

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

PACKAGE 6

## **WATER SUPPLY SYSTEM OF GA. NILANDHOO, MALDIVES**

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



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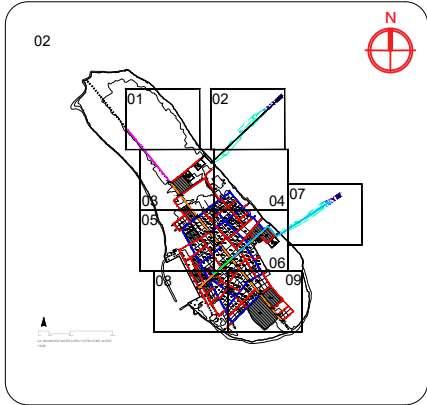


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GA. NILANDHOO WATER SUPPLY NETWORK LAYOUT  
1:5000



#### Legend

- Ø63 HDPE Water Main Distribution Pipe
- Ø90 HDPE Water Main Distribution Pipe
- Ø100 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:
- All levels are shown in meters.
  - All levels are shown from mean sea level.
  - This drawing to be read in conjunction with all other relevant drawing and specifications.
  - All pressure pipes and fittings shall be installed using electro-fusion and butt-fusion technologies.
  - All pressure pipes shall be laid in between 0.7m - 1.0m below natural ground level to achieve best flat alignment based on topographic survey.
  - All the service connections to the mains shall be made using electro-fusion saddle and coupler.
  - Minimum size of the main water supply network shall be OD 63mm PE100, PN10, SDR17 HDPE pipe.
  - Minimum size of the house service line shall be OD 25mm PE100, PN16, SDR11 HDPE pipe.
  - Minimum size of commercial and other institutional connection service line shall be 50mm, PE100, PN16, SDR11 HDPE pipe.

MAINS DISTRIBUTION		TYPE OF PIPE
DIAMETER (mm)	LENGTH HDPE (m)	HDPE (PE100, PN10, SDR17)
63	4823	
75	2361	
90	323	
110	1159	
160	123	
Total	8789	
Gate Valves	~ 25 nos	
Washout Valves	~ 02 nos	

OUTFALL		TYPE OF PIPE
DIAMETER (mm)	LENGTH HDPE (m)	HDPE (PE100, PN10, SDR11)
110	~430m (on land) ~282m (offshore)	

PSM BENCHMARKS	
PERMANENT BENCH MARK 1	32749.526E, 70041.431N 1031m From MSL
PERMANENT BENCH MARK 2	327775.055E, 70057.839N 1306m From MSL

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

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

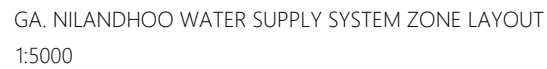
Sub Title:  
**Water Supply System in Ga. Nilandhoo**

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

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Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:5000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 01





- |   |  |   |  |
|---|--|---|--|
|  | 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 |  | Ø110 HDPE Brine Outfall Pipe           |
|  | Gate Valves                            |  | Washout Valves                         |
|  | 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.
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	4823	HDPE (PE100,PN10,SDR17)
75	2361	
90	323	
110	1159	
160	123	
Total	8789	

Gate Valves	- 25 nos
Washout Valves	- 02 nos
<b>OUTFALL</b>	
<b>DIAMETER (mm)</b>	<b>LENGTH HDPE (m)</b>
110	-430m (on land) -282m (offshore)
	HDPE (PE100, PN10, SDR11)


PSM BENCHMARKS	
	PERMANENT BENCH MARK 1 327149.526E, 70041.431N 1.031m From MSL
	PERMANENT BENCH MARK 2 327175.055E, 70057.839N 1.306m From MSL

R00	JUNE 2020	STAGE -1	PD	SBC	SD
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Rev:	Page:
<b>R-01</b>	<b>02</b>



WATER NETWORK LAYOUT - ZONE 01  
1:1000

02

### 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:

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

MAINS DISTRIBUTION		
DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	4823	HDPE (PE100,PN10,SDR17)
75	2361	
90	323	
110	1159	
160	123	
Total	8789	
Gate Valves ~ 25 nos		
Washout Valves ~ 02 nos		
OUTFALL		
DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	430m (on land) ~282m (offshore)	HDPE (PE100,PN10,SDR11)

PSM BENCHMARKS	
	PERMANENT BENCH MARK 1 327149.526E, 70041.431N 1.031m From MSL
	PERMANENT BENCH MARK 2 327175.055E, 70057.839N 1.306m From MSL

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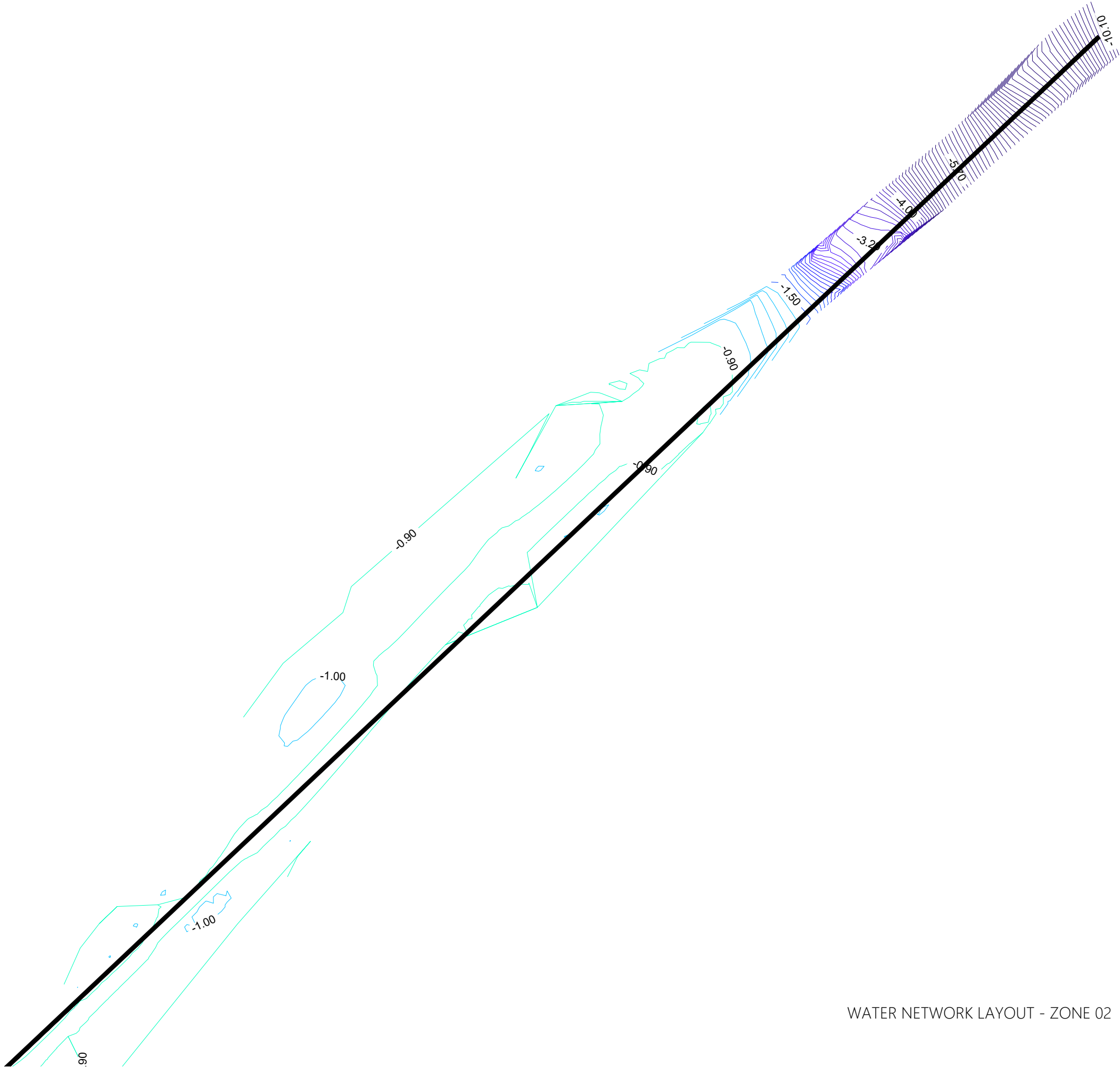
Date: Aug 2020

SCALE (A3): 1:1000

Project No: EP-WS/2019/06

Rev: R-01

Page: 03



WATER NETWORK LAYOUT - ZONE 02

02

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.

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	4823	HDPE (PE100,PN10,SDR17)
75	2361	
90	323	
110	1159	
160	123	
Total	8789	
Gate Valves	~ 25 nos	
Washout Valves	~ 02 nos	

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	430m (on land) -282m (offshore)	HDPE (PE100,PN10,SDR11)

PSM BENCHMARKS

PERMANENT BENCH MARK 1  
327149.526E, 70041.431N  
1.031m From MSL

PERMANENT BENCH MARK 2  
327175.055E, 70057.839N  
1.306m From MSL

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

Title:

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

Sub Title:

Water Supply System in Ga.Nilandhoo

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Maldiviyaa

Infrastruktura

Maqay

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: 04



- Notes:
1. All levels are shown in meters.
2. All levels are shown from mean sea level.
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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 coupling.
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, PN6, SDR17 HDPE pipe.
9. Minimum size of commercial and other institutional connection service line shall be 50mm PE100, PN6, SDR17 HDPE pipe.

OUTFALL		
DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	-430m (on land) -282m (offshore)	HDPE (PE100,PN10,SDR11)

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

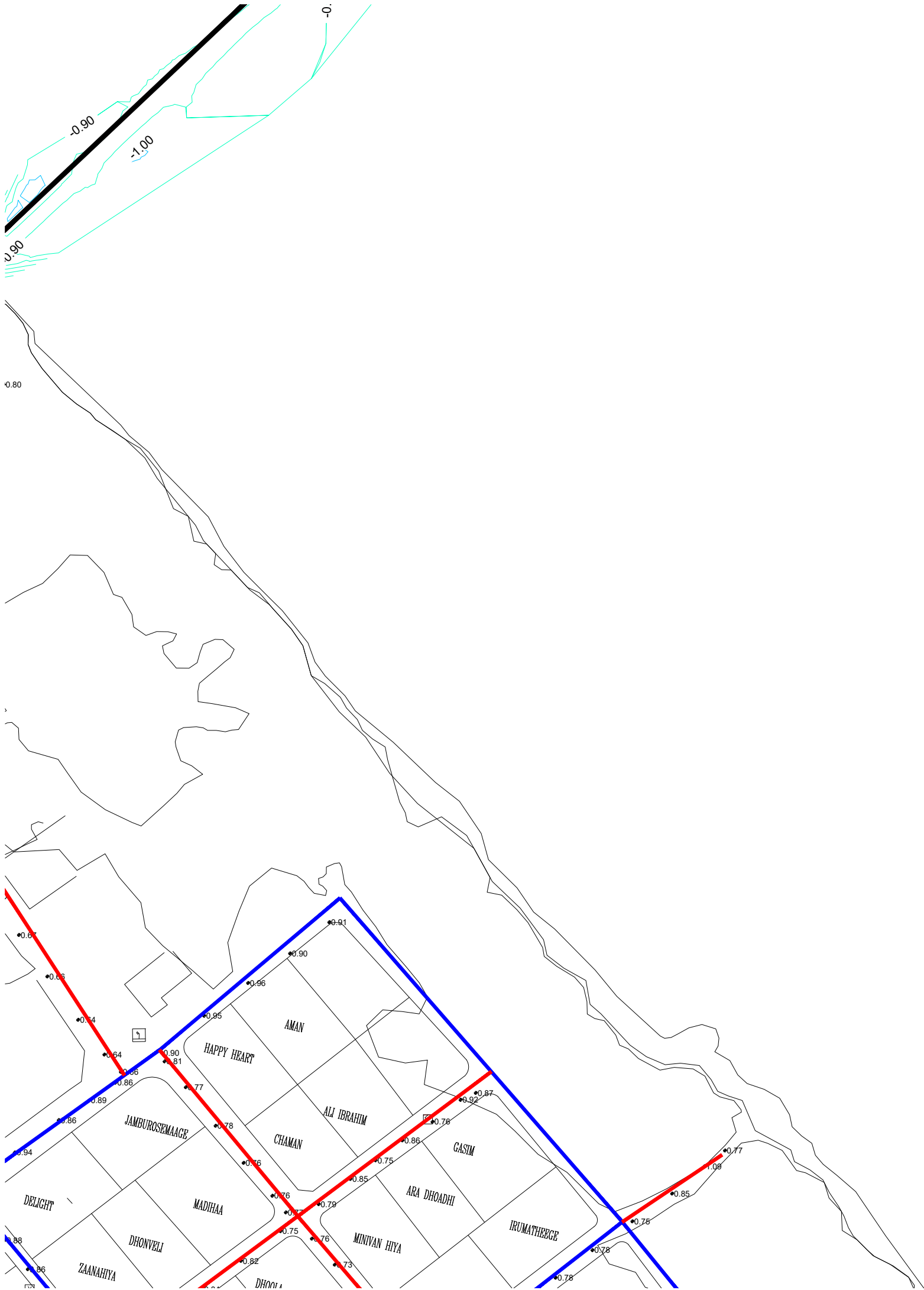
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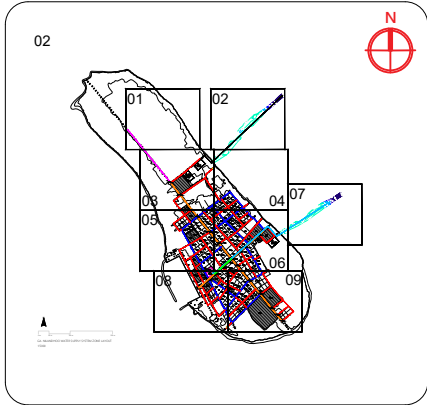
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Rev:	Page:
R-01	05



WATER NETWORK LAYOUT - ZONE 04

1:1000



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:
- All levels are shown in meters.
  - All levels are shown from mean sea level.
  - This drawing to be read in conjunction with all other relevant drawing and specifications.
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  - All the service connections to the mains shall be made using electro-fusion saddle and coupler.
  - Minimum size of the main water supply network shall be OD 63mm PE100, PN10, SDR17 HDPE pipe.
  - Minimum size of the house service line shall be OD 25mm PE100, PN16, SDR11 HDPE pipe.
  - Minimum size of commercial and other institutional connection service line shall be 50mm, PE100, PN16, SDR11 HDPE pipe.

MAINS DISTRIBUTION		TYPE OF PIPE
DIAMETER (mm)	LENGTH HDPE (m)	HDPE (PE100,PN10,SDR17)
63	4823	
75	2361	
90	323	
110	1159	
160	123	
Total	8789	
Gate Valves ~ 25 nos		
Washout Valves ~ 02 nos		

OUTFALL		TYPE OF PIPE
DIAMETER (mm)	LENGTH HDPE (m)	HDPE (PE100,PN10,SDR11)
110	430m (on land) ~282m (offshore)	

PSM BENCHMARKS	
1	PERMANENT BENCH MARK 1 327149.526E, 70041.431N 1.031m From MSL
2	PERMANENT BENCH MARK 2 327175.055E, 70057.839N 1.306m From MSL

R00	JUNE 2020	STAGE -1	PD	SBC	SD
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Sub Title:

**Water Supply System in Ga.Nilandhoo**

Client:

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Designed: F.I.A.	Approved: I.W.
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
- | MAINS DISTRIBUTION      |                 |                         |
|-------------------------|-----------------|-------------------------|
| DIAMETER (mm)           | LENGTH HDPE (m) | TYPE OF PIPE            |
| 63                      | 4823            | HDPE (PE100,PN10,SDR17) |
| 75                      | 2361            |                         |
| 90                      | 323             |                         |
| 110                     | 1159            |                         |
| 160                     | 123             |                         |
| Total                   | 8789            |                         |
| Gate Valves - 25 nos    |                 |                         |
| Washout Valves - 02 nos |                 |                         |

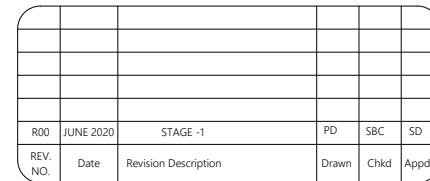
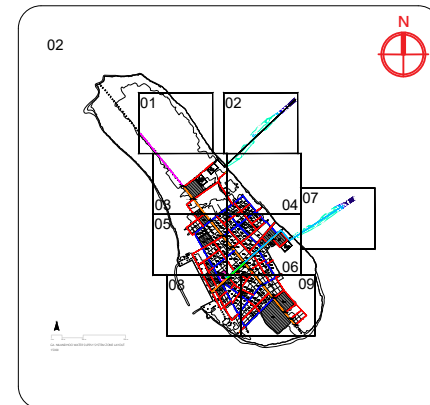
PSM BENCHMARKS	
	PERMANENT BENCH MARK 1 327149.526E, 70041.431N 1.031m From MSL



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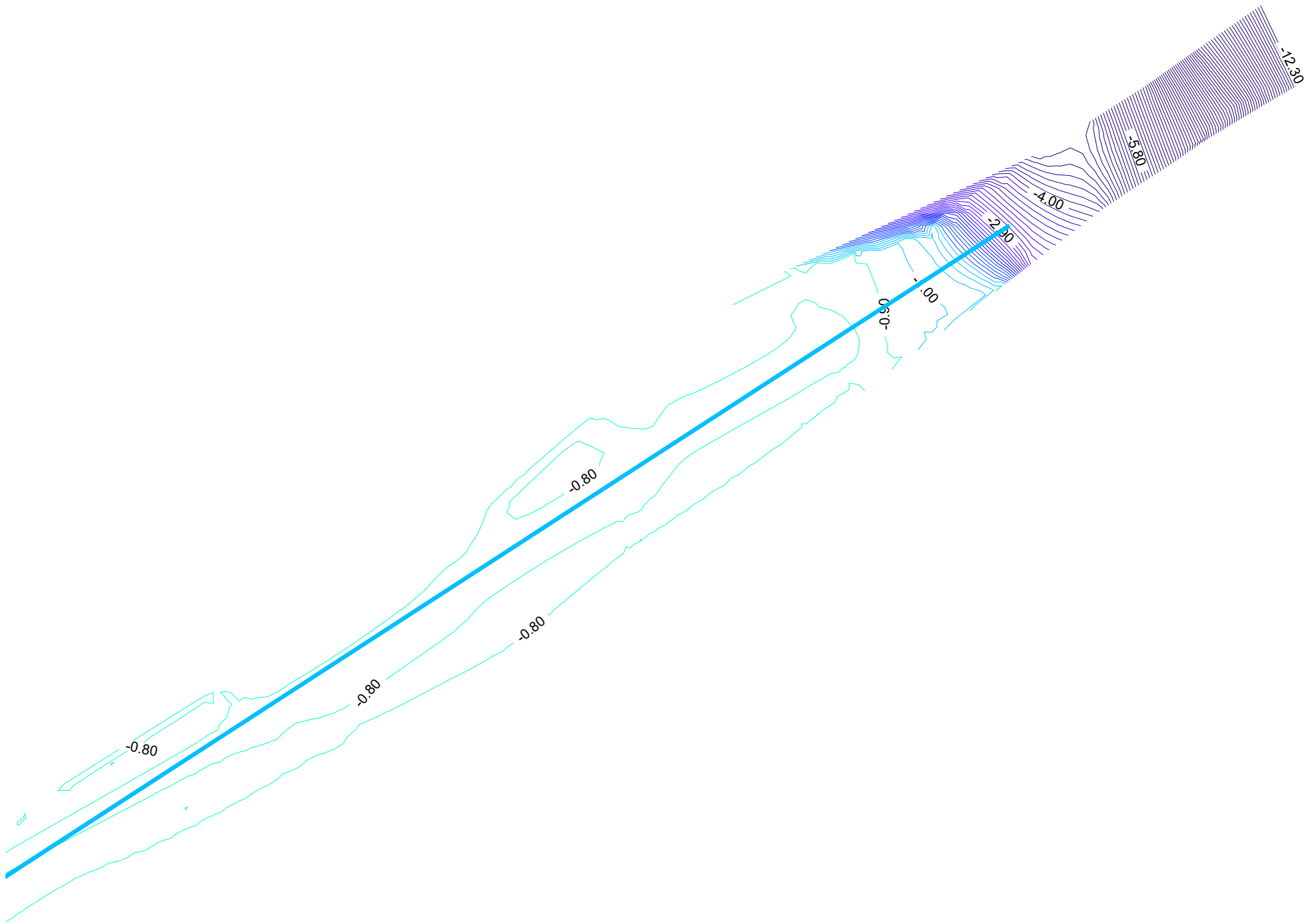
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Date: Aug 2020	SCALE (A3): 1:1000
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Rev: R-01	Page: 07



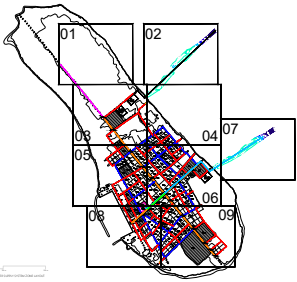
<p style="margin: 0;">Title:</p> <h2 style="margin: 0;">Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6</h2> <p style="margin: 0;">Sub Title:</p> <h3 style="margin: 0;">Water Supply System in Ga.Nilandhoo</h3>	
<p style="margin: 0;">Client:</p> <p style="margin: 0;"><b>Ministry of National Planning, Housing and Infrastructure, Republic of Maldives</b></p>	
<div style="display: flex; align-items: center; justify-content: center;">  <div> <p style="font-size: 2em; font-weight: bold; margin: 0;">EPOCH</p> <p style="font-size: 0.8em; margin: 0;">www.eepoch.com</p> </div> </div> <p style="margin-top: 10px;">T : +960 333 3288  E : info@epoch.associates  W : www.epoch.associates  A : G. Rosary West,  Huruheenta Magu, Male', Maldives</p>	<div style="display: flex; align-items: center; justify-content: center;">  <div> <p style="font-size: 1.2em; font-weight: bold; margin: 0;">INFRA</p> <p style="font-size: 0.8em; margin: 0;">Making Infrastructure Happen</p> </div> </div>
<p>Drawn: F.I.A.</p>	<p>Checked: M.S.S.</p>
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<p>Project No: EP-WS/2019/06</p>	
<p>Rev:</p> <p style="font-size: 1.5em; font-weight: bold;">R-01</p>	<p>Page:</p> <div style="border: 1px solid black; width: 50px; height: 50px; display: flex; align-items: center; justify-content: center; margin: 0 auto; font-size: 1.5em; font-weight: bold;">08</div>



WATER NETWORK LAYOUT - ZONE 07

1:1000

02



#### 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:

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#### MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	4823	HDPE (PE100,PN10,SDR17)
75	2361	
90	323	
110	1159	
160	123	
Total	8789	
Gate Valves	~ 25 nos	
Washout Valves	~ 02 nos	

#### OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	430m (on land) ~282m (offshore)	HDPE (PE100,PN10,SDR11)

#### PSM BENCHMARKS

PERMANENT BENCH MARK 1 327149.526E, 70041.431N 1.031m From MSL	
PERMANENT BENCH MARK 2 327175.055E, 70057.839N 1.306m From MSL	

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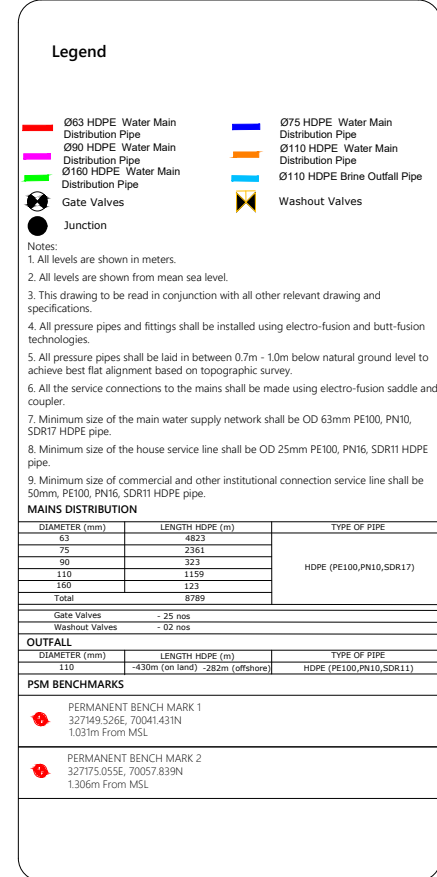
Drawn: F.I.A. Checked: M.S.S.



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

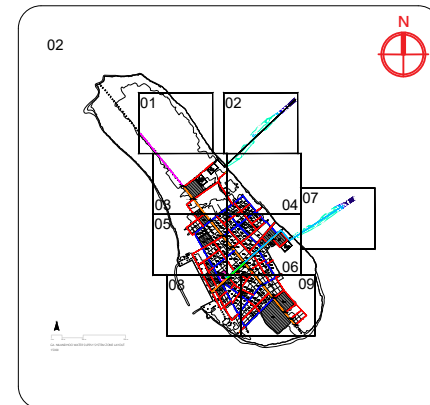
Date: Aug 2020 SCALE (A3): 1:1000

Project No: EP-WS/2019/06

Rev: R-01 Page: 09



<p>Title:</p> <h1>Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6</h1>	
<p>Sub Title:</p> <h2>Water Supply System in Ga.Nilandhoo</h2>	
<p>Client:</p> <h3>Ministry of National Planning, Housing and Infrastructure, Republic of Maldives</h3>	
 <p><b>EPOCH</b> CONSULTING</p> <p>T : +960 333 3528  E : info@epoch.associates  W : www.epoch.associates  A : G. Rosary West,  Husnuhena Magu, Male', Maldives</p>	 <p><b>FEEDBACK INFRA</b>  Working Infrastructure Happens</p>
<p>Drawn: F.I.A.</p>	<p>Checked: M.S.S.</p>
<p>Designed: F.I.A.</p>	<p>Approved: I.W.</p>
<p>Date: Aug 2020</p>	<p>SCALE (A3): 1:1000</p>
<p>Project No: EP-WS/2019/06</p>	
<p>Rev:</p> <p><b>R-01</b></p>	<p>Page:</p> <p><b>10</b></p>





	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		Ø110 HDPE Brine Outfall Pipe
	Gate Valves		Washout Valves
	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.
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 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, SDR11 HDPE pipe.
8. Minimum size of the house service line shall be OD 25mm PE100, PN6, SDR11 HDPE pipe.
9. Minimum size of commercial and other institutional connection service line shall be 50mm PE100, PN6, SDR11 HDPE pipe.

SDR11 PE100, PN16, SDR11 HDPE pipe.		
MAINS DISTRIBUTION		
DIAMETER (mm)	LENGTH (M)	TYPE OF PIPE
63	4823	HDPE (PE100,PN16,SDR17)
75	2361	
90	323	
110	1159	
160	123	
Total	8789	

Gate Valves	- 25 nos
Washout Valves	- 02 nos
<b>OUTFALL</b>	
<b>DIAMETER (mm)</b>	<b>LENGTH HDPE (m)</b>
110	-430m (on land) -282m (offshore)
<b>TYPE OF PIPE</b>	
HDPE (PE100, PN10, SDR11)	

110	-430m (on land) -282m (offshore)	HDPE (PE100, PN10, SUR11)
<b>PSM BENCHMARKS</b>		
	PERMANENT BENCH MARK 1 327149.526E, 70041.431N 1.031m From MSL	
	PERMANENT BENCH MARK 2 327175.055E, 70057.839N 1.306m From MSL	

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

Sub Title:  
**Water Supply System in Ga.Nilandhoo**

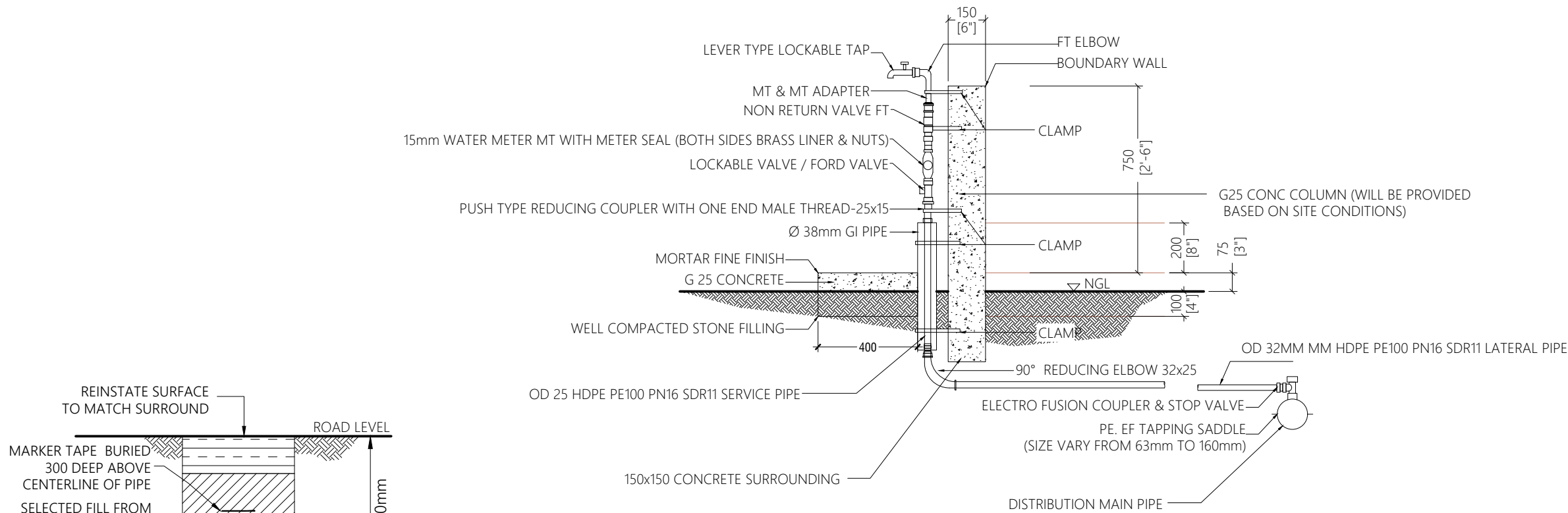
Client:  
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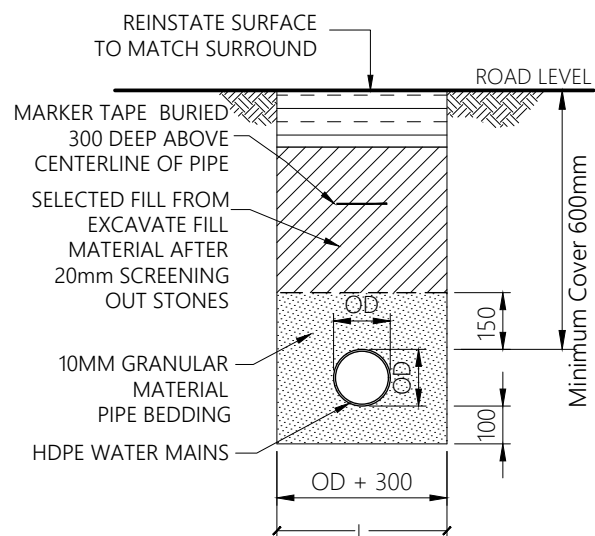
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Project No: EP-WS/2019/06	

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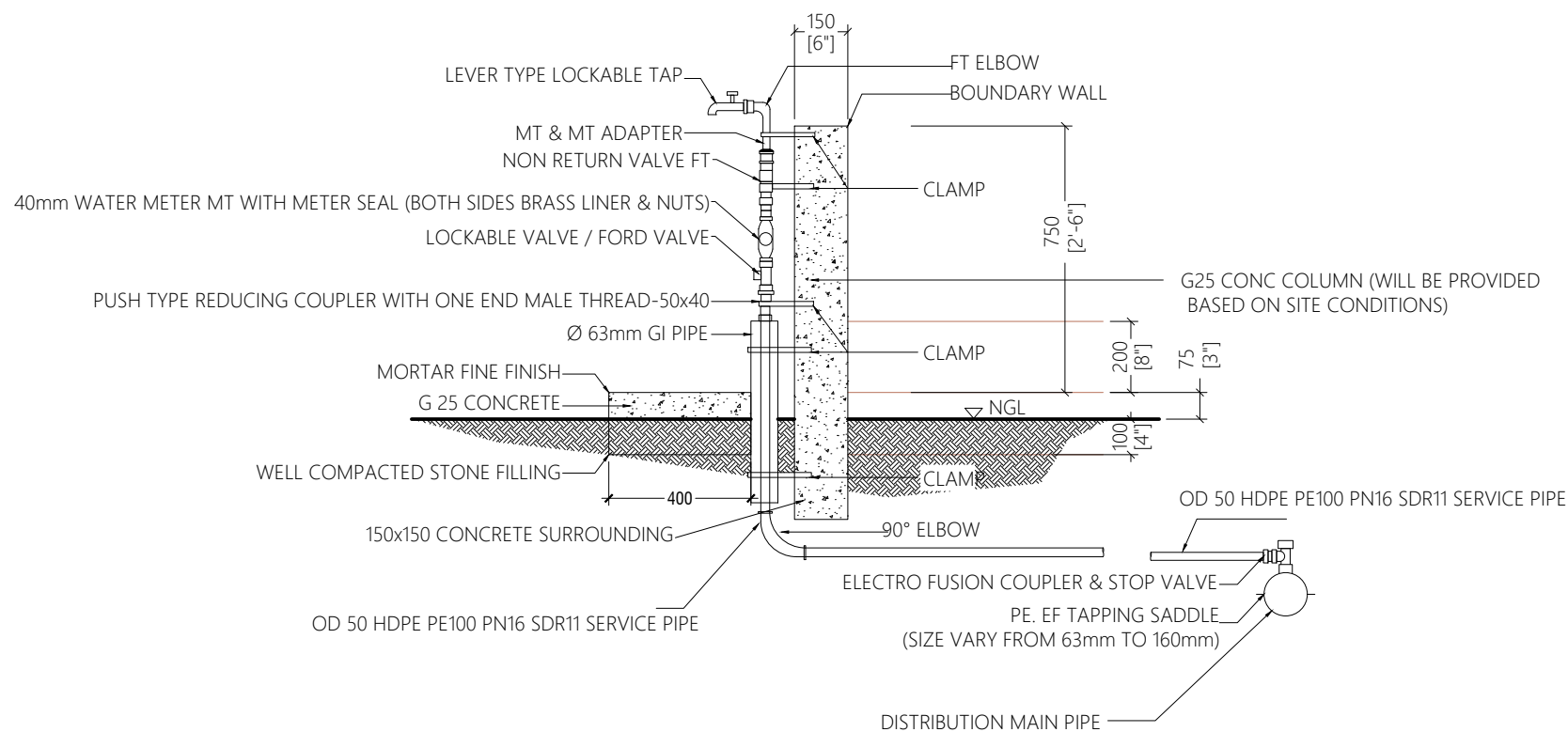
WATER NETWORK LAYOUT - ZONE 09



### WATER SUPPLY HOUSE CONNECTION DETAILS



### TRENCH & BEDDING DETAILS



### WATER SUPPLY COMMERCIAL/INSTITUTIONAL CONNECTION DETAILS

## WATER SUPPLY HOUSE AND COMMERCIAL/INSTITUTIONAL CONNECTIONS

1:20

#### Legend

#### Notes:

- Location of house connection meters to be determined based on house connection survey.
- Commercial connections for public buildings and industrial buildings to be provided as per approved connections list from island council.

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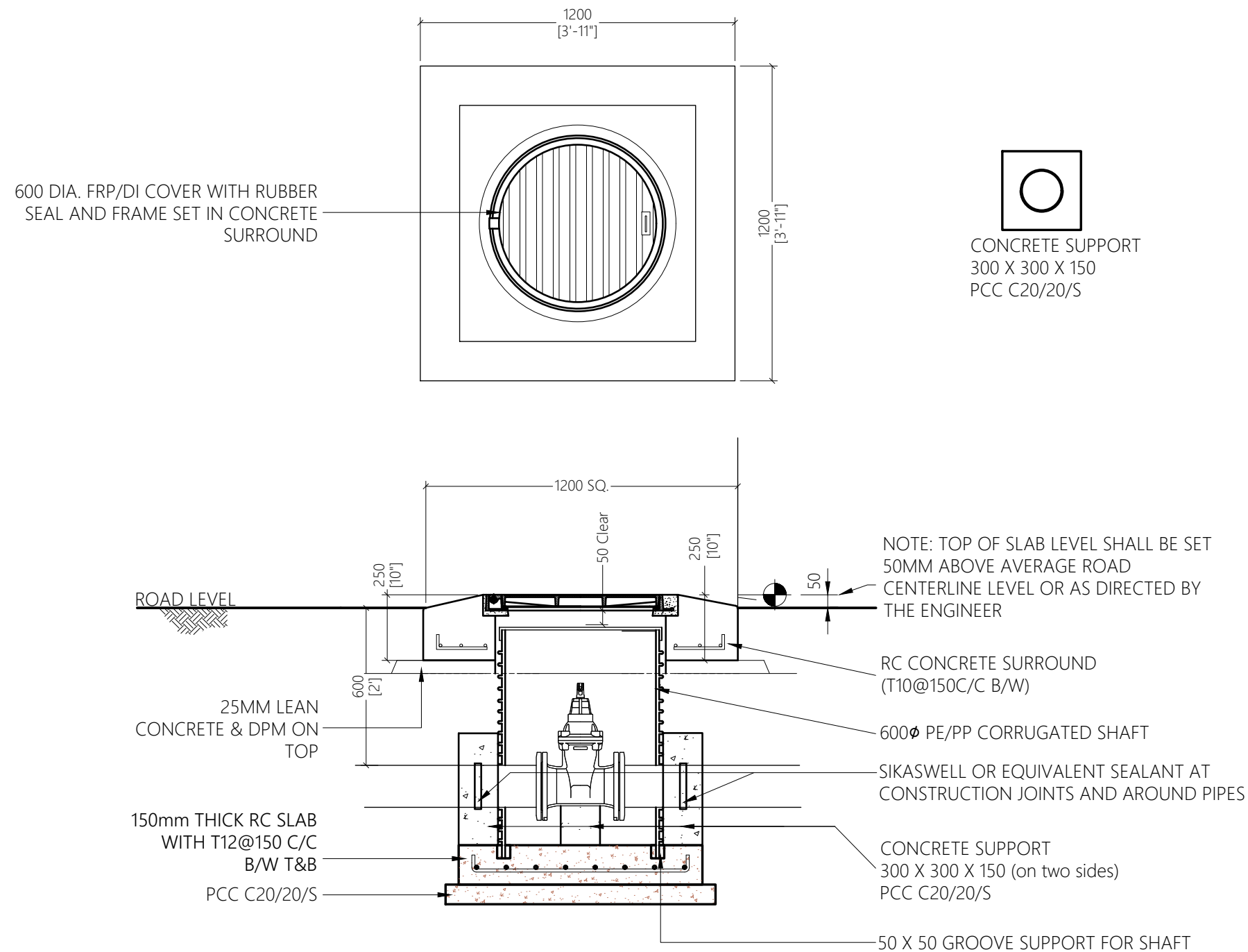
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Project No: EP- WS/2019/06

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SECTION - VALVE CHAMBER

## VALVE CHAMBER DETAILS

1:20



### Legend

#### Notes:

- All structural concrete shall be of grade C25.
- 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.

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Title:

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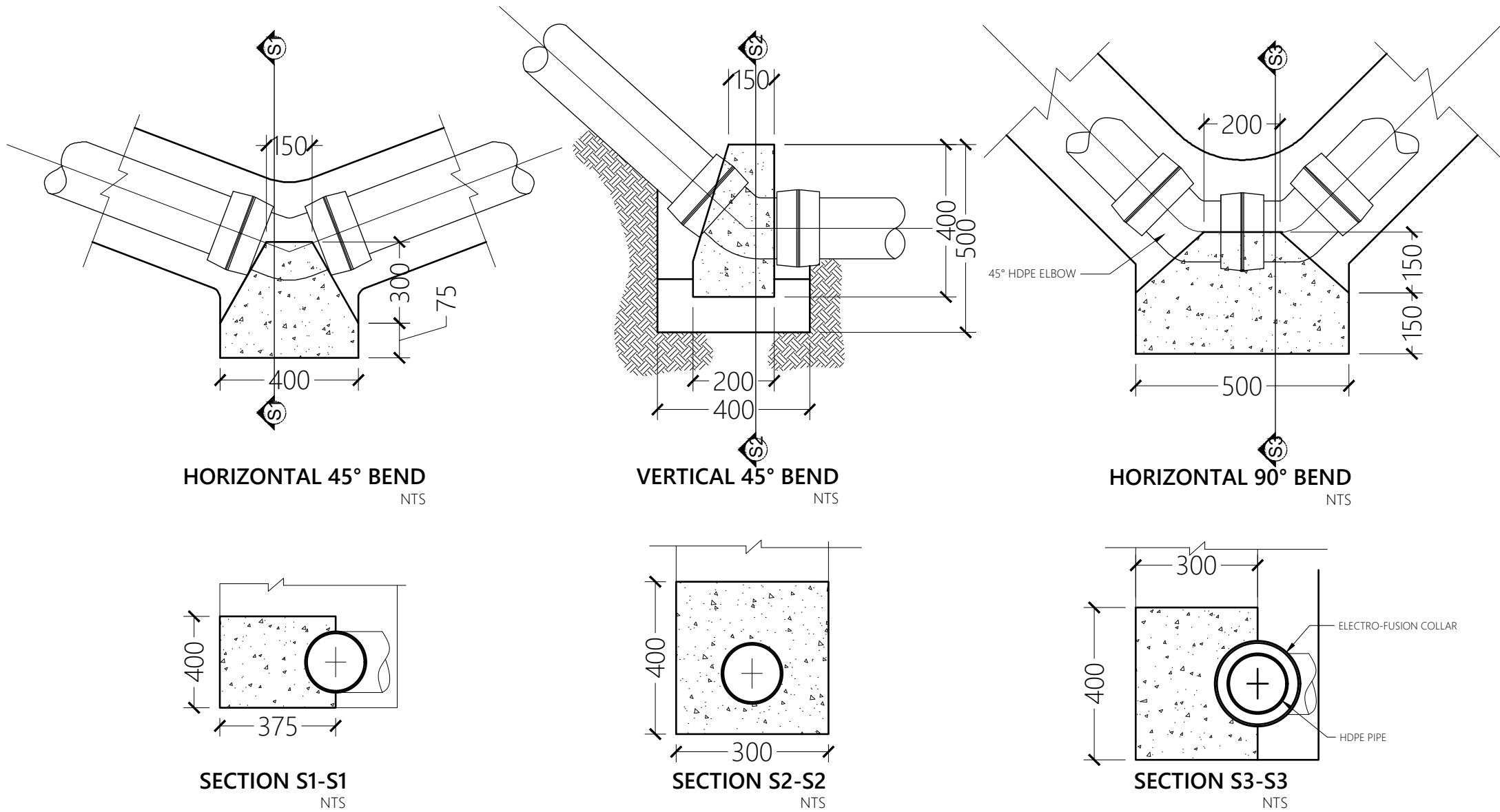
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Project No: EP- WS/2019/06

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## THRUST BLOCK DETAILS

NTS



### Legend

**Notes:**  
-All structural concrete shall be of grade C25.  
-All castings shall be done using sulphate resistant portland cement to BS 4027:1996.

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

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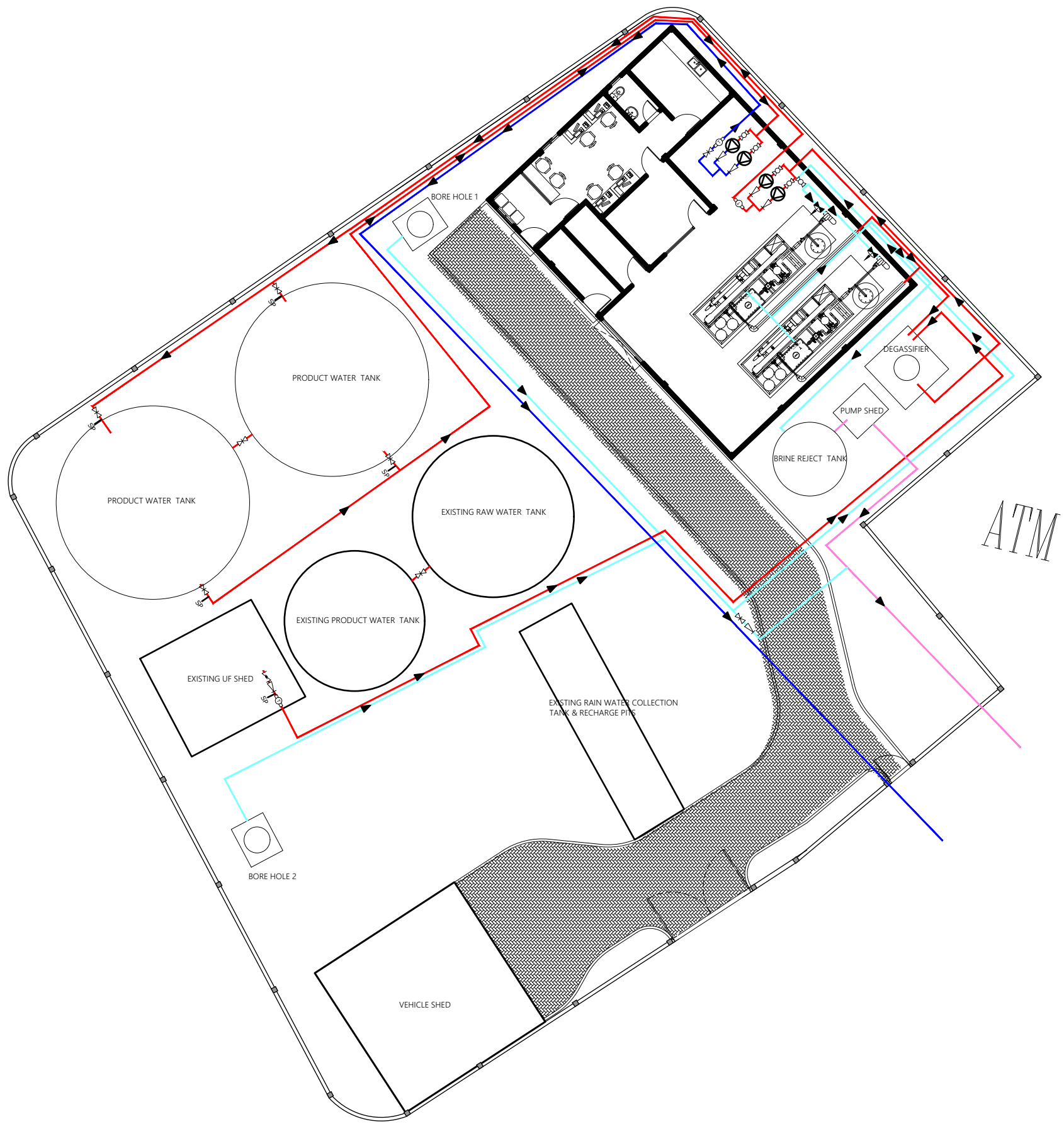
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Project No: EP- WS/2019/06

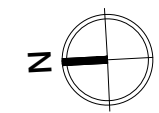
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PUMP DETAILS

- Borehole Pump : 2 Nos  
- Flow (Q) = 36.66 m<sup>3</sup>/hr  
- Head (h) = 50 m
- High Pressure Pump : 2 Nos  
- Flow (Q) = 8.33 m<sup>3</sup>/hr  
- Pressure Range = 45-85 bar
- Transfer Pump : 2 Nos  
- Flow (Q) = 7.50 m<sup>3</sup>/hr  
- Head (h) = 30 m
- Distribution Pump Set : 2 Nos  
- Flow (Q) = 10.8 m<sup>3</sup>/hr  
- Head (h) = 35 m
- Brine Pump : 2 Nos  
- Flow (Q) = 11.66 m<sup>3</sup>/hr  
- Head (h) = 23 m

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



INTERNAL PIPE LAYOUT

1:200

Legend

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

Notes:

- All Pump sizes are based on 15 year demands.
- Rainwater collection Pump sizing is done considering Maximum Rainfall intensity of 50mm/hr.
- UF feed pump will be subject to Approved UF Plant suppliers approval.
- Both Feed Pump and High pressure pump capacity will need to be approved by the approved RO plant Supplier. The working pressure range will be established based on the approved suppliers requirements.
- Distribution Pump set will have Variable Frequency Drive.
- All pump control float switches and automated valves will be provided.
- Contractor to produce shop drawings of interior layout based on site condition for approval by engineer.

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**Water Supply System in Ga. Nilandhoo**

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

NTS





**Note:**

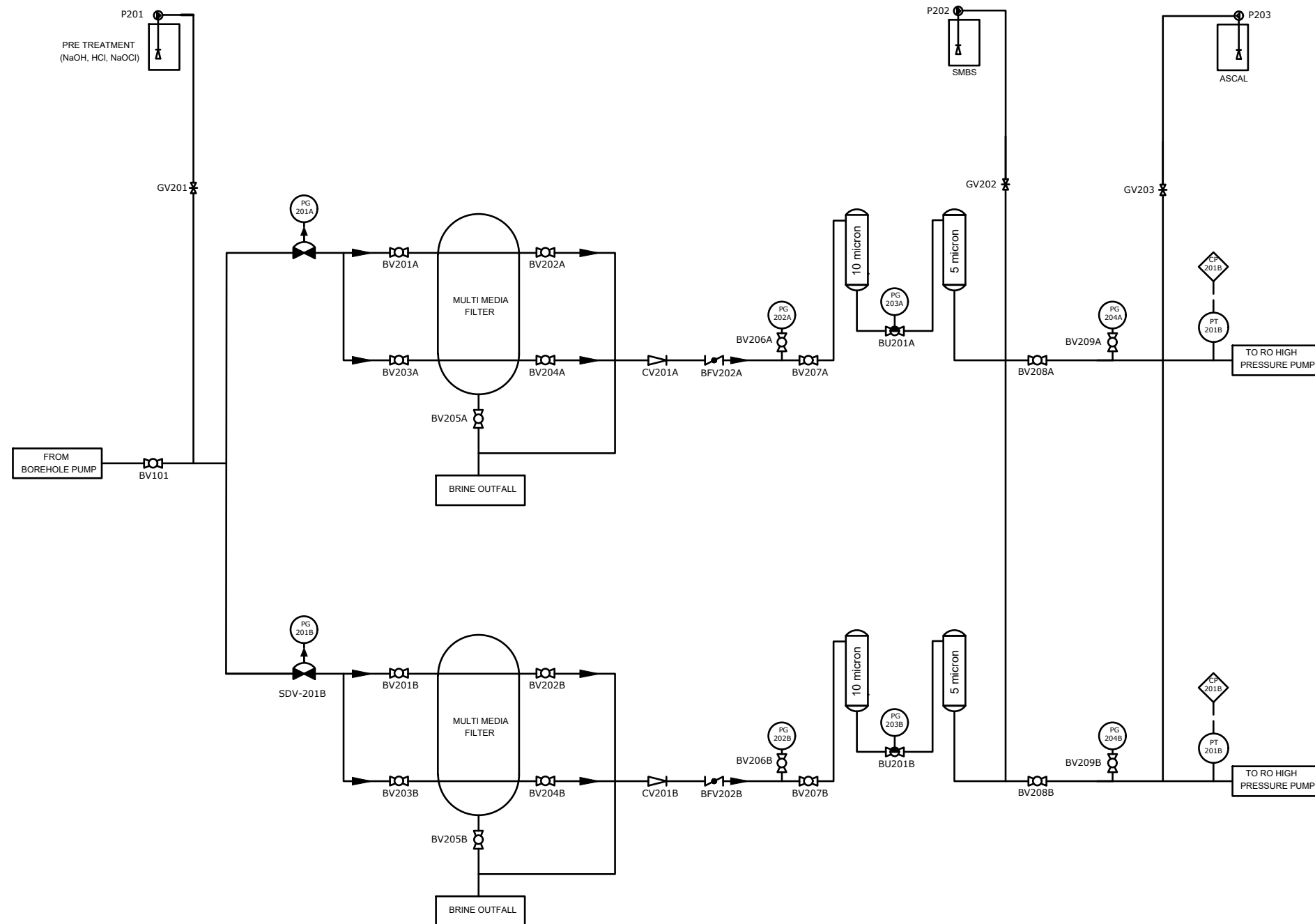
- Borehole pumps to be controlled by Variable Frequency Drive (VFD)






















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**Water Supply System in Ga. Nilandhoo**

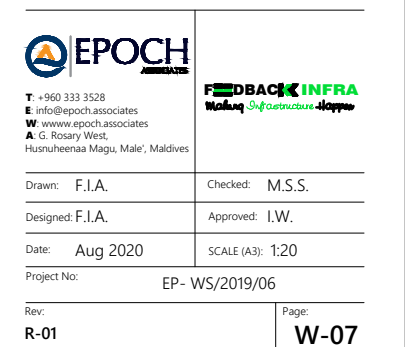
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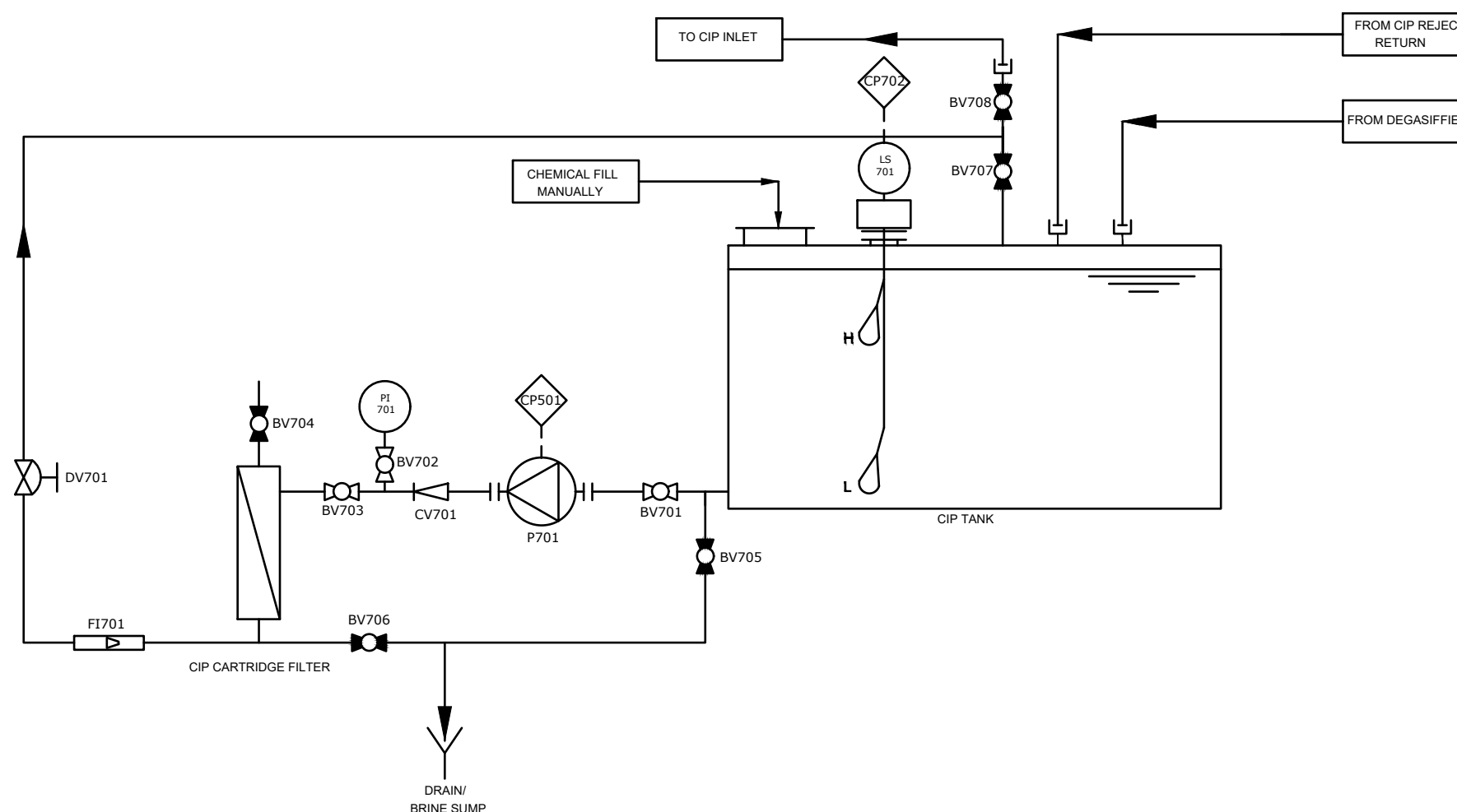
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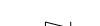

LEGEND									
ACTUATION		VALVES			FEATURES		CONDITION		ABBREVIATIONS
	MANUALLY OPERATED		BUTTERFLY		MOTORIZED BALL		FLANGED CONNECTION		LS - LEVEL SENSOR FT - FLOW TRANSMITTER
	DIAPHRAGM - SINGLE ACTING		BALL		TORTALIZER		TRAP		PI - PRESSURE INDICATOR SP - SAMPLING POINT
	DIAPHRAGM - DOUBLE ACTING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

NTS





### DETAIL C

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

IWRM PLANT P&amp;I DETAIL C

NTS

### Legend

**Note:**



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

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REV. NO.	Date	Revision Description	Drawn	Chkd	Appd

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Sub Title:  
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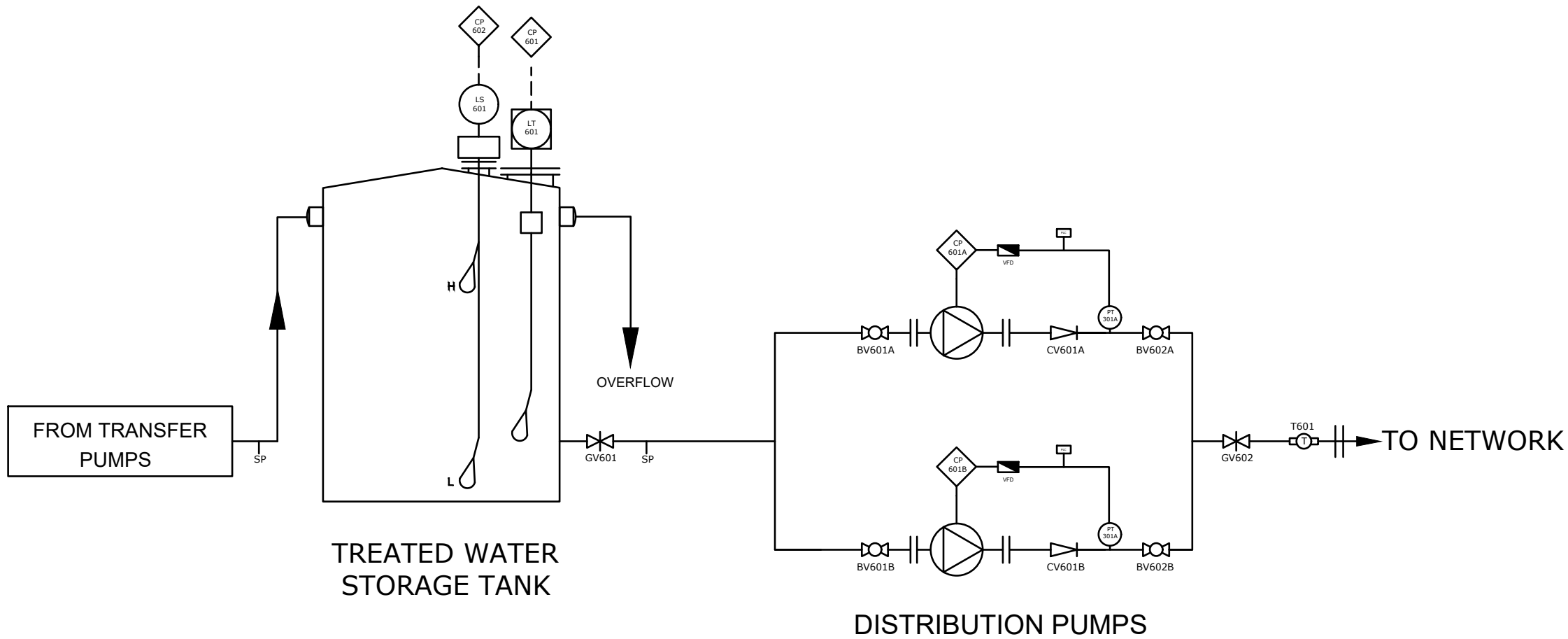
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<b>Drawn:</b> F.I.A.	<b>Checked:</b> M.S.S.
<b>Designed:</b> F.I.A.	<b>Approved:</b> I.W.
<b>Date:</b> Aug 2020	<b>SCALE (A3):</b> 1:20
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<b>Rev:</b>  <b>R-01</b>	<b>Page:</b>  <b>W-08</b>

IWRM PLANT P&I DETAIL D

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

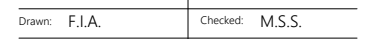
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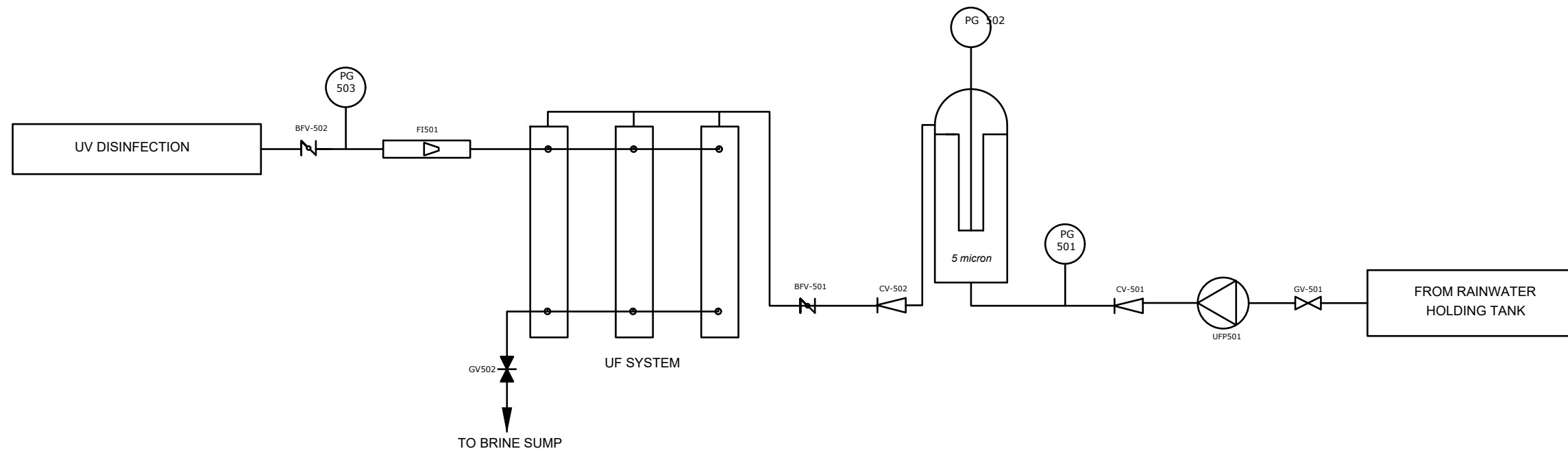
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Project No: EP- WS/2019/06

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## UV DISINFECTION



### DETAIL G

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

IWRM PLANT P&amp;I DETAIL G

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### Legend

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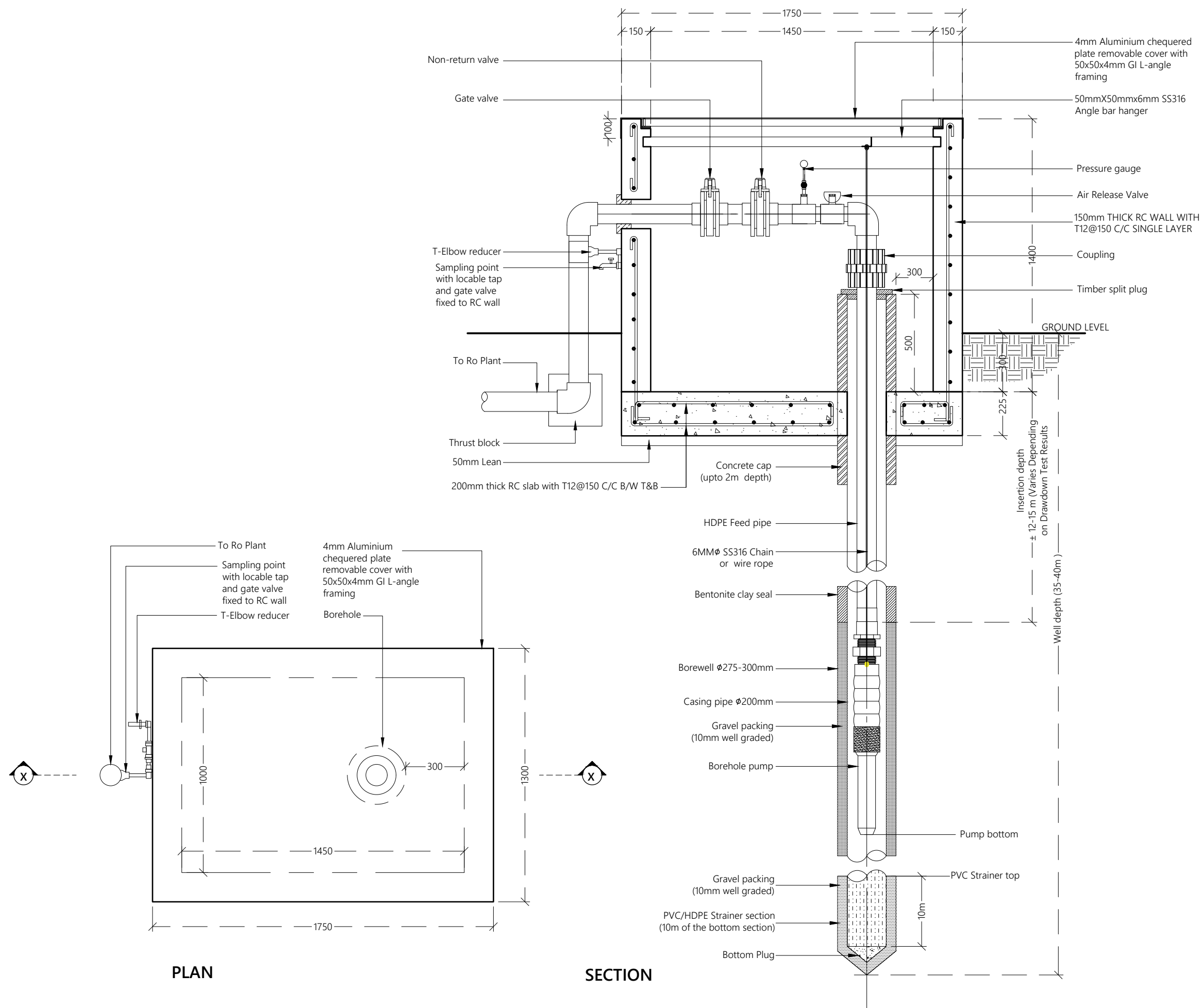
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R-01	W-12



### Legend

Notes:

- Notes:**
- All structural concrete shall be of grade C30.
  - 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 shall be given for all reinforcements
  - All concrete cold joints shall casted with bonding agent
  - Casing pipe to be HDPE or PVC with a diameter of 200mm.
  - Contractor to submit well development methodology for approval by engineer.
  - Contractor to submit drill logs.
  - Contractor to submit drawdown test results for approval by engineer prior to pipe insertion.

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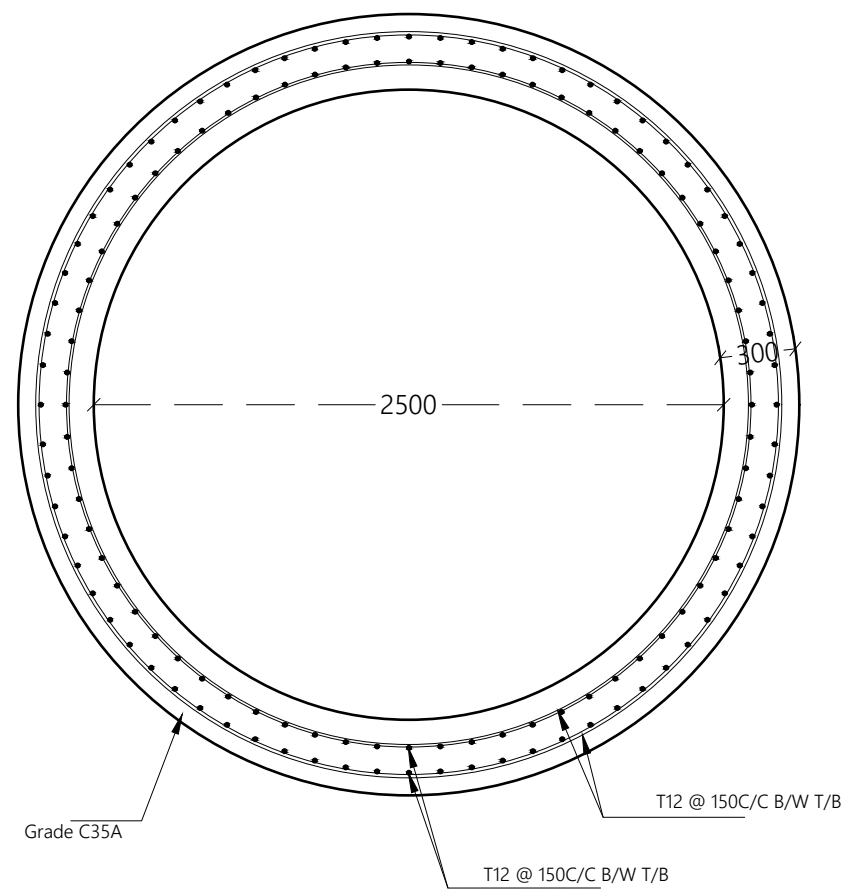
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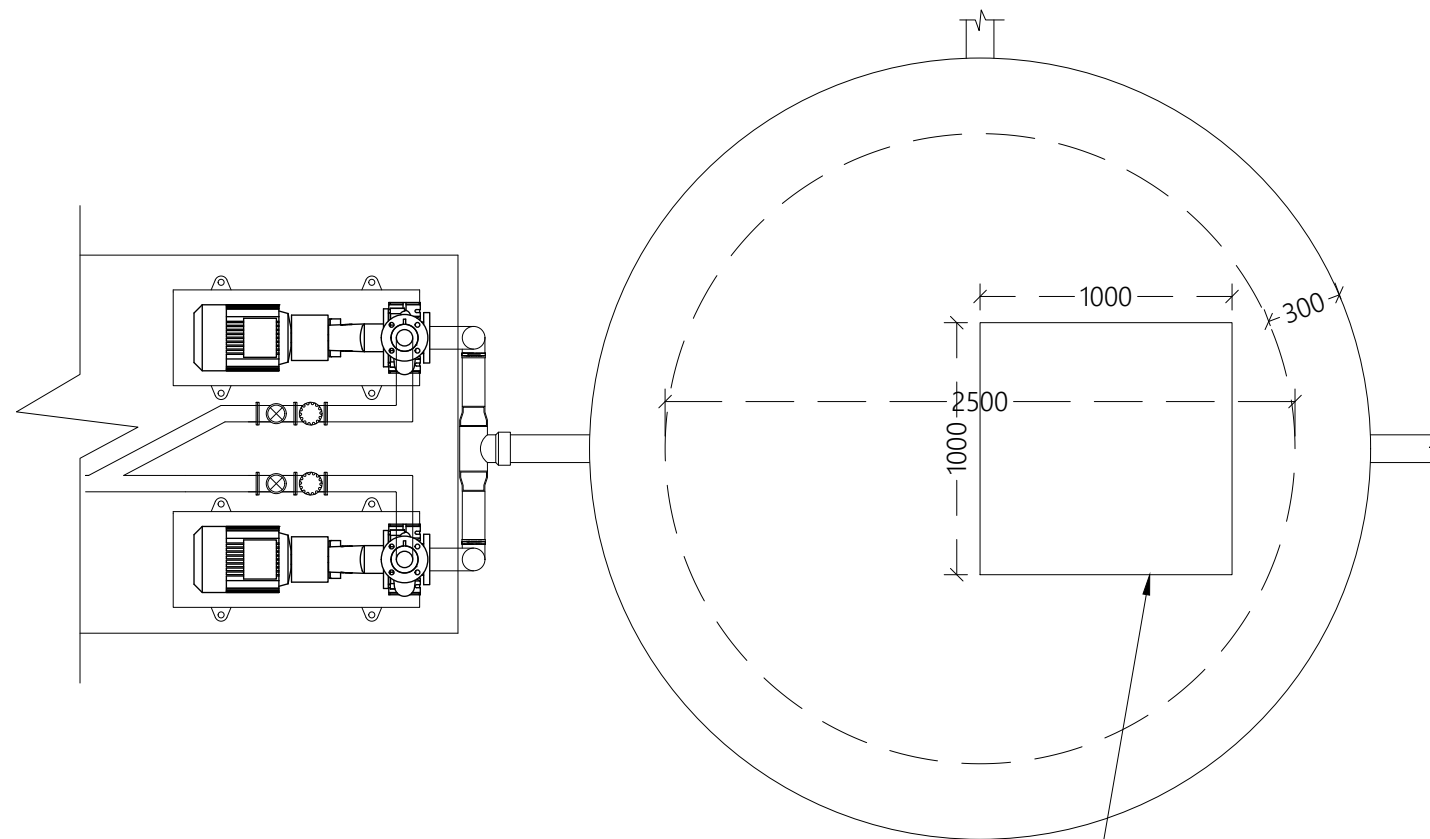
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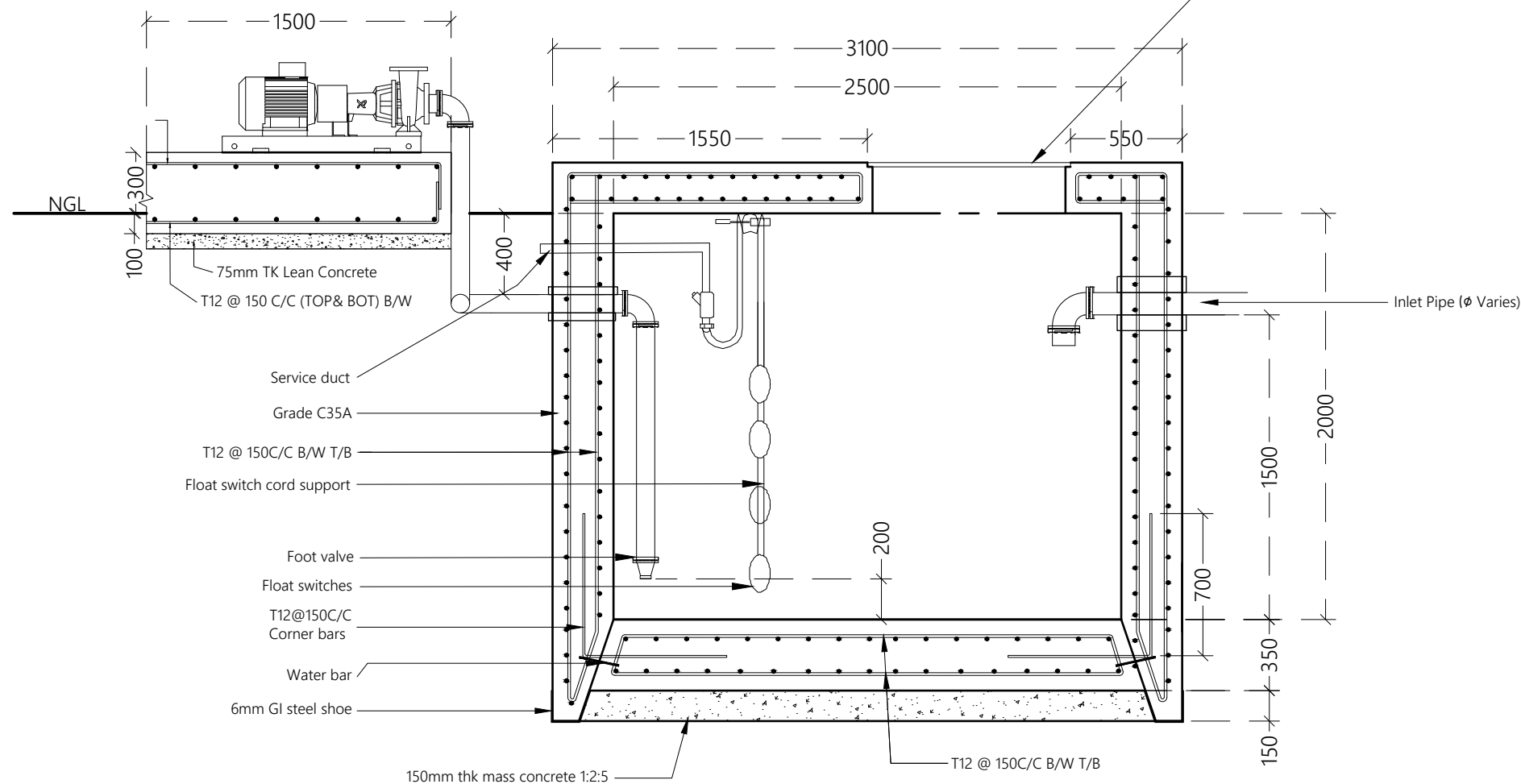
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Date: Aug 2020	SCALE (A3): NTS
Project No: EP- WS/2019/06	
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BRINE WATER TANK PLAN - STRUCTURAL



BRINE WATER TANK PLAN



BRINE WATER TANK SECTION X-X

BRINE TANK DETAILS

1:30

#### Legend

- Note:**
- Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
  - Orientation of tanks and pipe work to suit location.
  - All structural concrete shall be of grade C35A.
  - 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.
  - Internal concrete surfaces to be coated with 5mm thickness of epoxy bonded glass fibre and finished with gel coat or 500 microns epoxy paint coating.
  - External concrete surfaces to be painted with 3 coats of bitumen/rubber emulsion and protected by 500 micron polyethene.
  - All concrete cold joints shall casted with bonding agent.
  - Corner bars (4T16@75C/C T&B) shall be provided around top slab opening.

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 Ga. Nilandhoo**

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

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

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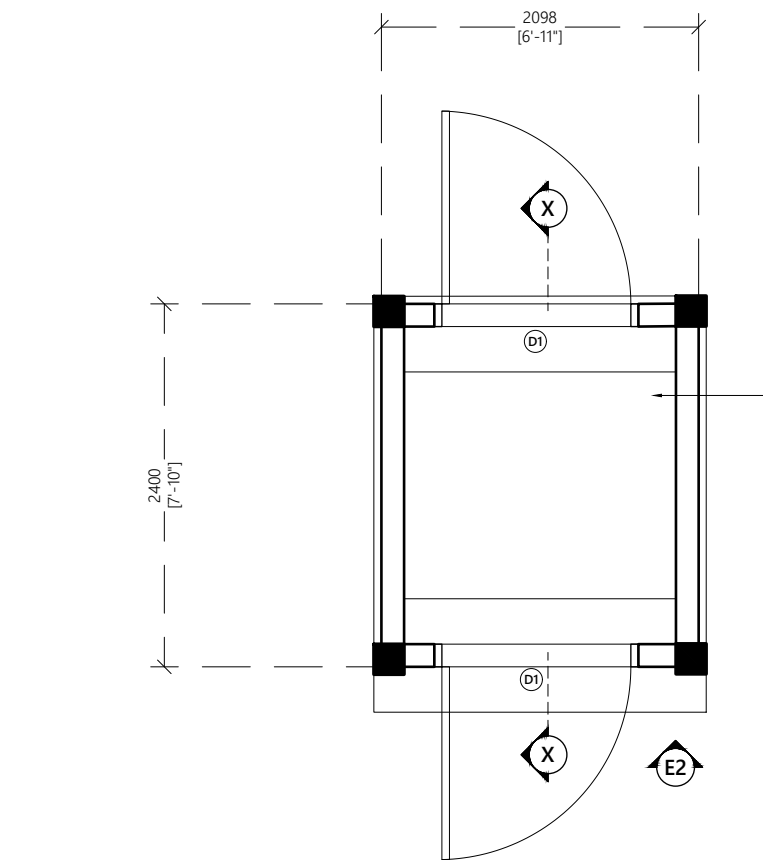
Drawn: F.I.A. Checked: M.S.S.

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

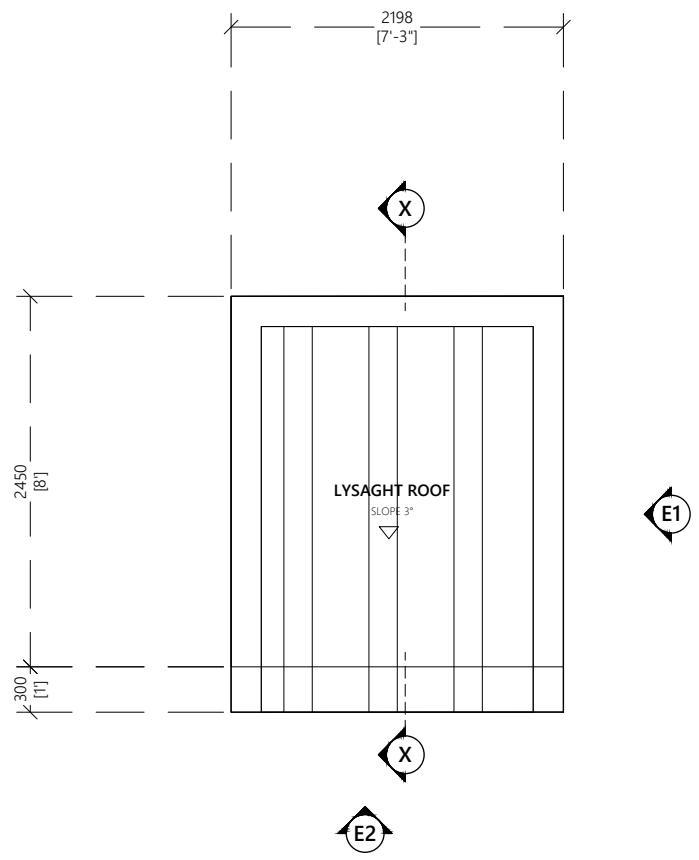
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Project No: EP- WS/2019/06

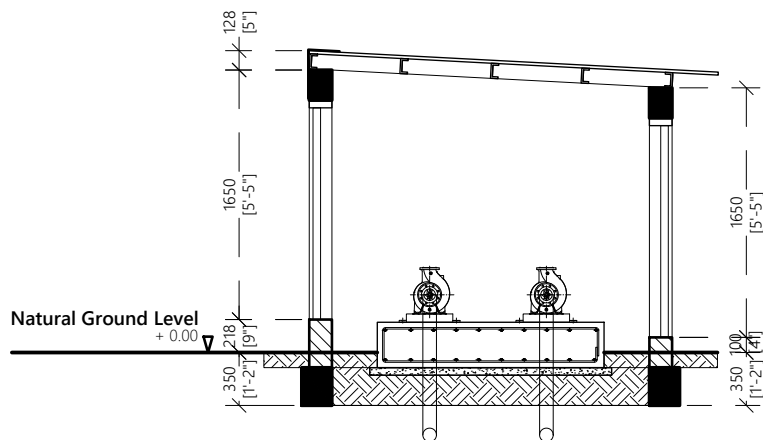
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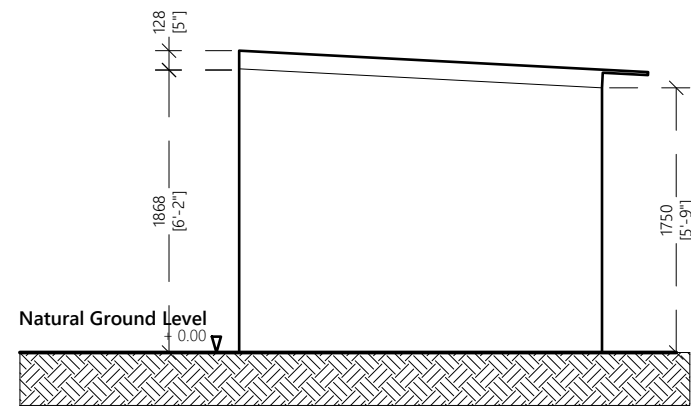
**GROUND FLOOR PLAN**  
1:50



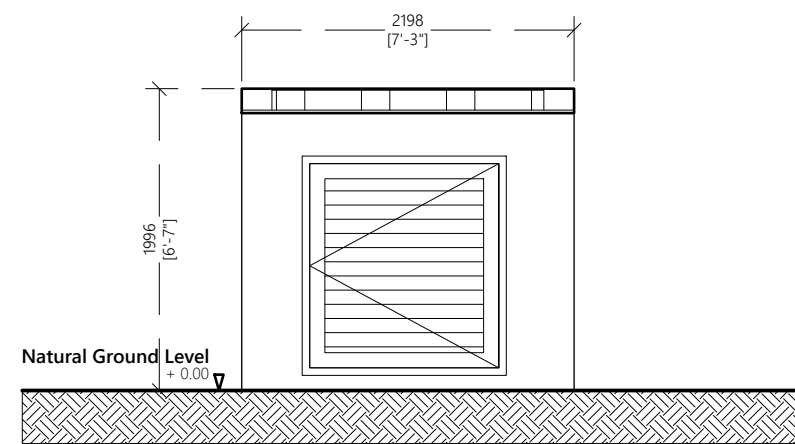
**ROOF PLAN**  
1:50



**SECTION X-X**  
1:50



**ELEVATION E1**  
1:100



**ELEVATION E2**  
1:100

**PUMP SHED DETAILS**




**Legend**

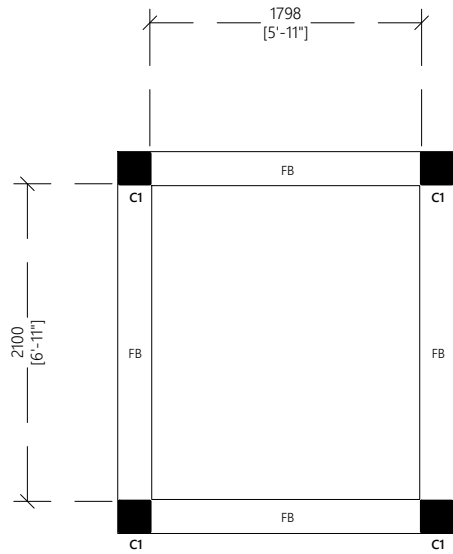
REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
001	2020-06-01	Initial Design	F.I.A.	M.S.S.	
002	2020-06-15	Revised Design	F.I.A.	M.S.S.	
003	2020-06-25	Final Design	F.I.A.	M.S.S.	

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 Ga. Nilandhoo**

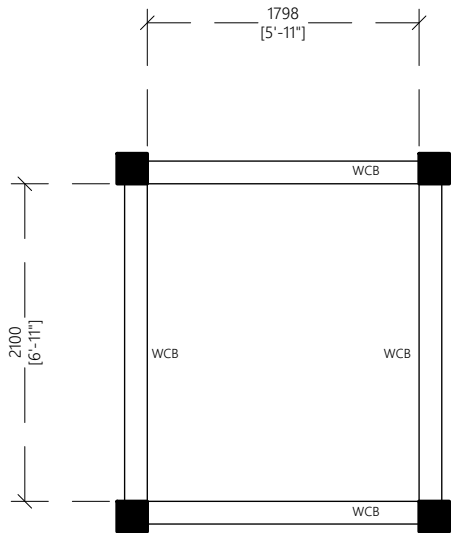
Client:  
**Ministry of National Planning, Housing and Infrastructure, Republic of Maldives**

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Designed: F.I.A.	Approved: I.W.		
Date: Aug 2020	SCALE (A3): 1:20		
Project No: EP- WS/2019/06			
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GROUND FLOOR PLAN

1:100



ROOF PLAN

1:100

Door ID		
Plan view		
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	-	

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

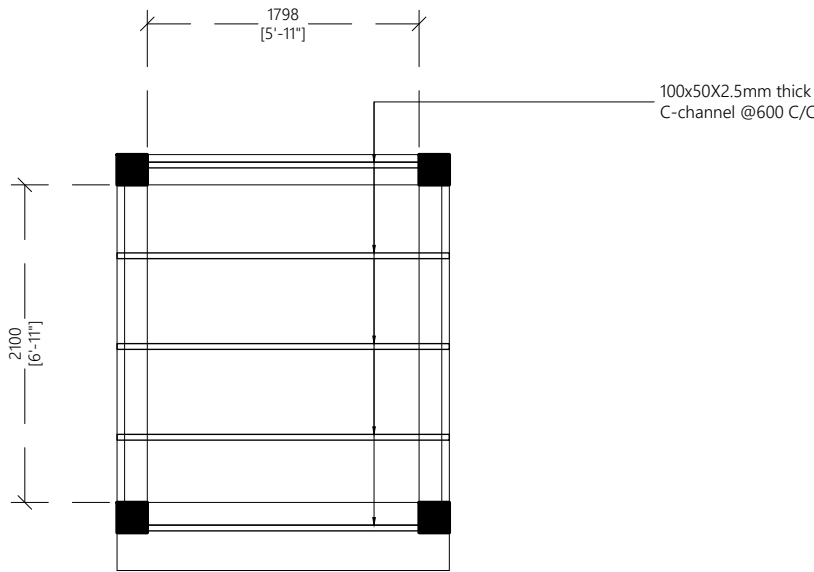
- Door size more than 700X1900mm  
WD: 125mm X2 sets  
SD: 150mm X3 sets
- Door size less than 700X1900mm  
WD: 100mm X2 sets  
SD: 125mm X2 sets

Locks shall be cylindrical with master key sets

Door knobs shall be1000mm above FFL

Door Schedule

1:100



ROOF PLAN

1:100

PUMP SHED DETAILS



Legend

- Notes:**
- Cover for foundation pads and foundation beams shall be 50mm
  - Cover for columns shall be 40mm
  - Cover for roof beams shall be 30mm
  - Concrete shall be of grade C25
  - All concrete cold joints shall casted with bonding agent
  - Roof purlins shall be fixed to roof beam with hot-dip galvanized bolts and GI cleats

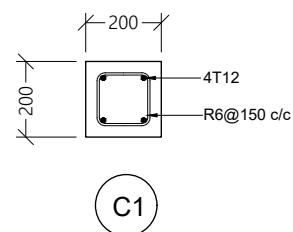
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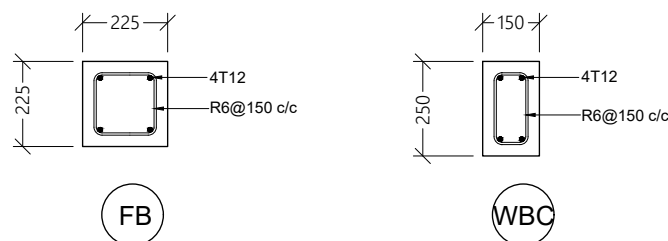
Sub Title:  
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Client:  
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1:20



## 1:20

Notes:

- Cover for foundation pads and foundation beams shall be 50mm
- Cover for columns shall be 40mm
- Cover for roof beams shall be 30mm
- Concrete shall be of grade C25
- All concrete cold joints shall be casted with bonding agent
- Roof purlins shall be fixed to roof beam with hot-dip galvanized bolts and GI cleats

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

Title:

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

Sub Title:

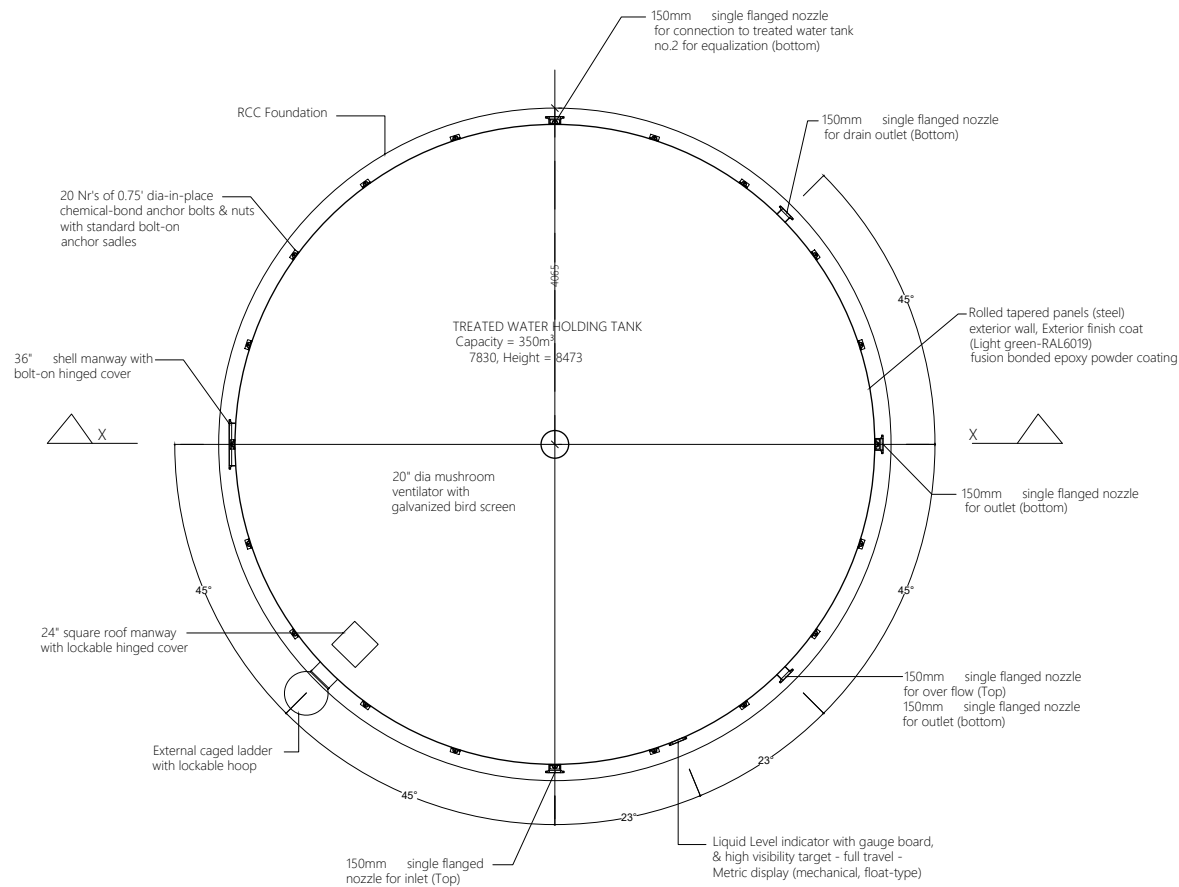
### Water Supply System in Ga. Nilandhoo

Client:

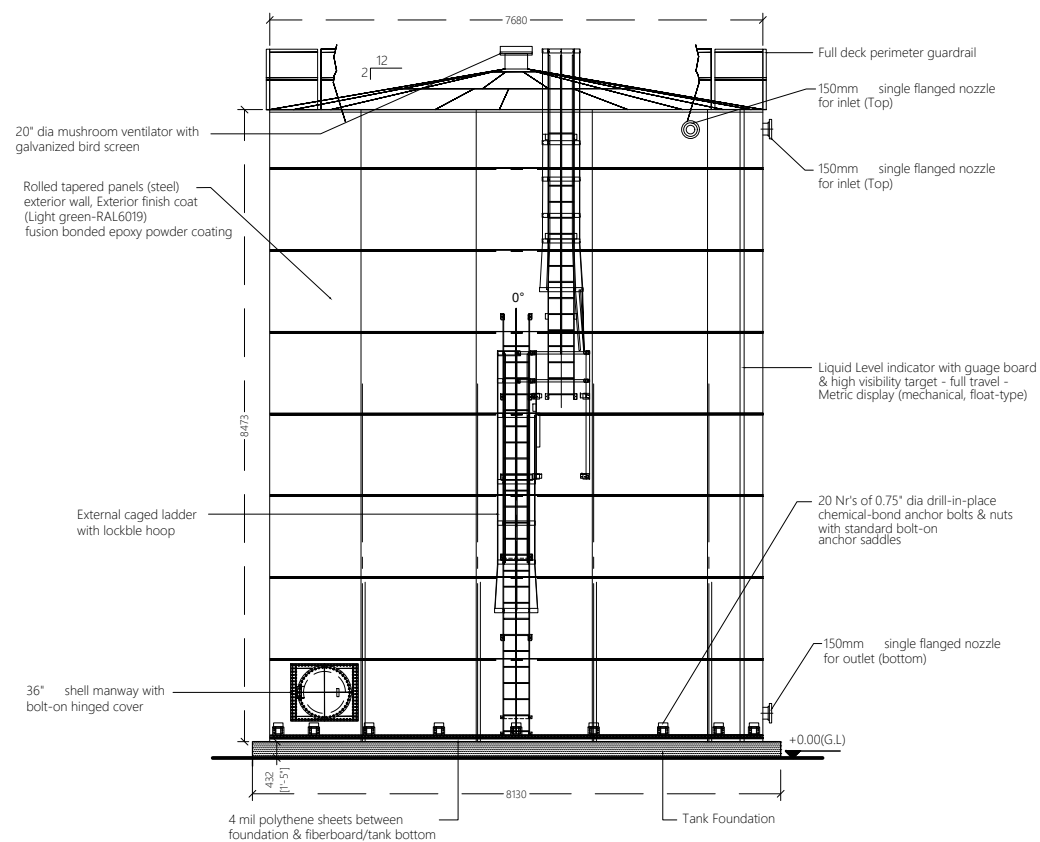
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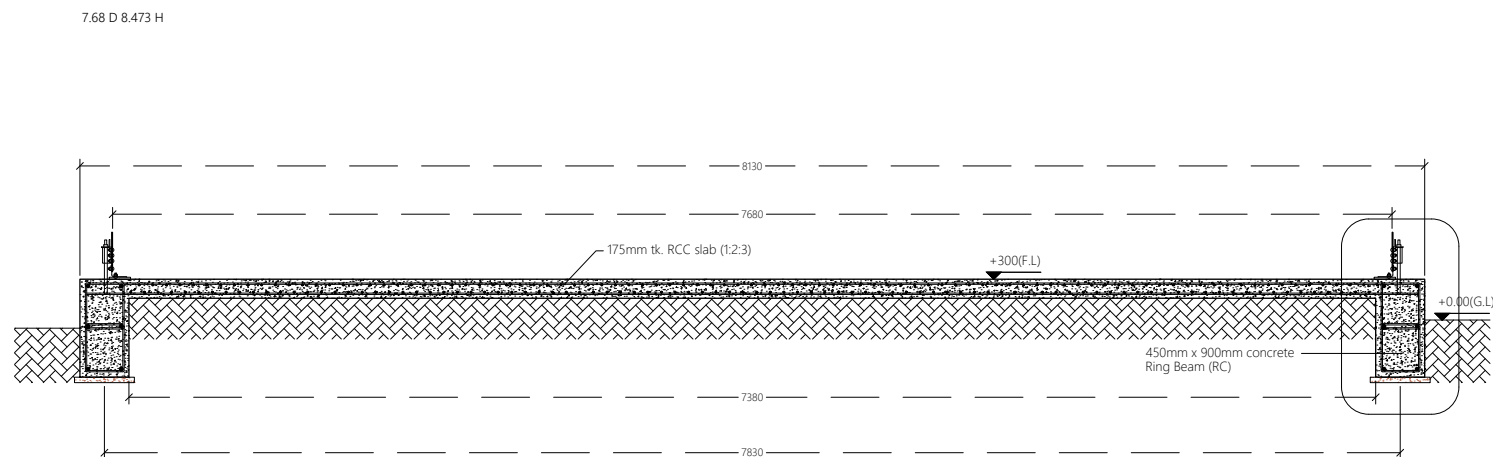
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Project No: EP- WS/2019/06	
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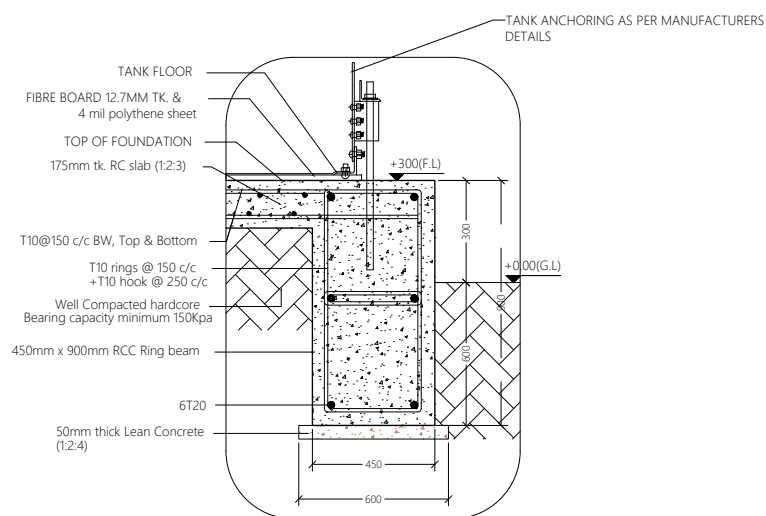
TREATED WATER HOLDING TANK AND FOUNDATION- PLAN



TREATED WATER HOLDING TANK AND FOUNDATION- ELEVATION



SECTION X-X



DETAIL

Note:-  
Cover = 50mm  
Lap length 50

TREATED WATER TANK DETAILS

#### Legend

**Note:**  
-Orientation of tanks and pipe work to suit location.  
-All structural concrete shall be of grade C30.  
-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.  
-All concrete cold joints shall casted with bonding agent.  
-Tank foundation to be approved based on manufacturers recommendation.

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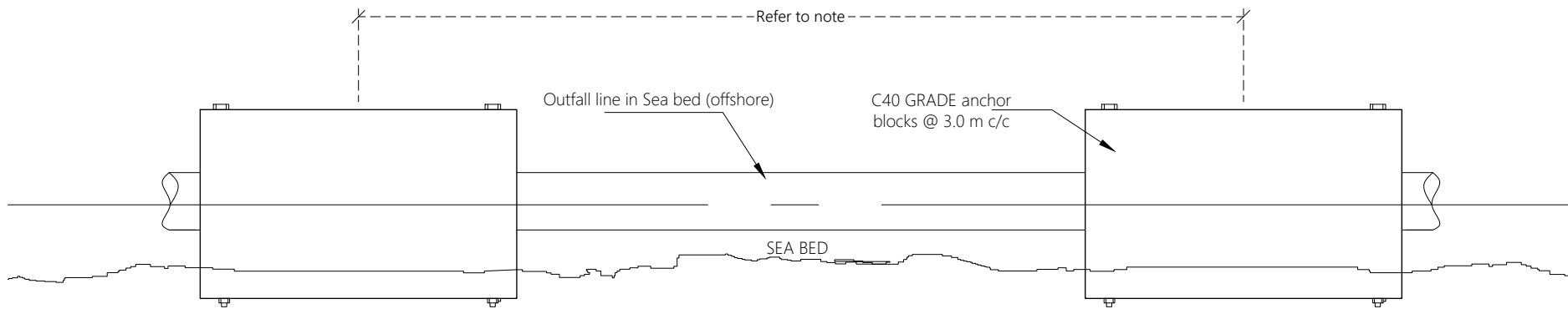
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Project No: EP- WS/2019/06

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Technical drawing of a sea bed marker. The marker has a trapezoidal base and a semi-circular top. The base has a width of 900 mm and a height of 300 mm. The semi-circular top has a radius of 150 mm. The total height of the marker is 600 mm. The marker is shown resting on a sea bed, which is indicated by a horizontal line and the text "SEA BED".

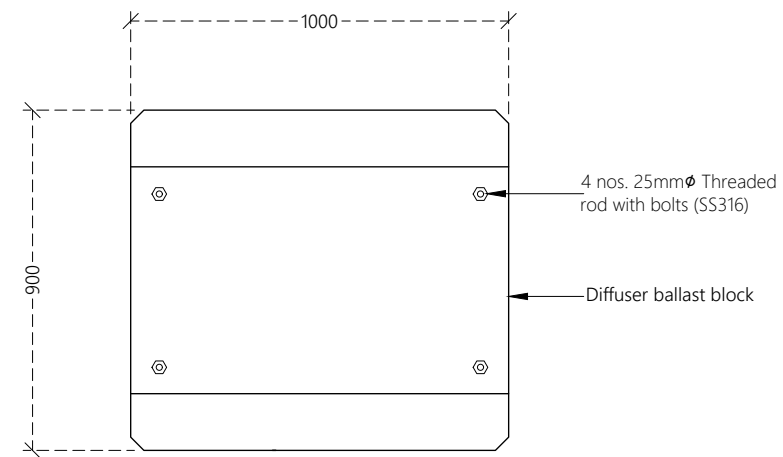
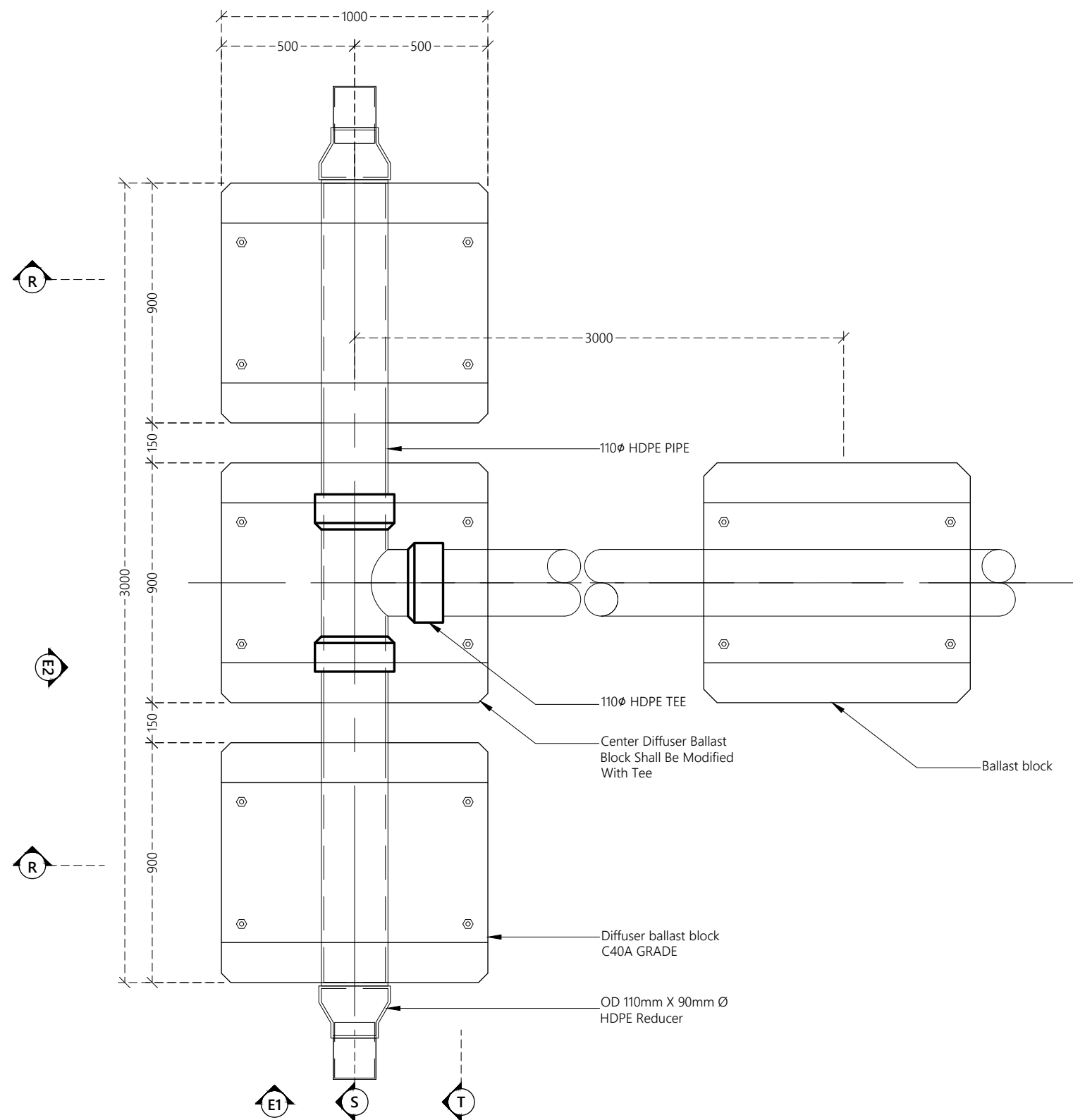
Technical drawing of a dome-shaped structure on a sea bed. The structure features a hemispherical top and a trapezoidal base. Key components and dimensions are labeled as follows:

- Reinforcement:** T12 @200c/c B/W (twice).
- Anchor blocks:** C40A GRADE.
- Fasteners:** 4 nos. 25mmØ Threaded rod with bolts (SS316).
- Outfall pipe:** Located at the center of the dome's base.
- SEA BED:** The structure rests on the seabed.
- Dimensions (mm):**
  - Horizontal base width: 600 (with 150mm overhangs on each side).
  - Vertical height: 300 (twice).
  - Base thickness: 100.

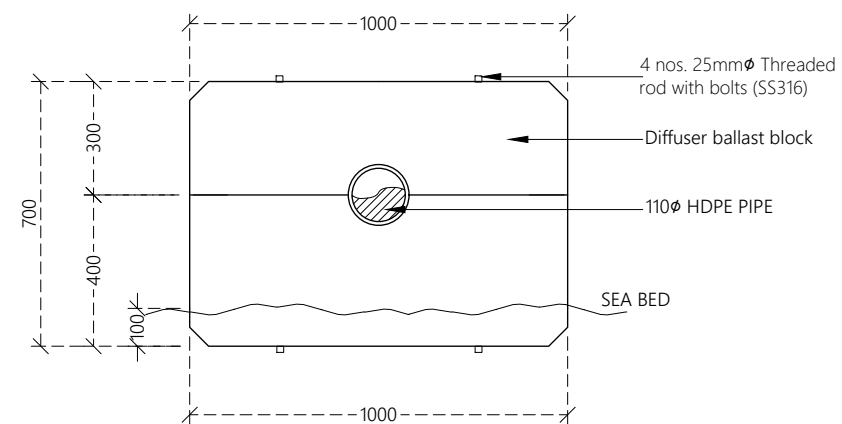
Technical drawing of a rectangular plate with the following dimensions and annotations:

- Overall Dimensions:**
  - Length: 1000 mm (indicated by a dashed line at the top).
  - Width: 600 mm (indicated by a dashed line on the right).
- Internal Features:**
  - 27mm  $\phi$  hole:** A circular hole with a diameter of 27 mm, located in the upper right quadrant.
  - 4 nos. 25mm  $\phi$  Threaded rod with bolts (SS316):** Four threaded rods are shown, two in the upper half and two in the lower half, spaced 100 mm apart from the edges.
- Other Dimensions:**
  - 100 mm: Distance from the top edge to the center of the upper threaded rods.
  - 100 mm: Distance from the bottom edge to the center of the lower threaded rods.
  - 150 mm: Distance from the right edge to the center of the 27mm hole.
  - 400 mm: Distance from the left edge to the center of the lower threaded rods.
  - 600 mm: Distance from the left edge to the center of the 27mm hole.

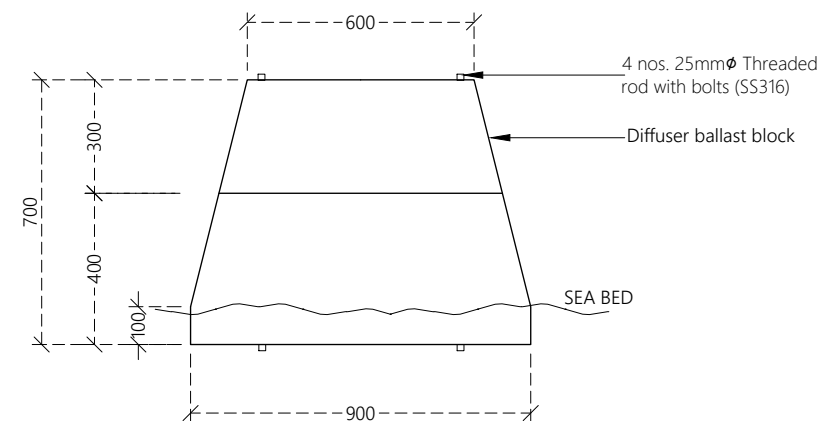
NTS



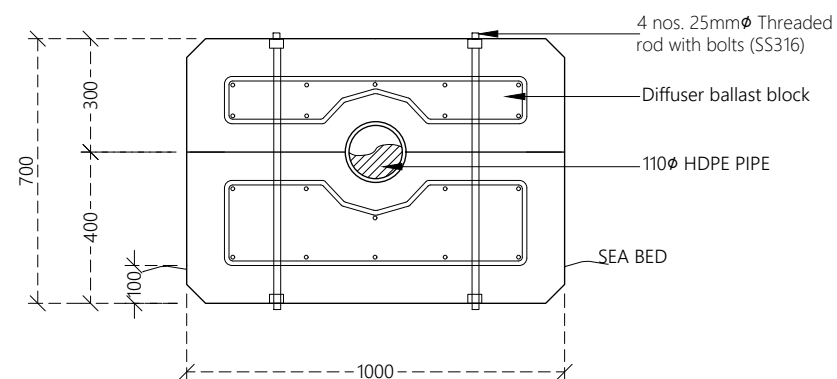
DIFFUSER BALLAST BLOCK PLAN



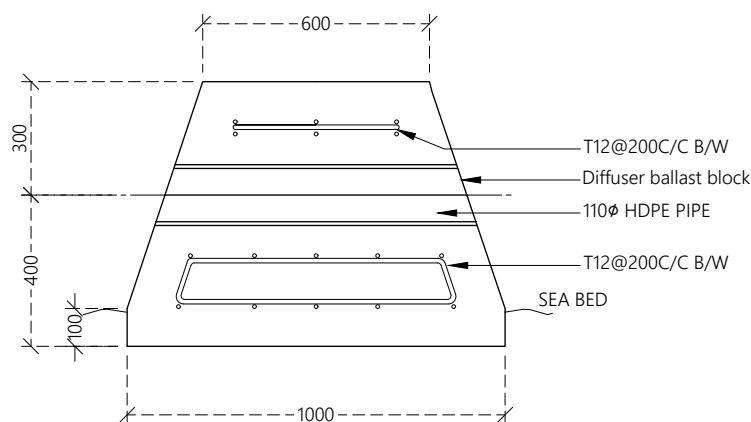
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E1



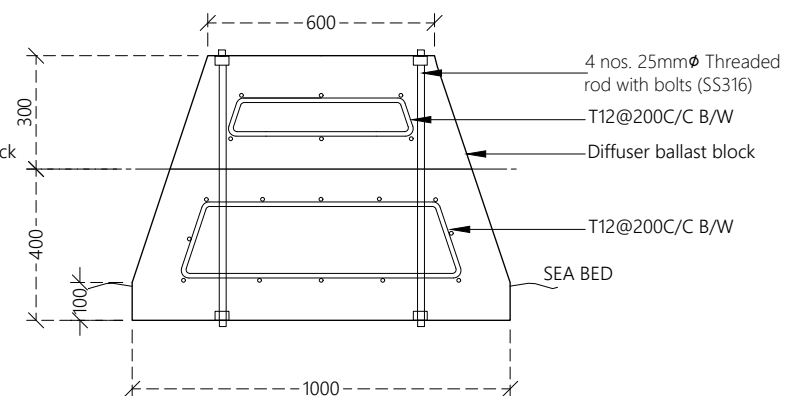
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E2



DIFFUSER BALLAST BLOCK SECTION - R



DIFFUSER BALLAST BLOCK SECTION - S



DIFFUSER BALLAST BLOCK SECTION - T

DIFFUSER DETAILS

NTS

#### Legend

#### Notes:

- All backing rings for stub flanges , nuts and bolts shall be grade 316 stainless steel.
- All pipe work shall be bedded on 10mm thick neoprene rubber seat in semicircular recess matching the O.D. the pipe.
- Fabricate specific pipe clamps to provide firm clamping action according to pipe O.D.
- All structural concrete shall be of grade C40A.
- All castings shall be done using sulphate resistant portland cement to BS 4027:1996.
- All structural reinforcement shall be epoxy coating of non-pre-stressed reinforcement to ASTM-A775/A775M.
- A cover of 75mm should be given for all reinforcements.

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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**

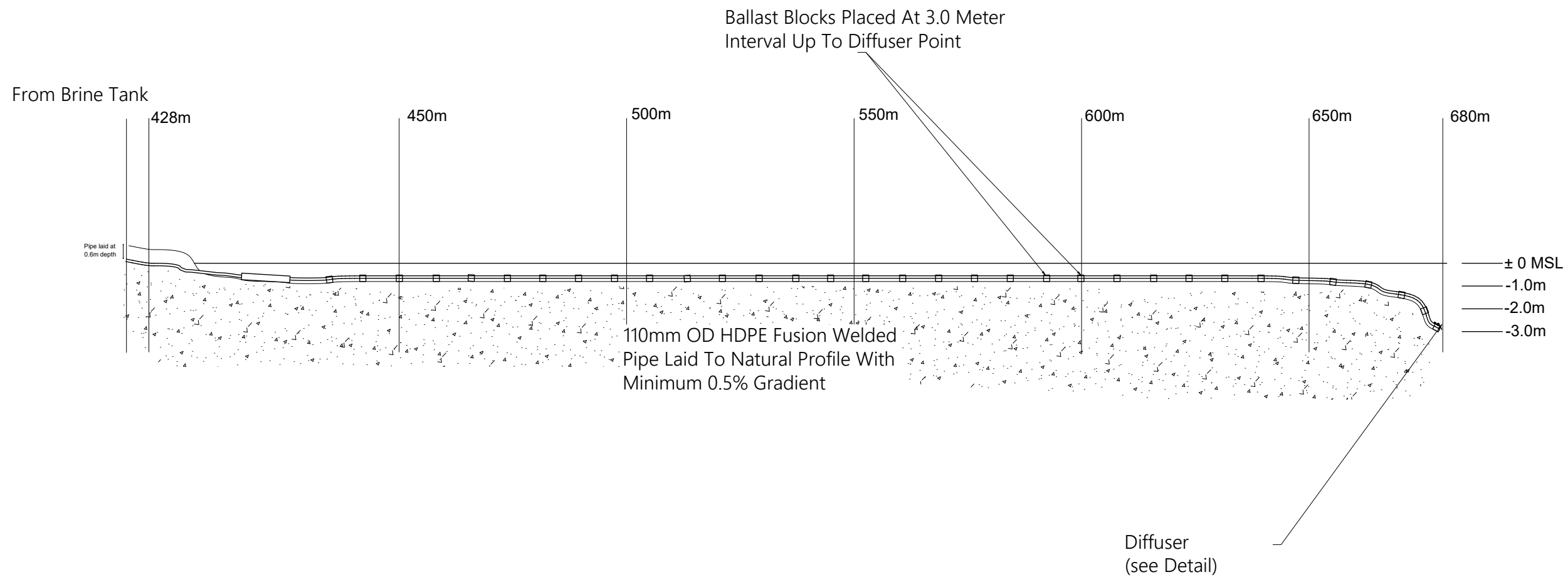
Sub Title:  
**Water Supply System in Ga. Nilandhoo**

Client:  
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Notes:

### BRINE SEA OUTFALL DETAIL

NTS

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Title:  
**Consultancy Services for Survey,  
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Supply and Sewerage Facilities in  
5 islands, Maldives - Package 6**

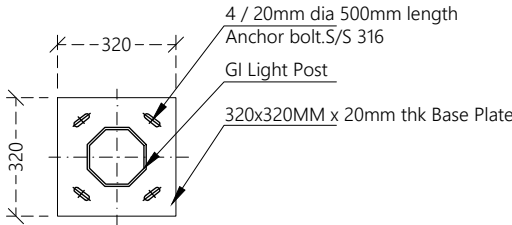
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Project No: EP- WS/2019/06	
Rev: <b>R-01</b>	Page: <b>W-21</b>



ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

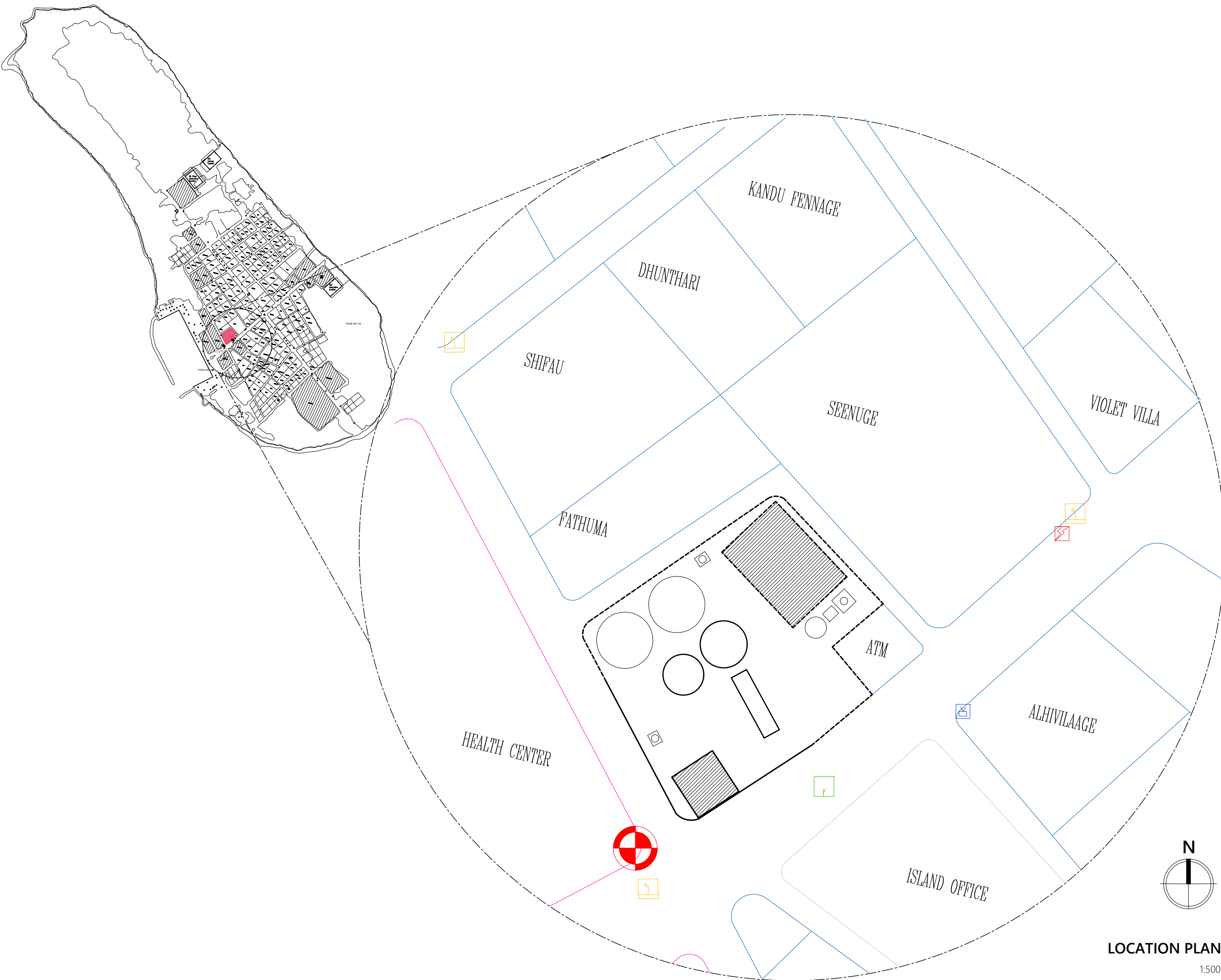
PROPOSED SINGLE STOREY BUILDING AT

**RO PLANT ADMIN BUILDING & VEHICLE SHED, GA.NILANDHOO**

For Ministry of National Planning, Housing and Infrastructure

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Roof Truss Plan	S.4 (2)
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## LOCATION PLAN

1:500

Legend

Note:

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Title:  
**Consultancy Services for  
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Client:  
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Project No: EP-WS/2019/06	
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ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

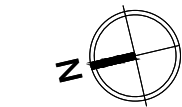
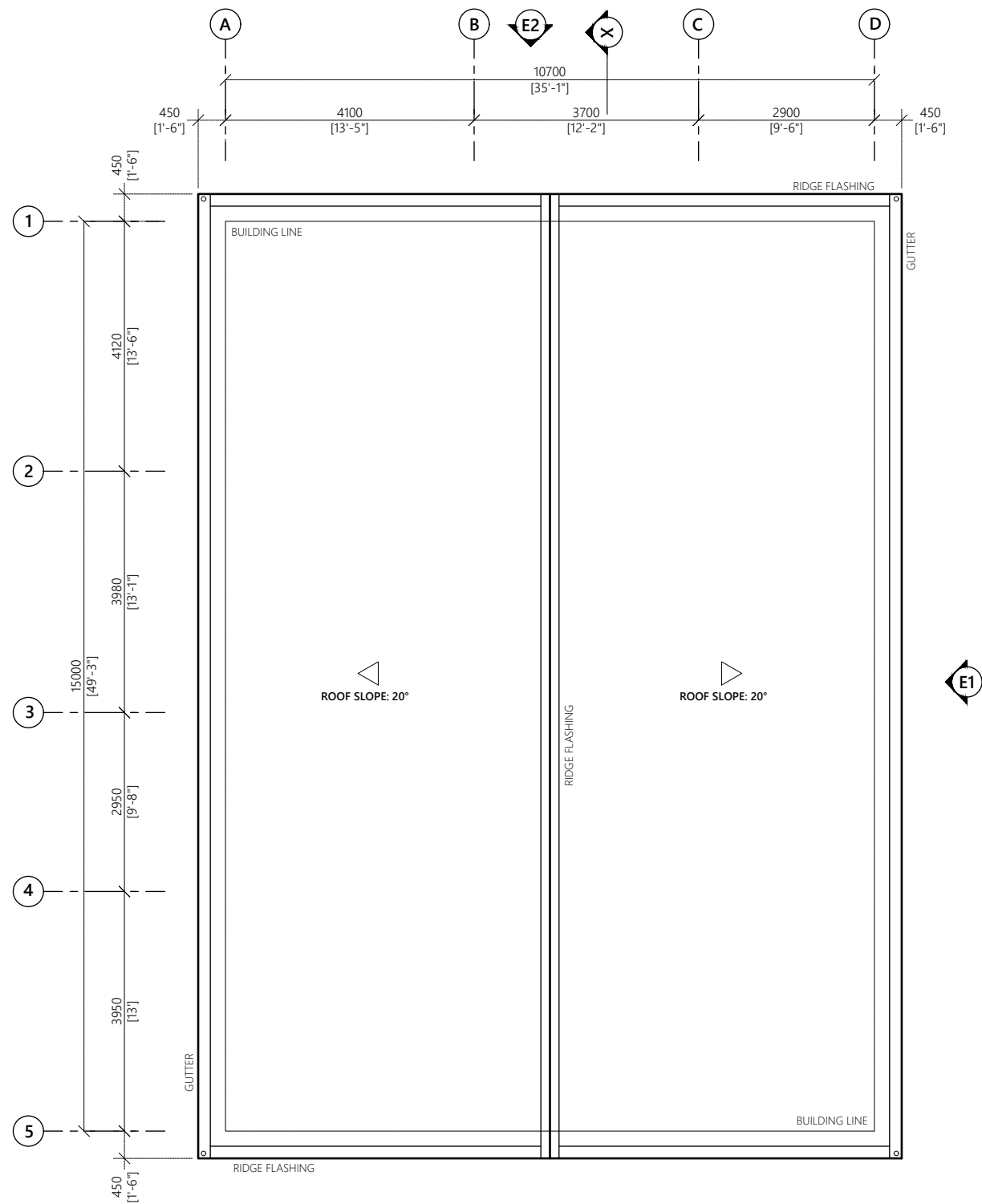
PROPOSED SINGLE STOREY BUILDING AT

**RO PLANT ADMIN BUILDING, GA.NILANDHOO**



1:100

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<p> <b>Client:</b>  Ministry of National Planning, Housing and  Infrastructure, Republic of Maldives </p>			
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<p> <b>Drawn:</b> A.S.A. </p>		<p> <b>Checked:</b> F.I.A. </p>	
<p> <b>Designed:</b> A.S.A. </p>		<p> <b>Approved:</b> M.H. </p>	
<p> <b>Date:</b> Nov 2020 </p>		<p> <b>SCALE (A3):</b> 1:100 </p>	
<p> <b>Rev:</b>  R-01 </p>		<p> <b>Page:</b>  A.2 (1) </p>	



ROOF PLAN

1:100

Legend

Note:

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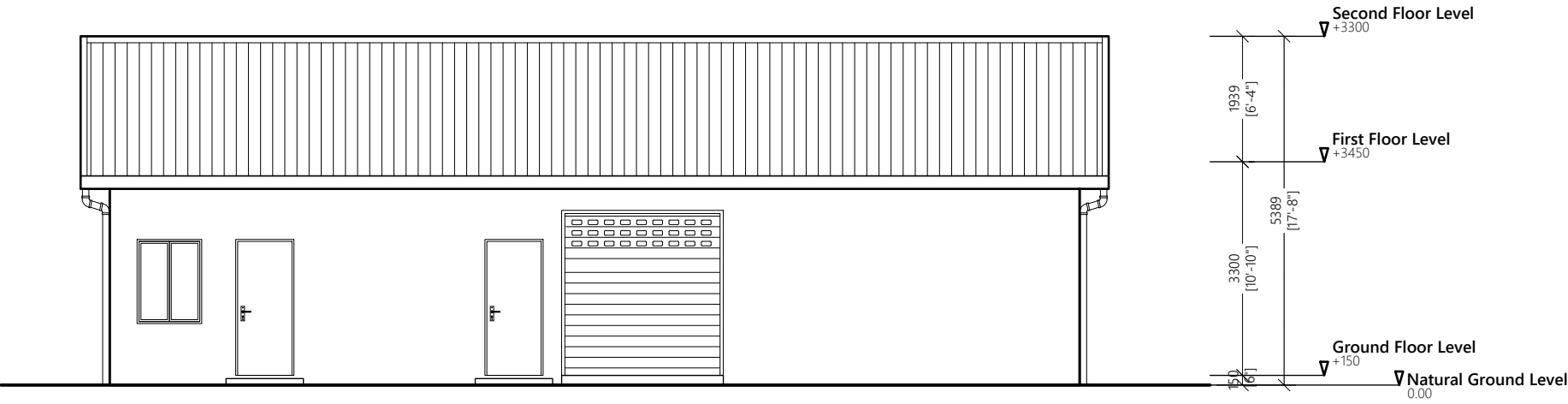
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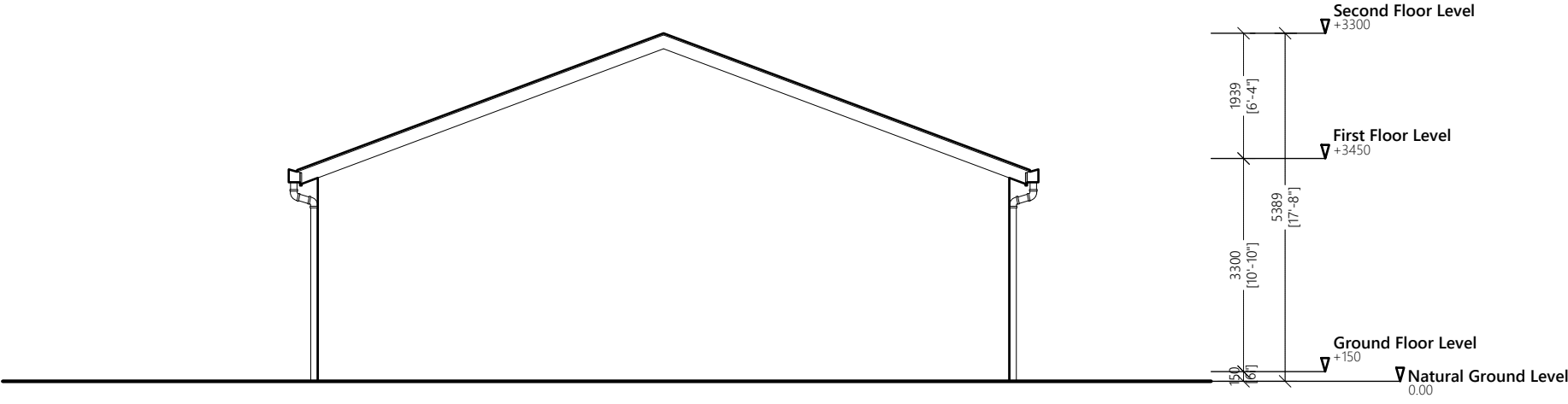


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ELEVATION E1

1:100



ELEVATION E2

1:100

ELEVATIONS

1:100

Legend

Note:

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Date: Nov 2020

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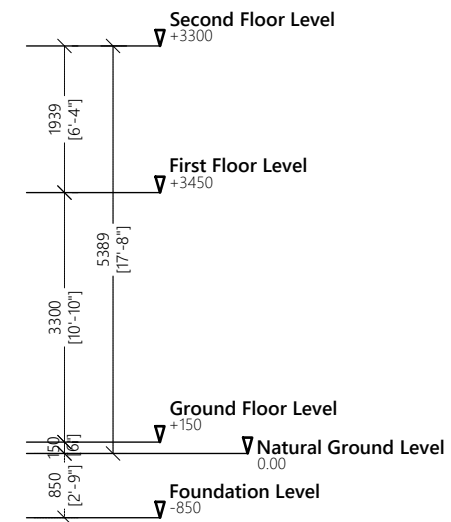
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1:100


Note:

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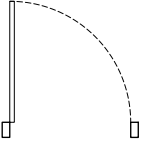
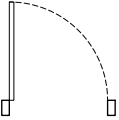
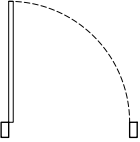
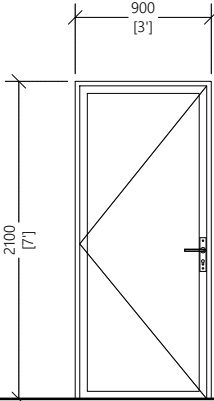
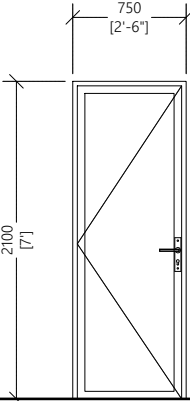
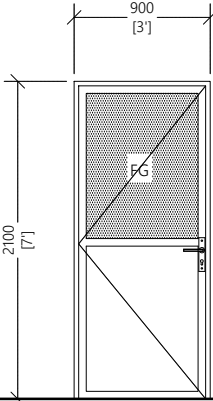
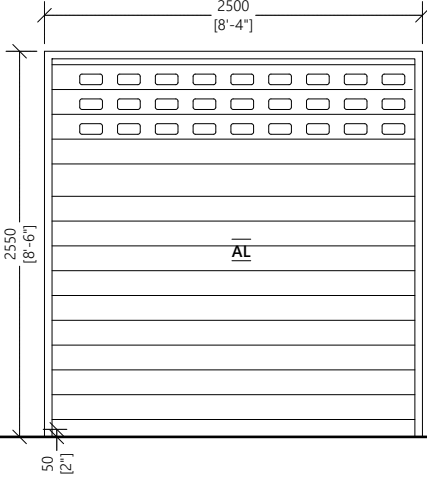
Title:  
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Survey, Design and EIA works of  
Water Supply and Sewerage  
Facilities  
in 6 Islands, Maldives – Package 6**

Sub Title:  
**Water Supply System in Ga. Nilandhoo**

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

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1:100

Door ID	D1	D2	D3	GD1
Plan view				
Elevation view				
FFL				50 [2"]
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 wooden components should be wood stained finish

All glazing should be of 6mm unless specified

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

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

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

- Hinges shall confirm to
- 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 be1000mm above FFL

DOOR & WINDOW SCHEDULE -1

1:50

Legend

Note:

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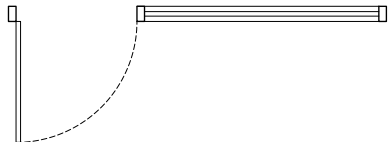
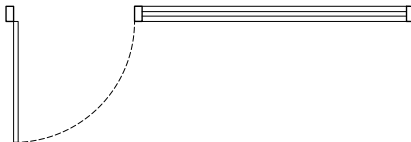

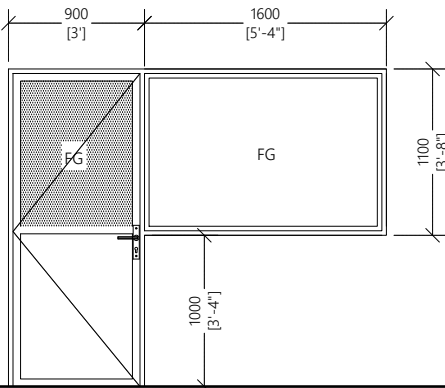
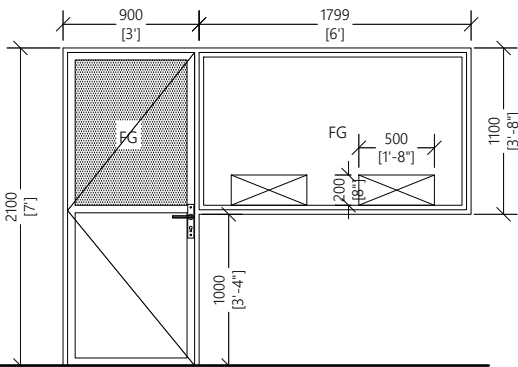
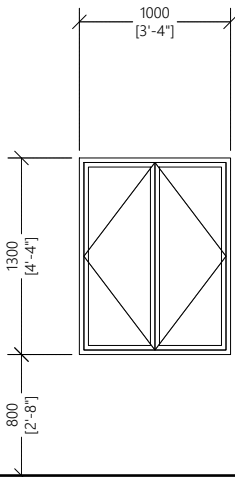
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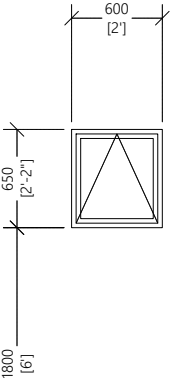


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Door ID	DW 1	DW 2	W2
Plan view			
Elevation view			
FFL			
Frame material	Aluminum black powder coated	Aluminum black powder coated	Aluminum black powder coated
Panel material	Aluminum cladding sheet & Fixed clear glass	Aluminum cladding sheet & Fixed clear glass	Reflective Glass
Openable area	-	-	-

Door ID	V1
Plan view	
Elevation view	 <p>600 [2']</p> <p>650 [2'-2"]</p> <p>1800 [6']</p> <p>F.F.L.</p>
Frame material	Aluminum black powder coated
Panel material	Reflective Glass
Openable area	0.32

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Sub Title:  
**Water Supply System in Ga. Nilandhoo**

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Client:  
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### 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

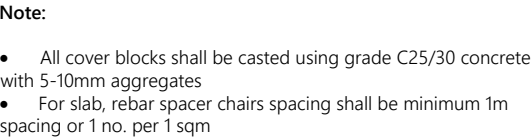
All hardware should be provided for the performance of all functions of the units

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 should be cylindrical with master key sets

Door knobs shall be 1000mm above FFL



## TYPICAL GROUND SLAB DETAIL

1:20

1:20

Legend

Note:

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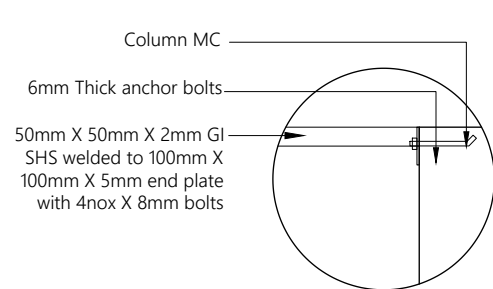
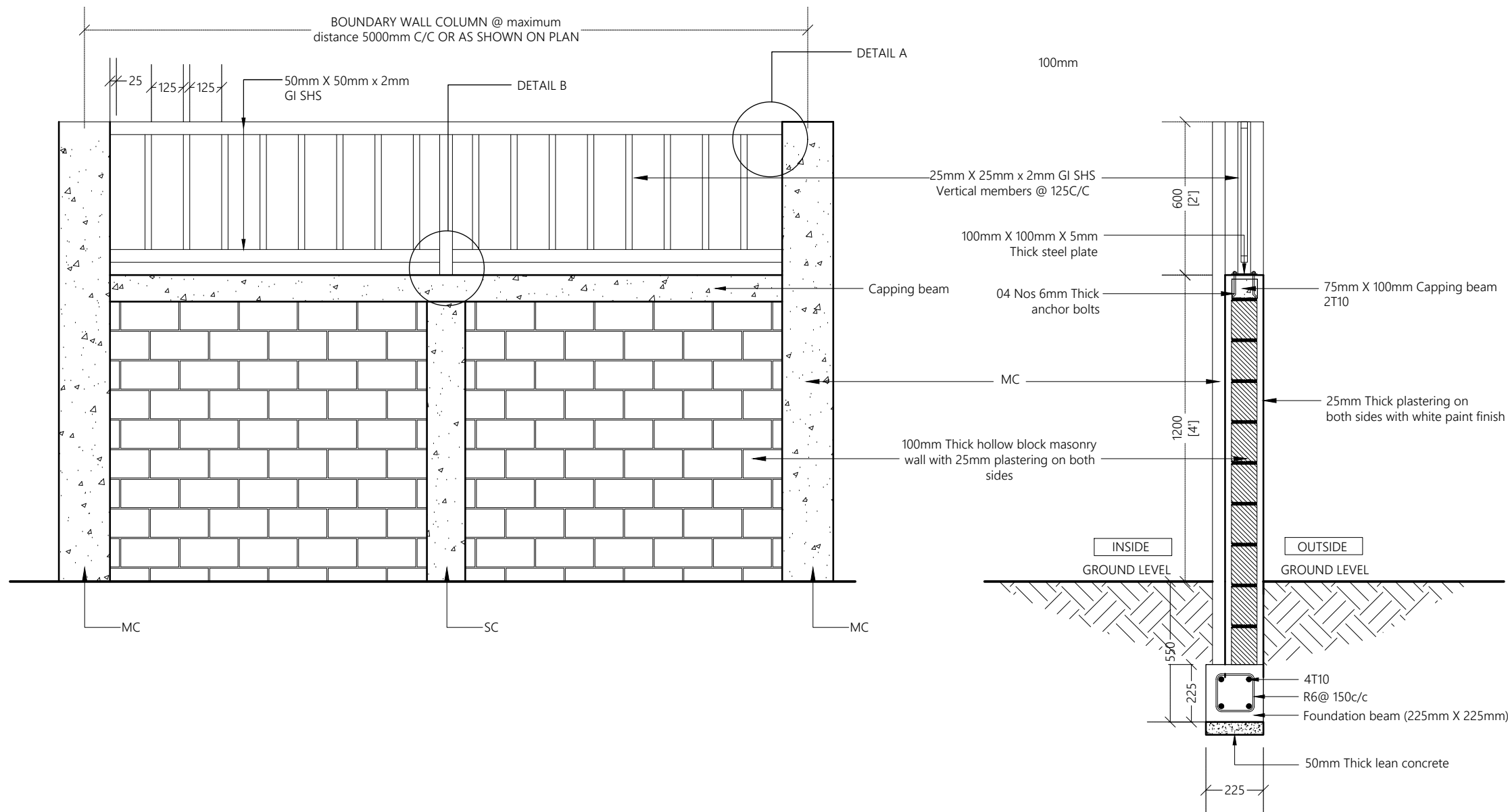
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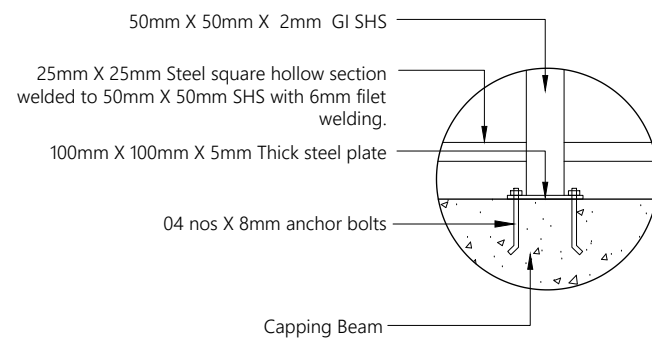
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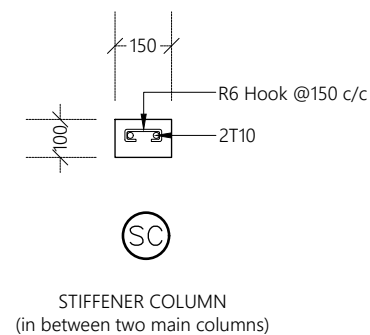
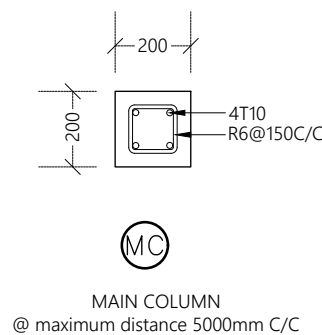




**DETAIL A**  
1:10



**DETAIL B**  
1:10



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:

- 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
- Cover for foundation beams shall be 50mm
- Cover for columns (MC) shall be 40mm
- Concrete shall be of grade C25
- All concrete cold joints shall casted with bonding agent

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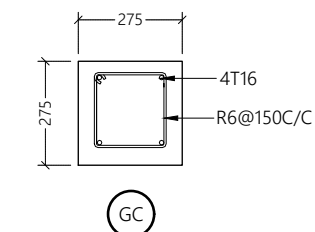
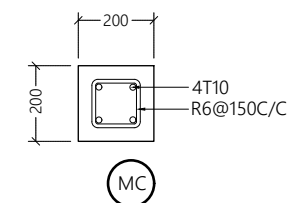
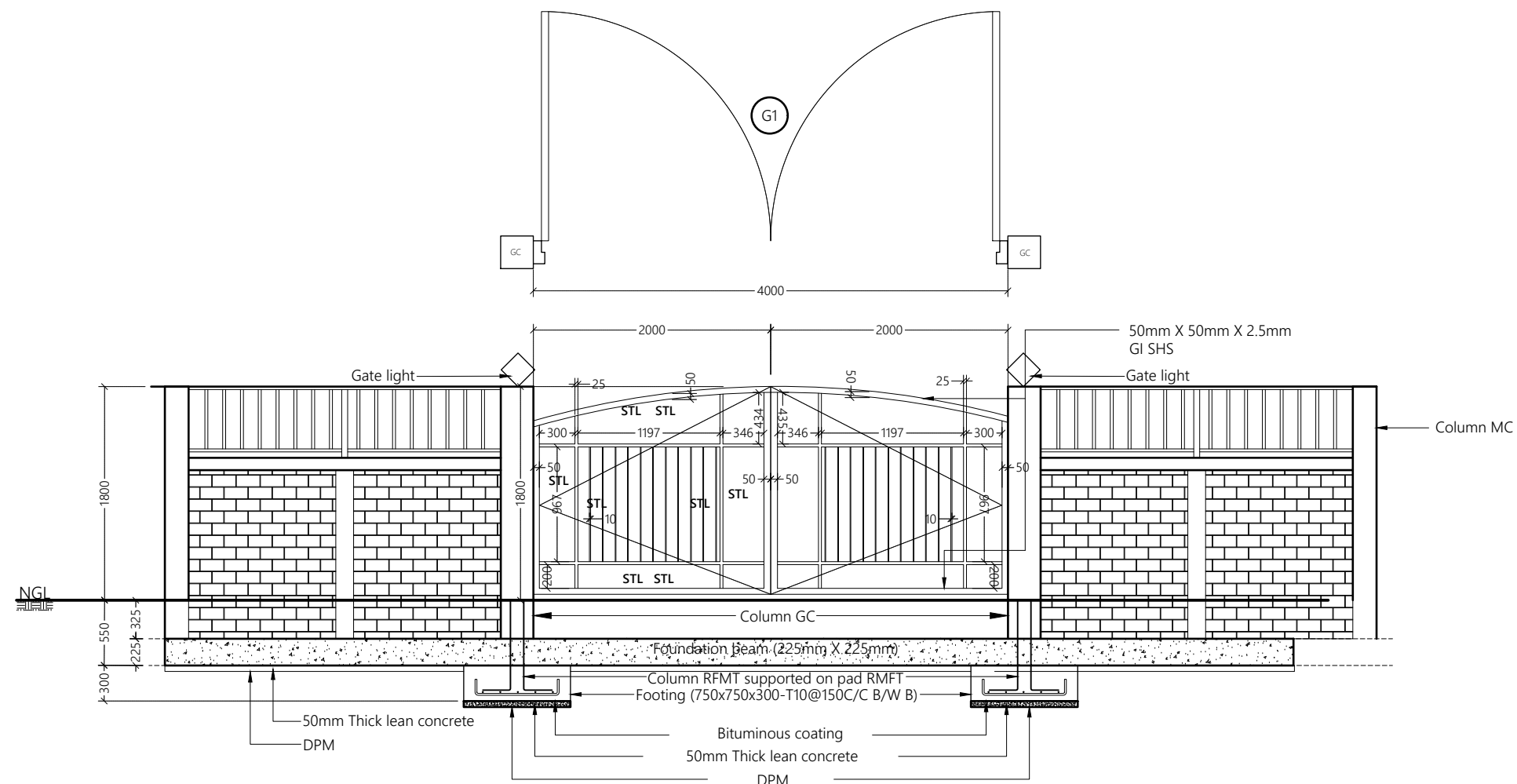
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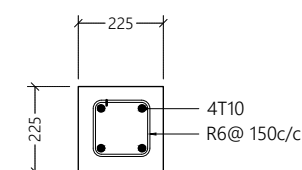
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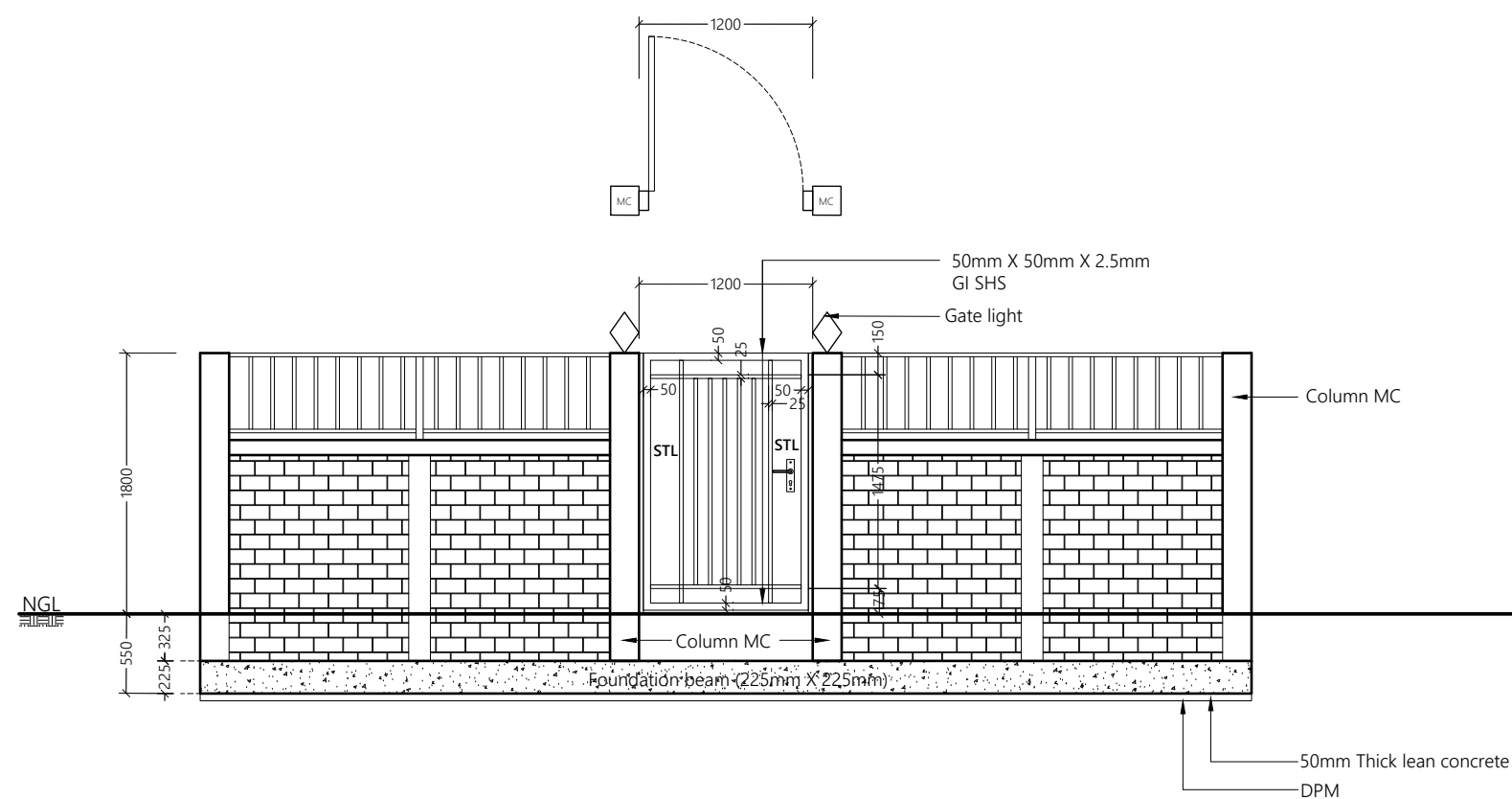
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**COLUMN DETAILS**  
1:20



**FOUNDATION BEAM DETAIL**  
1:20



## GATE DETAILS

Legend


Note:

- FRAME MATERIAL : Steel gate frame 2.5mm thick GI sections RHS
- PANEL MATERIAL : Steel frame with steel panels (STL) as shown on elevation view
- 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
- Cover for foundation pads and foundation beams shall be 50mm
- Cover for columns (GC) and(MC) shall be 40mm
- Concrete shall be of grade C25
- All concrete cold joints shall casted with bonding agent

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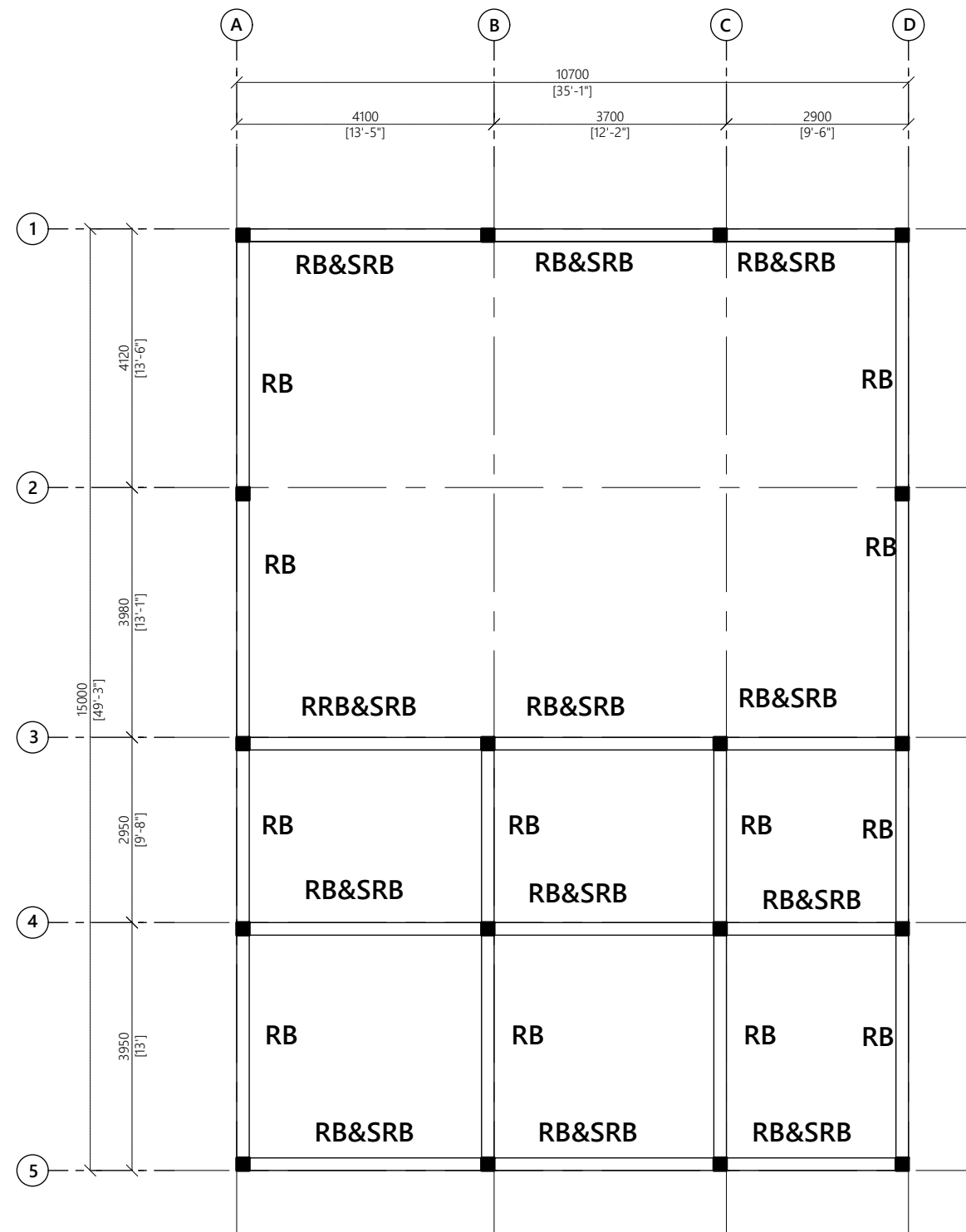
  

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ROOF BEAM PLAN

1:100

Legend

Note:

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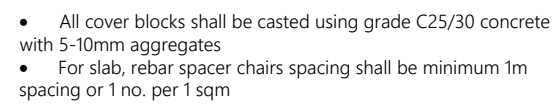
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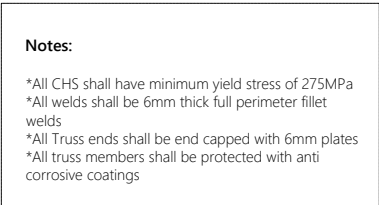
- Cover for foundation pads and foundation beams shall be 50mm
- Cover for floor slabs shall be 30mm
- Cover for columns shall be 40mm
- Concrete shall be of grade C25
- All concrete cold joints shall be casted with bonding agent
- laps = 45 dia (dia = bar diameter)
- mid bars =  $0.85 \times \text{span}$
- sup bars =  $1/3 \times \text{span}$
- concrete mix = 1:2:3 (C:S:A)
- lean concrete mix = 1:2:5

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ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

**RO PLANT VEHICLE SHED, GA.NILANDHOO**






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

Sub Title: **Water Supply System in Ga. Nilandhoo**

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

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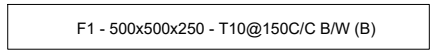
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### VEHICLE SIDE FOOTING DETAIL

Technical drawing of the column base plate assembly. The drawing shows a cross-section of the assembly. The components are labeled as follows:

- CHS 76.10dia 3.2mm thick GI column
- 6mm thick stiffener plate
- 200x200x12mm thk GI base plate
- 4Nos 12mm $\phi$  M12 anchor bolts
- Column Stump

The drawing also indicates the "Natural Ground Level +0.00" and a dimension of 300 mm for the height of the column above the base plate.



## TRUSS DETAIL

S.D (4)

BUILDING SERVICES DRAWINGS OF  
PROPOSED SINGLE STOREY BUILDING AT  
**RO PLANT ADMIN BUILDING, GA.NILANDHOO**

For Ministry of National Planning, Housing and Infrastructure





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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
VEHICLE PARKING AREA - PLUMBING LAYOUT	PL-02
VEHICLE PARKING AREA - DRAINAGE LAYOUT	DR-03

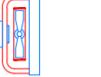
	13A Twin Socket
	13A Twin Socket With USB Ports
	15A Switched Socket @ H.L.
	15A Socket In Polycarbonate Box
	15A Switch @ 1200mm From F.F.L.
	13A Power Socket

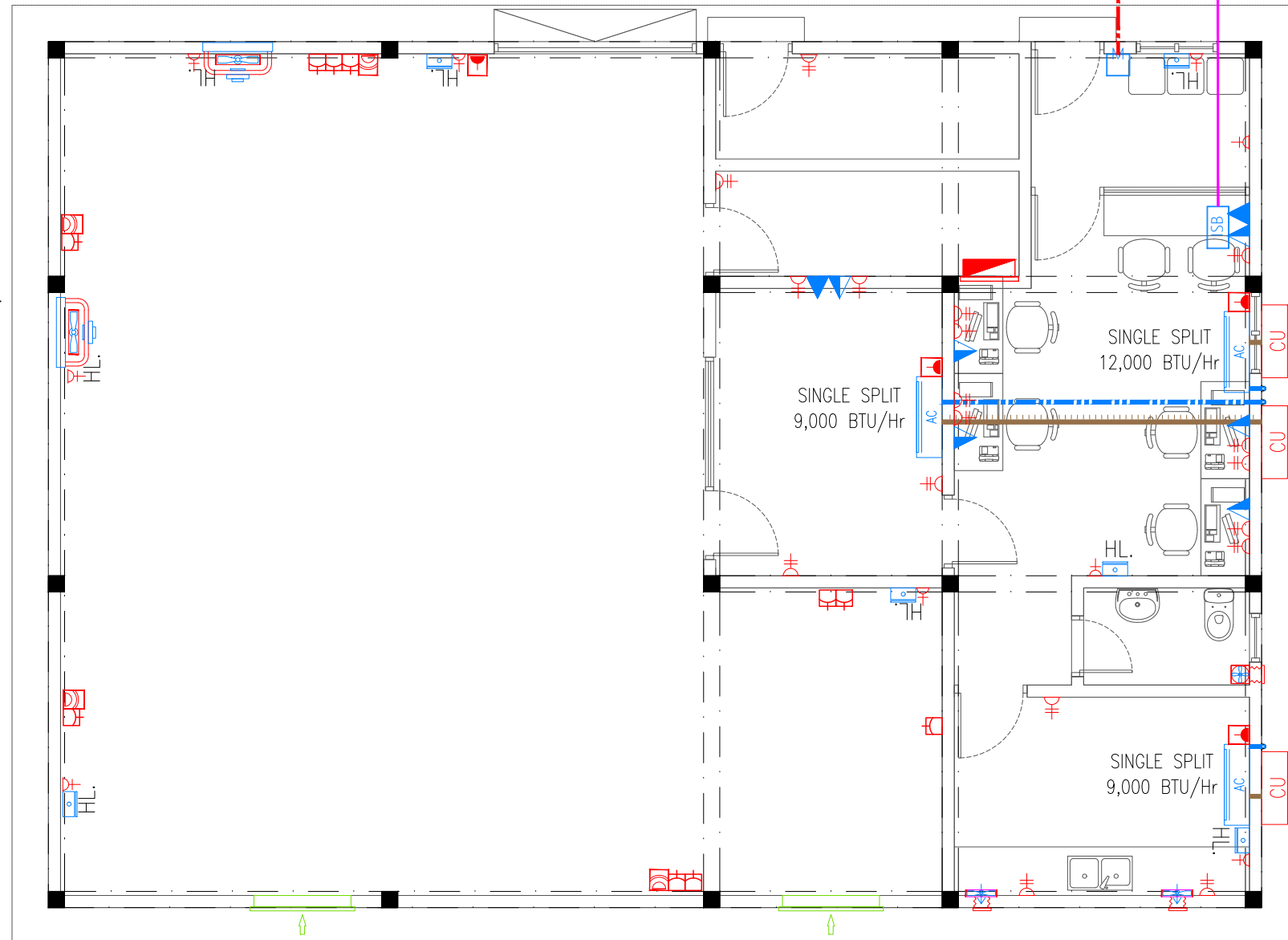
HL. High Level

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

-  Telephone Outlet
-  Computer Network Outlet
-  Emergency Light
-  Electricity Meter

- 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.

	Refrigerant Pipes
	25Ø Condensate Drain Pipe
	▶ 40Ø Condensate Drain Riser Pipe
	Wall Mount Air Conditioner
	Outdoor Condensing Unit
	Ceiling Mounted Exhaust Fan 90m <sup>3</sup> /hr
	Wall Mounted Exhaust Fan
	Single Intake, Centrifugal, External Motor, 800m <sup>3</sup> /hr
	Fresh Air Intake Grille/screen 1200 x 600



1:75

Legend

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

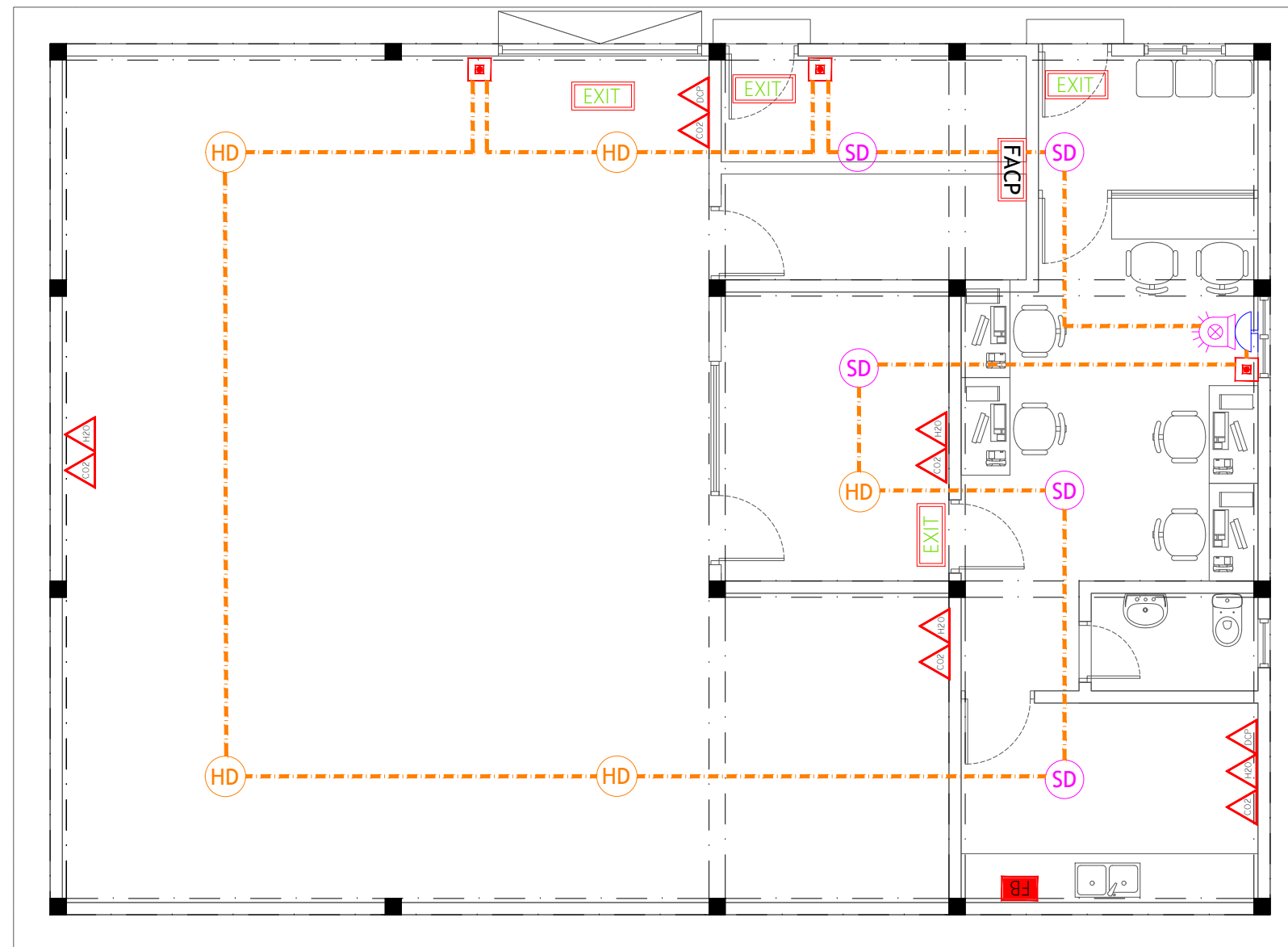
Sub Title:  
Water Supply System in Ga. Nilandhoo

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

**FEEDBACK INFRA**  
Making Infrastructure Happen

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Designed: H.R.	Approved: M.R.
Date: Nov 2020	SCALE (A3): 1:75
Project No: EP-WS/2019/06	
Rev: R-01	Page: PAC-01

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



1:75

Note:

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






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in 6 Islands, Maldives – Package 6**  
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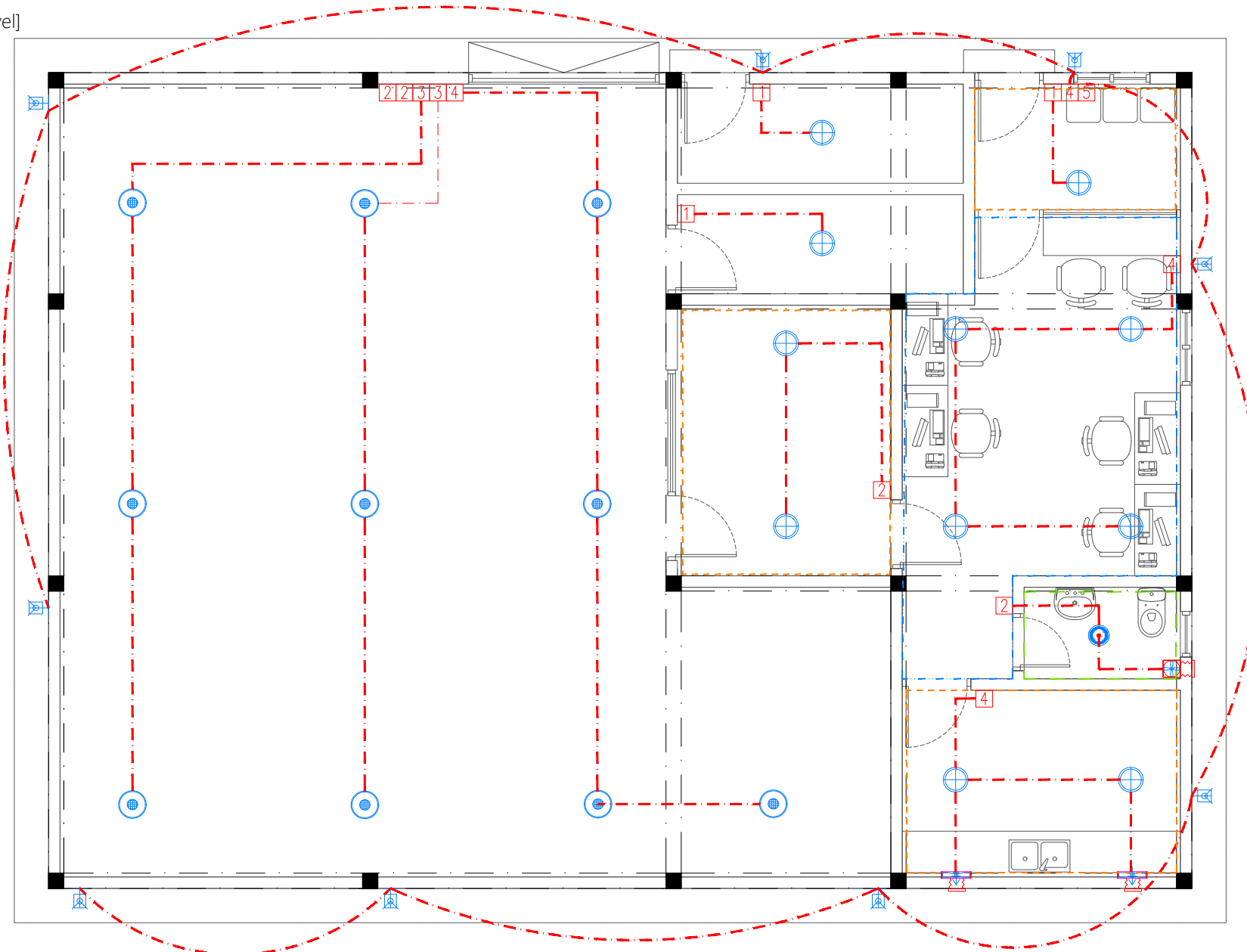
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Legend

-  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]



## GROUND FLOOR LIGHTING LAYOUT

1:75

Legend

Note:

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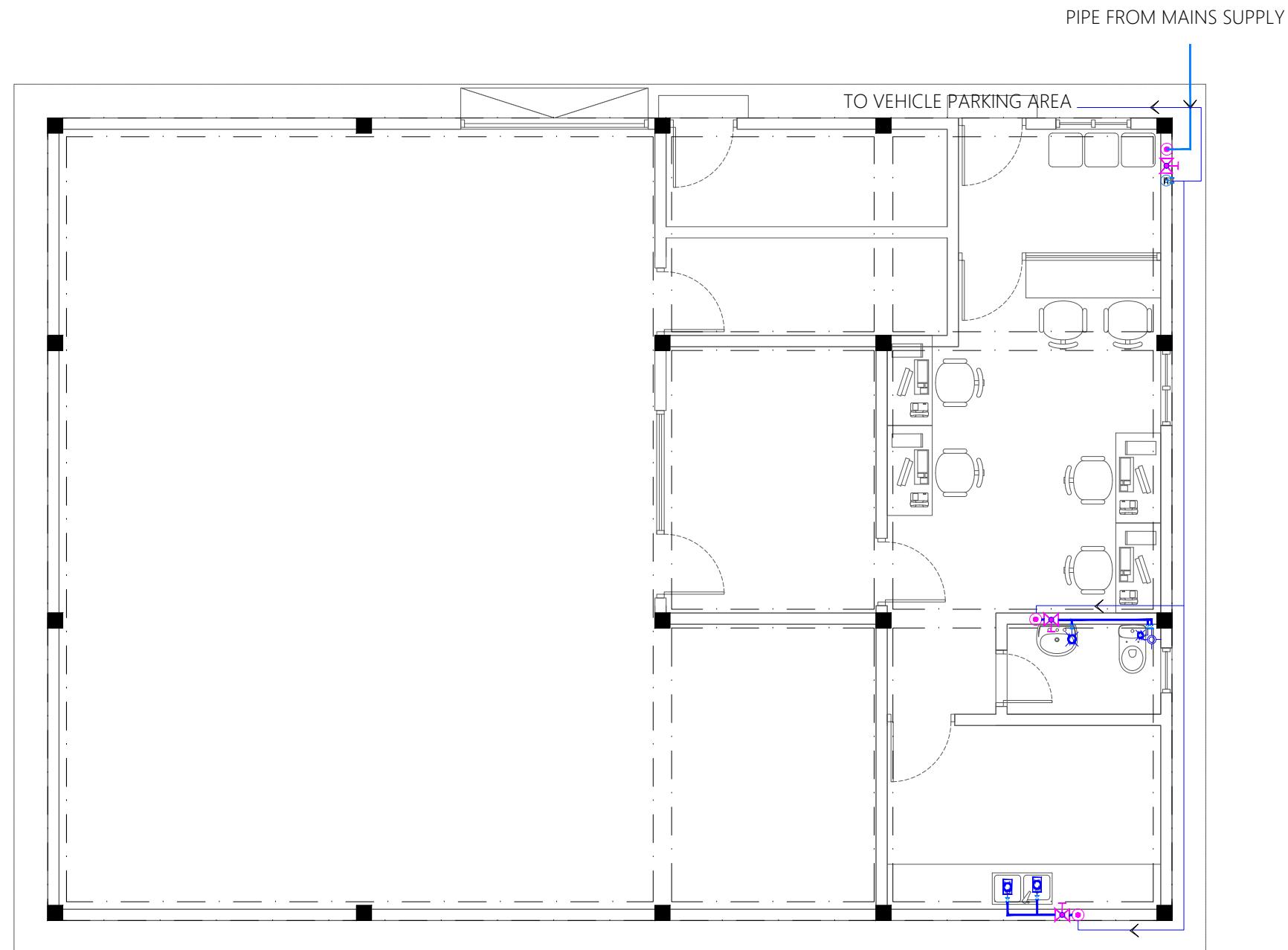
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Legend

- |   |   |
|---|---|
|  | 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

Note:

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### Sub Title: Water Supply System in Ga. Nilandhoo

**Client:**

Ministry of National Planning, Housing and  
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 Floor Drain  
 Floor Gully

- Notes: -

Architectural floor plan of a building showing water and sewer connections. The plan includes a large open area on the left, a central corridor, and a kitchen/bathroom area on the right. Orange lines represent water supply, and blue dashed lines represent sewer lines. Labels indicate connections to the rainwater network, main network, and a brine tank.

Labels on the plan:

- CONNECTED TO RAINWATER NETWORK (top left)
- CONNECTED TO RAINWATER NETWORK (top right)
- CONNECTED TO RAINWATER NETWORK (bottom left)
- TO BRINE TANK (bottom center)
- CONNECTED TO RAINWATER NETWORK (bottom right)
- CONNECTED TO MAIN NETWORK (top right, near a red circle labeled 'Mh')

The plan shows a large open area on the left, a central corridor, and a kitchen/bathroom area on the right. The kitchen/bathroom area includes a sink, stove, and toilet. The plan also shows a central corridor and a large open area on the left. The plan is oriented with the top of the building at the top of the image.

## GROUND FLOOR DRAINAGE LAYOUT

1:75

### Legend

Note:

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

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SCALE (A3): 1:75

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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



GROUND FLOOR DRAINAGE LAYOUT

1:75

Legend

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

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The site plan illustrates the layout of the proposed water treatment facility. Key components include:

- Product Water Tanks:** Two large circular tanks labeled "PRODUCT WATER TANK".
- Existing Raw Water Tank:** A circular tank labeled "EXISTING RAW WATER TANK".
- Existing Product Water Tank:** A circular tank labeled "EXISTING PRODUCT WATER TANK".
- Existing Rain Water Collection Tank & Recharge Pits:** A rectangular area labeled "EXISTING RAIN WATER COLLECTION TANK & RECHARGE PITS".
- Vehicle Shed:** A large rectangular area labeled "VEHICLE SHED".
- Admin Building:** A small rectangular building labeled "ADMIN BUILDING".
- Brine Reject Tank:** A circular tank labeled "BRINE REJECT TANK".
- Deaerator:** A small rectangular building labeled "DEAERATOR".
- Bore Holes:** Two square structures labeled "BORE HOLE 1" and "BORE HOLE 2".
- Existing UF Shed:** A small rectangular building labeled "EXISTING UF SHED".
- ATM:** A small rectangular building labeled "ATM".

The plan also shows a network of pipes and valves, indicated by blue lines and symbols, connecting the various tanks and buildings. A large, irregularly shaped area with a hatched pattern represents the existing rain water collection tank and recharge pits. The entire facility is enclosed within a boundary line, with an "ATM" label outside the boundary on the right side.



1:200

Note:

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Project No: FP-WS/2019/06

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EL-02

16Ø Cold Water Supply To Wall Tap  
 Gate Valve  
 Rise In Wall  
 MWSC Meter  
 25Ø Cold Water Supply Pipes Running Underground  
 20Ø Cold Water Supply Pipes Running Along Wall



1:200

Note:

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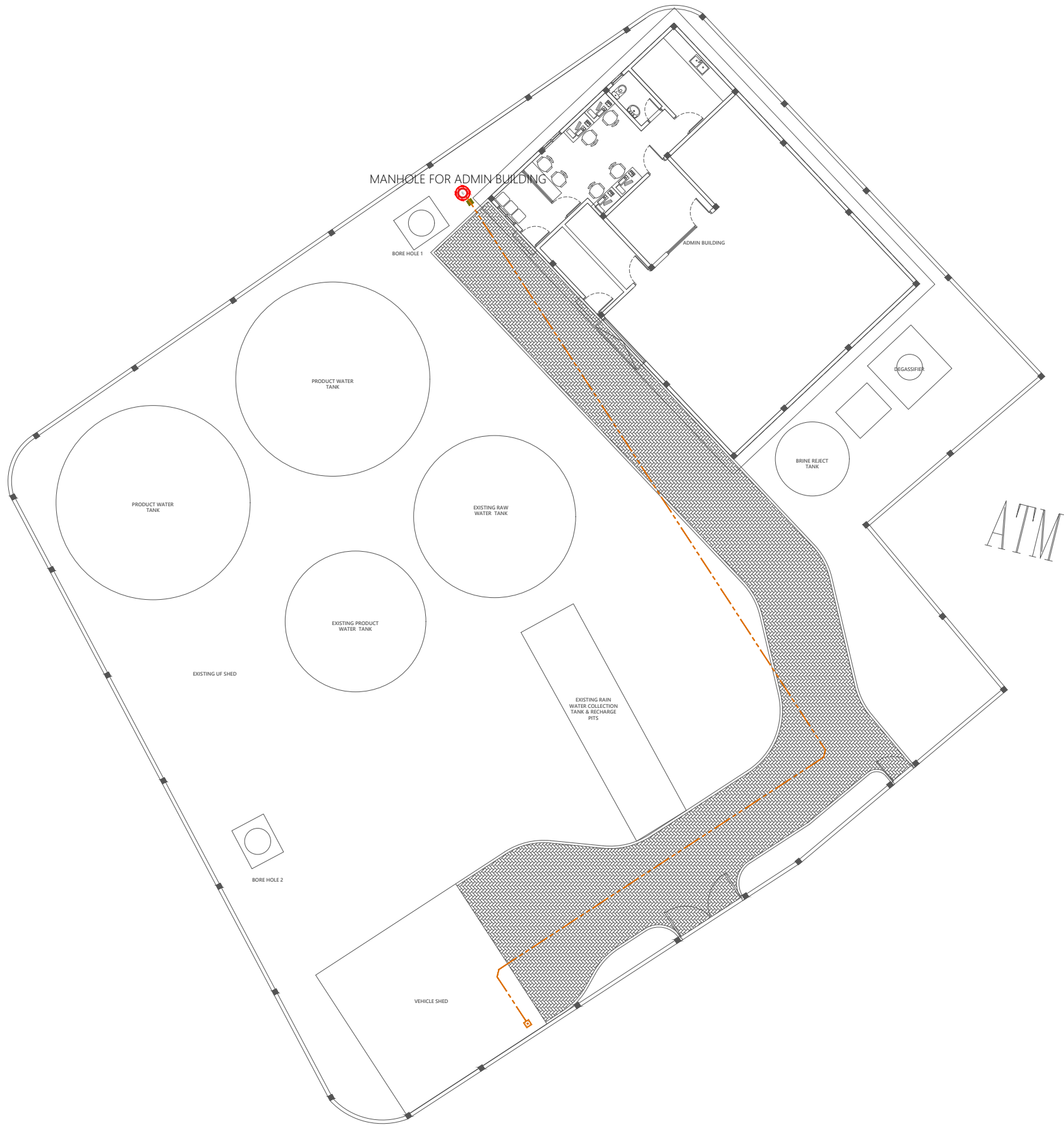
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PL-02

- Legend
- Floor Drain
  - 400 Stub For Washing Machine Or Tub
  - 820 Soil Pipe (uPVC Pipe)
  - 820 Soil Vent Pipe (uPVC Pipe)
  - 630 Waste Pipe (uPVC Pipe)
  - 630 Waste Vent Pipe (uPVC Pipe)
  - 400 Waste Pipe (uPVC Pipe)
  - 500 Manhole Vent Pipe (uPVC Pipe)
  - 1100 Rain Water Pipes (uPVC Pipe)
  - Gully Trap
  - Clean Out Point



VEHICLE PARKING AREA - DRAINAGE LAYOUT  
1:200



Legend

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

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