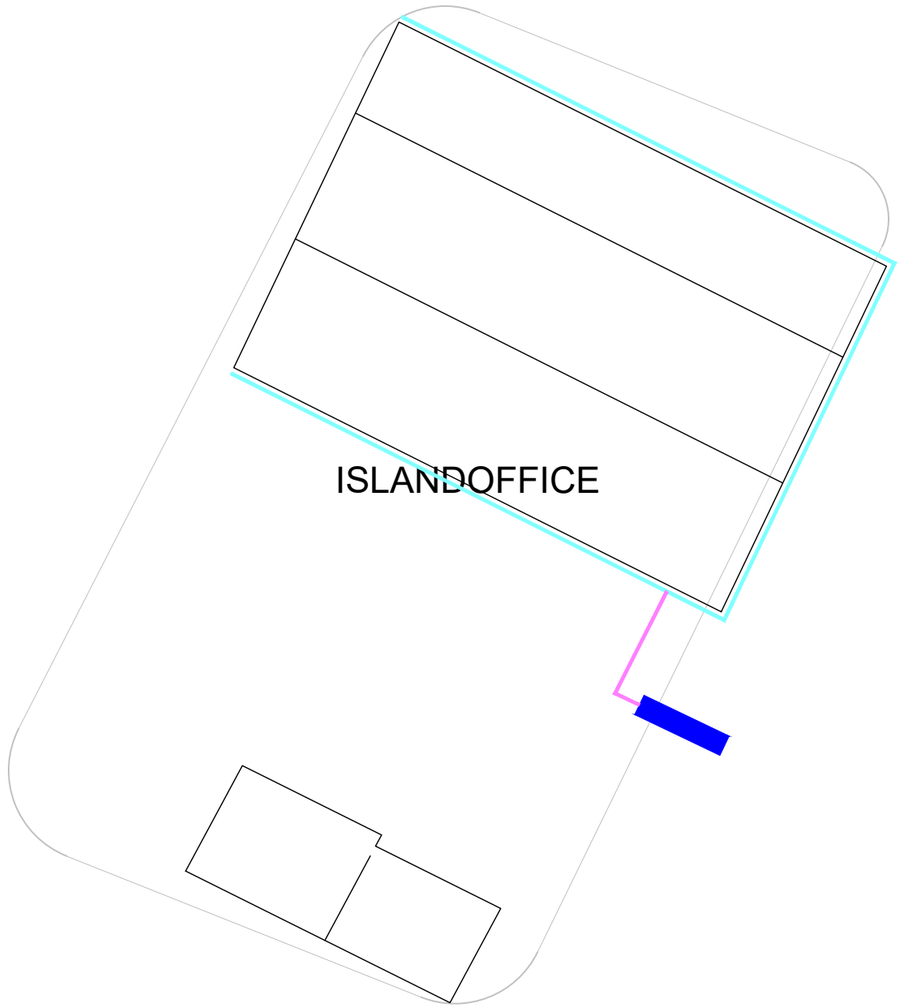

INTERNAL NETWORK LAYOUT- ISLAND OFFICE

1:200

N

Legend

= PVC PIPES Ø160mm

= PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 54m

APPROXIMATE GUTTER LENGTH = 34m

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

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 49m

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

Title:

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Sub Title:

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Client:

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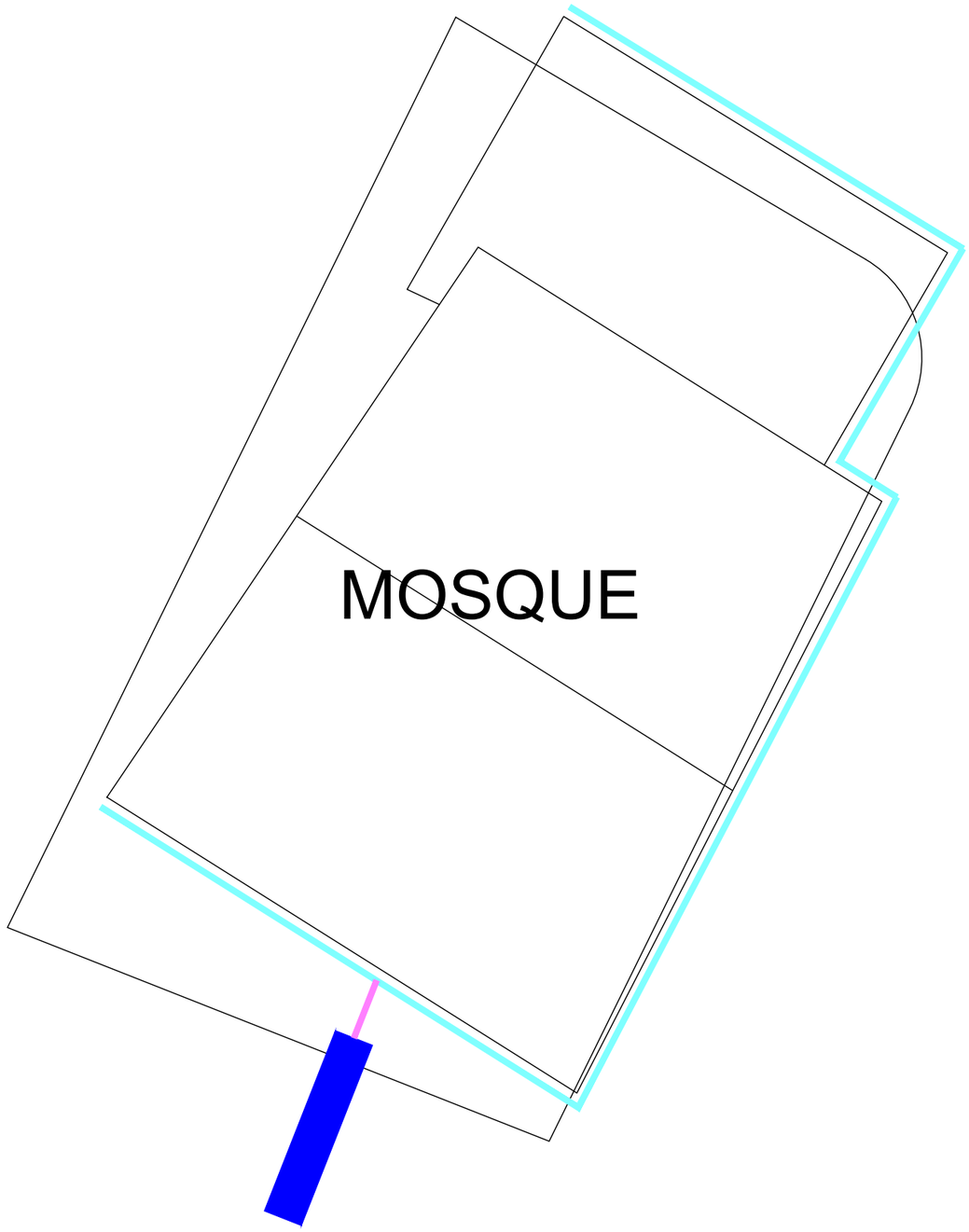

INTERNAL NETWORK LAYOUT- MOSQUE

1:100

N

Legend

= PVC PIPES Ø160mm

= PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 36m

APPROXIMATE GUTTER LENGTH = 18m

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

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 35m

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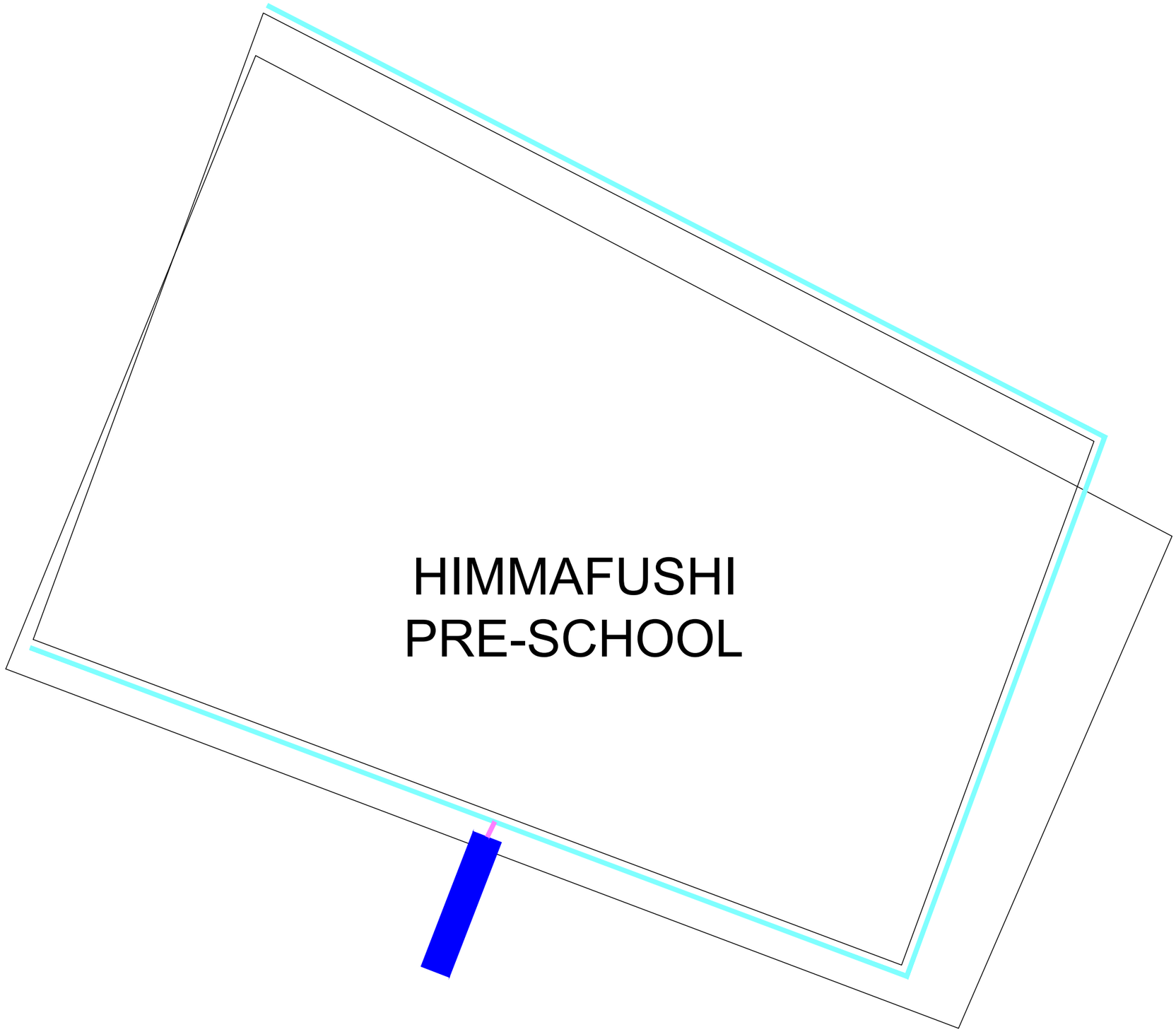

N

Legend

= PVC PIPES Ø160mm

= PVC PIPES Ø110mm

APPROXIMATE TOTAL NETWORK LENGTH = 58m

APPROXIMATE GUTTER LENGTH = 42m

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

APPROXIMATE PIPE NETWORK LENGTH (DIAMETER 110mm) = 57m

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

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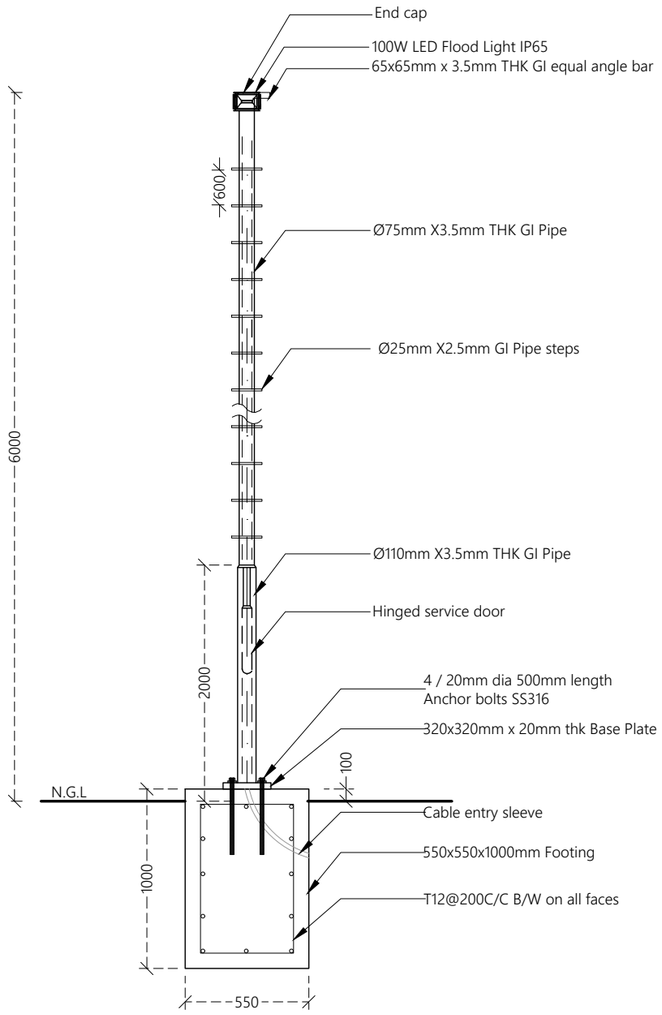
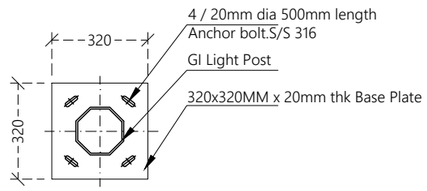
INTERNAL NETWORK LAYOUT- PRE SCHOOL

1:100



LIGHT POST DETAILS FOR STP COMPOUND (LP1)



BASE PLATE (LP1)

LIGHT POST DETAILS

NTS

N

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

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

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Date: Sep 2020	SCALE (A3): NTS
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ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING AND VEHICLE SHED, K.HIMMAFUSHI

For Ministry of National Planning, Housing and Infrastructure

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Typical Opening Detail	A.D (1)
Typical Wall Construction Detail	A.D (2)
Boundary Wall Detail	A.D (3)
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Detail A	S.D (3)
ARCHITECTURAL DRAWINGS (VEHICLE SHED)	
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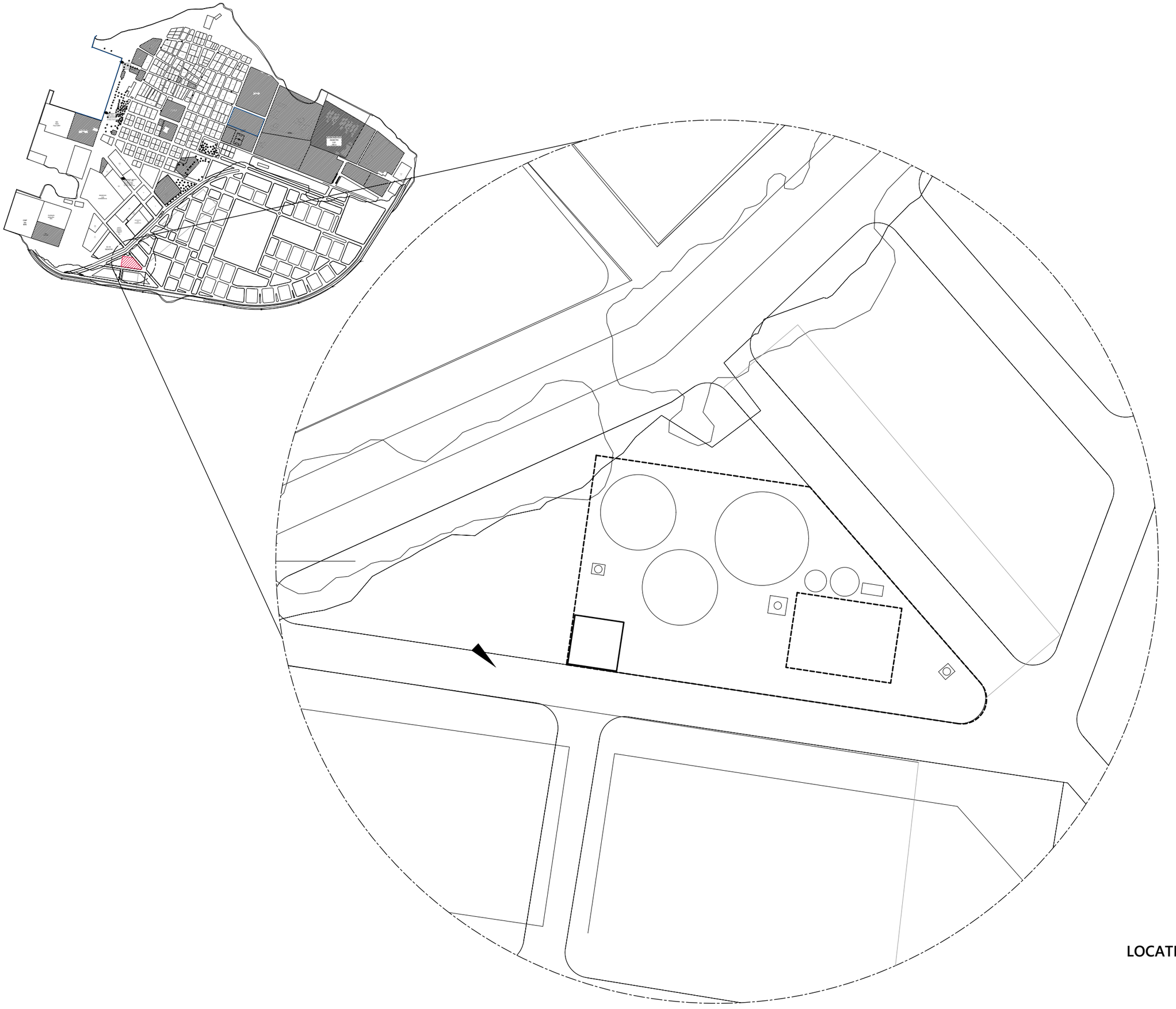
Roof Plan	A.6 (1)
Elevations	A.6 (2)
Section	A.6 (2)
STRUCTURAL DRAWINGS (VEHICLE SHED)	
Foundation Plan	S.4 (1)
Roof Truss Plan	S.4 (2)
Roof Framing Plan	S.D (4)



N

LOCATION PLAN

1:500

Legend

Note:

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

Title:

Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 Islands, Maldives – Package 3

Sub Title:

Water Supply System in K.Himmafushi

Client:

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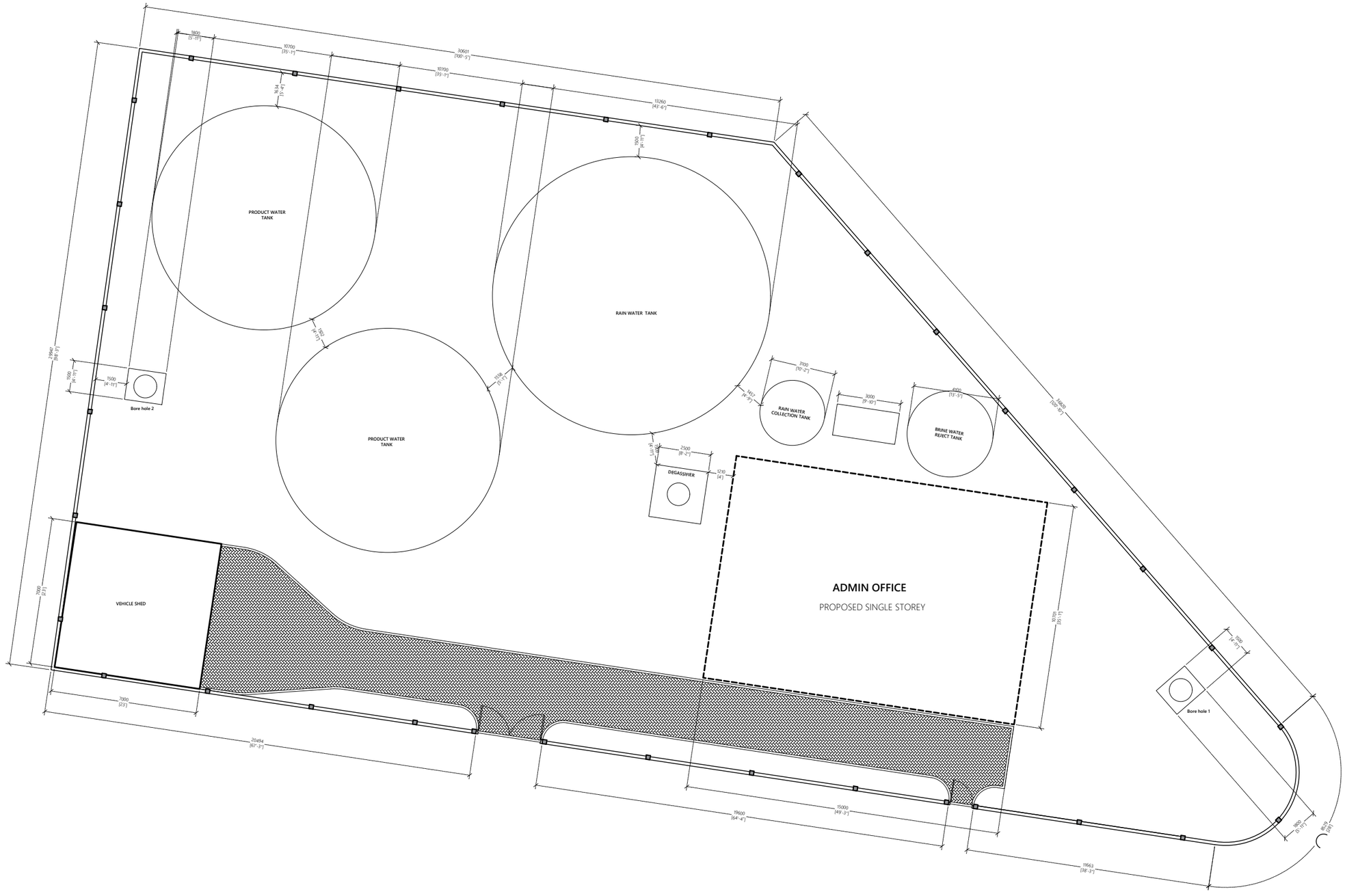
Date: Sep 2020	SCALE (A3): 1:500
Project No: EP-WS/2019/03	
Rev: **R-00**	Page: **A.1 (1)**



SITE PLAN

1:200

Legend

Note:

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

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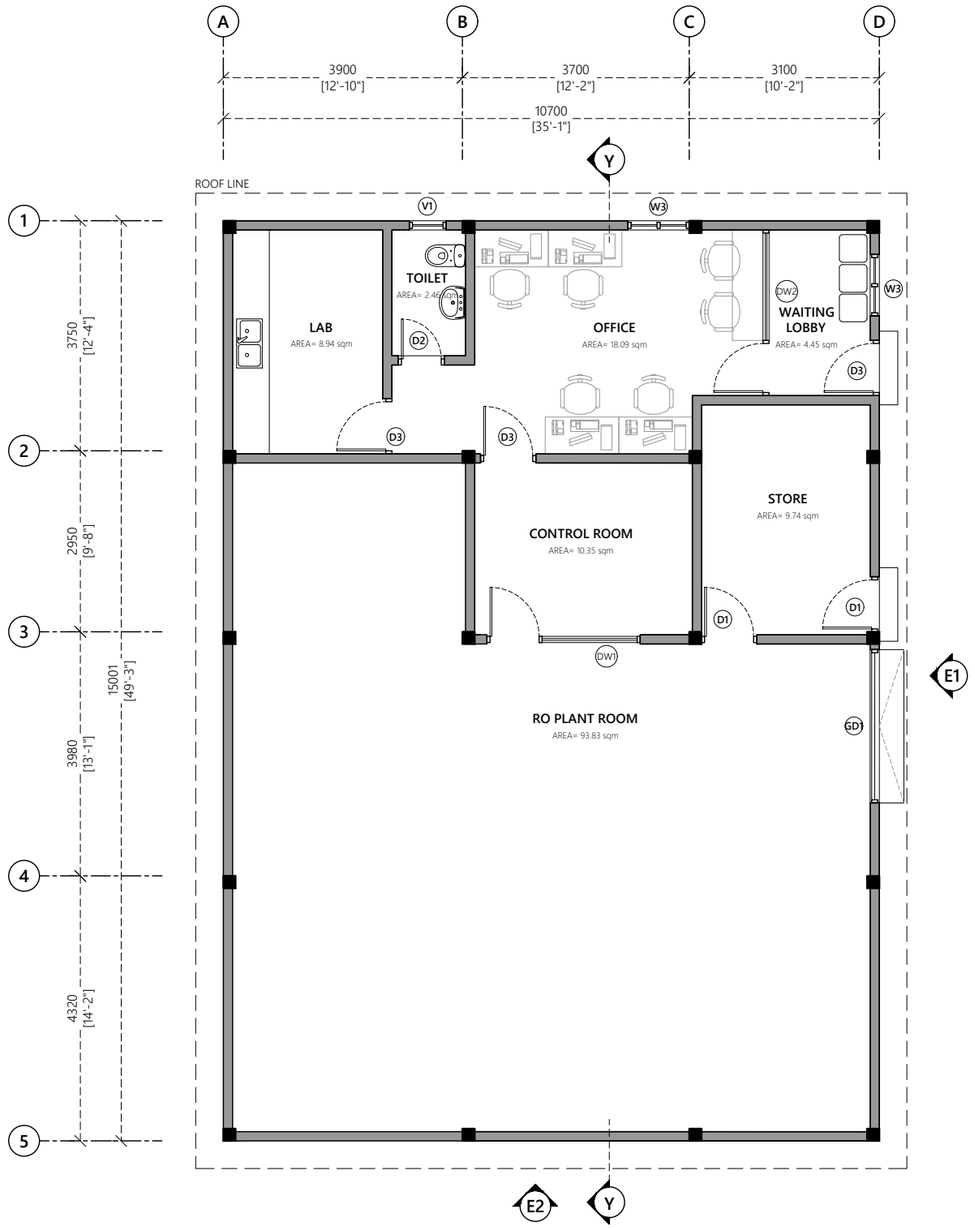
Project No: EP-WS/2019/03	
Rev: **R-00**	Page: **A.1 (2)**

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING, K.HIMMAFUSHI



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: Weathe rbond 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

N

GROUND FLOOR PLAN

1:100

Legend

Note:

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

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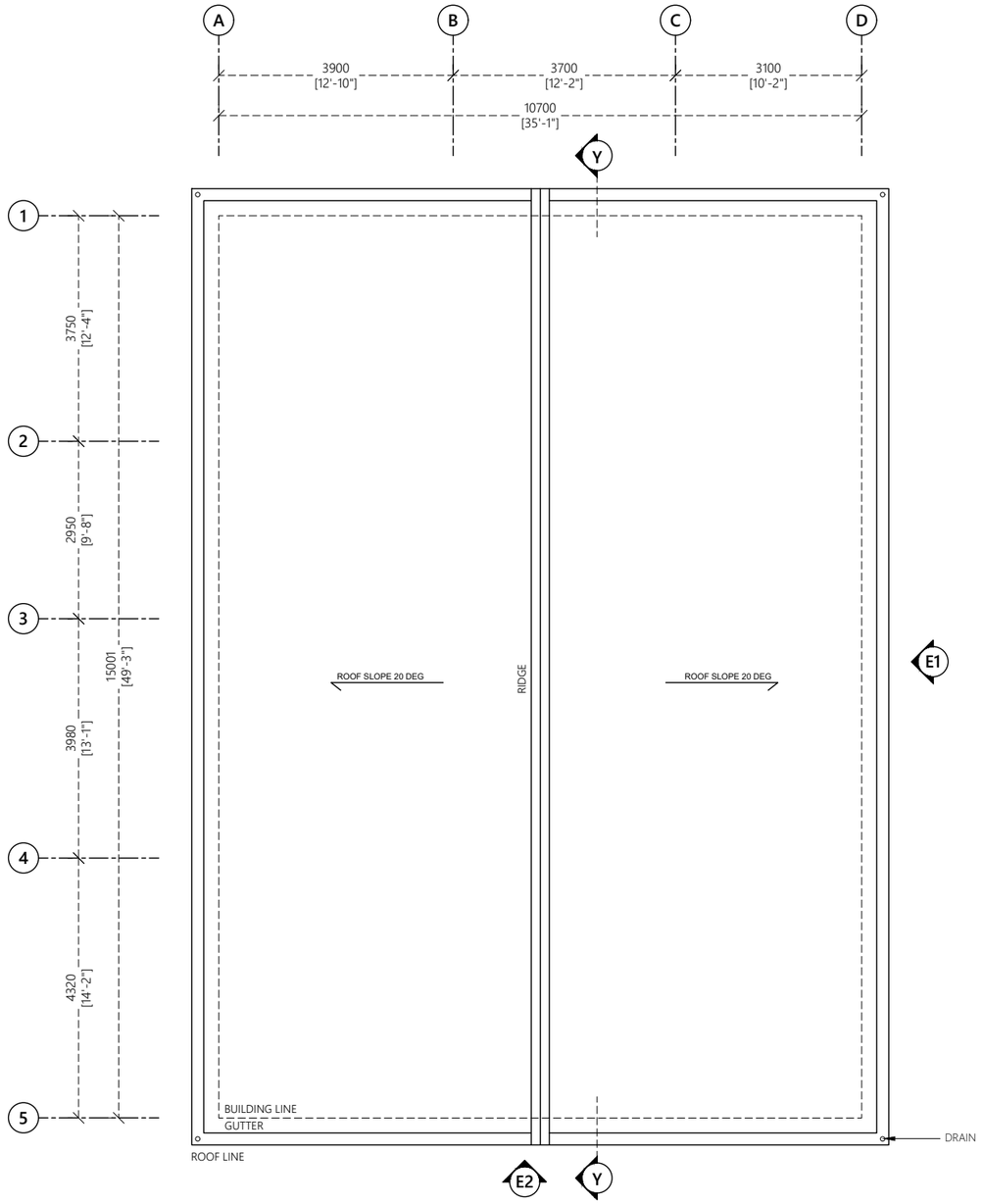

N

ROOF PLAN

1:100

Legend

Note:

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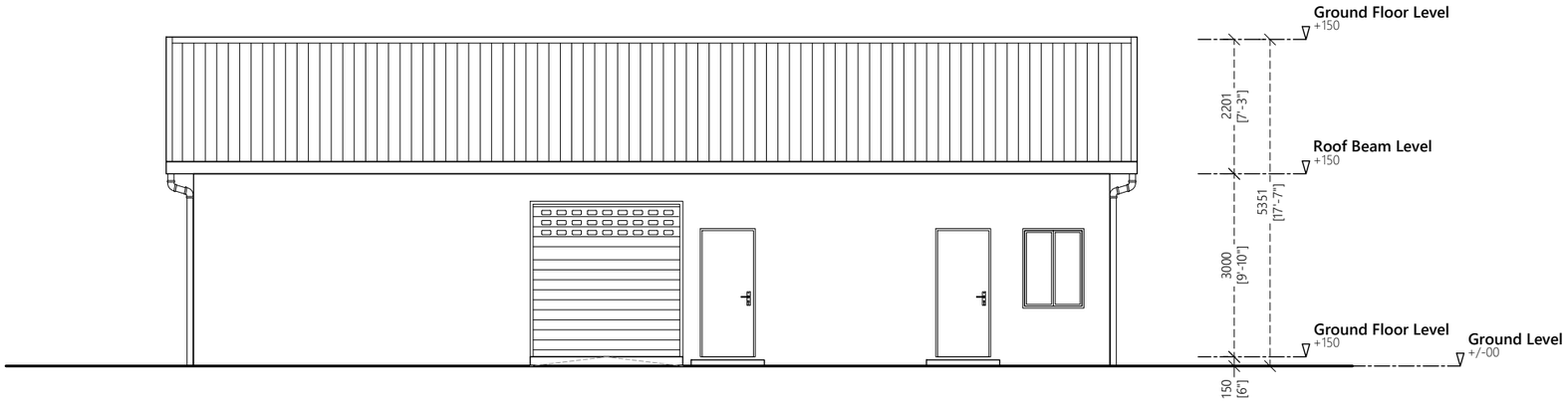
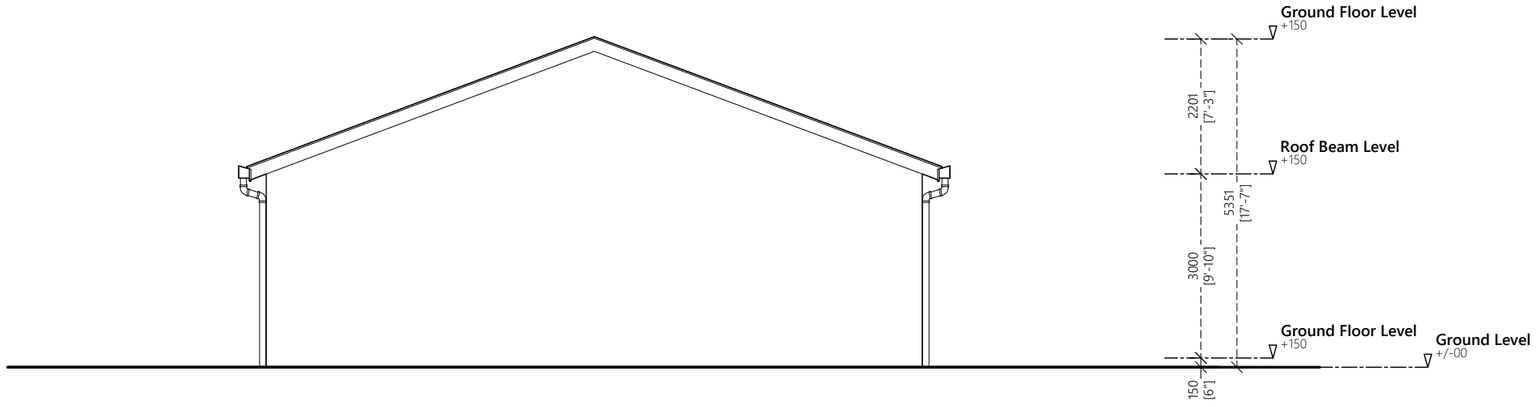


ELEVATION E1

1:100



ELEVATION E2

1:100

ELEVATIONS

1:100

Legend

Note:

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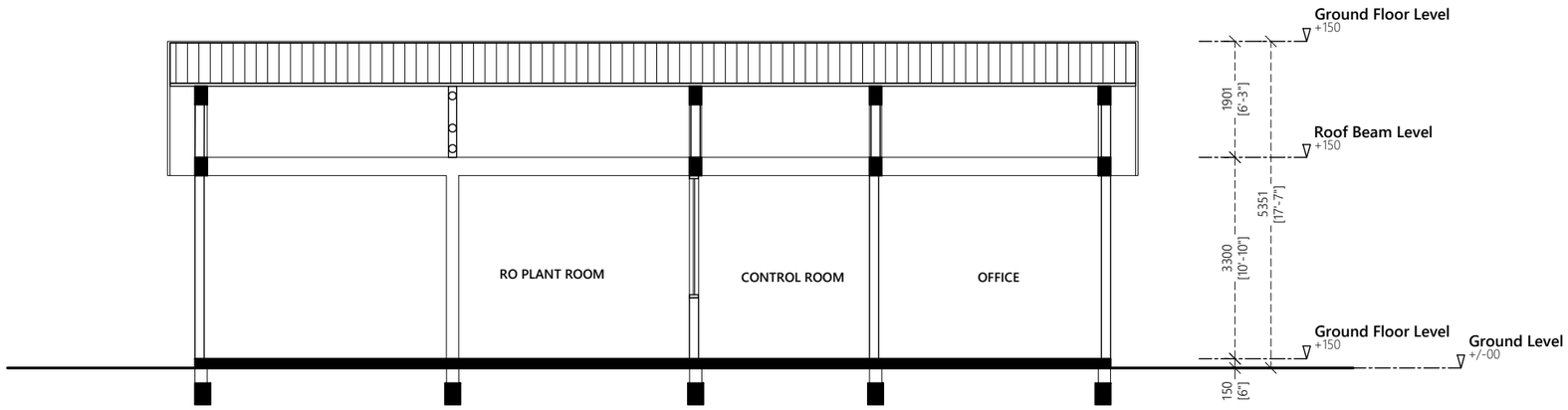
Rev: **R-00**	Page: **A.3 (1)**



SECTION XX

1:100

SECTION

1:100

Legend

Note:

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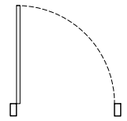
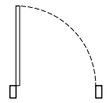
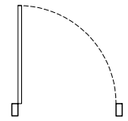
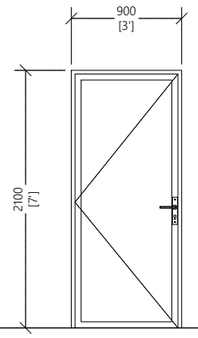
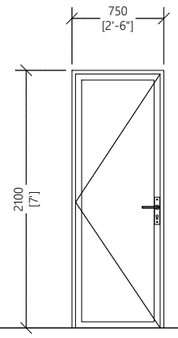
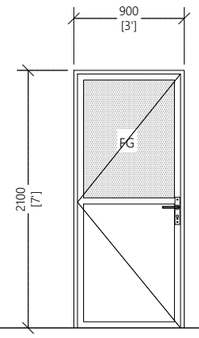
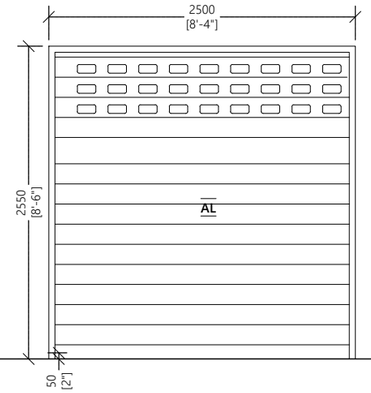
Project No: EP-WS/2019/03

Rev: **R-00**

Page: **A.4(1)**

Door ID	D1	D2	D3	GD1
Plan view				
Elevation view				
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 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 cylinderical with master key sets

Door knobs shall be1000mm above FFL

DOOR & WINDOW SCHEDULE -1

1:50

Legend

Note:

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

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Sub Title:
Water Supply System in K.Himmafushi

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

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

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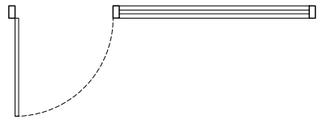
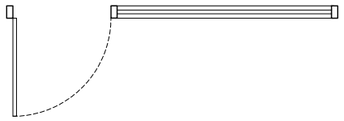
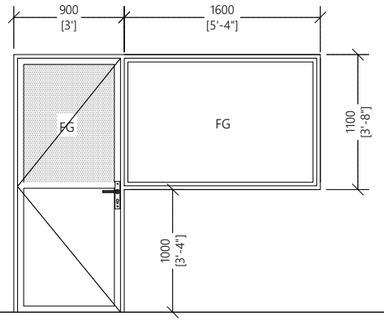
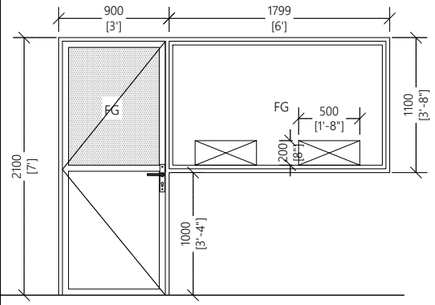
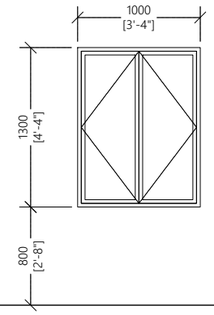
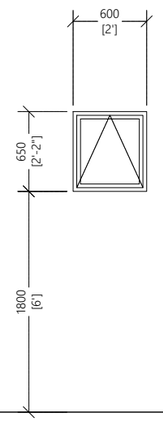
Drawn: A.S.A.	Checked: F.I.A.
Designed: A.S.A.	Approved: M.H.
Date: Sep 2020	SCALE (A3): 1:50
Project No: EP-WS/2019/03	
Rev: **R-00**	Page: **A.5 (1)**

Door ID	DW 1	DW 2	W3
Plan view			
Elevation view			
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	
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 cylinderical with master key sets

Door knobs shall be1000mm above FFL

DOOR & WINDOW SCHEDULE -2

1:50

Legend

Note:

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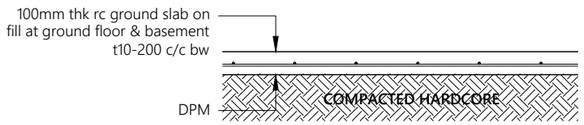
Project No: EP-WS/2019/03	
Rev: R-00	Page: A.5 (2)

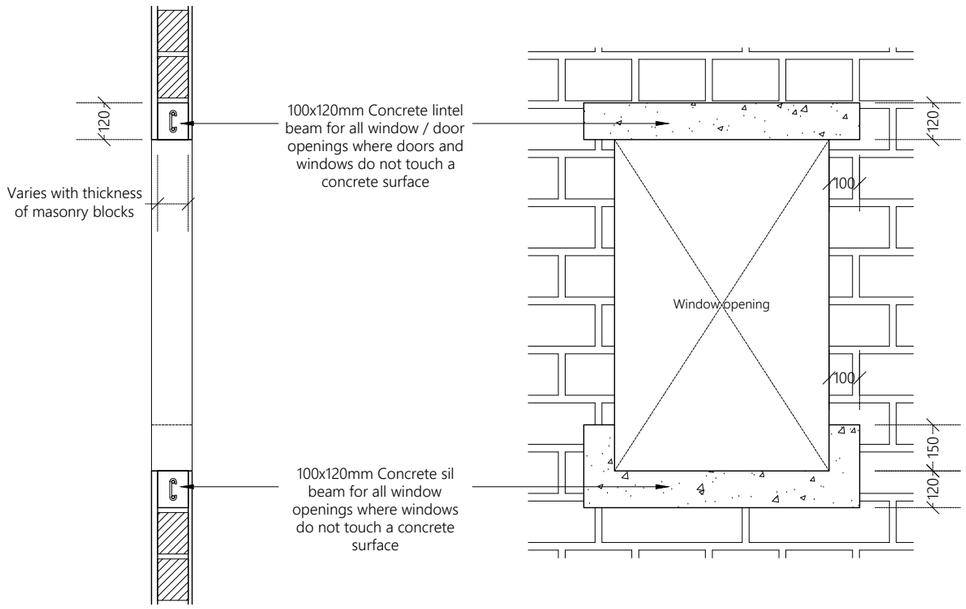


Note:

- 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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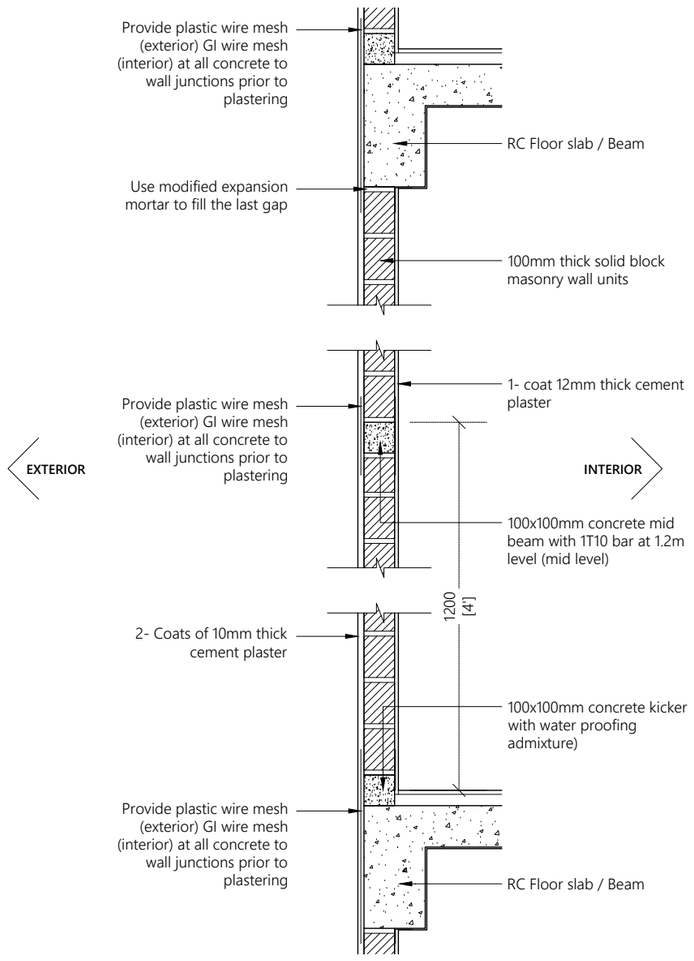

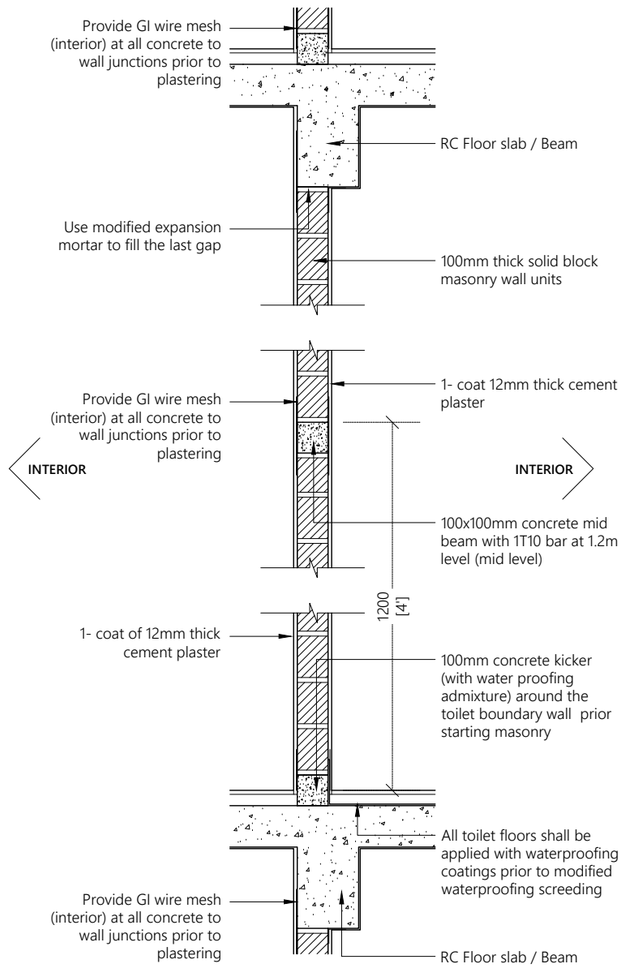

Note:

- 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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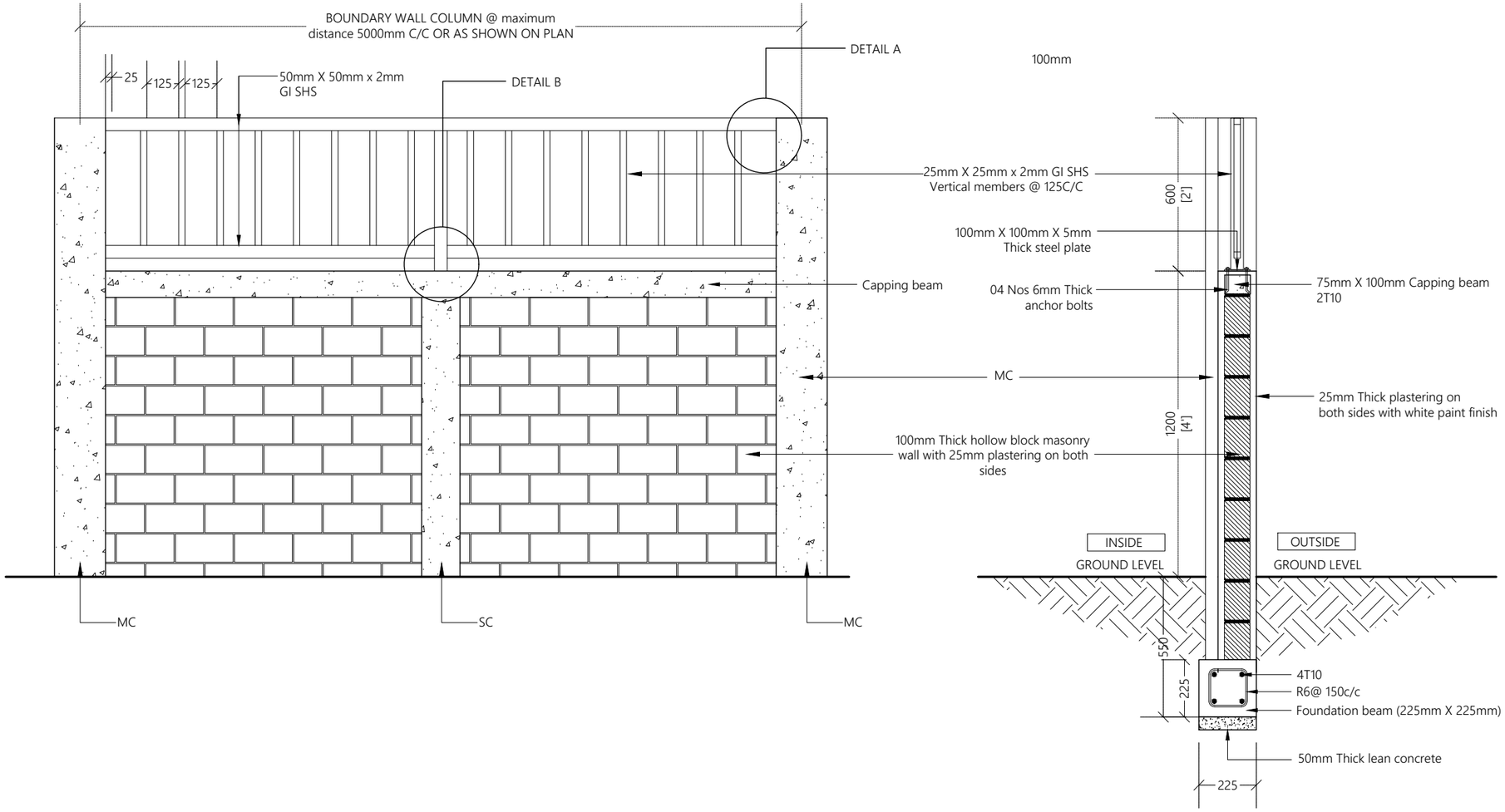
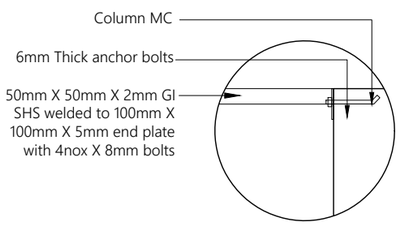
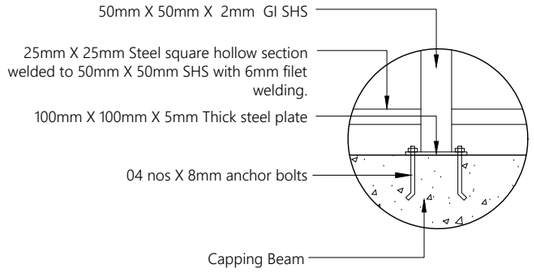




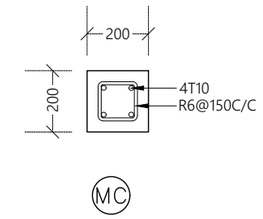
DETAIL A

1:10

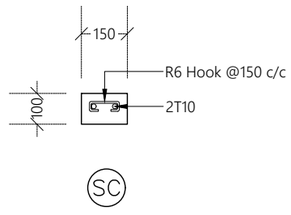


DETAIL B

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

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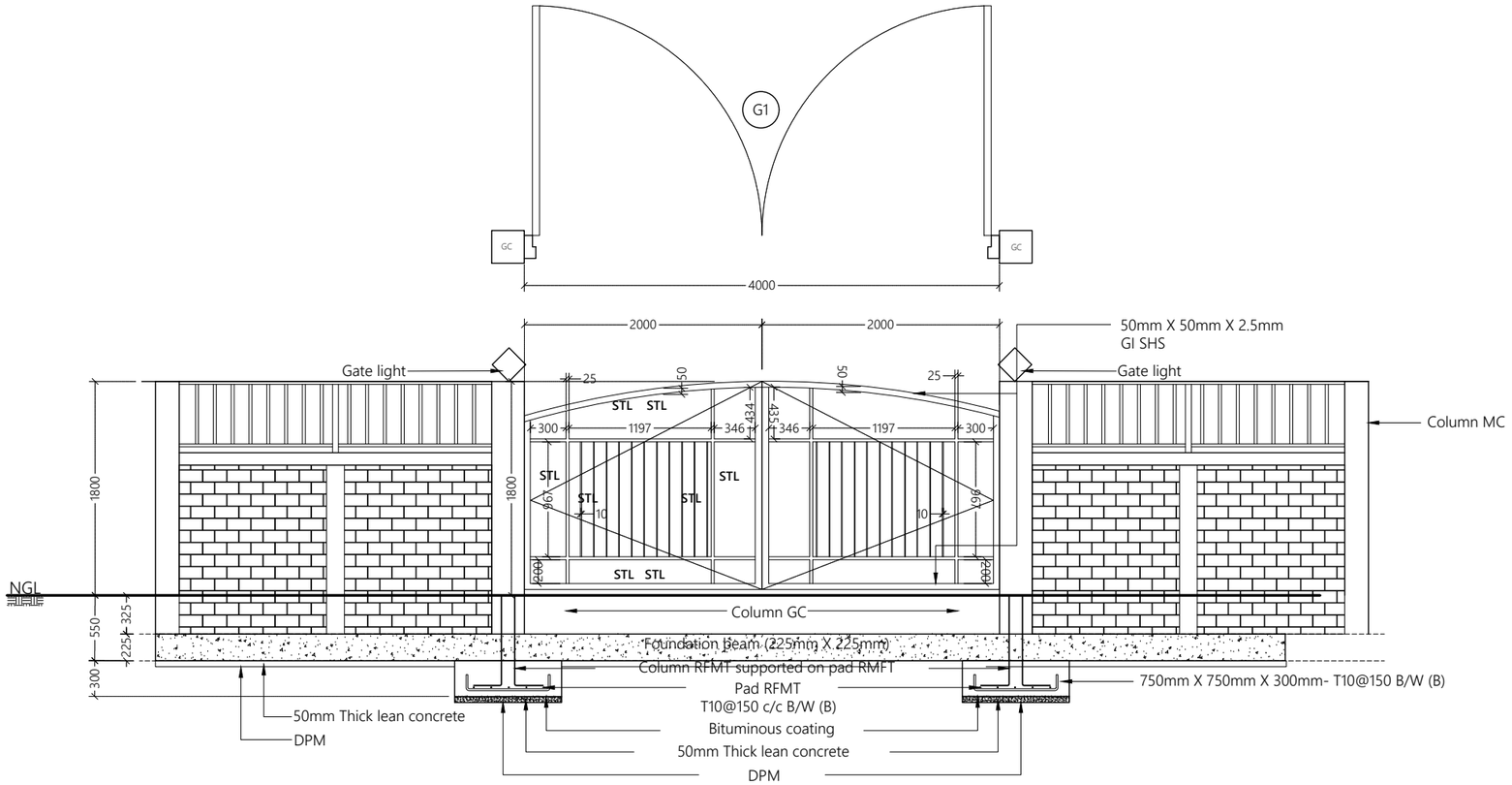
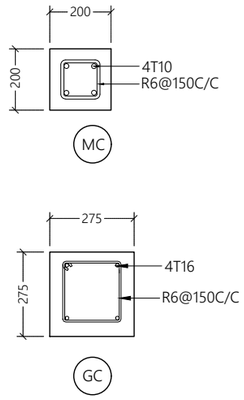


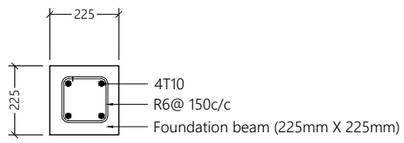
GATE DETAILS

1:50



COLUMN DETAILS

1:20



FOUNDATION BEAM DETAIL

1:20

Legend

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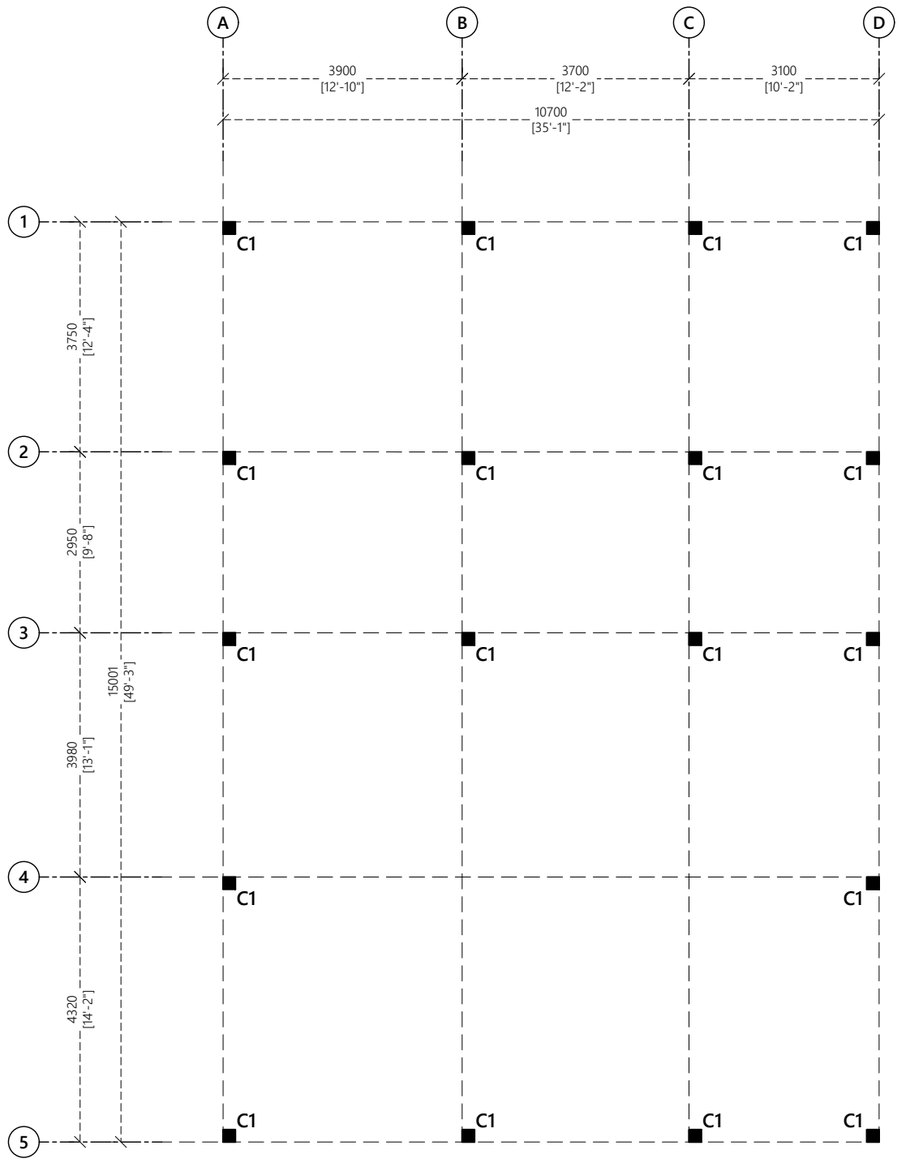
Page: **A.D (4)**



COLUMN LAYOUT PLAN

1:100

Legend

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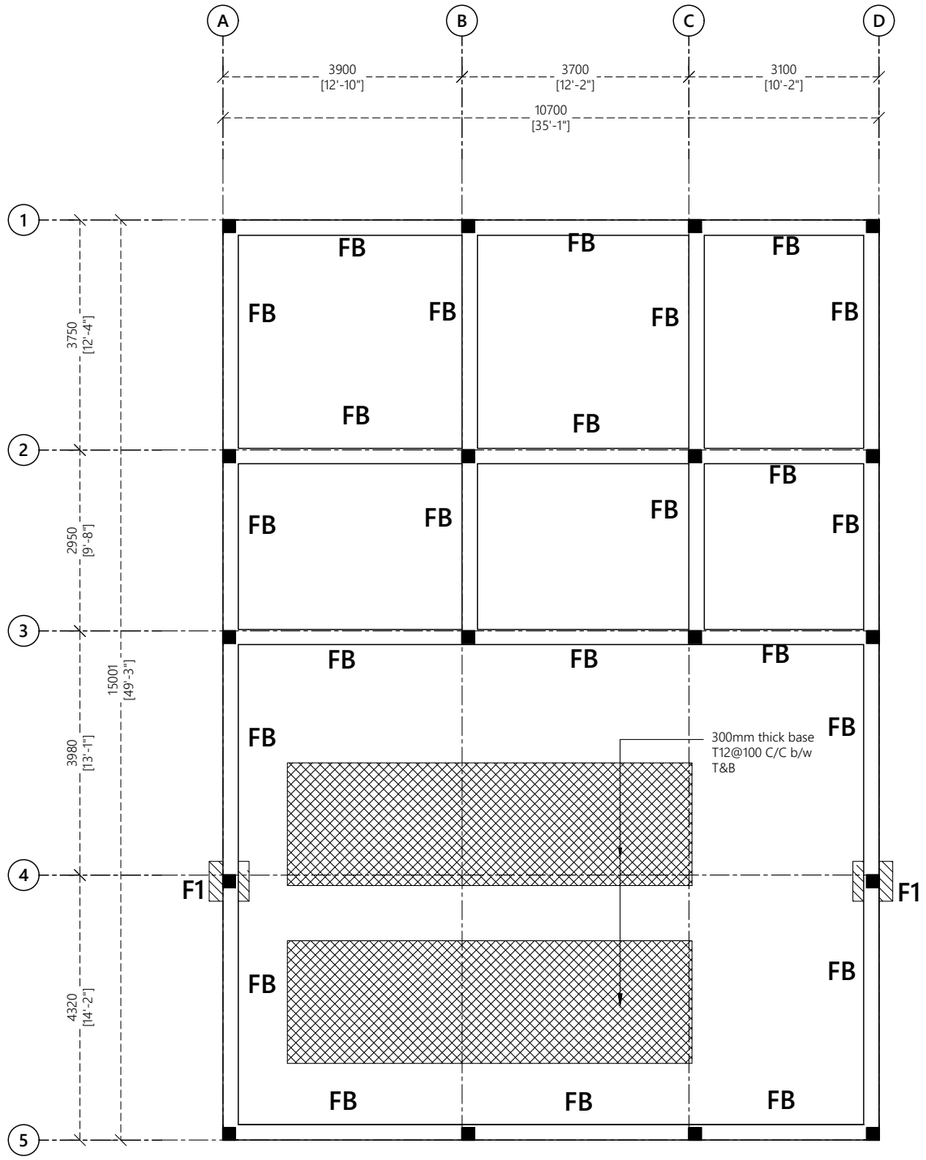

Notes:

Foundation Depth: 600mm

FOUNDATION PLAN

1:100

Legend

Note:

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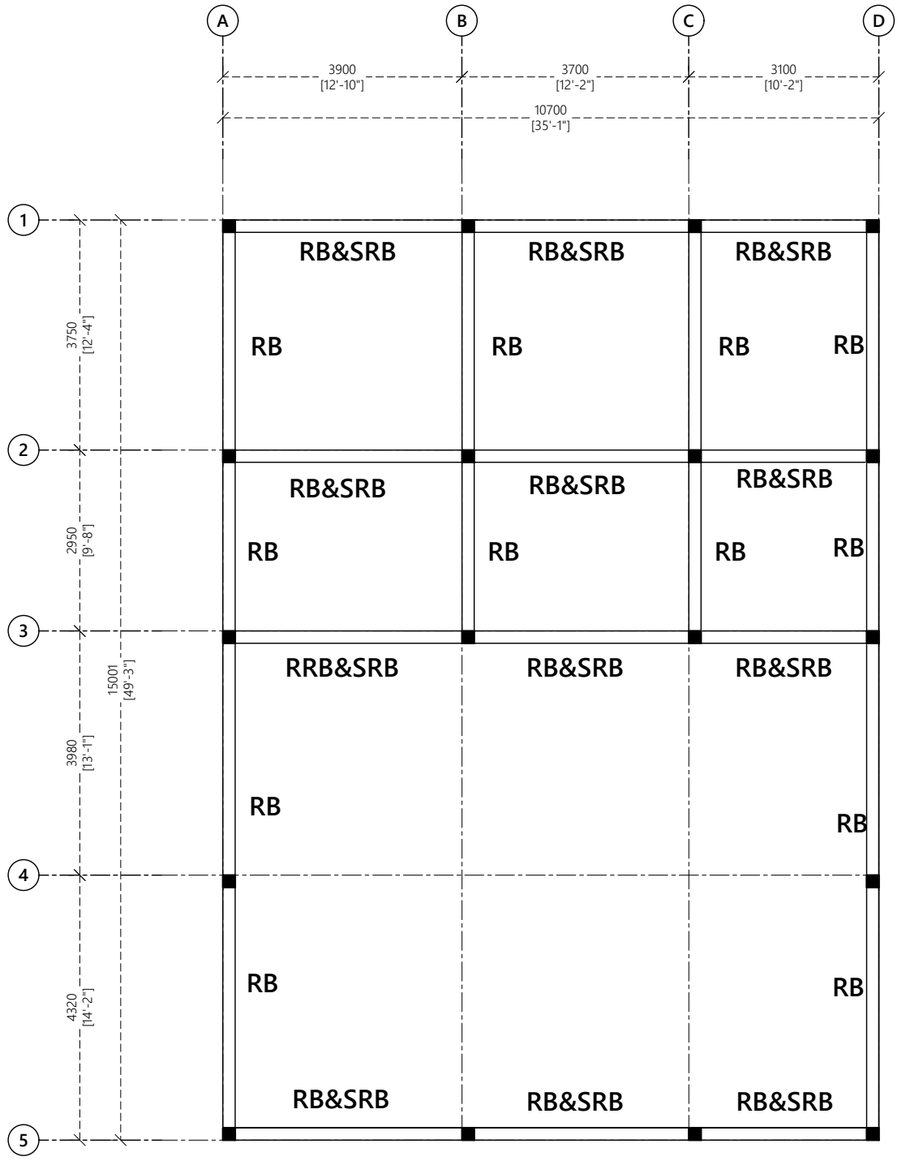

ROOF BEAM PLAN

1:100

Legend

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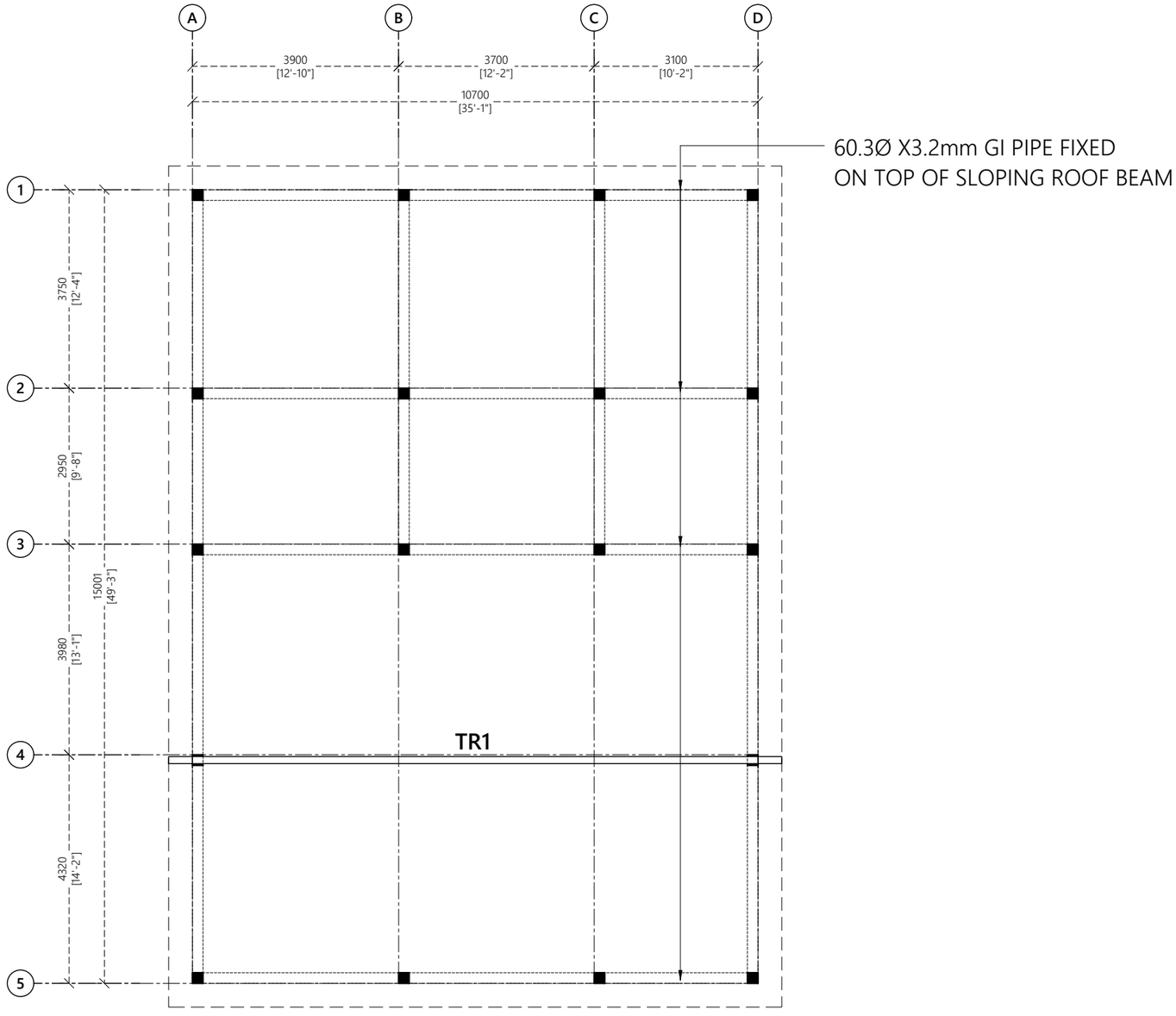

ROOF TRUSS PLAN

1:100

Legend

Note:

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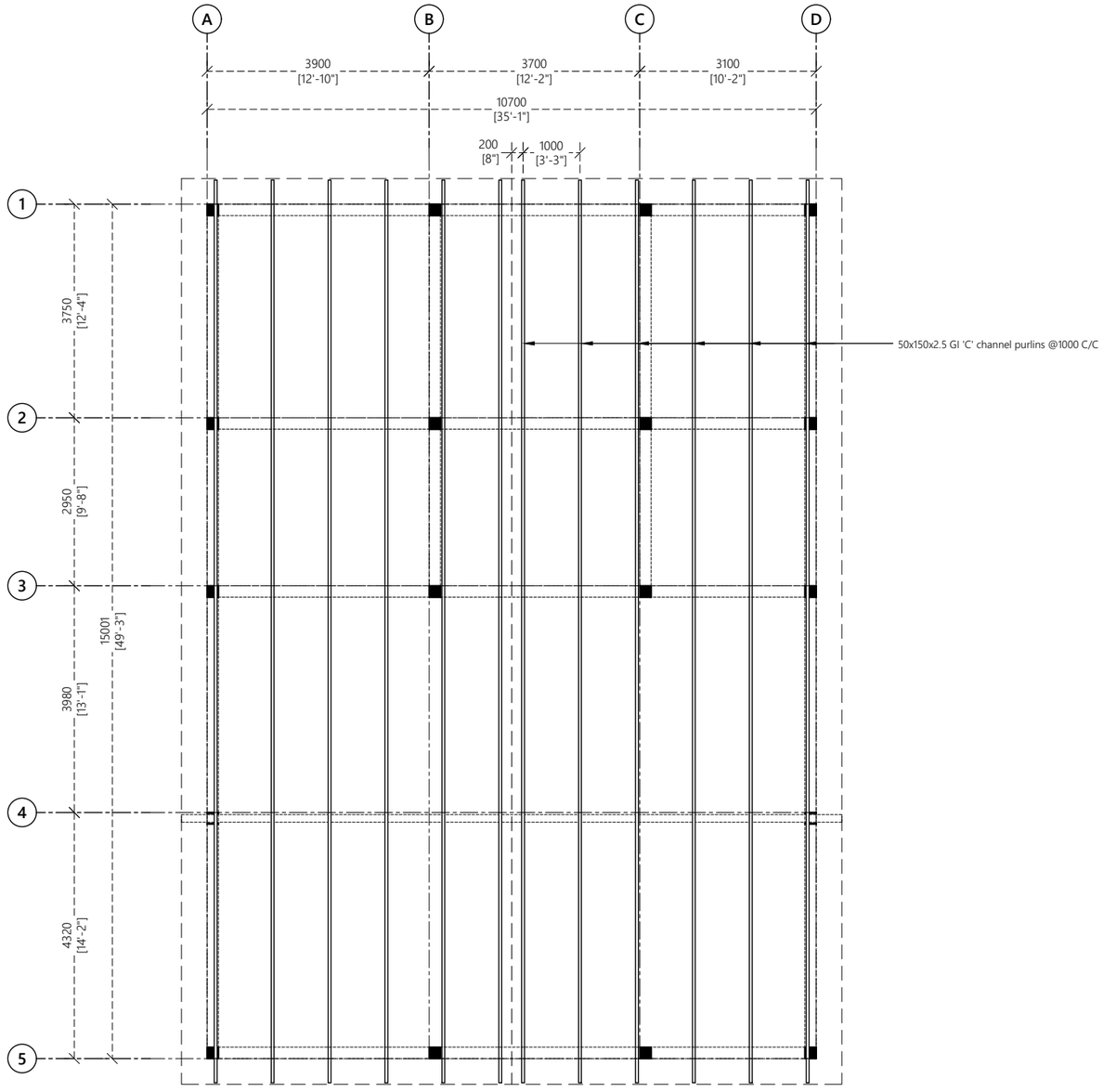

ROOF FRAMING PLAN

1:100

Legend

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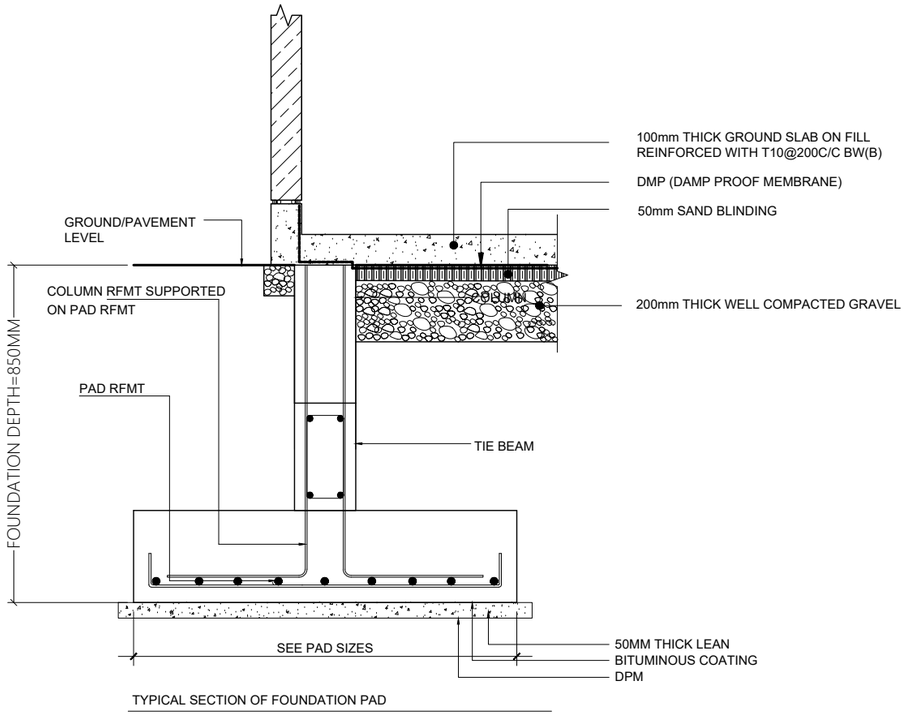
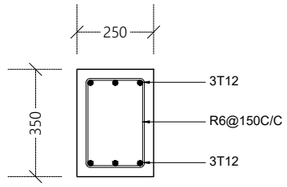


TYPICAL SECTION OF FOUNDATION PAD

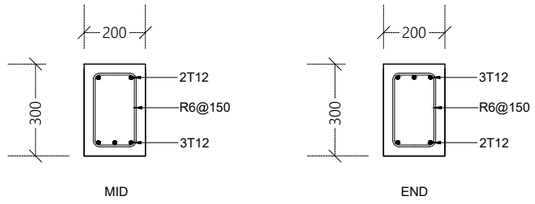
TYPICAL COLUMN SECTION



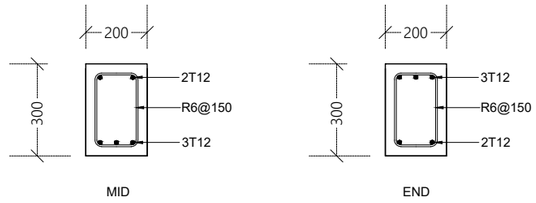
FOUNDATION BEAM (FB)

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

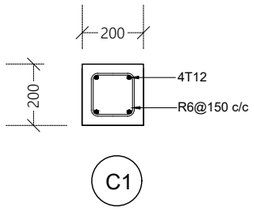
FOUNDATION PAD DETAILS



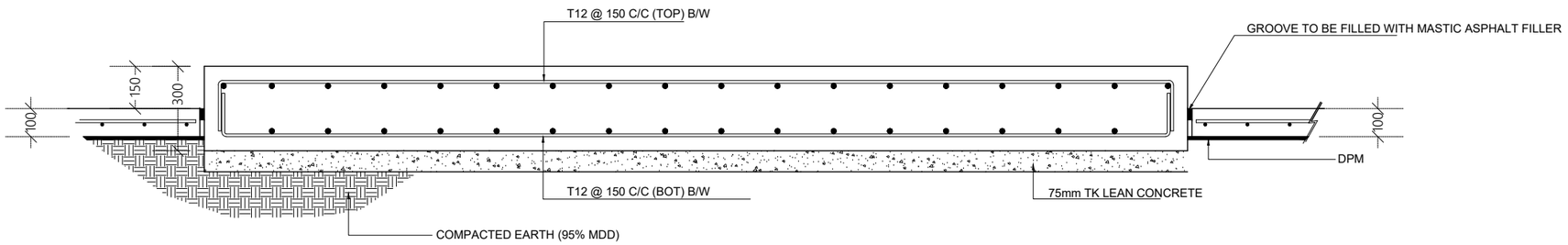
ROOF BEAM (RB)



SLOPING ROOF BEAM (SRB)



COLUMN DETAIL



RO PLANT BASE DETAIL

STRUCTURAL DETAILS

1:20

Legend

Note:

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

Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 Islands, Maldives – Package 3

Sub Title:
Water Supply System in K.Himmafushi

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

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A: G. Rosary West, Husnuheenaa Magu, Male', Maldives
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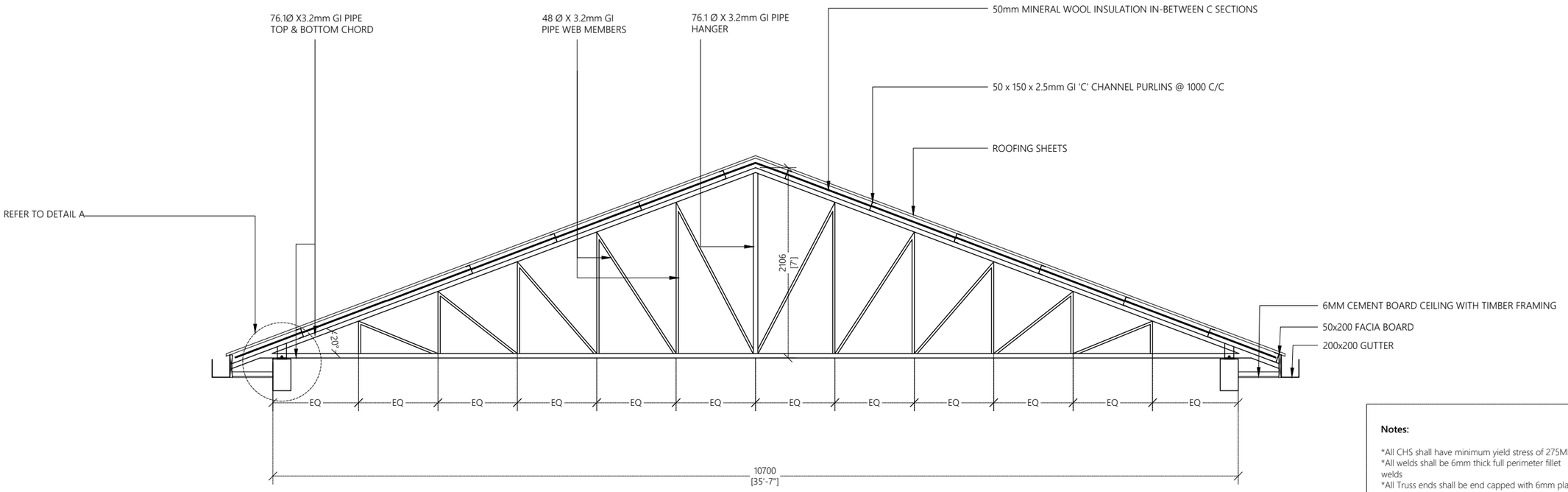
Drawn: A.S.A.	Checked: F.I.A.
Designed: A.S.A.	Approved: M.H.
Date: Sep 2020	SCALE (A3): 1:100
Project No: EP-WS/2019/03	
Rev: **R-00**	Page: **S.D (1)**

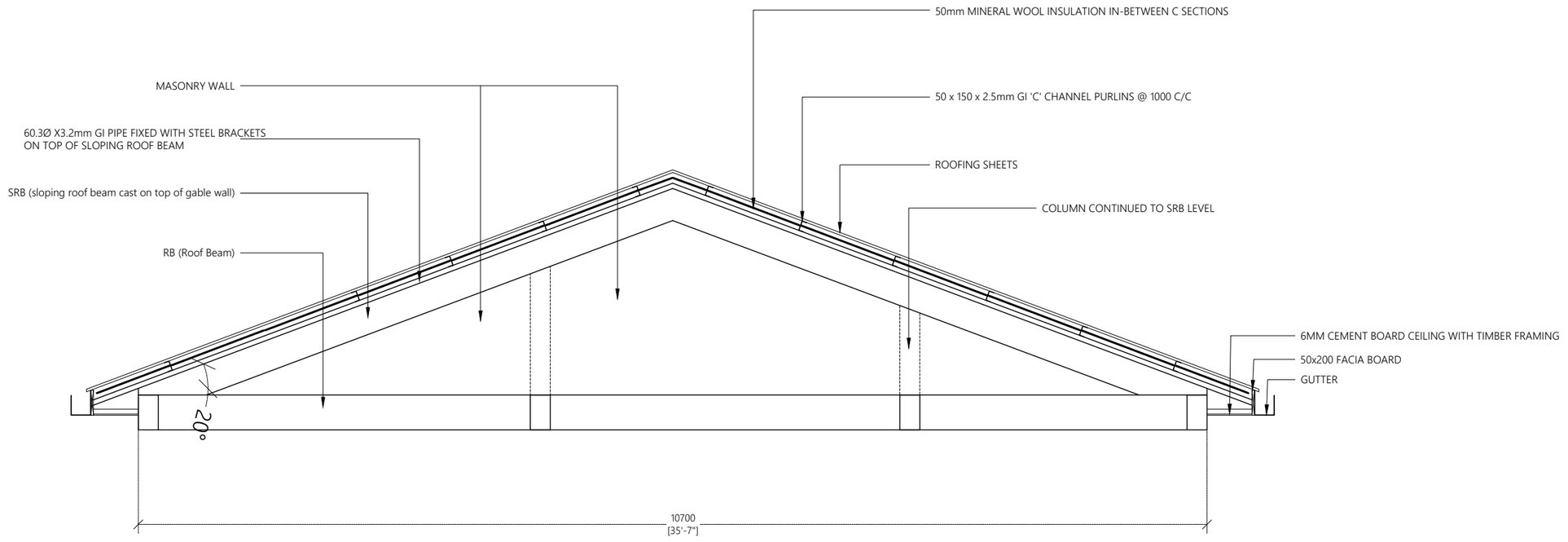


TRUSS DETAIL TR1 @ GRID 2

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 63ϕx3.2MM PIPE FIXED ON GRID 1,3,4 & 5

1:50

Legend

Note:

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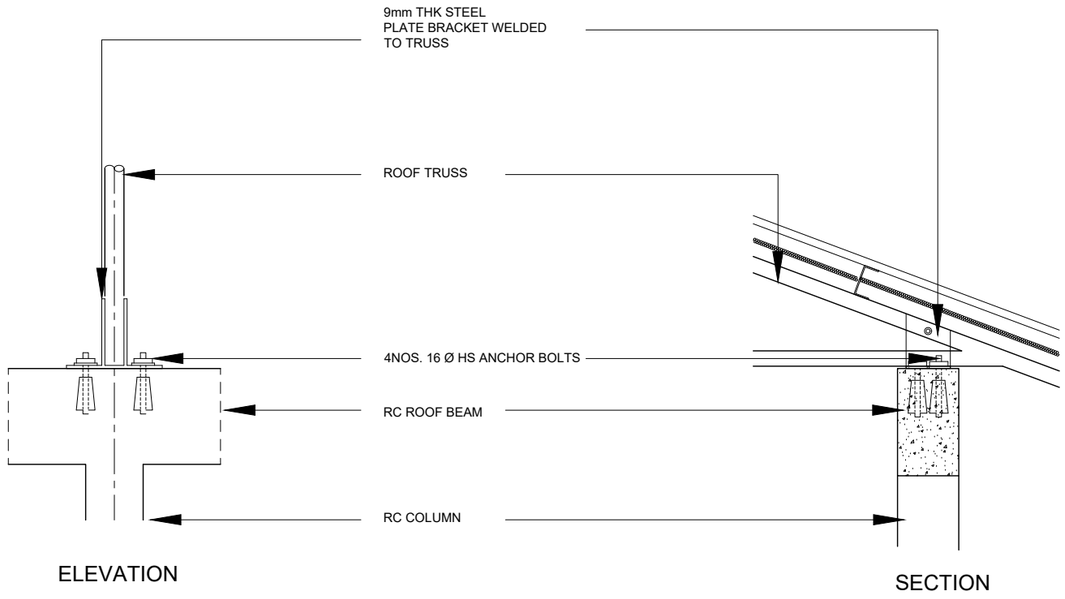
Rev:	R-00	Page:	S.D (2)



ELEVATION

SECTION

DETAIL A

1:20

Legend

Note:

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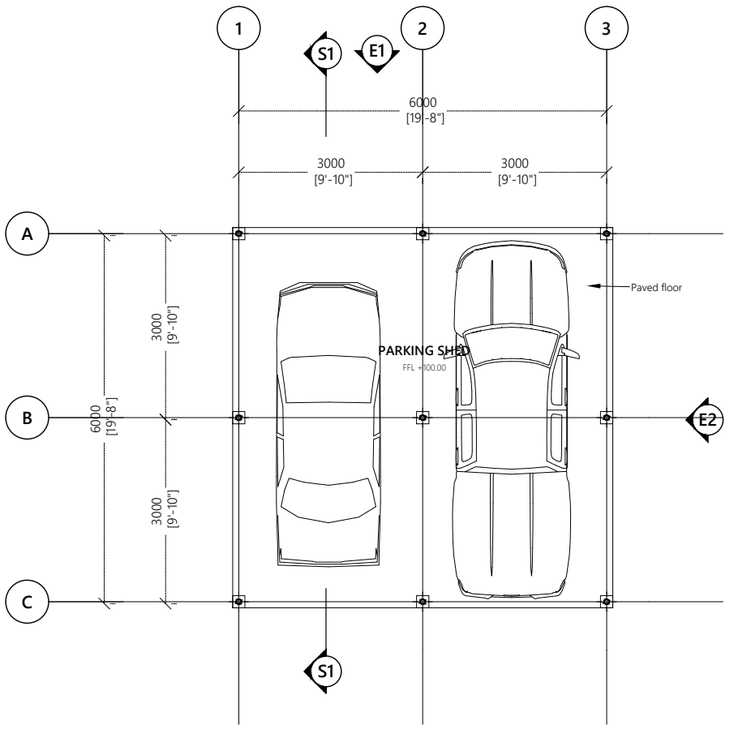
ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

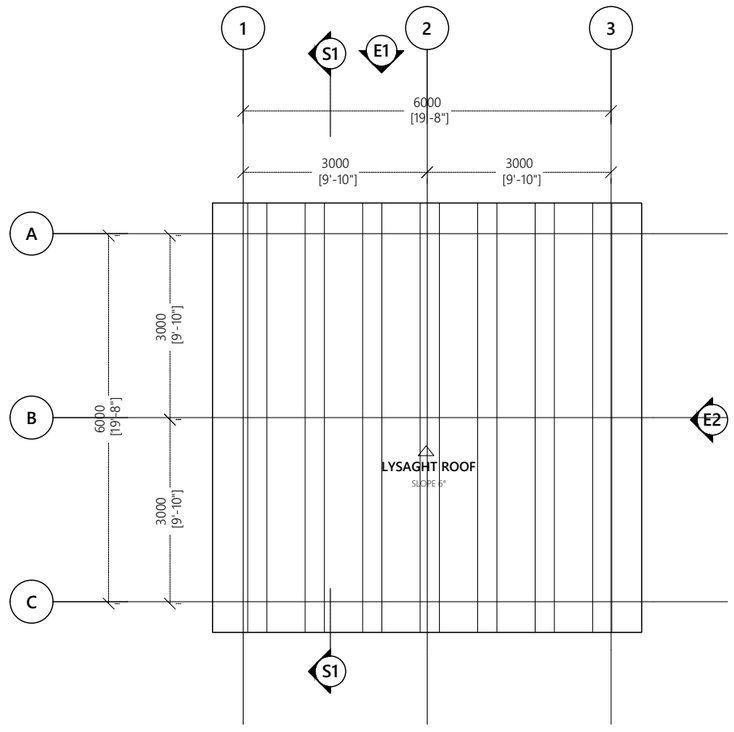
PROPOSED SINGLE STOREY BUILDING AT

RO PLANT VEHICLE SHED, K.HIMMAFUSHI



GROUND FLOOR PLAN

1:100



ROOF PLAN

1:100

Legend

Note:

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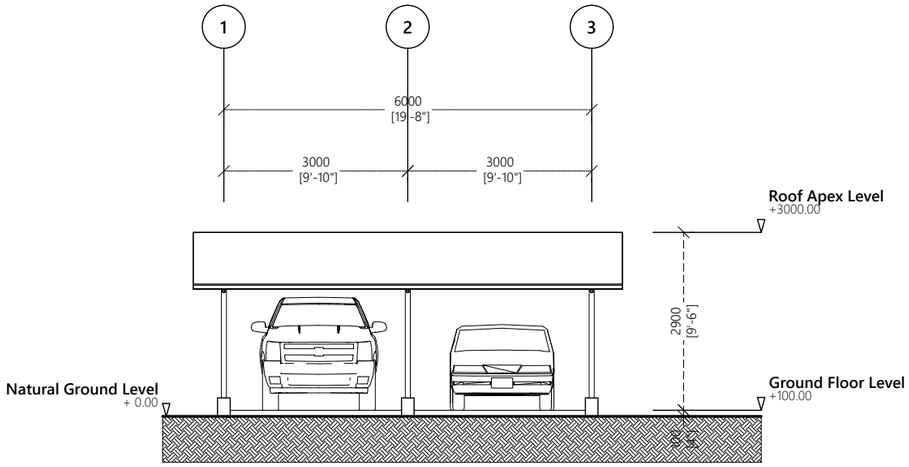
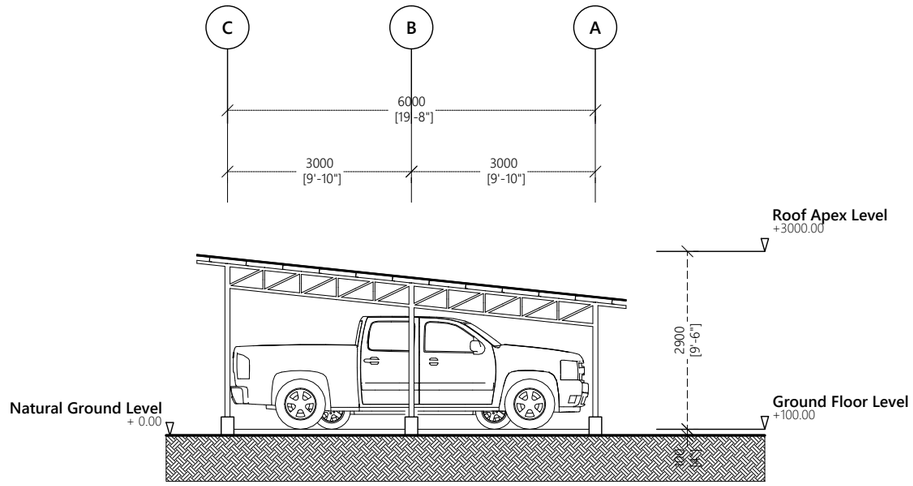
Page: **A.6(1)**



ELEVATION E1

1:100



ELEVATION E2

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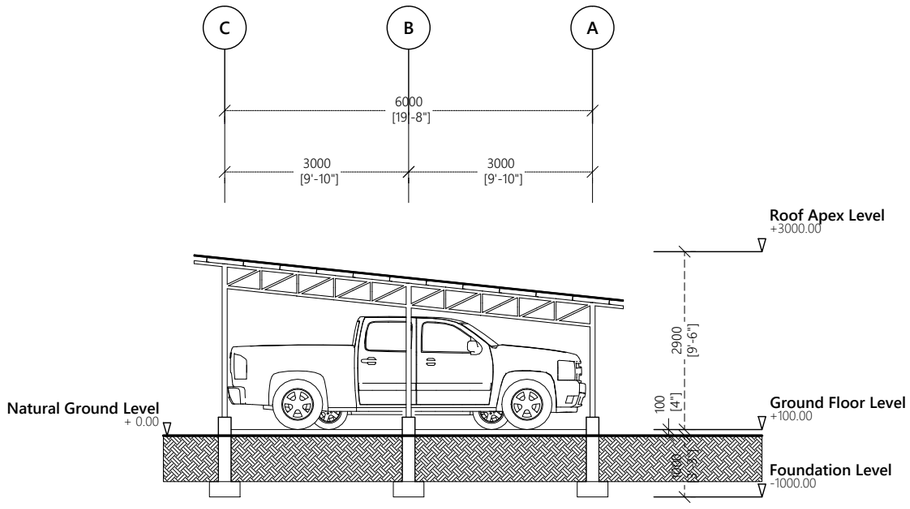

SECTION S1

1:100

Legend

Note:

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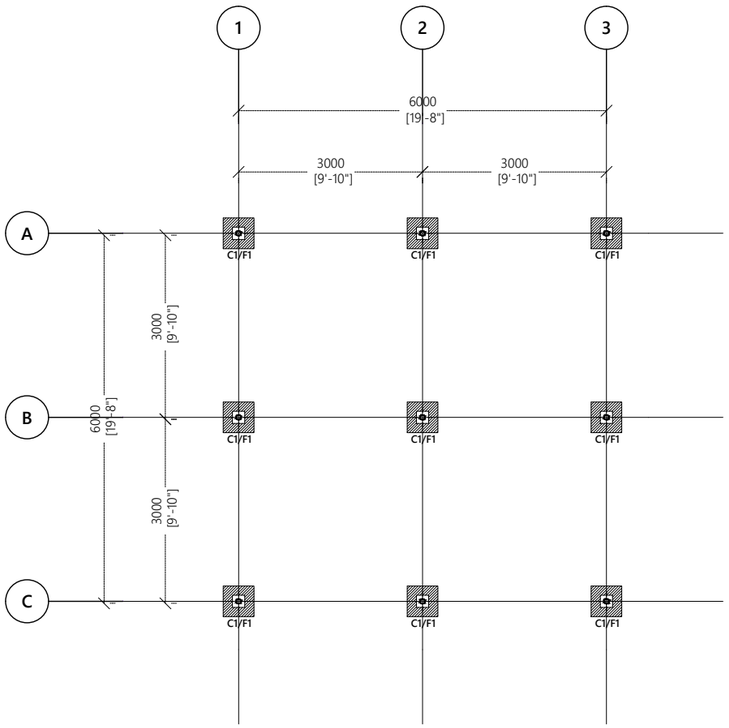
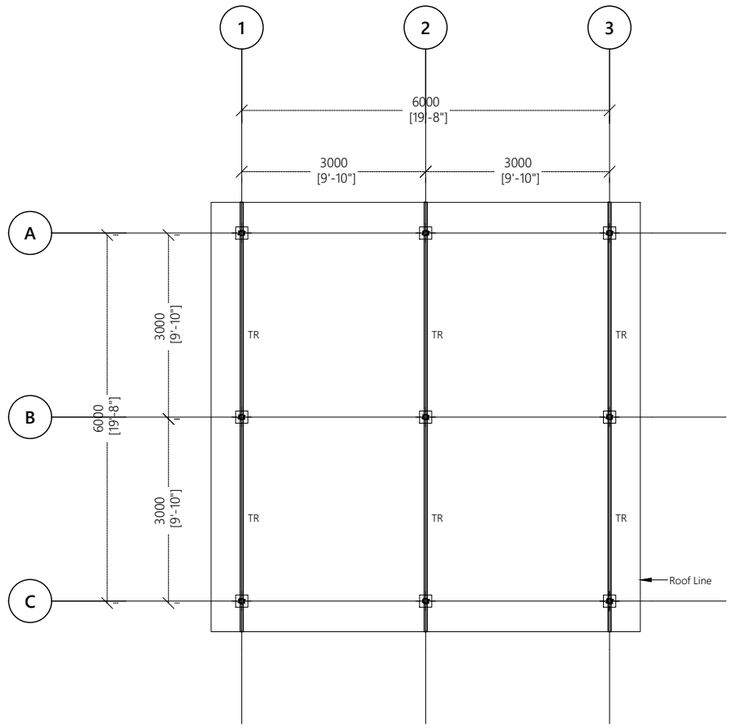
Page: **A.6(2)**



FOUNDATION PLAN

1:100



ROOF TRUSS PLAN

1:100

Legend

Note:

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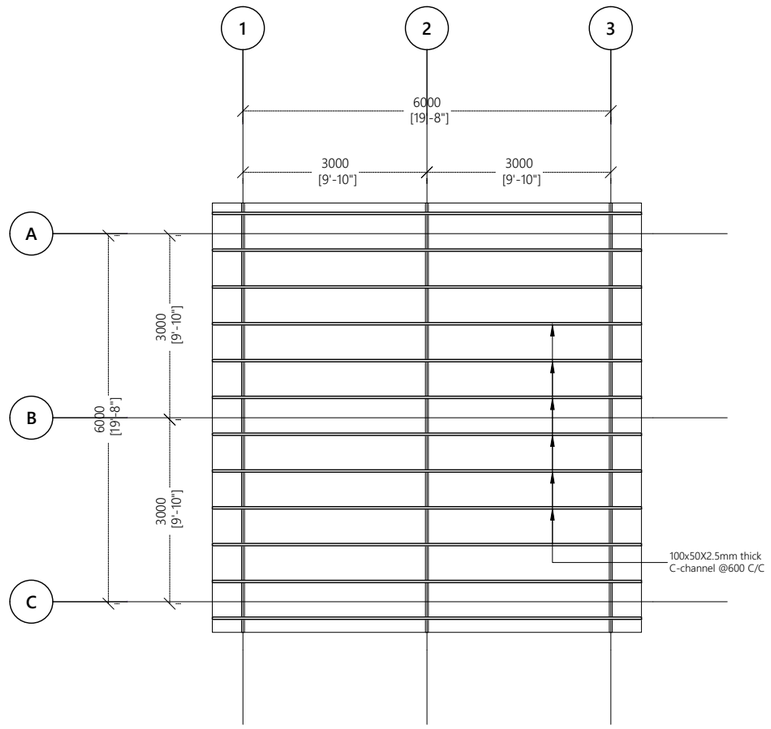
Rev: **R-00**

Page: **A.1 (3)**



ROOF FRAMING PLAN

1:100

Legend

Note:

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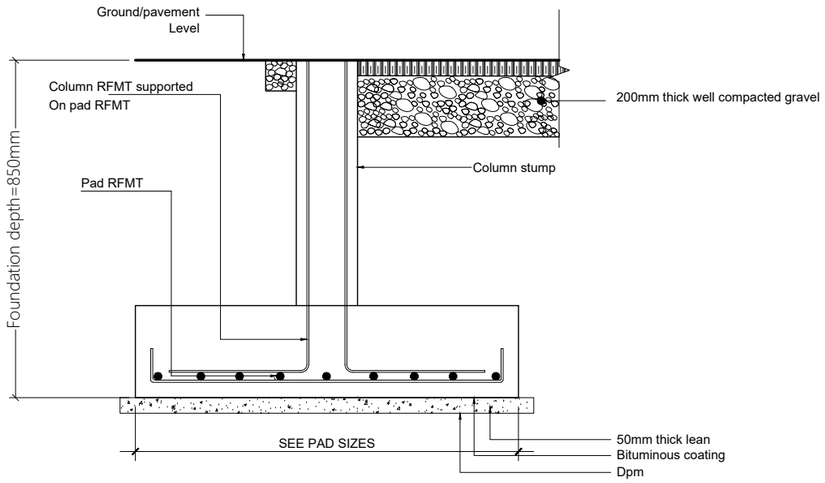
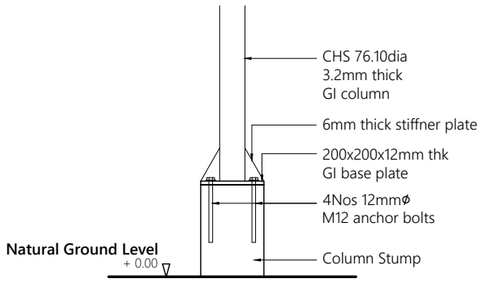
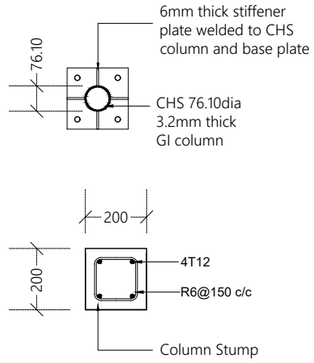


TYPICAL FOOTING DETAIL

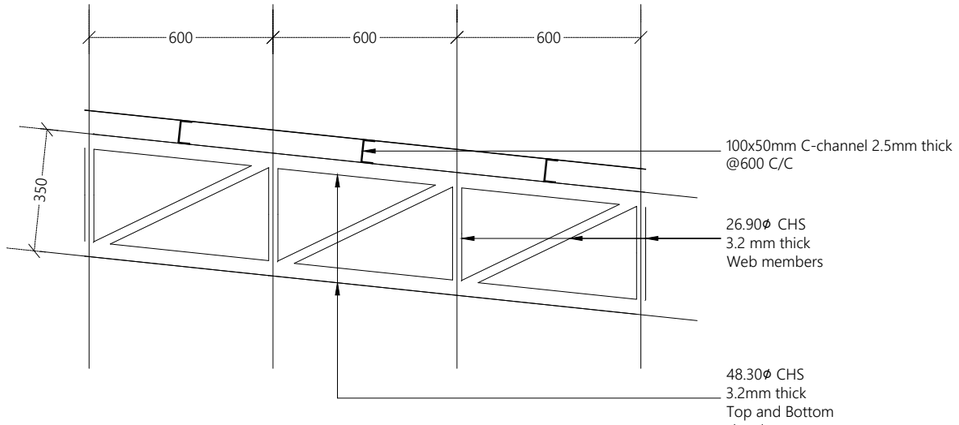
1:20





COLUMN DETAIL

1:20



TRUSS DETAILS

1:20

Legend

Note:

Foundation Pad Detail.
* F1 - 500x500x250 - T10@150C/C B/W (B)

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

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Date: Sep 2020	SCALE (A3): 1:50
Project No: EP-WS/2019/03	
Rev: **R-00**	Page: **S.4(2)**

BUILDING SERVICES DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING, K. HIMMAFUSHI

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

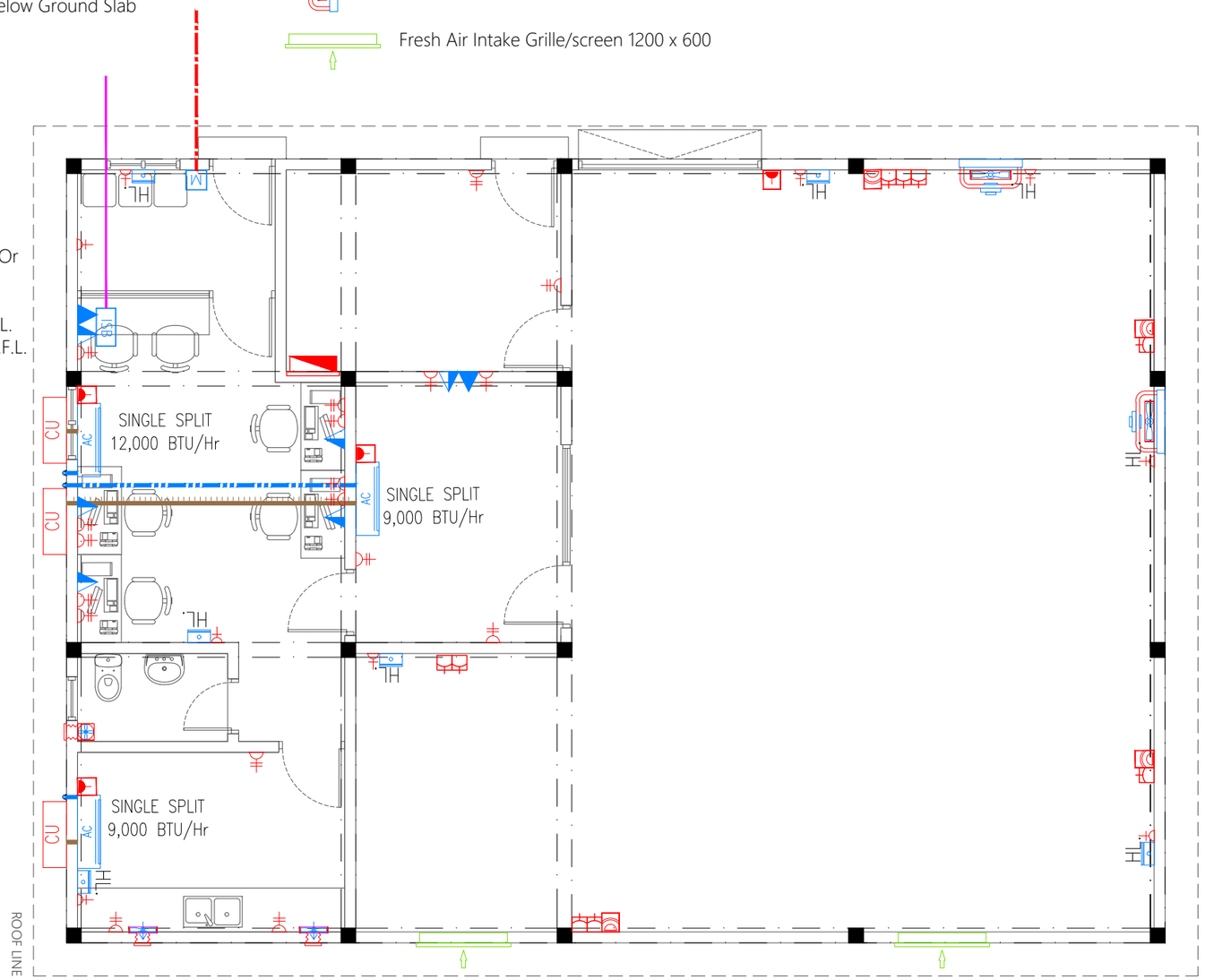
- 13A Twin Socket
- 13A Twin Socket With USB Ports
- 15A Switched Socket @ H.L.
- 15A Socket In Polycarbonate Box
- 15A Switch @ 1200mm From F.F.L.
- 13A Power Socket
- Distribution Board
- HL. High Level
- 82Ø PVC Duct For Tel./Internet Cable Lead In Below Ground Slab
- Main Incoming Cable For Power In 110Ø PVC Duct Below Ground Slab
- ISB Internet Switchboard
- Telephone Outlet
- Computer Network Outlet
- Emergency Light
- M 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
- AC Wall Mount Air Conditioner
- CU 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 1200 x 600



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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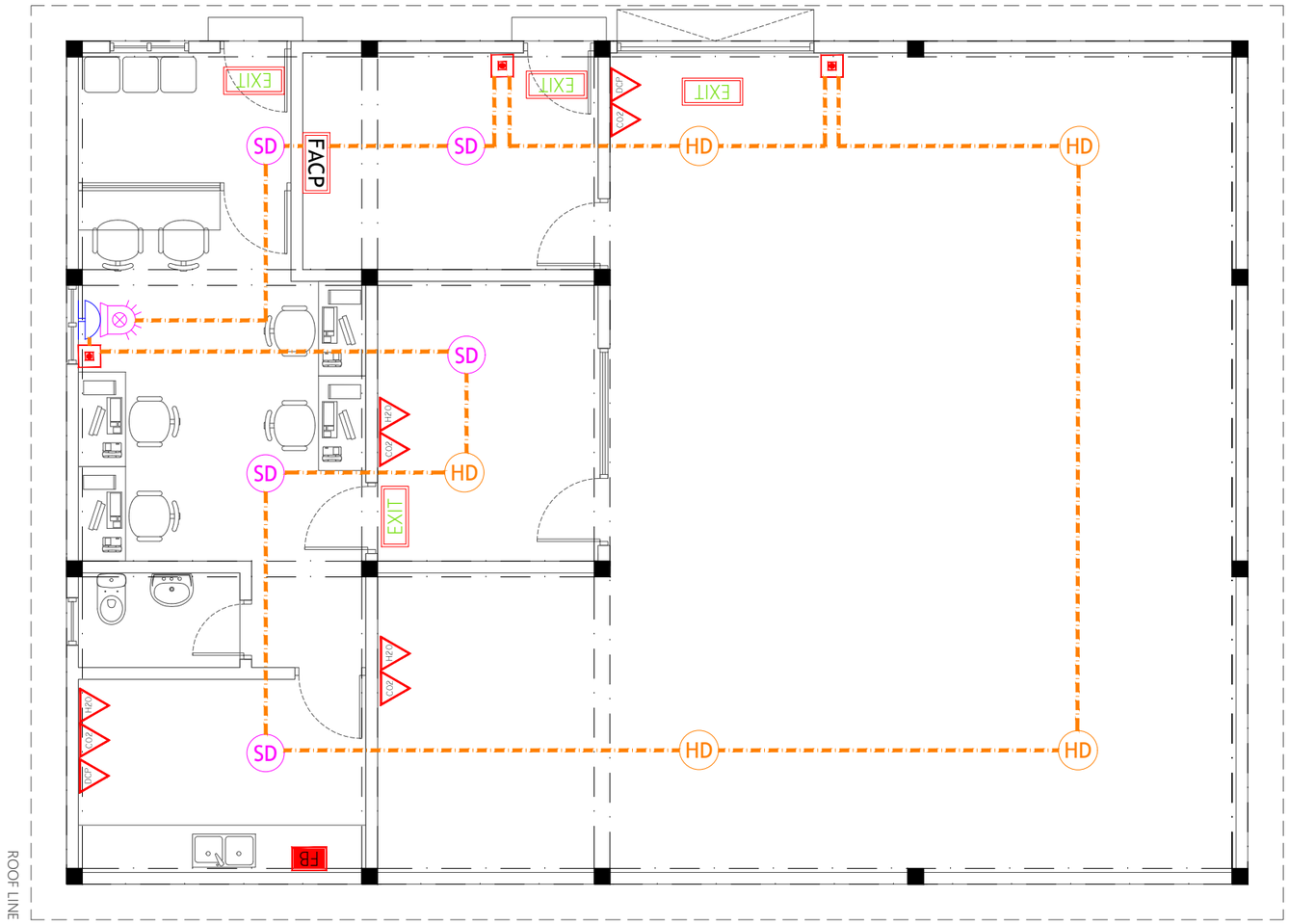
Legend

- DCP Extinguisher (load: 6kg) In Polycarbonate Enclosure
- CO_2 Extinguisher (load: 2kg) In Polycarbonate Enclosure
- H_2O Extinguisher (load: 9L) In Polycarbonate Enclosure
- Manual Call Point
- SD Smoke Detector
- HD Heat Detector
- Beacon
- Sounder Bell
- FB Fire Blanket
- 2.5mm^2 Fire Retardant Low Smoke (FRLS) Cables In FRLS Conduits
- FACP Fire Alarm Control Panel
- EXIT Exit Sign



GROUND FLOOR FDP LAYOUT

1:75

Legend

Note:

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Project No: EP- WS/2019/03	
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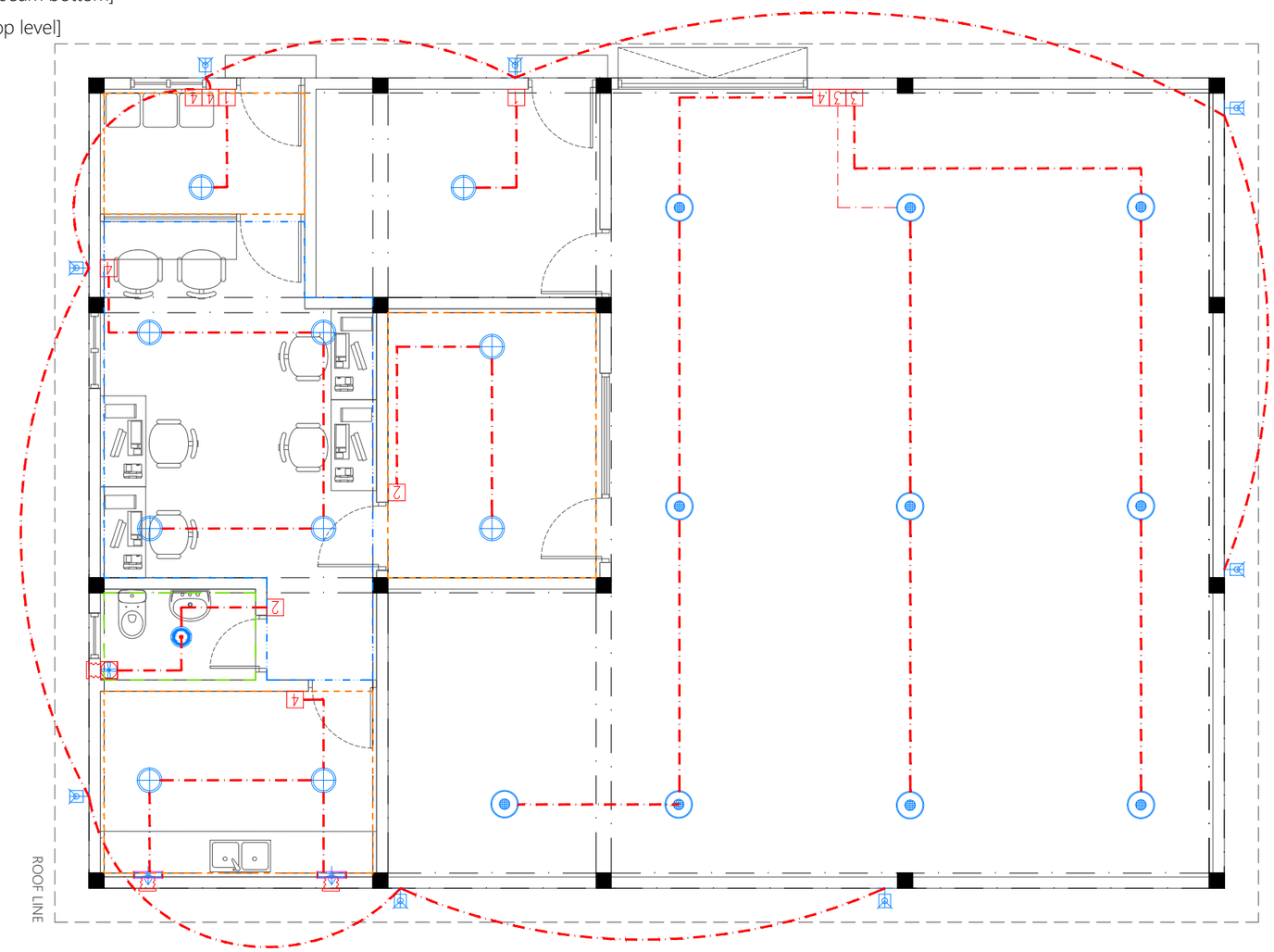
Legend

- Ceiling Light (12W)
- Recessed Ceiling Light (12W)
- Weather Proof Wall Light IP55 (12W)
- 60W, HPS, Low Bay Light
- 1 2 3 4 Light Switch (1 Gang - 4 Gang)
- 1 2 3 4 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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Project No: EP- WS/2019/03

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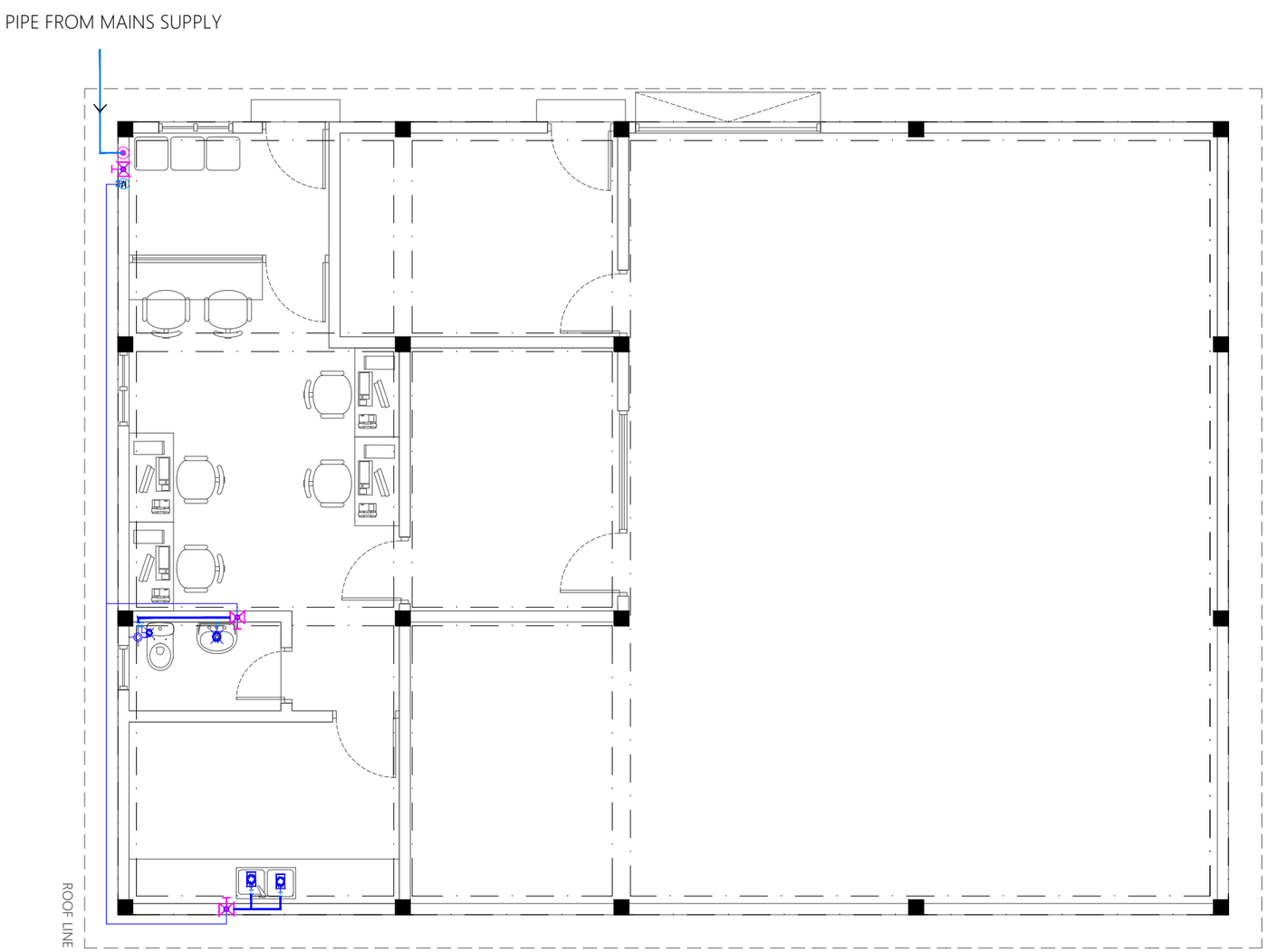
Page: EL-01

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



GROUND FLOOR PLUMBING LAYOUT

1:75

Legend

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Designed: H.R.	Approved: M.R.
Date: Sep 2020	SCALE (A3): 1:75

Project No: EP- WS/2019/03

Rev: R-00

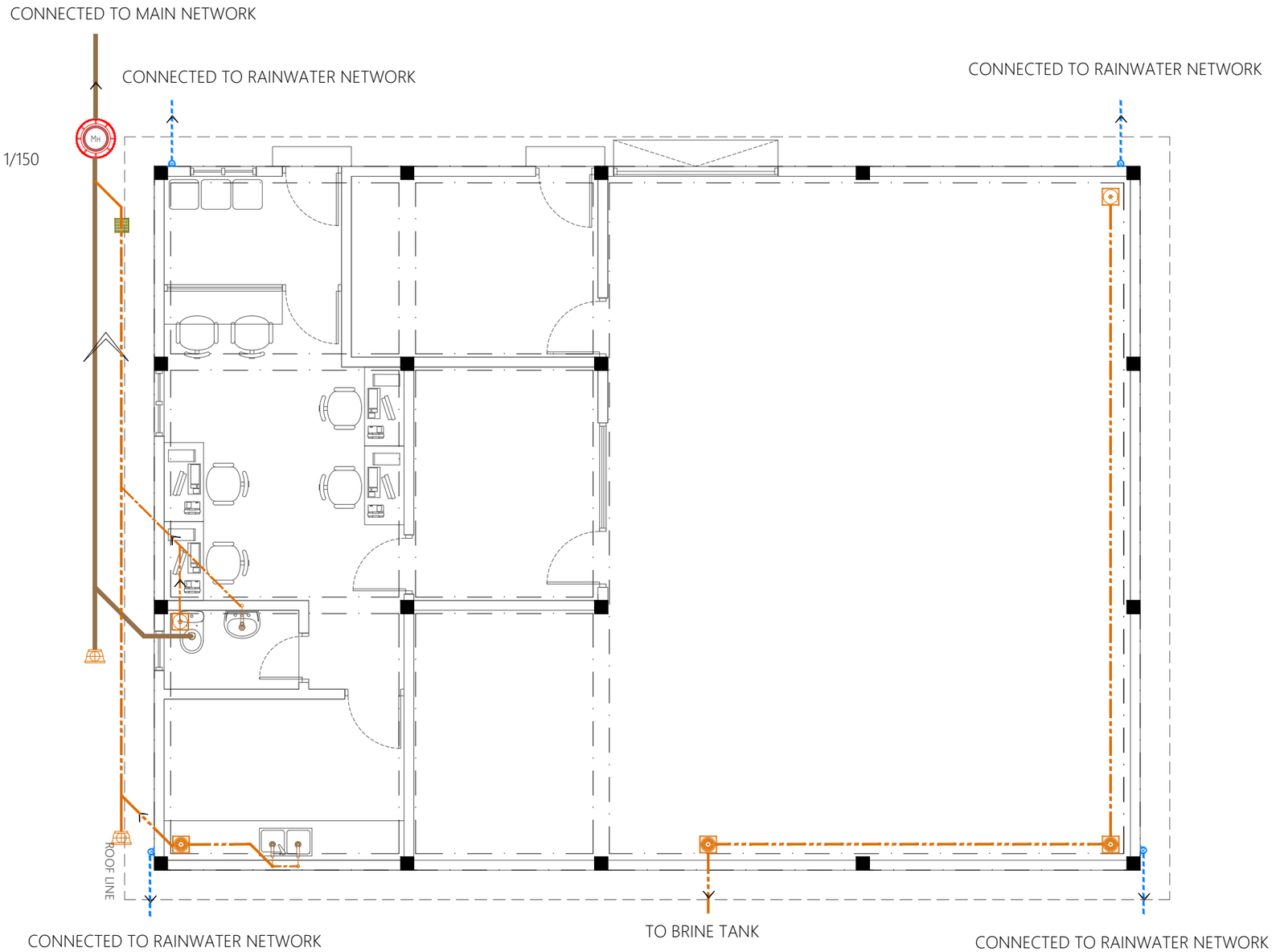
Page: PL-01

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



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

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 3

Sub Title:
Water Supply System in K. Himmafushi

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

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Date:	Sep 2020	SCALE (A3):	1:75
Project No:	EP- WS/2019/03		
Rev:	R-00	Page:	DR-01

Legend

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GROUND FLOOR DRAINAGE LAYOUT

1:75

Legend

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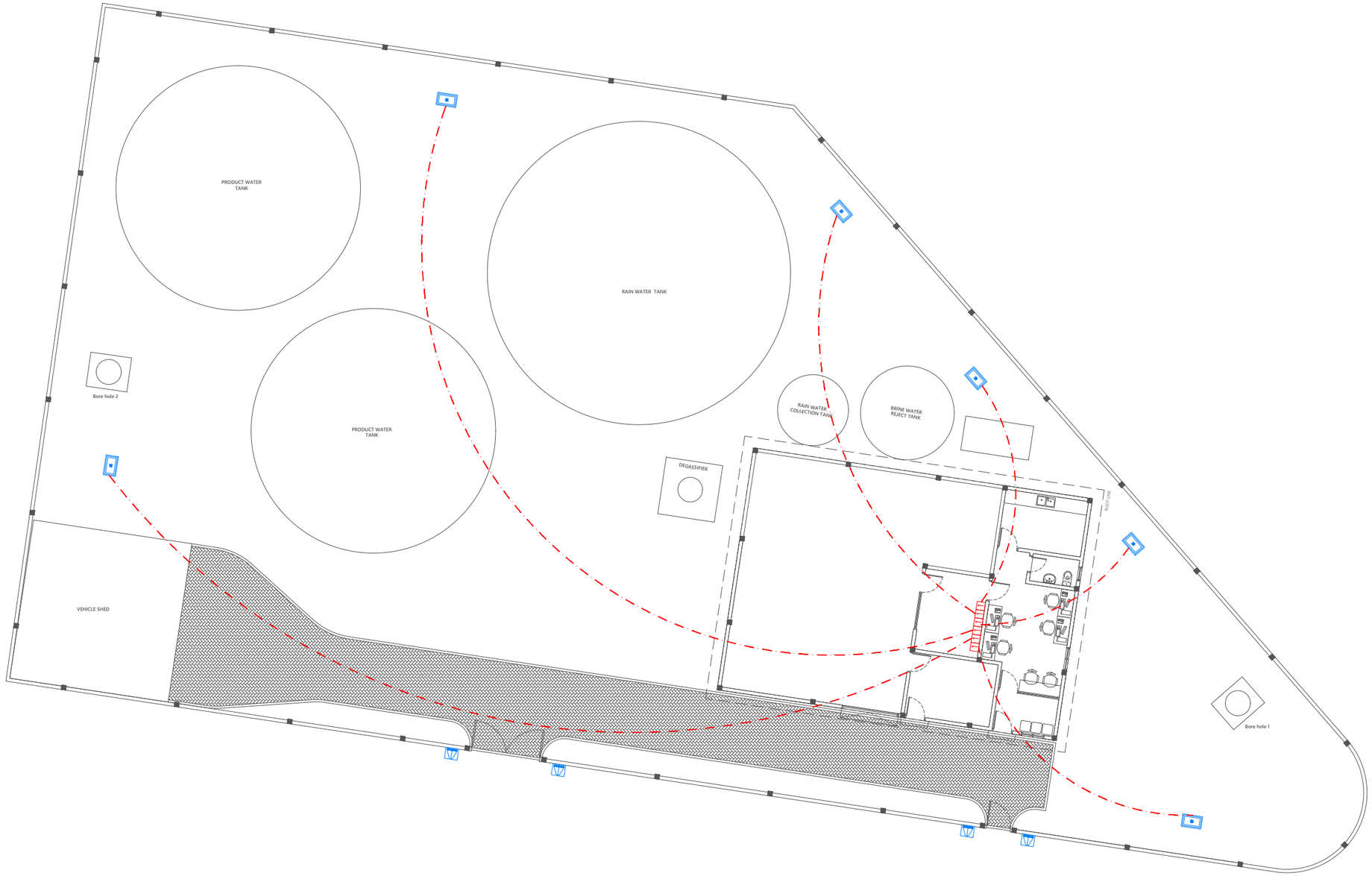
Project No: EP- WS/2019/03	
Rev: R-00	Page: DR-02

Legend

100W LED Flood Light IP65 @ 6m Light Post

Solar Powered LED Gate Lights (12W)

1 2 3 4 Light Switch (1 Gang - 4 Gang)



SITE LIGHTING LAYOUT

1:200

Legend

Note:

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-All Floor Drains Should Have 'P' Traps

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R00	AUG 2020	STAGE -1	H.R.	M.R.	M.R.

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