

Legend

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

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

MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	6936	HDPE (PE100, PN10, SDR17)
90	2844	
110	1725	
150	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

PSM BENCHMARKS

<p>PERMANENT SURVEY MARK PSM_5363 32059.497E, 199025.942N 0.996m From MSL.</p>
<p>PERMANENT SURVEY MARK PSM_5364 32119.956E, 198953.066N 1.066m From MSL.</p>
<p>PERMANENT SURVEY MARK PSM_5365 320825.281E, 198897.178N 0.996m From MSL.</p>

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

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

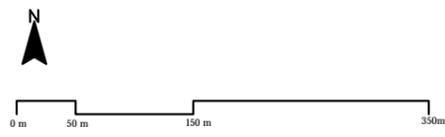
Sub Title:
 Water Supply System in L. Hithadhoo

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

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 W: www.epochassociates
 A: G. Rosnay West,
 Husubeenaa Magu, Male', Maldives

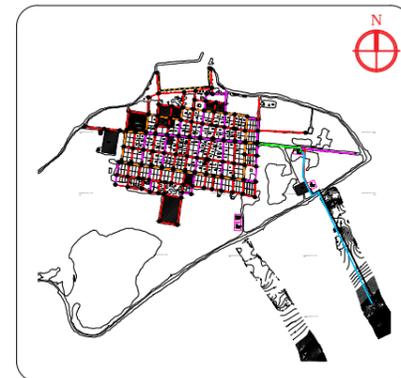
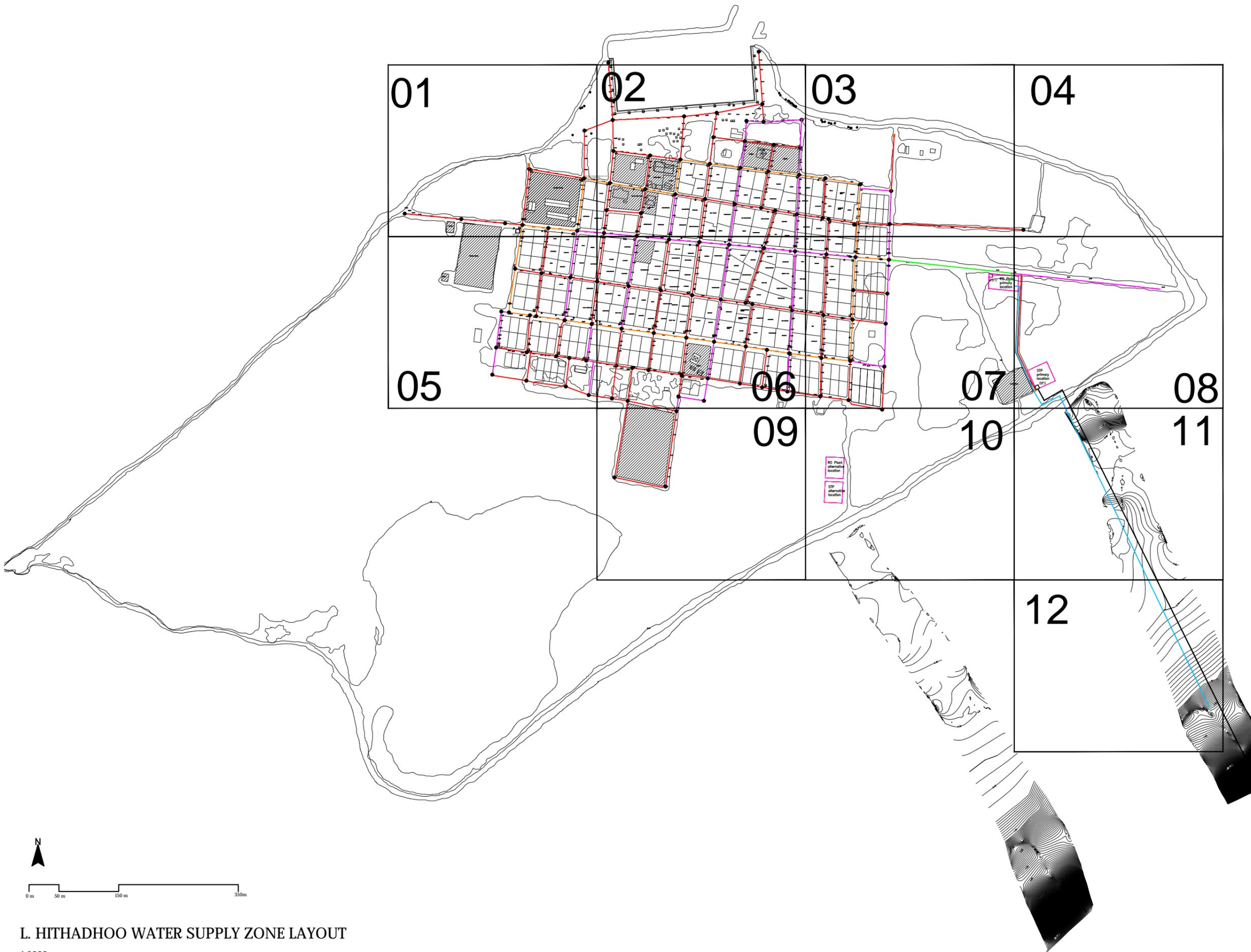
Maldivian Infrastructure Development

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



L. HITHADHOO WATER SUPPLY NETWORK LAYOUT

1:6000



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

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110	1725	
160	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

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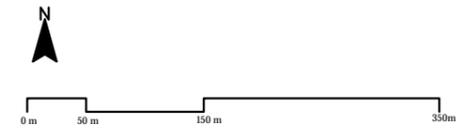
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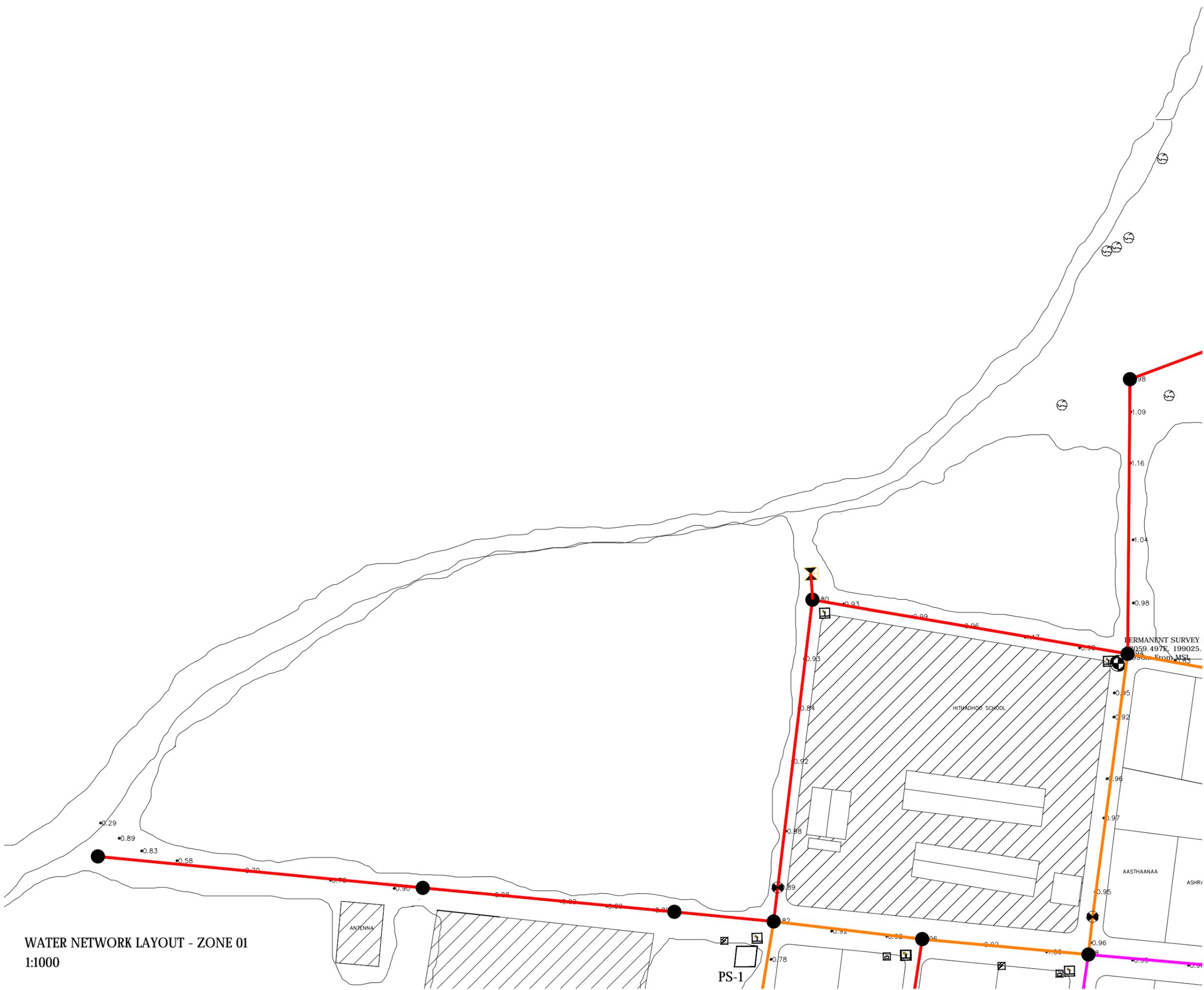
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Maldivian Infrastructure Development

Drawn: F.I.A.	Checked: M.S.S.
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Rev: R-01	Page: 02



L. HITHADHOO WATER SUPPLY ZONE LAYOUT
 1:6000



WATER NETWORK LAYOUT - ZONE 01
1:1000



- Legend**
- Ø63 HDPE Water Main Distribution Pipe
 - Ø90 HDPE Water Main Distribution Pipe
 - Ø150 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

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110	1725	
150	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

- PSM BENCHMARKS**
- PERMANENT SURVEY MARK PSM_5363
32059.497E, 199025.942N
0.996m From MSL
 - PERMANENT SURVEY MARK PSM_5364
32119.956E, 198953.066N
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320825.261E, 198897.178N
0.996m From MSL

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6

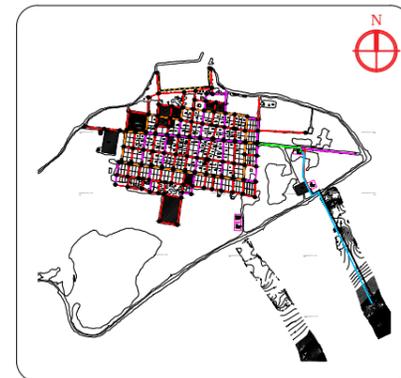
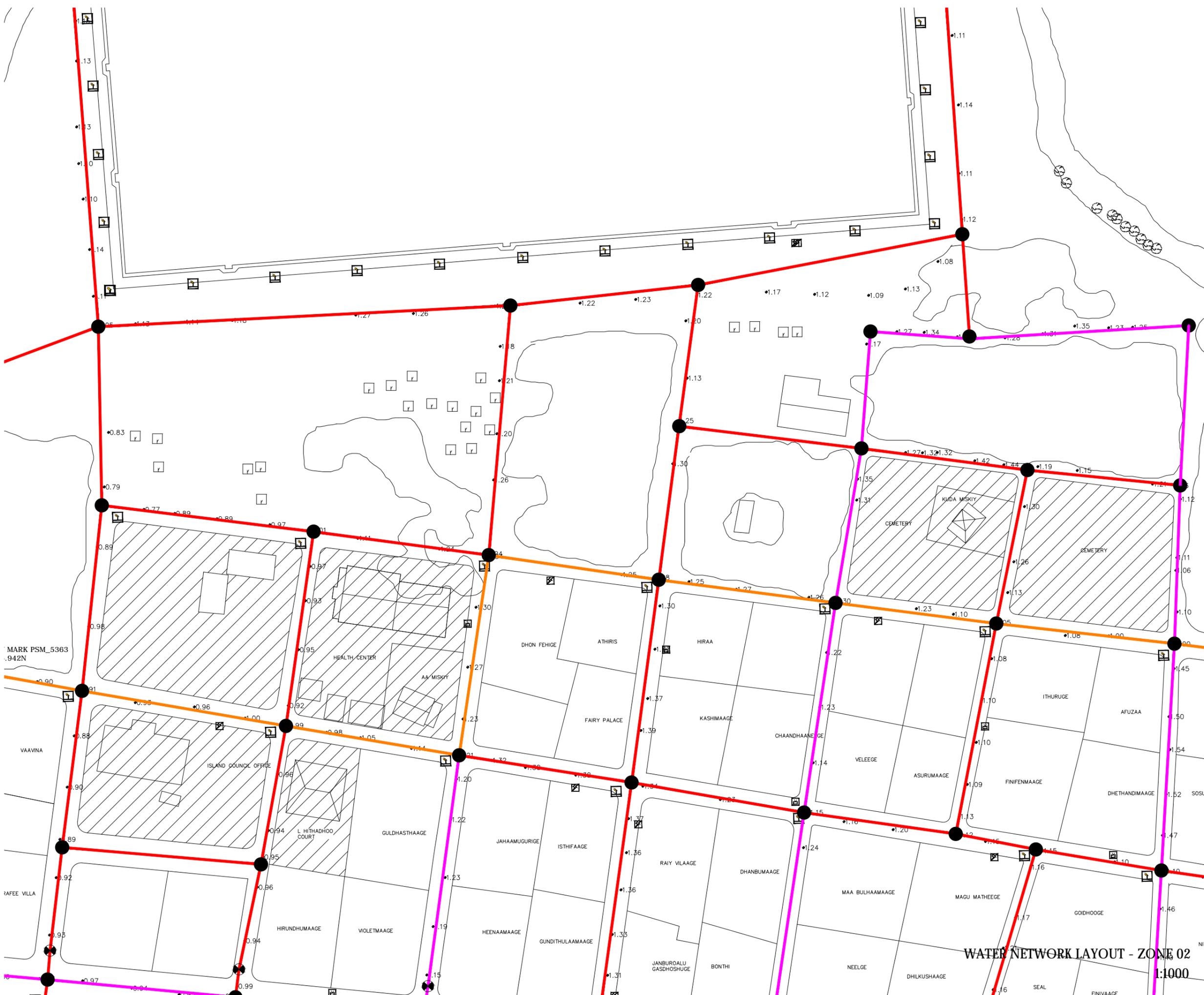
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A: G. Rosnay West,
Husubeenaa Magu, Male', Maldives

Maldivian Infrastructure Development

Drawn: F.I.A.	Checked: M.S.S.
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Date: Aug 2020	SCALE (AS): 1:1000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 03



- Legend**
- Ø63 HDPE Water Main Distribution Pipe
 - Ø90 HDPE Water Main Distribution Pipe
 - Ø110 HDPE Water Main Distribution Pipe
 - Ø150 HDPE Water Main Distribution Pipe
 - Ø75 HDPE Water Main Distribution Pipe
 - Ø110 HDPE Water Main Distribution Pipe
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 - Gate Valves
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OUTFALL

DIAMETER (mm)	LENGTH (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

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R00	JUNE 2020	STAGE -1	PD	SBC	SD

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

Sub Title:
Water Supply System in L. Hithadhoo

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

EPOCH

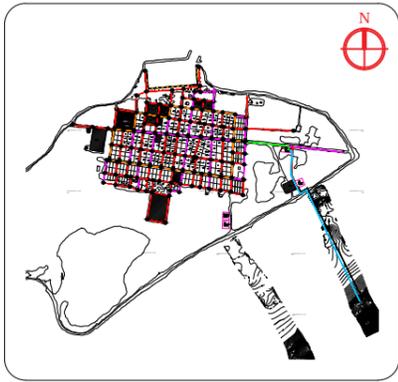
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 Husnabeena Magu, Male', Maldives

INFRA

Working Software Solutions

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Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (AS): 1:1000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 04

WATER NETWORK LAYOUT - ZONE 02
 1:1000



Legend

- Ø63 HDPE Water Main Distribution Pipe
- Ø90 HDPE Water Main Distribution Pipe
- Ø150 HDPE Water Main Distribution Pipe
- Ø75 HDPE Water Main Distribution Pipe
- Ø110 HDPE Water Main Distribution Pipe
- Ø110 HDPE Brine Outfall Pipe
- Gate Valves
- Junction
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150	224	
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Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

PSM BENCHMARKS

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

Sub Title:
 Water Supply System in L. Hithadhoo

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

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DBACK INFRA

Maldiviyaa Self-Construction & Support

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

Rev: R-01 Page: 05



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

PACKAGE 6

WATER SUPPLY SYSTEM OF L.HITHADHOO, MALDIVES

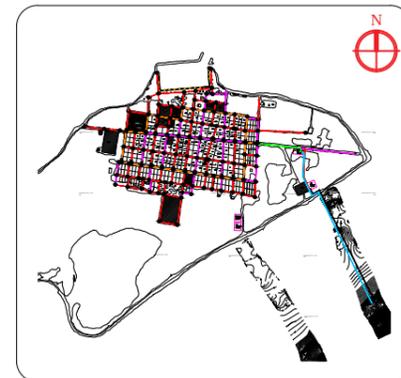
For Ministry of National Planning and Housing Infrastructure, Republic of Maldives



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Legend

- Ø63 HDPE Water Main Distribution Pipe
- Ø90 HDPE Water Main Distribution Pipe
- Ø150 HDPE Water Main Distribution Pipe
- Gate Valves
- Junction
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- Ø110 HDPE Water Main Distribution Pipe
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OUTFALL

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Maldiviyaa Self Governance Kappoo

Drawn: F.I.A.	Checked: M.S.S.
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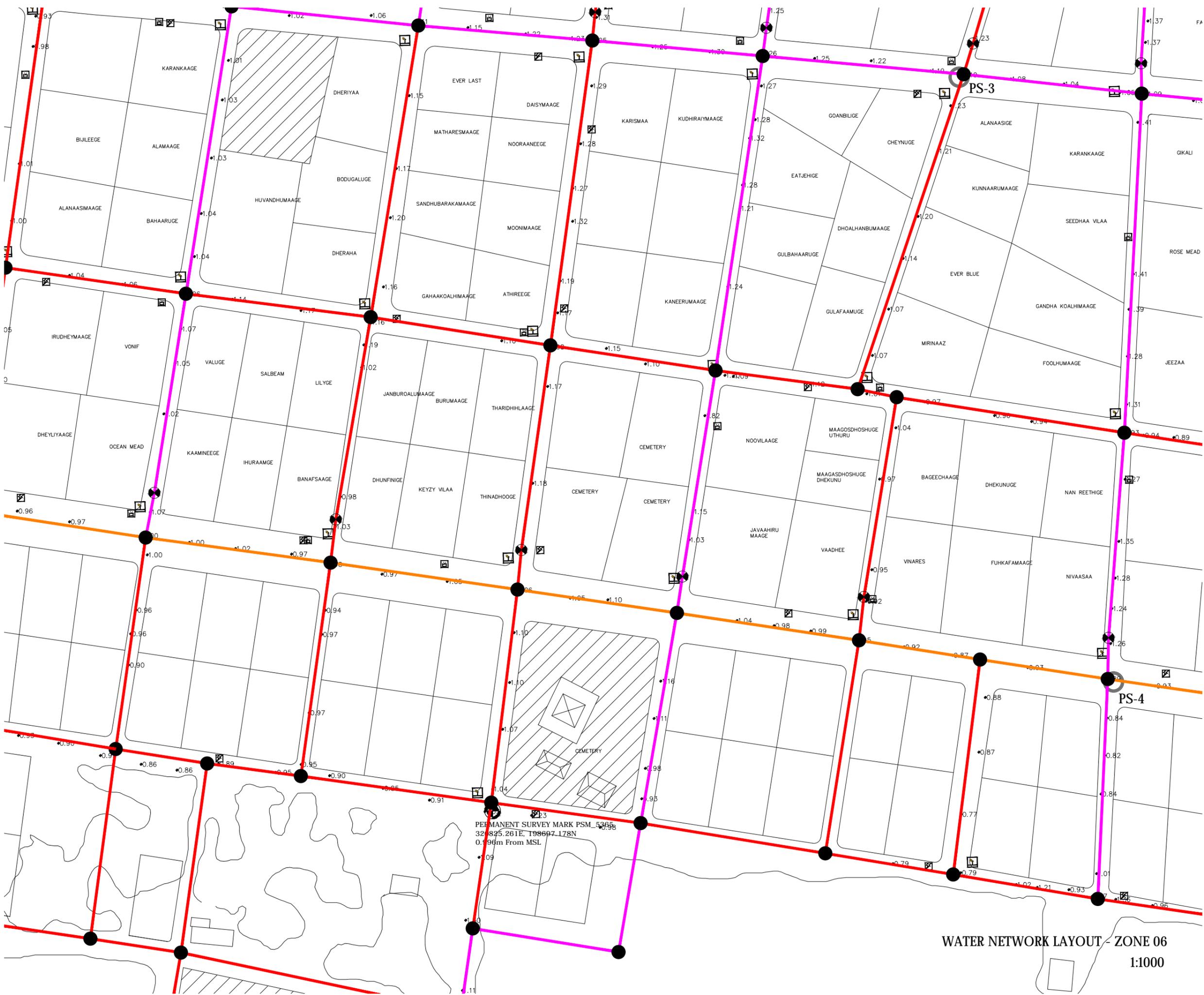
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Maldivian Infrastructure Development

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WATER NETWORK LAYOUT - ZONE 05
 1:1000



- Legend**
- Ø63 HDPE Water Main Distribution Pipe
 - Ø90 HDPE Water Main Distribution Pipe
 - Ø110 HDPE Water Main Distribution Pipe
 - Ø150 HDPE Water Main Distribution Pipe
 - Ø110 HDPE Brine Outfall Pipe
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Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH (HDPE (m))	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

PSM BENCHMARKS

- PERMANENT SURVEY MARK PSM_5363
32059.497E, 199025.942N
0.996m From MSL
- PERMANENT SURVEY MARK PSM_5364
32119.956E, 198953.066N
1.066m From MSL
- PERMANENT SURVEY MARK PSM_5365
320825.261E, 198897.178N
0.996m From MSL

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

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

Sub Title:
Water Supply System in L. Hithadhoo

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

EPOCH

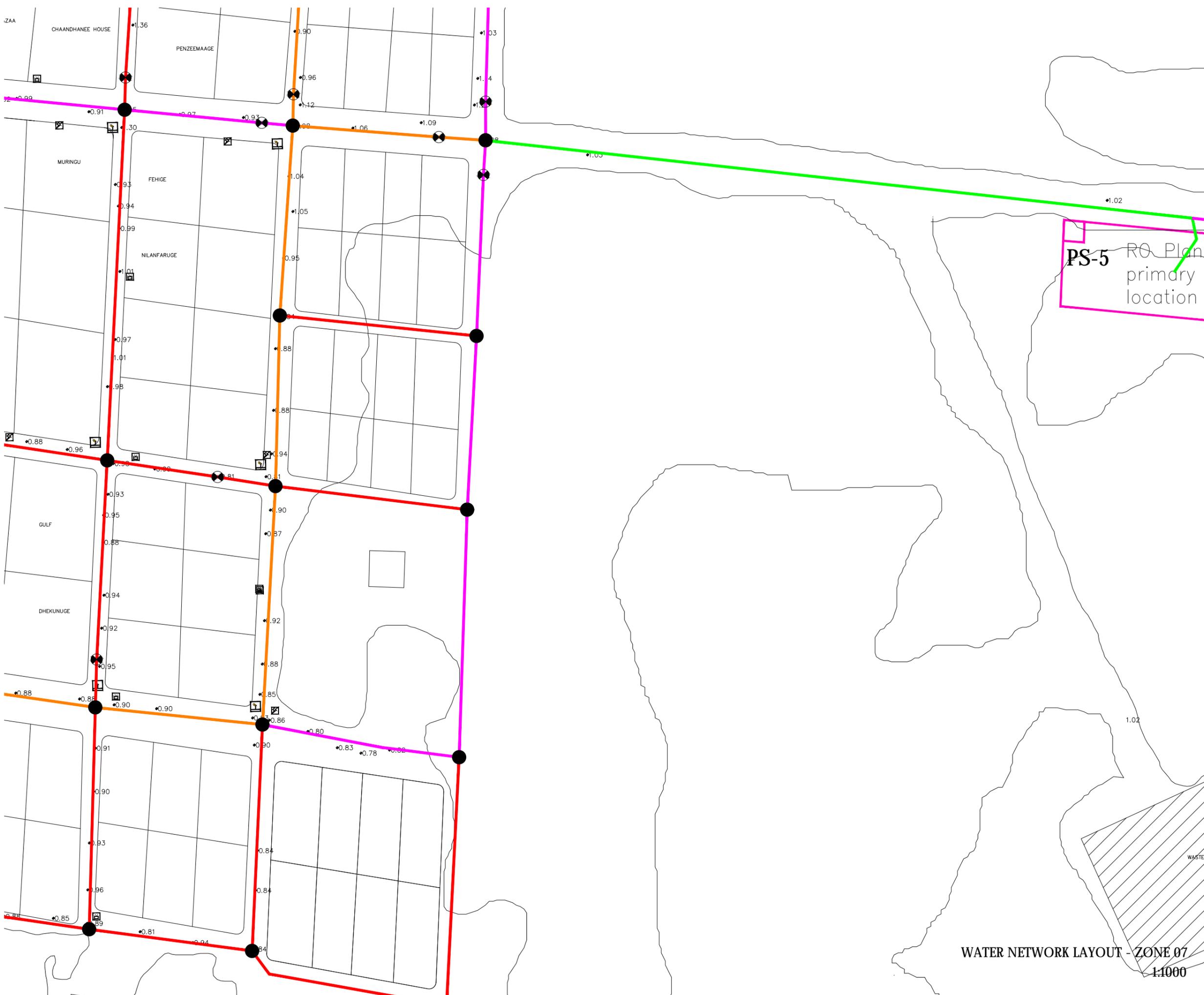
T: +960 333 3528
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W: www.epochassociates
A: G. Rosnay West,
Husubeenaa Magu, Male', Maldives

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Maldivian Infrastructure Development

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (AS): 1:1000
Project No: EP-WS/2019/06	Page: 08
Rev: R-01	

WATER NETWORK LAYOUT - ZONE 06
1:1000



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

- Notes:**
- 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, PN6, SDR11 HDPE pipe.
 - Minimum size of commercial and other institutional connection service line shall be 50mm, PE100, PN6, SDR11 HDPE pipe.

MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH (m)	TYPE OF PIPE
63	6936	HDPE (PE100, PN10, SDR17)
90	2844	
110	1725	
150	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

PSM BENCHMARKS

PERMANENT SURVEY MARK PSM_5363 32059.497E, 199025.942N 0.996m From MSL.
PERMANENT SURVEY MARK PSM_5364 32119.956E, 198953.066N 1.066m From MSL.
PERMANENT SURVEY MARK PSM_5365 320825.261E, 198897.178N 0.996m From MSL.

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

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

Sub Title:
 Water Supply System in L. Hithadhoo

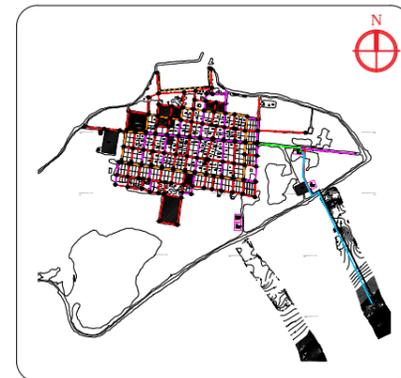
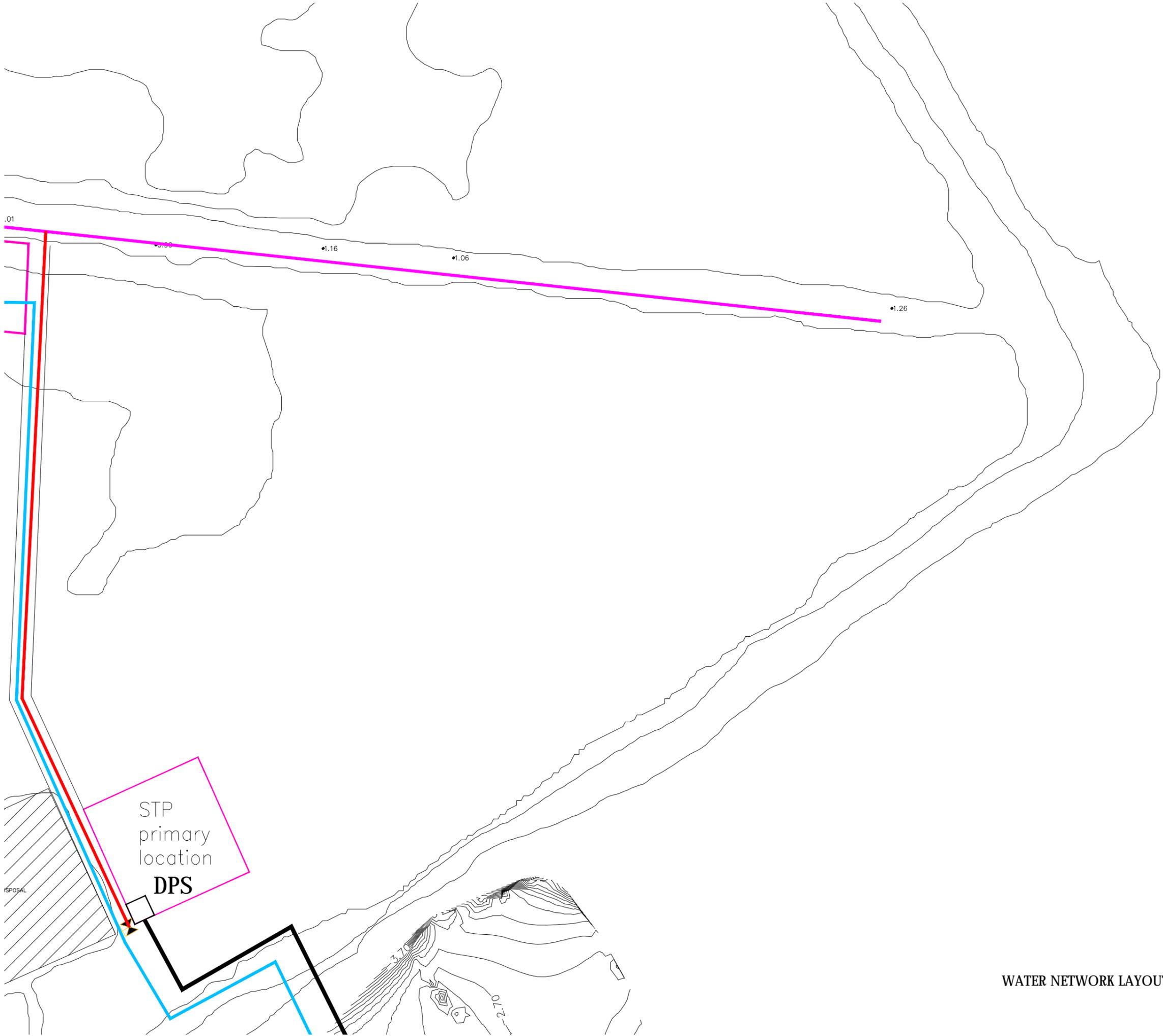
Client:
 Ministry of National Planning, Housing and Infrastructure, Republic of Maldives

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 W: www.epochassociates
 A: G. Rosnay West,
 Husubeenaa Magu, Male', Maldives

Maldivian Infrastructure Development

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (AS): 1:1000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 09

WATER NETWORK LAYOUT - ZONE 07
 1:1000



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
— Ø150 HDPE Water Main Distribution Pipe	— Ø110 HDPE Brine Outfall Pipe
Gate Valves	Washout Valves
Junction	

- 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, PN6, SDR11 HDPE pipe.
 - Minimum size of commercial and other institutional connection service line shall be 50mm, PE100, PN6, SDR11 HDPE pipe.

MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	6936	HDPE (PE100, PN10, SDR17)
90	2844	
110	1725	
150	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

PSM BENCHMARKS

	PERMANENT SURVEY MARK PSM_5363 32059.497E, 199025.942N 0.996m From MSL.
	PERMANENT SURVEY MARK PSM_5364 32119.956E, 198953.066N 1.066m From MSL.
	PERMANENT SURVEY MARK PSM_5365 320825.261E, 198897.178N 0.996m From MSL.

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

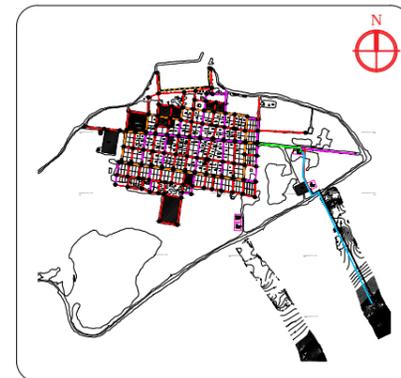
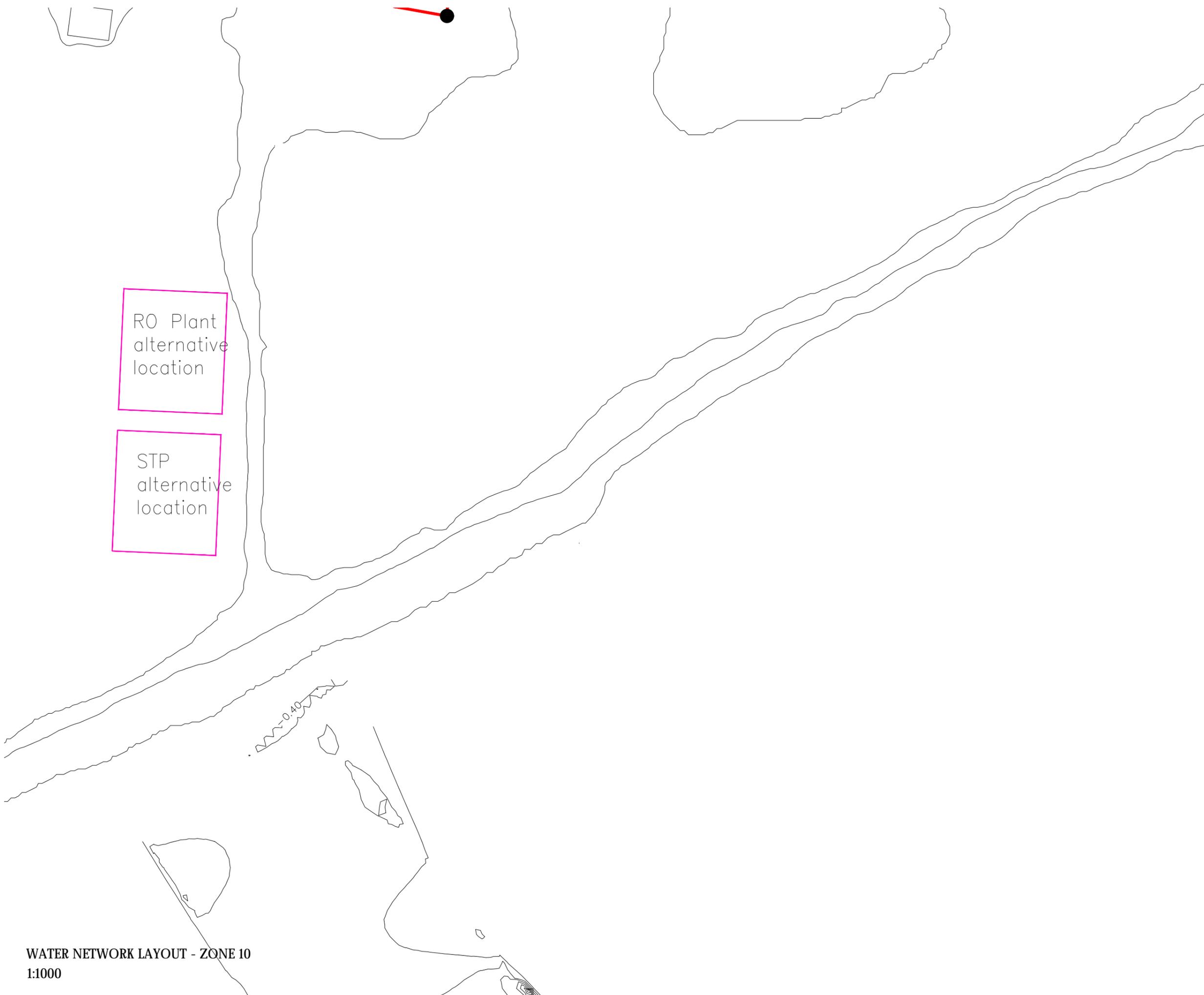
Title:
 Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6

Sub Title:
 Water Supply System in L. Hithadhoo

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

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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: 10

WATER NETWORK LAYOUT - ZONE 08
 1:1000



Legend

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

- Notes:**
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, PN6, SDR11 HDPE pipe.
 9. Minimum size of commercial and other institutional connection service line shall be 50mm, PE100, PN6, SDR11 HDPE pipe.

MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	6936	HDPE (PE100, PN10, SDR17)
90	2844	
110	1725	
150	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

PSM BENCHMARKS

	PERMANENT SURVEY MARK PSM_5363 32059.497E, 199025.942N 0.996m From MSL.
	PERMANENT SURVEY MARK PSM_5364 32119.956E, 198953.066N 1.066m From MSL.
	PERMANENT SURVEY MARK PSM_5365 320825.261E, 198897.178N 0.996m From MSL.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Water Supply System in L. Hithadhoo

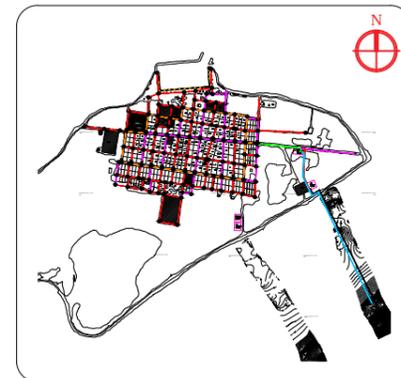
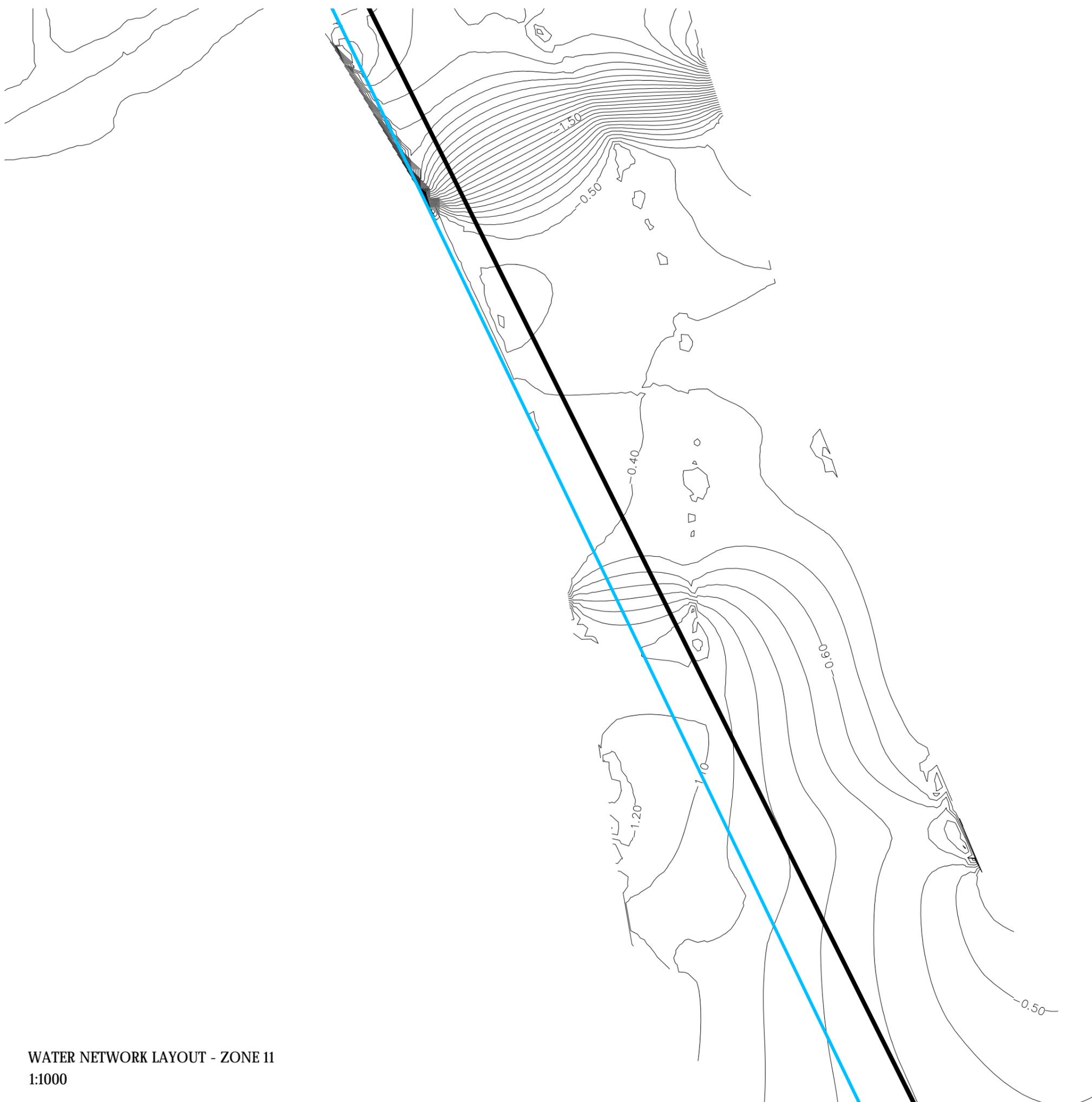
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 A: G. Rosnay West,
 Husubeenaa Magu, Male', Maldives

Maldiviyaa Self-Governance Kappoo

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: 12

WATER NETWORK LAYOUT - ZONE 10
1:1000



Legend

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

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

MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	6936	HDPE (PE100, PN10, SDR17)
90	2844	
110	1725	
150	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

PSM BENCHMARKS

PERMANENT SURVEY MARK PSM_5363 32059.497E, 199025.942N 0.996m From MSL.
PERMANENT SURVEY MARK PSM_5364 32119.956E, 198953.066N 1.066m From MSL.
PERMANENT SURVEY MARK PSM_5365 320825.261E, 198897.178N 0.996m From MSL.

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

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

Sub Title:
Water Supply System in L. Hithadhoo

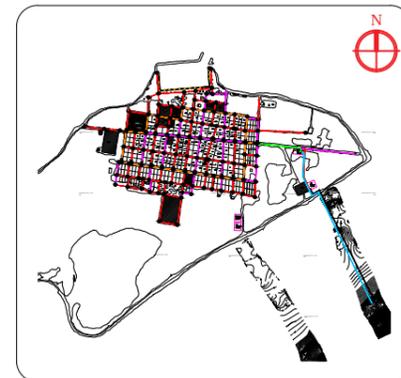
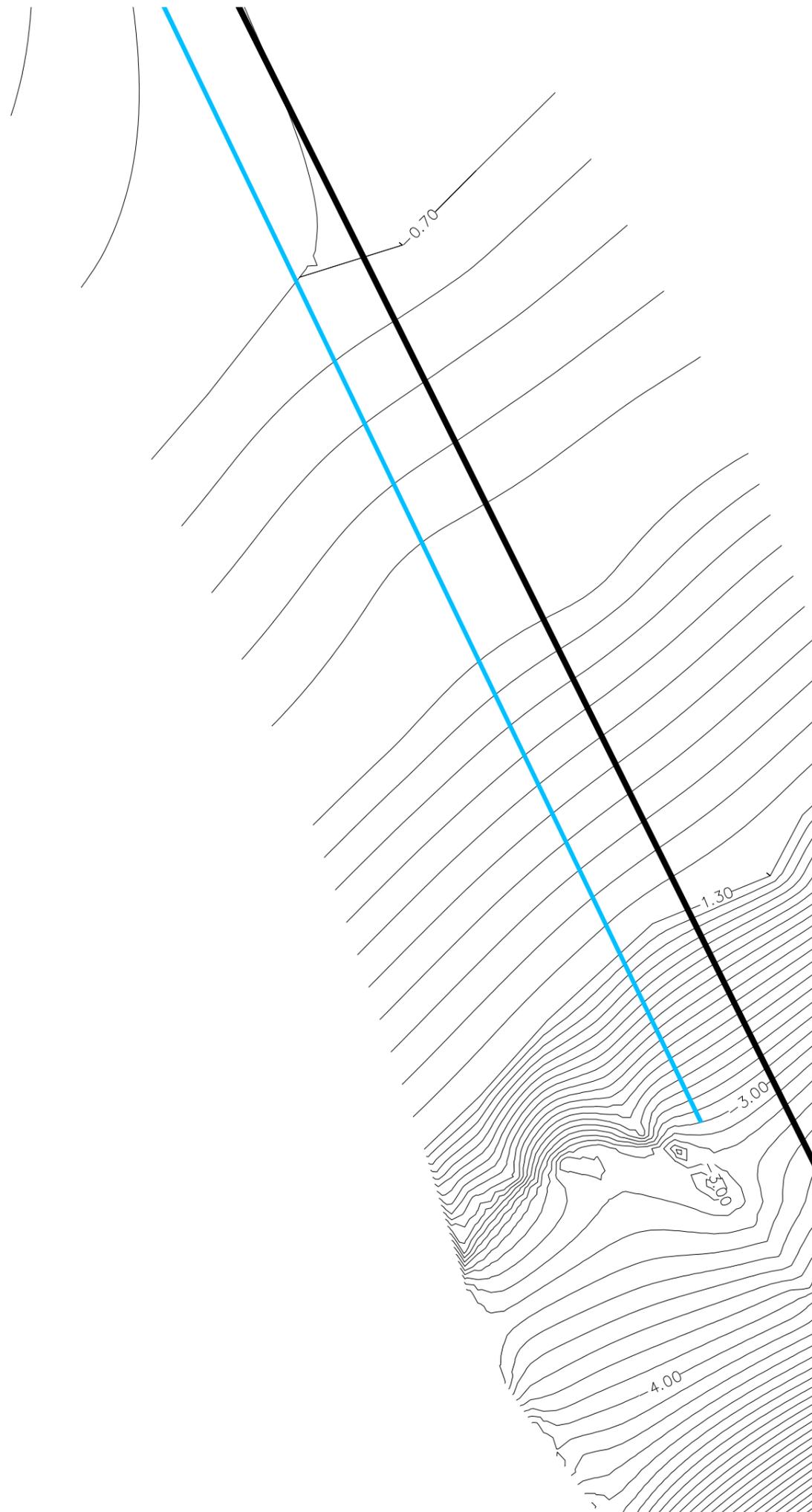
Client:
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A: G. Rosnay West,
Husubeenaa Magu, Male', Maldives

Maldiviyafaayinaa Kappoo

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: 13

WATER NETWORK LAYOUT - ZONE 12
1:1000



Legend

- Ø63 HDPE Water Main Distribution Pipe
- Ø90 HDPE Water Main Distribution Pipe
- Ø150 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, PN6, SDR11 HDPE pipe.
 9. Minimum size of commercial and other institutional connection service line shall be 50mm, PE100, PN6, SDR11 HDPE pipe.

MAINS DISTRIBUTION

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
63	6936	HDPE (PE100, PN10, SDR17)
90	2844	
110	1725	
150	224	
Total	11779	
Gate Valves	27 nos	
Washout Valves	02 nos	

OUTFALL

DIAMETER (mm)	LENGTH HDPE (m)	TYPE OF PIPE
110	257m (on land) - 571m (offshore)	HDPE (PE100, PN10, SDR11)

PSM BENCHMARKS

PERMANENT SURVEY MARK PSM_5363 32059.497E, 199025.942N 0.996m From MSL.
PERMANENT SURVEY MARK PSM_5364 32119.956E, 198953.066N 1.066m From MSL.
PERMANENT SURVEY MARK PSM_5365 320825.261E, 198897.178N 0.996m From MSL.

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

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

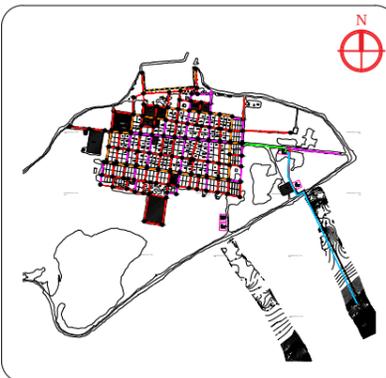
Sub Title:
Water Supply System in L. Hithadhoo

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

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A: G. Rosnay West,
Husubeenaa Magu, Male', Maldives

Maldiviyafuwaafuwa

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 14



Legend

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

- 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 gravity pipes should be HDPE PE100, PN6, SDR26 pipes.
 - All gravity pipes are to be laid as per invert levels indicated. Any change based on site condition should be made based on approval from engineer.

RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH (HDPE) (m)	TYPE OF PIPE
100	738	HDPE (PE100, PN6, SDR26)
200	18	
225	42	
315	632	
Total	1430	

PSM BENCHMARKS

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

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

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

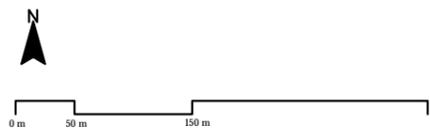
Sub Title:
 Water Supply System in L. Hithadhoo

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

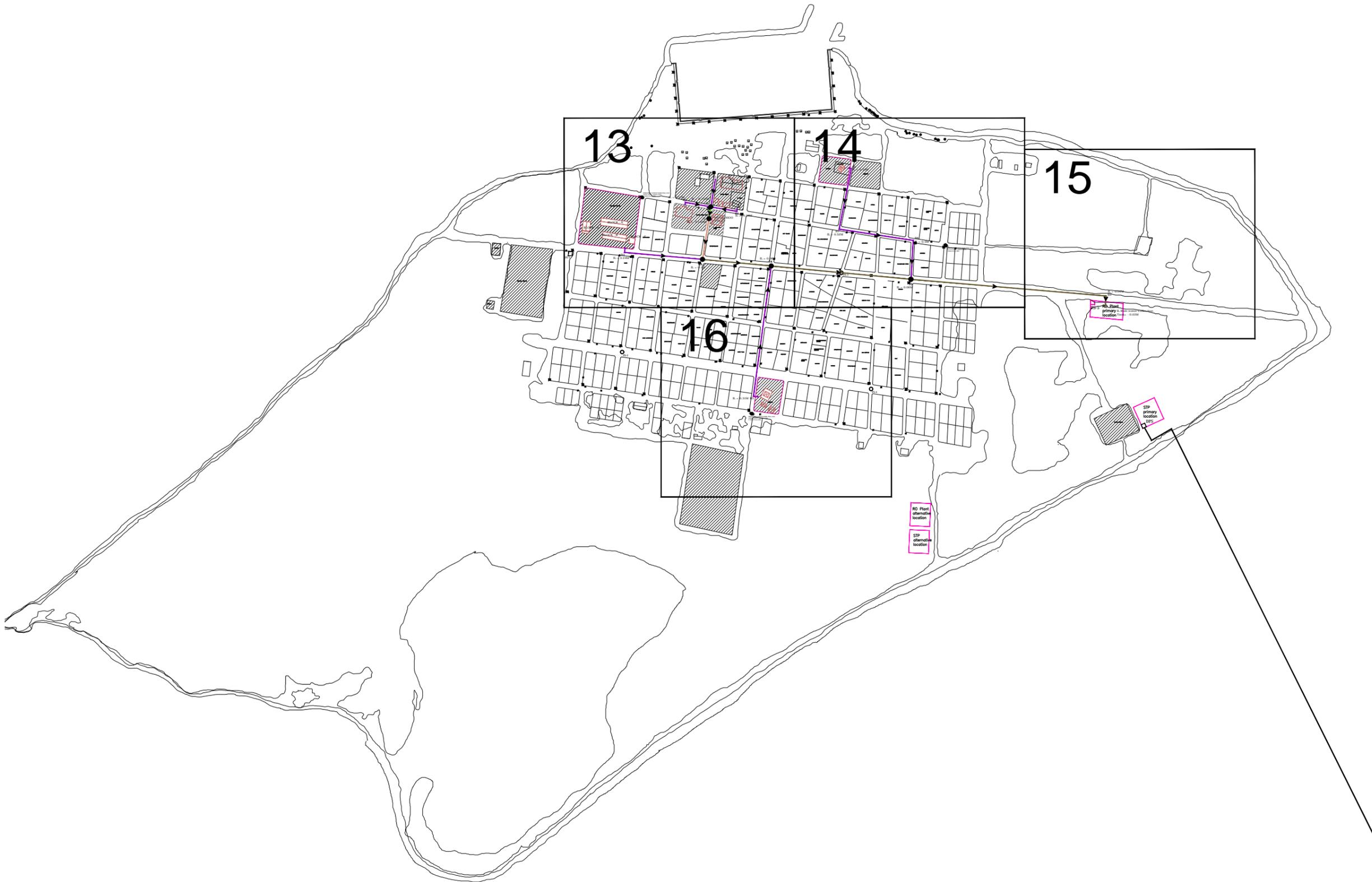
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 A: G. Rosnay West,
 Husnubeenaa Magu, Male', Maldives

DBACK INFRA
 Maldives

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:6000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 15



L. HITHADHOO RAINWATER COLLECTION NETWORK LAYOUT
 1:6000



Legend

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

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 gravity pipes should be HDPE PE100, PN6, SDR26 pipes.
- All gravity pipes are to be laid as per invert levels indicated. Any change based on site condition should be made based on approval from engineer.

RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH (HDPE (m))	TYPE OF PIPE
100	738	HDPE (PE100, PN6, SDR26)
200	18	
225	42	
315	632	
Total	1430	

PSM BENCHMARKS

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

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

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

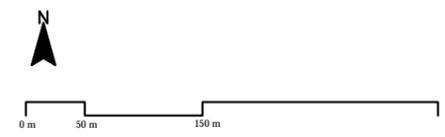
Sub Title:
 Water Supply System in L. Hithadhoo

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

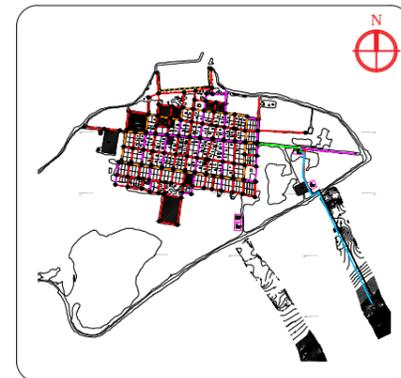
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 Husnubeenaa Magu, Male', Maldives

Maldivian Infrastructure Development

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:6000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 16



**L. HITHADHOO RAINWATER COLLECTION NETWORK
 ZONE LAYOUT**
 1:6000



Legend

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

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 gravity pipes should be HDPE PE100, PN6, SDR26 pipes.
- All gravity pipes are to be laid as per invert levels indicated. Any change based on site condition should be made based on approval from engineer.

RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH (m)	TYPE OF PIPE
160	738	HDPE (PE100, PN6, SDR26)
200	18	
225	42	
315	632	
Total	1430	

PSM BENCHMARKS

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

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

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

Sub Title:
Water Supply System in L. Hithadhoo

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

EPOCH

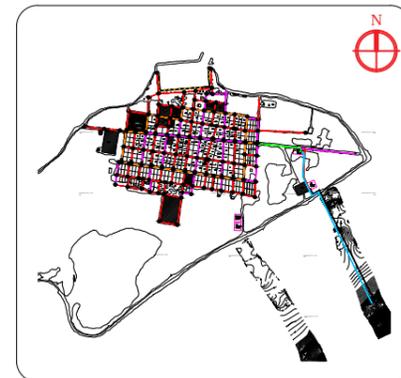
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Husubeenaa Magu, Male', Maldives

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Drawn: F.I.A.	Checked: M.S.S.
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Date: Aug 2020	SCALE (AS): 1:6000
Project No: EP-WS/2019/06	
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RAINWATER NETWORK LAYOUT - ZONE 13

1:1000



Legend

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

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 gravity pipes should be HDPE PE100, PN6, SDR26 pipes.
- All gravity pipes are to be laid as per invert levels indicated. Any change based on site condition should be made based on approval from engineer.

RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH (HDPE) (m)	TYPE OF PIPE
160	738	HDPE (PE100, PN6, SDR26)
200	18	
225	42	
315	632	
Total	1430	

PSM BENCHMARKS

PERMANENT SURVEY MARK PSM_5363	32059.497E, 199025.942N	0.996m From MSL
PERMANENT SURVEY MARK PSM_5364	321119.956E, 198953.066N	1.066m From MSL
PERMANENT SURVEY MARK PSM_5365	320825.261E, 198697.178N	0.996m From MSL

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

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

Sub Title:
 Water Supply System in L. Hithadhoo

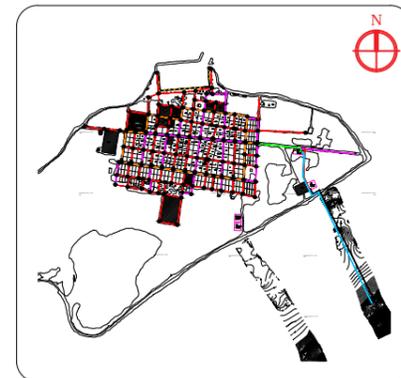
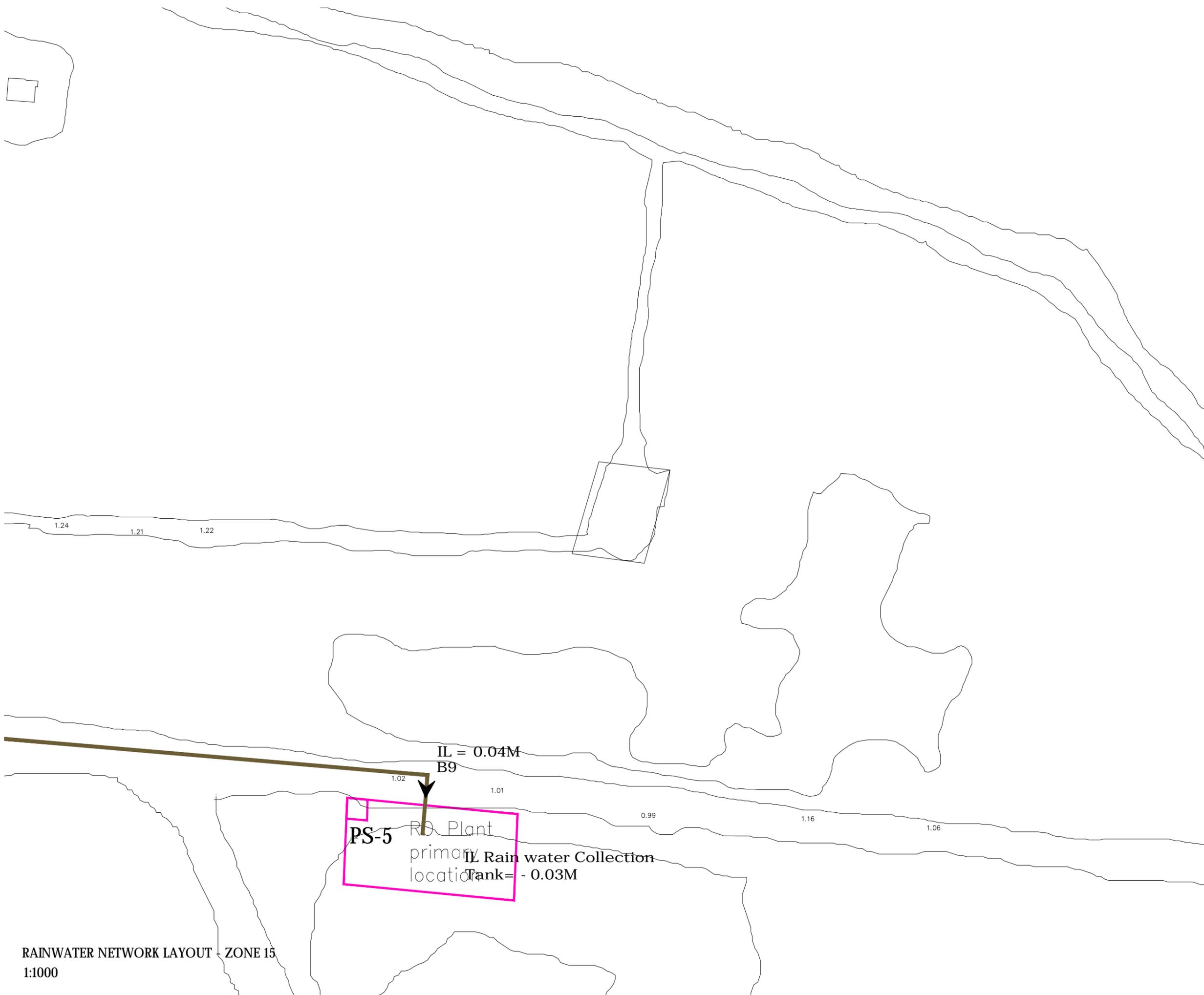
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Date: Aug 2020	SCALE (A3): 1:6000
Project No: EP-WS/2019/06	Page: 18
Rev: R-01	

RAINWATER NETWORK LAYOUT - ZONE 14
 1:1000



Legend

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

- Notes:**
- All levels are shown in meters.
 - All levels are shown from mean sea level.
 - This drawing is to be read in conjunction with all other relevant drawing and specifications.
 - All gravity pipes should be HDPE PE100, FN0, SDR26 pipes.
 - All gravity pipes are to be laid as per invert levels indicated. Any change based on site condition should be made based on approval from engineer.

RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH (m)	TYPE OF PIPE
100	738	HDPE (PE100, FN0, SDR26)
200	18	
225	42	
315	532	
Total	1450	

PSM BENCHMARKS

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

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Sub Title:
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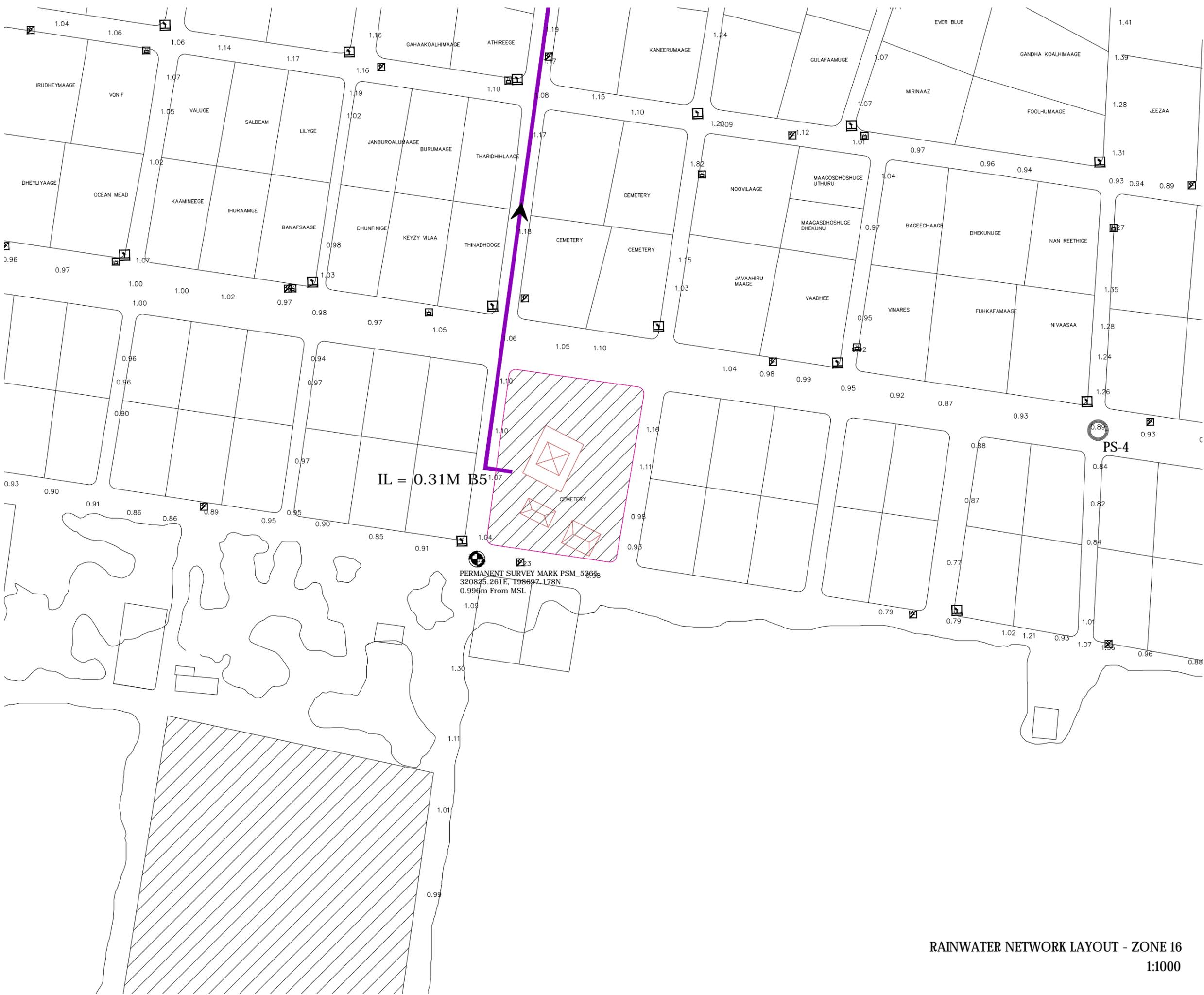
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Maldivian Infrastructure Development

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Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (A3): 1:6000
Project No: EP-WS/2019/06	
Rev: R-01	Page: 19

RAINWATER NETWORK LAYOUT - ZONE 15
 1:1000



Legend

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

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 gravity pipes should be HDPE PE100, PN6, SDR26 pipes.
- All gravity pipes are to be laid as per invert levels indicated. Any change based on site condition should be made based on approval from engineer.

RAINWATER FLOW PIPES

DIAMETER (mm)	LENGTH (HDPE) (m)	TYPE OF PIPE
160	738	HDPE (PE100, PN6, SDR26)
200	18	
225	42	
315	632	
Total	1430	

PSM BENCHMARKS

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

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R00	JUNE 2020	STAGE -1	PD	SBC	SD

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

Sub Title:
Water Supply System in L. Hithadhoo

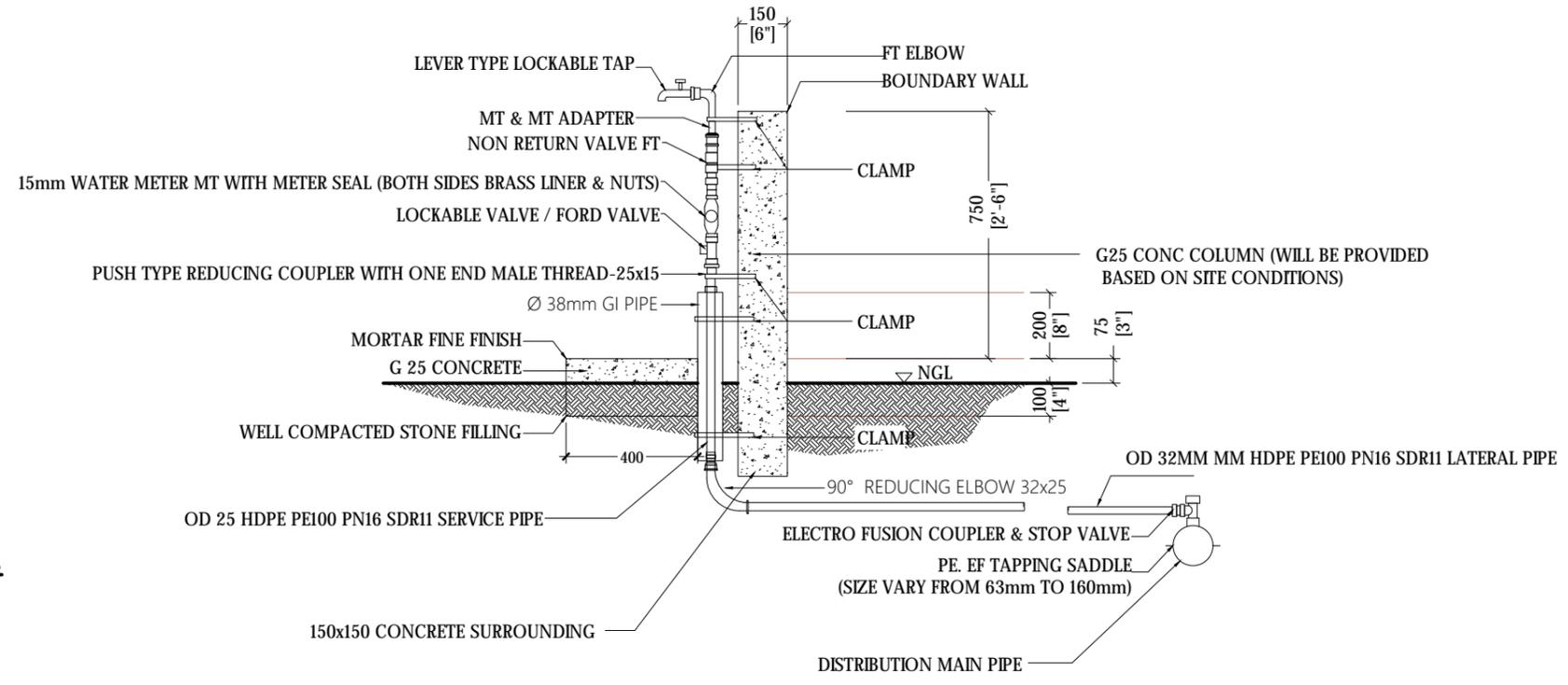
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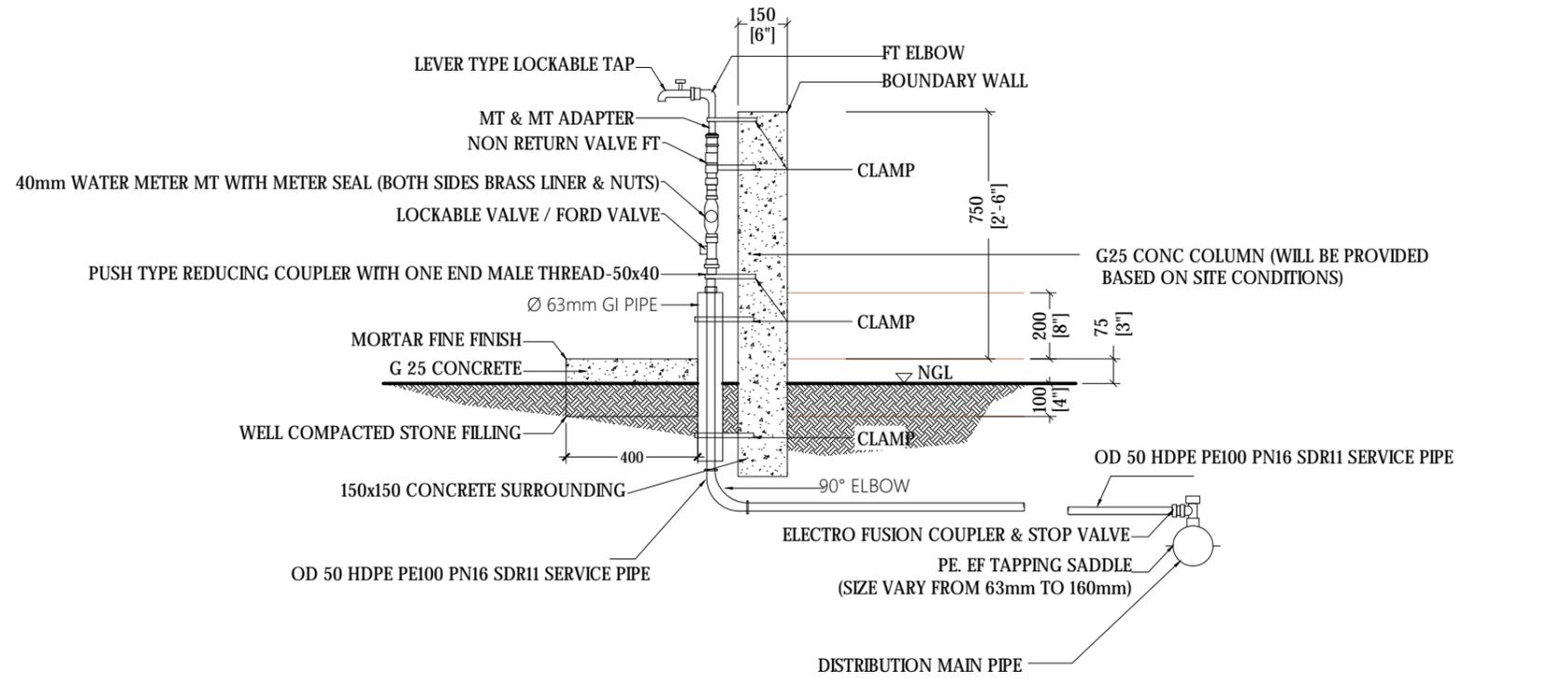
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 Date: Aug 2020 SCALE (AS): 1:6000
 Project No: EP-WS/2019/06
 Rev: R-01 Page: 20

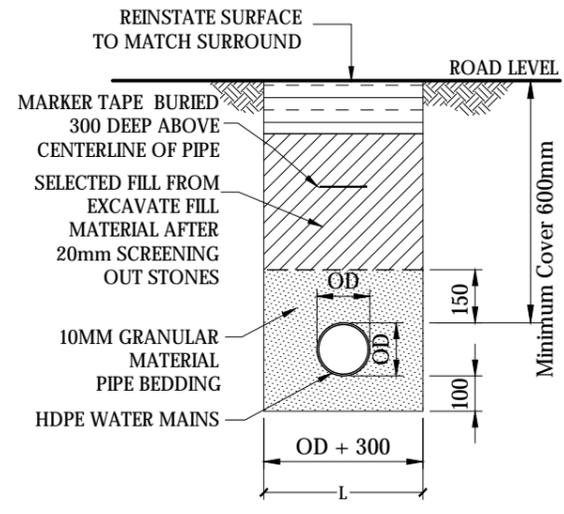
RAINWATER NETWORK LAYOUT - ZONE 16
1:1000



WATER SUPPLY HOUSE CONNECTION DETAILS



WATER SUPPLY COMMERCIAL/INSTITUTIONAL CONNECTION DETAILS



TRENCH & BEDDING DETAILS

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.

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

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

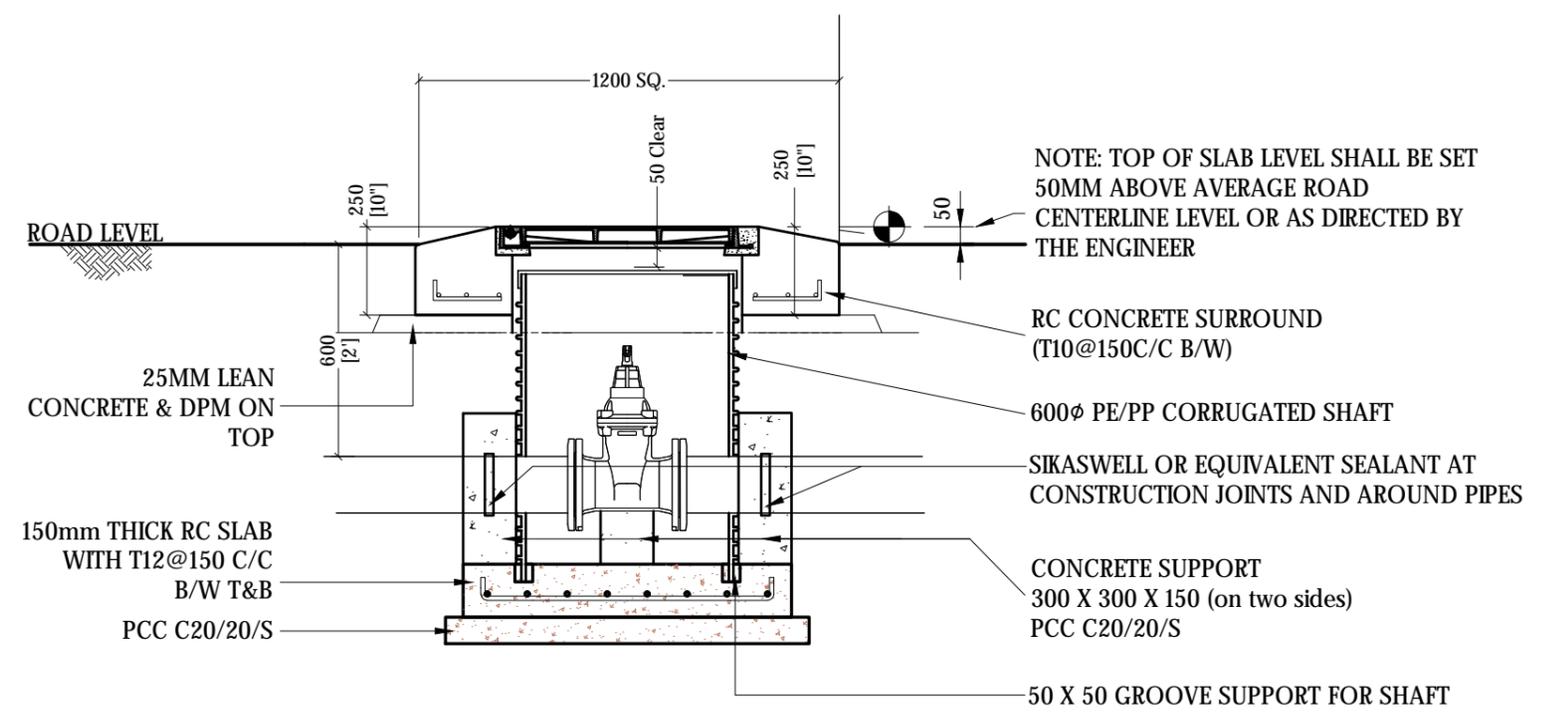
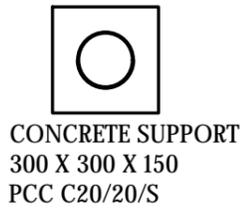
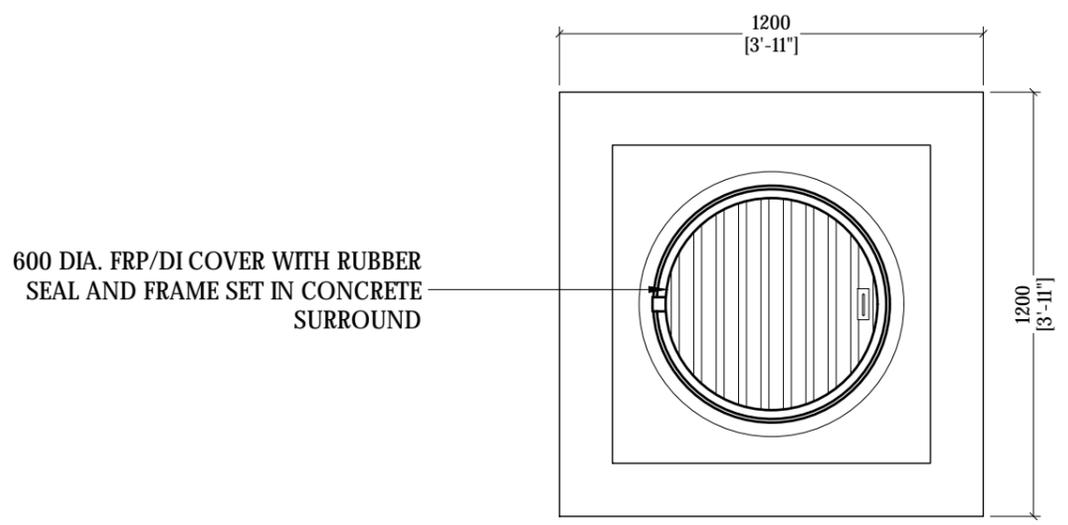
Sub Title:
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Project No: EP-WS/2019/06	
Rev: R-01	Page: W-01



SECTION - VALVE CHAMBER

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.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Sub Title:
Water Supply System in L.Hithadhoo

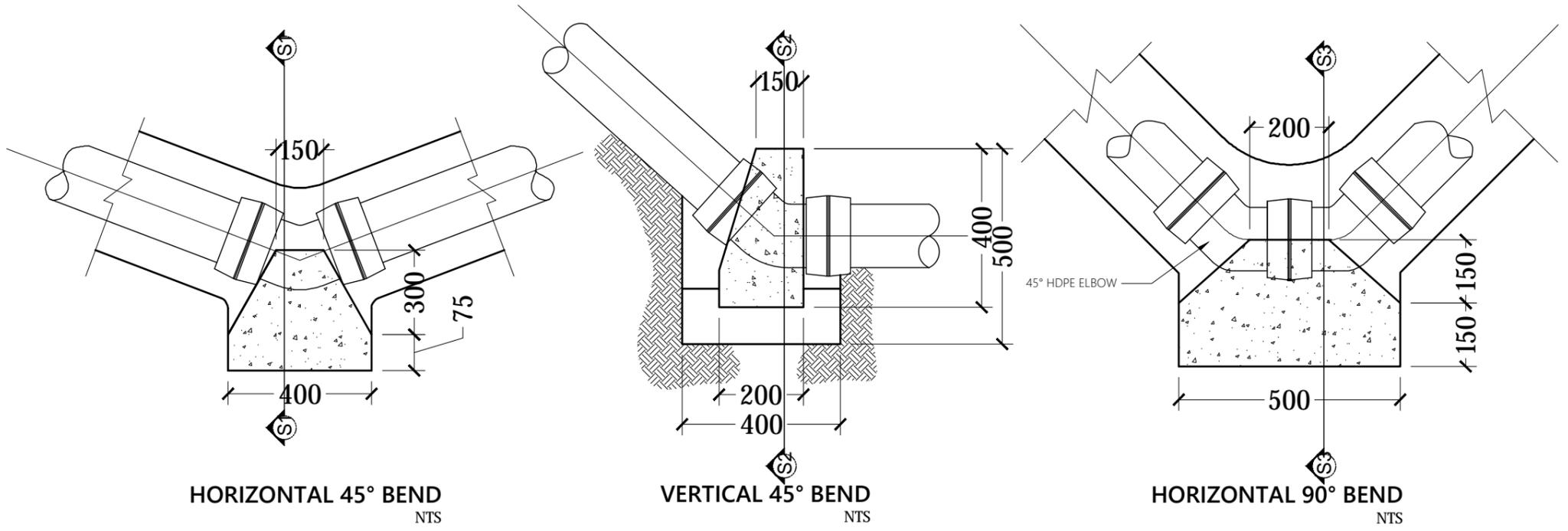
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Date: Aug 2020	SCALE (AS): 1:20
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-02

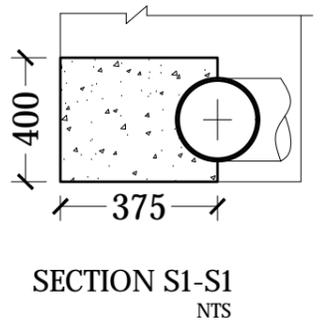
VALVE CHAMBER DETAILS



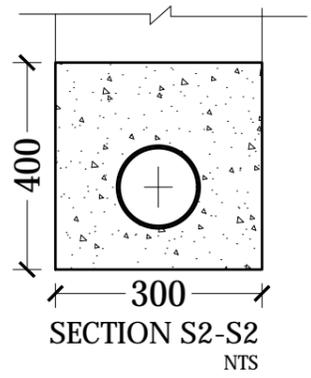
HORIZONTAL 45° BEND
NTS

VERTICAL 45° BEND
NTS

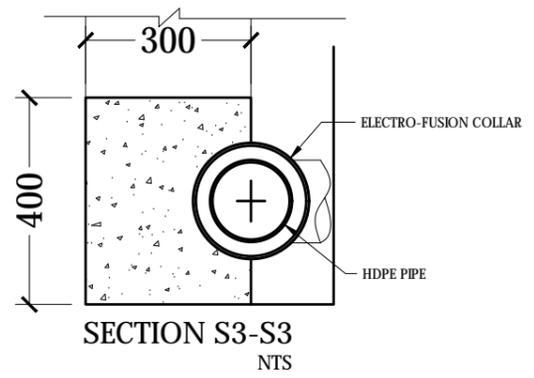
HORIZONTAL 90° BEND
NTS



SECTION S1-S1
NTS



SECTION S2-S2
NTS



SECTION S3-S3
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

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Date: Aug 2020	SCALE (AS): NTS
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Rev: R-01	Page: W-03



PUMP DETAILS

- Borehole Pump : 2 Nos
 - Flow (Q) = 20.37 m³/hr
 - Head (H) = 35 m
- High Pressure Pump : 2 Nos
 - Flow (Q) = 10.19 m³/hr
 - Pressure Range = 45-85 bar
- Transfer Pump : 2 Nos
 - Flow (Q) = 8.61 m³/hr
 - Head (H) = 16m
- Distribution Pump Set : 2 Nos
 - Flow (Q) = 14.4 m³/hr
 - Head (H) = 35 m
- Brine Pump : 2 Nos
 - Flow (Q) = 14.26 m³/hr
 - Head (H) = 29 m
- Rain Water lift Well Pump : 2 Nos
 - Flow (Q) = 54.79 m³/hr
 - Head (H) = 17m
- UF Feed Pump : 2 Nos
 - Flow (Q) = 2.5 m³/hr
 - Head (H) = 35 m

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

Legend

- Ø90 HDPE (PE100, PN10, SDR17)
- Ø63 HDPE (PE100, PN10, SDR17)
- Ø110 HDPE (PE100, PN10, SDR17)
- Ø160 HDPE (PE100, P10, SDR17)
- Ø110 HDPE (OUTFALL PE100, PN16, SDR11)
- Ø300 HDPE (RAINWATER PE100, PN6, SDR26)

Notes:

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

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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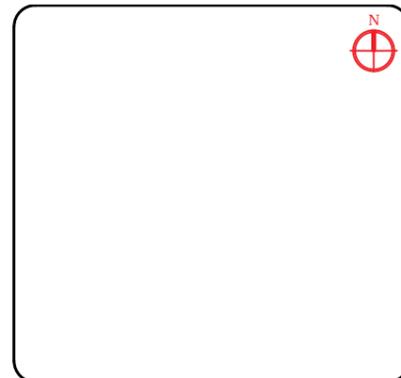
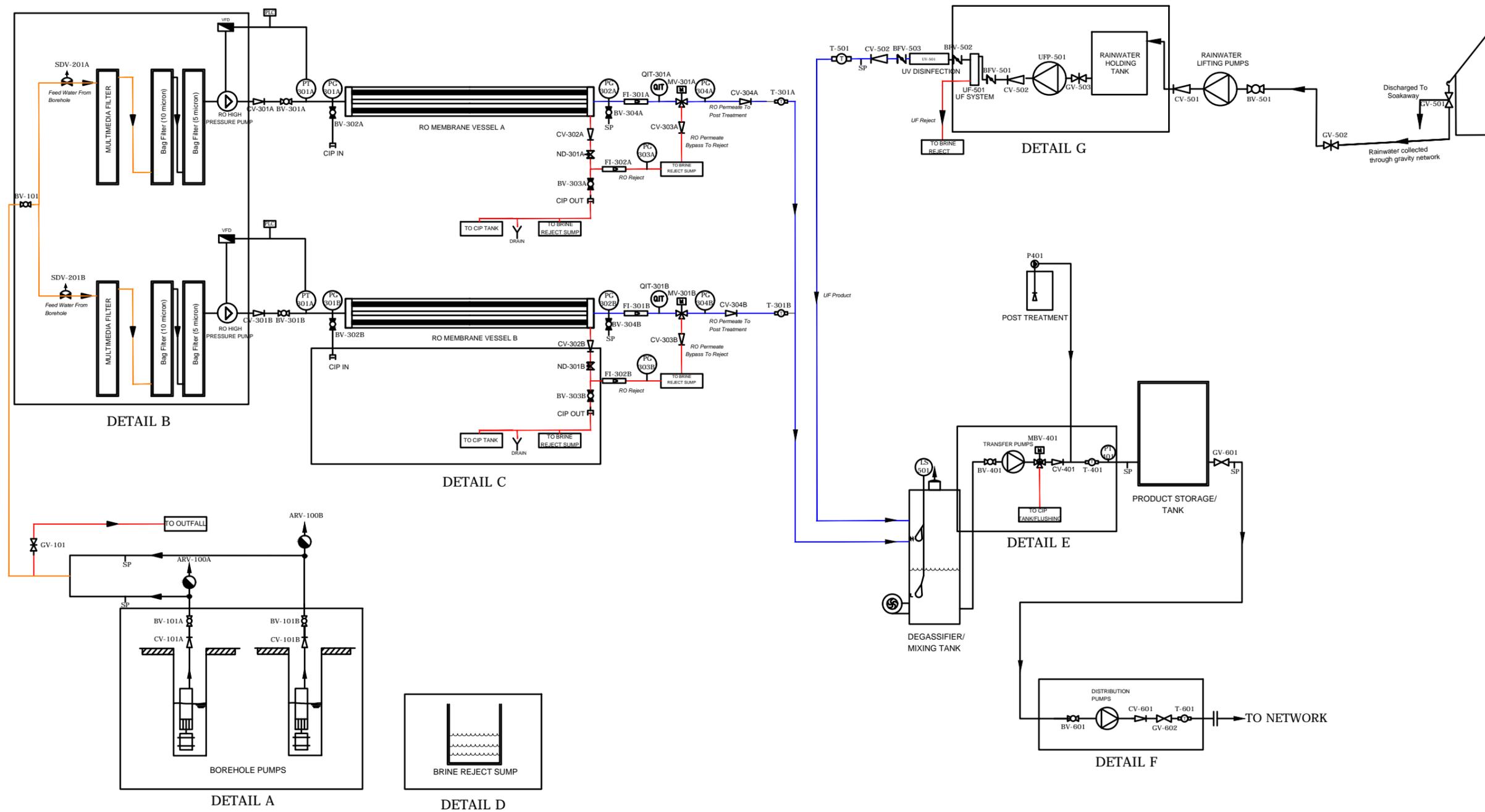
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Date: Aug 2020	SCALE (AS): 1:200
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-04



INTERNAL PIPE LAYOUT

1:200



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

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

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

IWRM PLANT P&I OVERVIEW

NTS

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

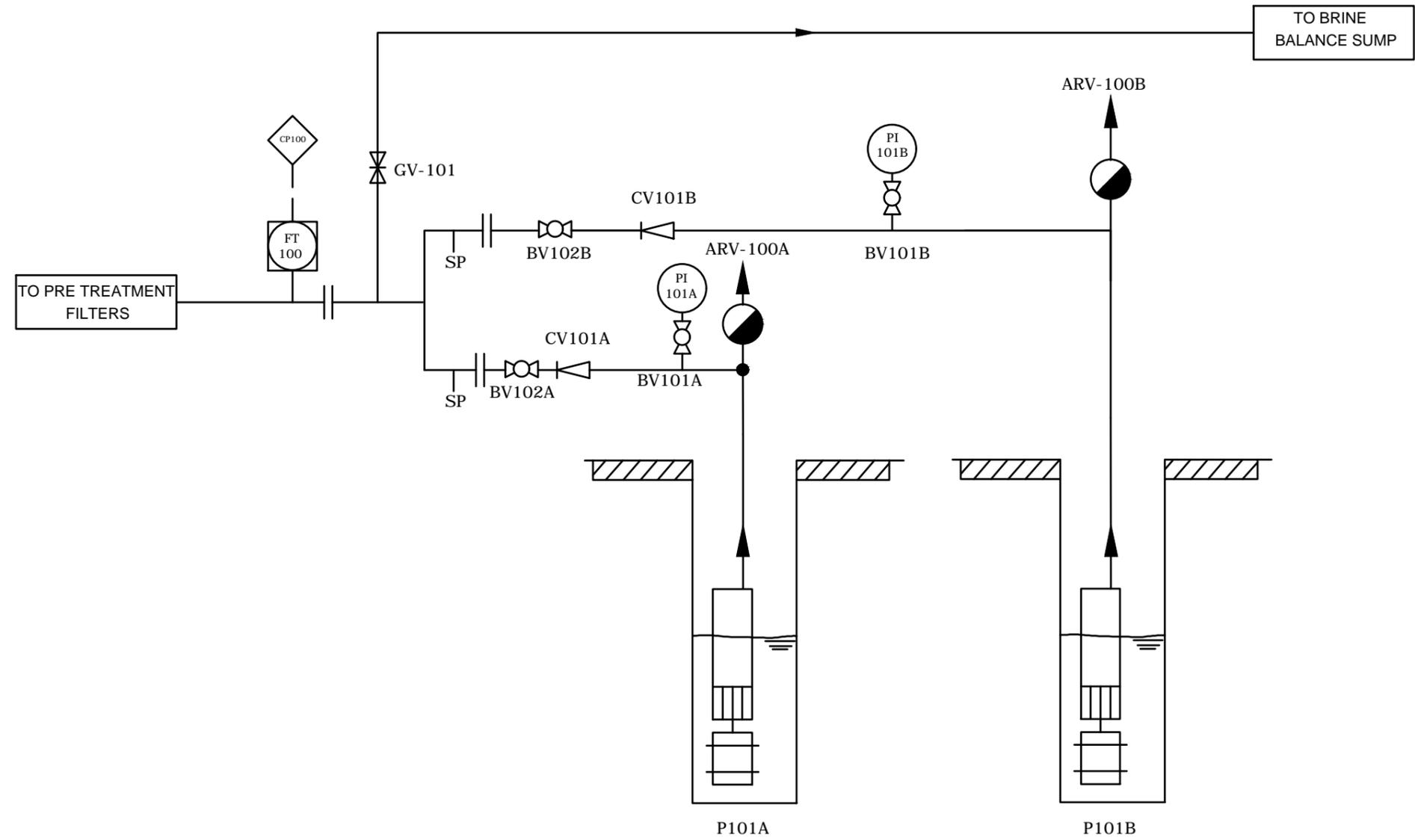
Sub Title:
Water Supply System in L.Hithadhoo

Client:
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Project No: EP-WS/2019/06	
Rev: R-01	Page: W-05



BOREHOLE PUMPS

DETAIL A

Legend

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

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

LEGEND

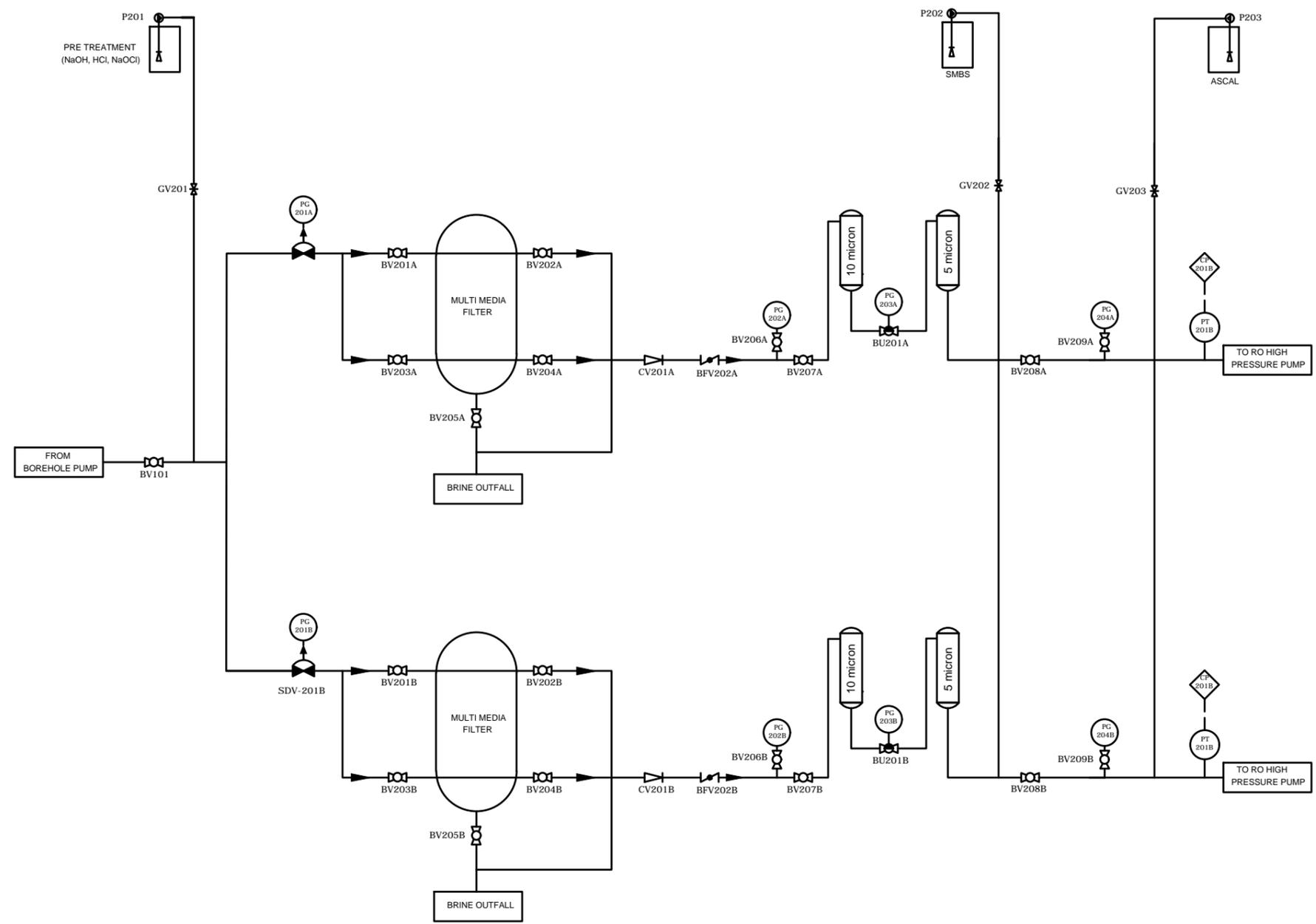
ACTUATION	VALVES	FEATURES	CONDITION	ABBREVIATIONS
MANUALLY OPERATED DIAPHRAGM - SINGLE ACTING DIAPHRAGM - DOUBLE ACTING PNEUMATIC PISTON	BUTTERFLY BALL DIAPHRAGM 3-WAY SLUICE MOTORIZED BALL TORTALIZER GATE CHECK VALVE MOTORIZED 3 WAY	FLANGED CONNECTION TRAP DISCHARGE TO ATMOSPHERE SAMPLING POINT FLOW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

IWRM PLANT P&I DETAIL A

NTS

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Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (AS): 1:20
Project No: EP-WS/2019/06	Page: R-01
	W-06



DETAIL B

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

Legend

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

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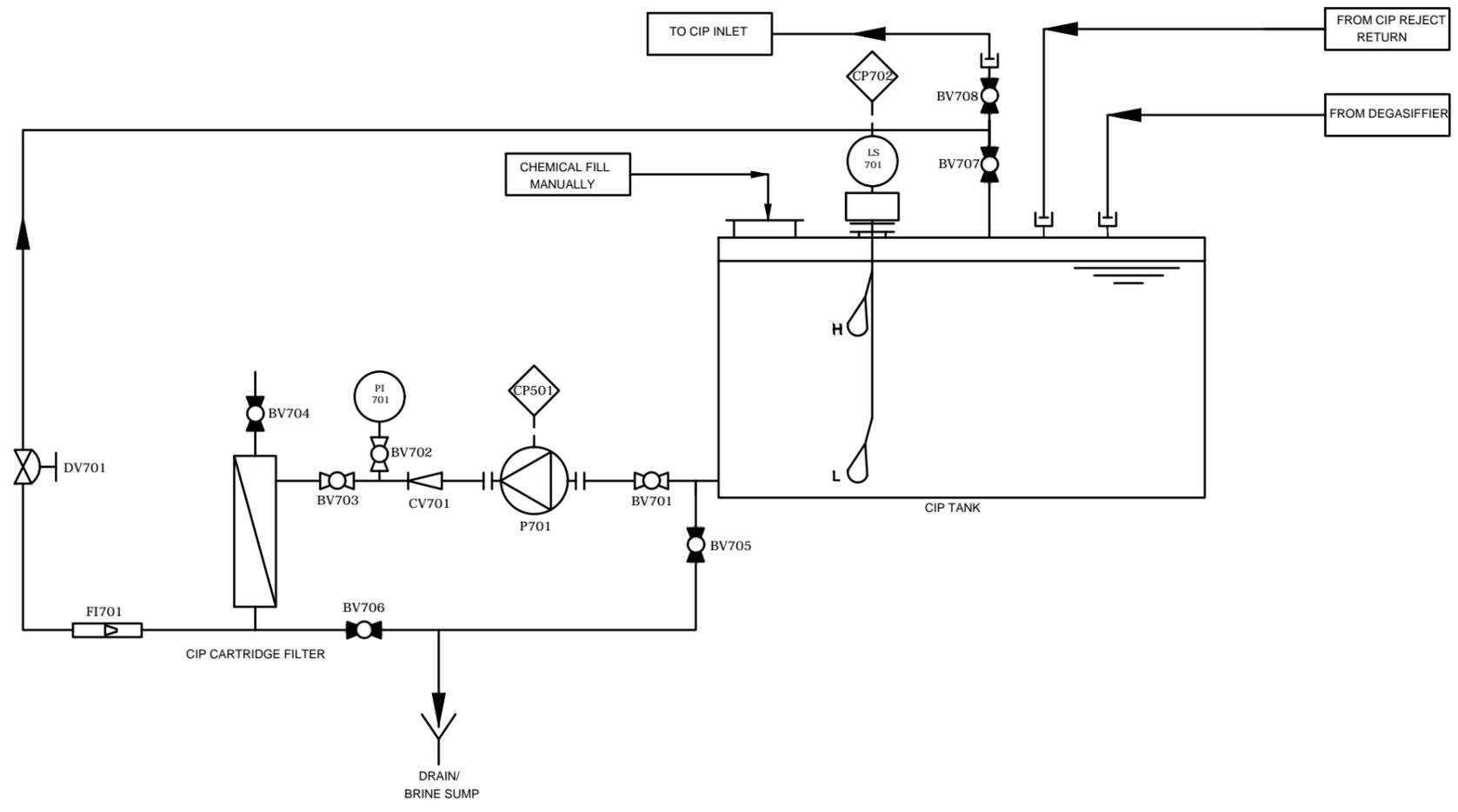
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 Date: Aug 2020 SCALE (AS): 1:20
 Project No: EP-WS/2019/06
 Rev: R-01 Page: W-07



DETAIL C

Legend

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

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

LEGEND

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

IWRM PLANT P&I DETAIL C

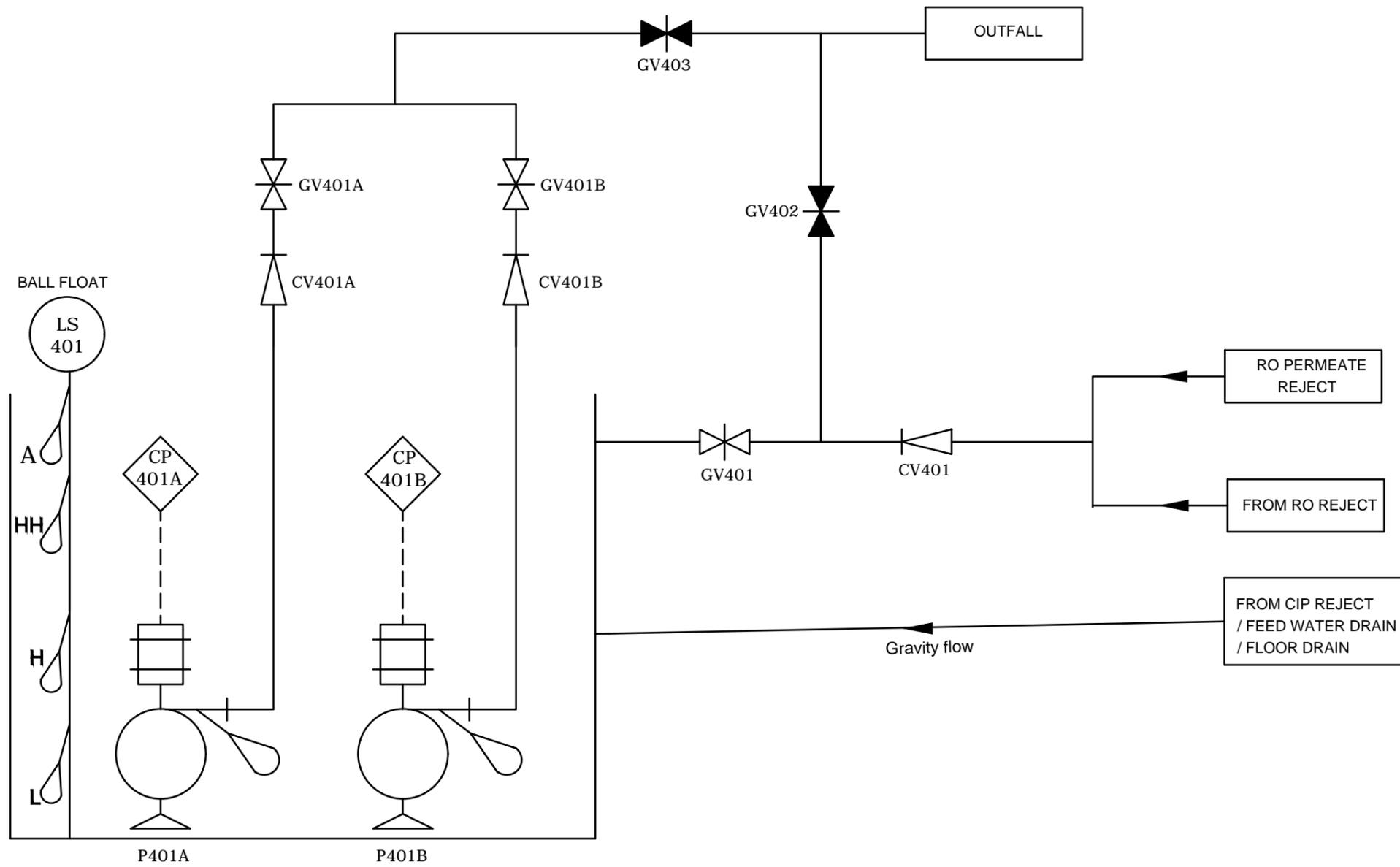
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Title:
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Sub Title:
Water Supply System in L.Hithadhoo
Client:
Ministry of National Planning, Housing and Infrastructure, Republic of Maldives

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Hunshheema Magu, Male', Maldives

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Rev: R-01	Page: W-08



BRINE BALANCE SUMPS

DETAIL D

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

IWRM PLANT P&I DETAIL D

NTS



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

Sub Title:
Water Supply System in L.Hithadhoo

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



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



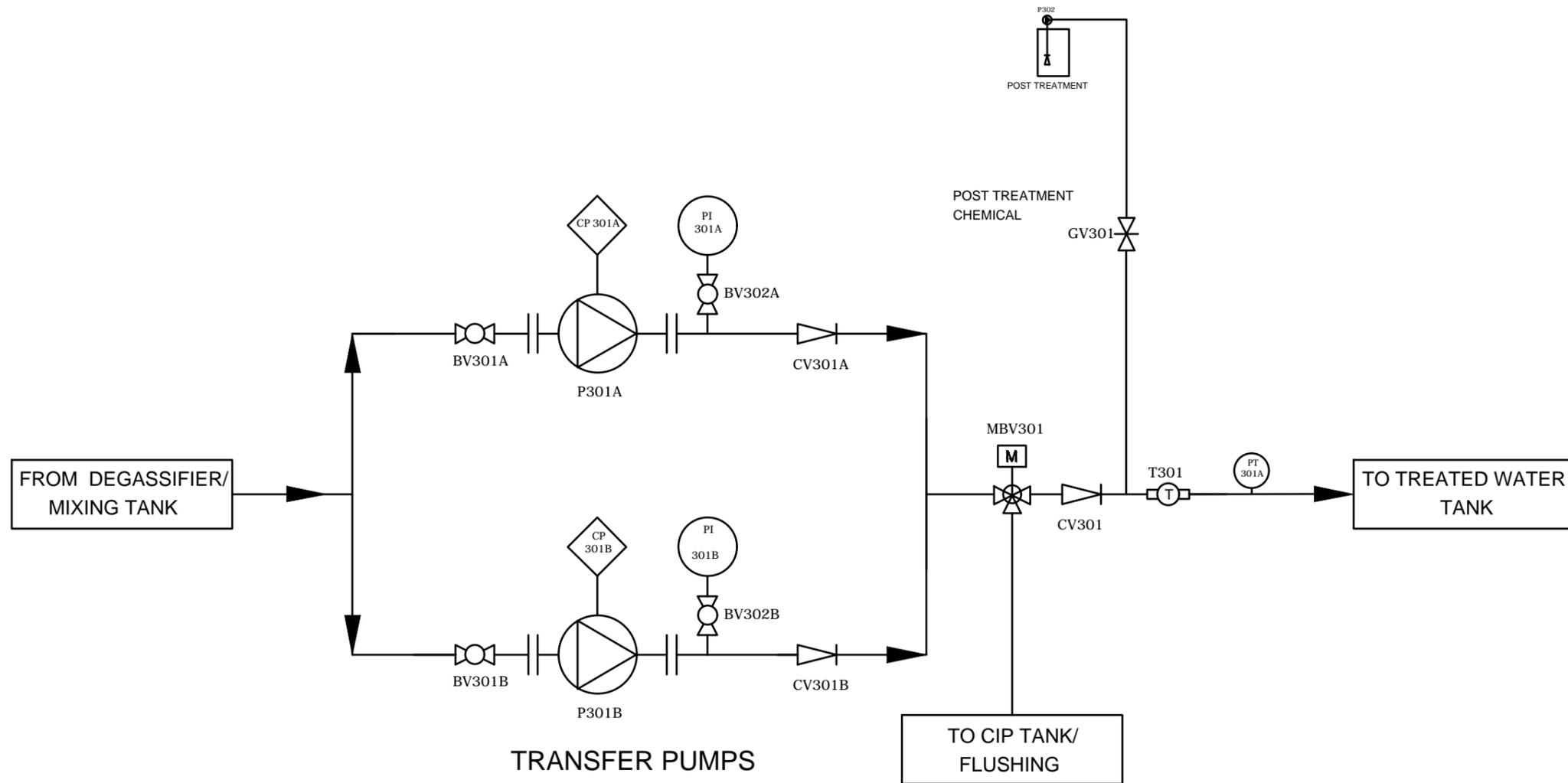
Drawn: F.I.A. Checked: M.S.S.

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

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

Project No: EP-WS/2019/06

Rev: R-01 Page: W-09



TRANSFER PUMPS

DETAIL E

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

Legend

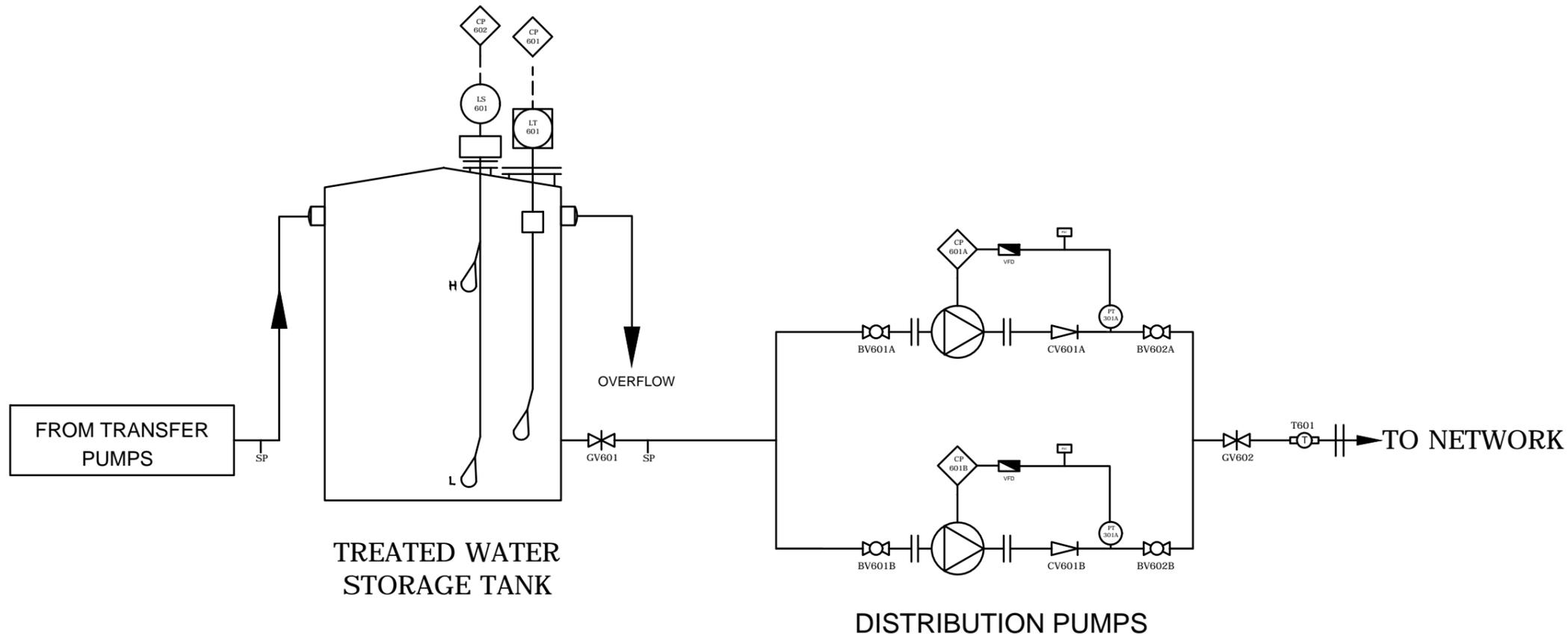
REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R00	JUNE 2020	STAGE -1	PD	SBC	SD

Title:
 Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6
 Sub Title:
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Date: Aug 2020	SCALE (AS): 1:20
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-10



DETAIL F

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

IWRM PLANT P&I DETAIL F

NTS



Legend

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

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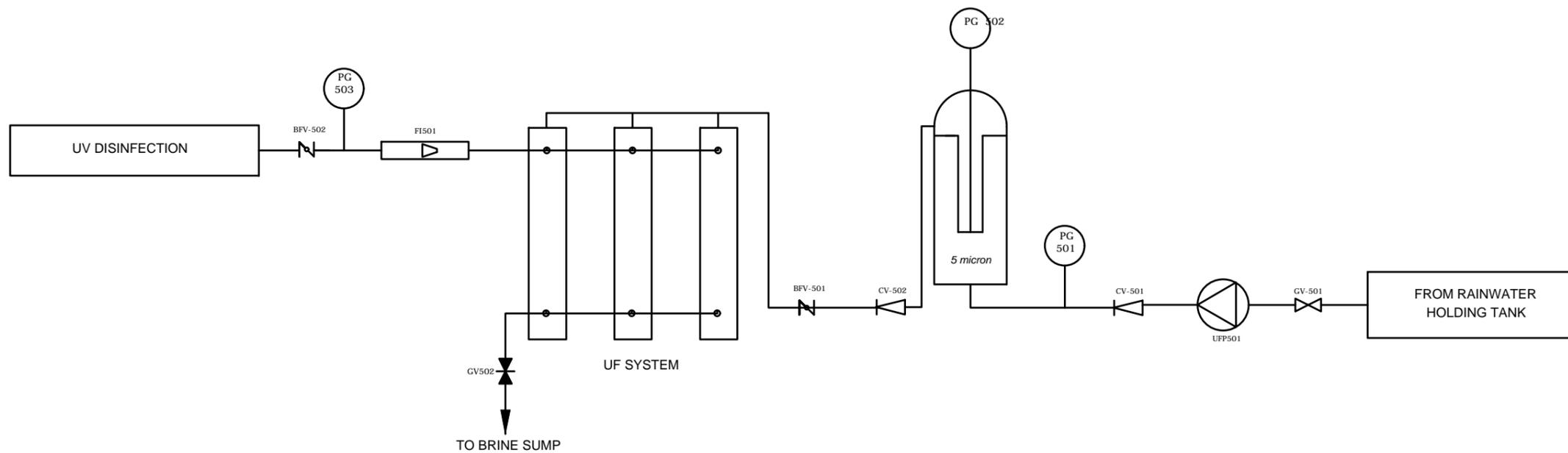
Designed: F.I.A. Approved: I.W.

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

Project No: EP-WS/2019/06

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UV DISINFECTION



Legend

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

DETAIL G

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

IWRM PLANT P&I DETAIL G

NTS

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

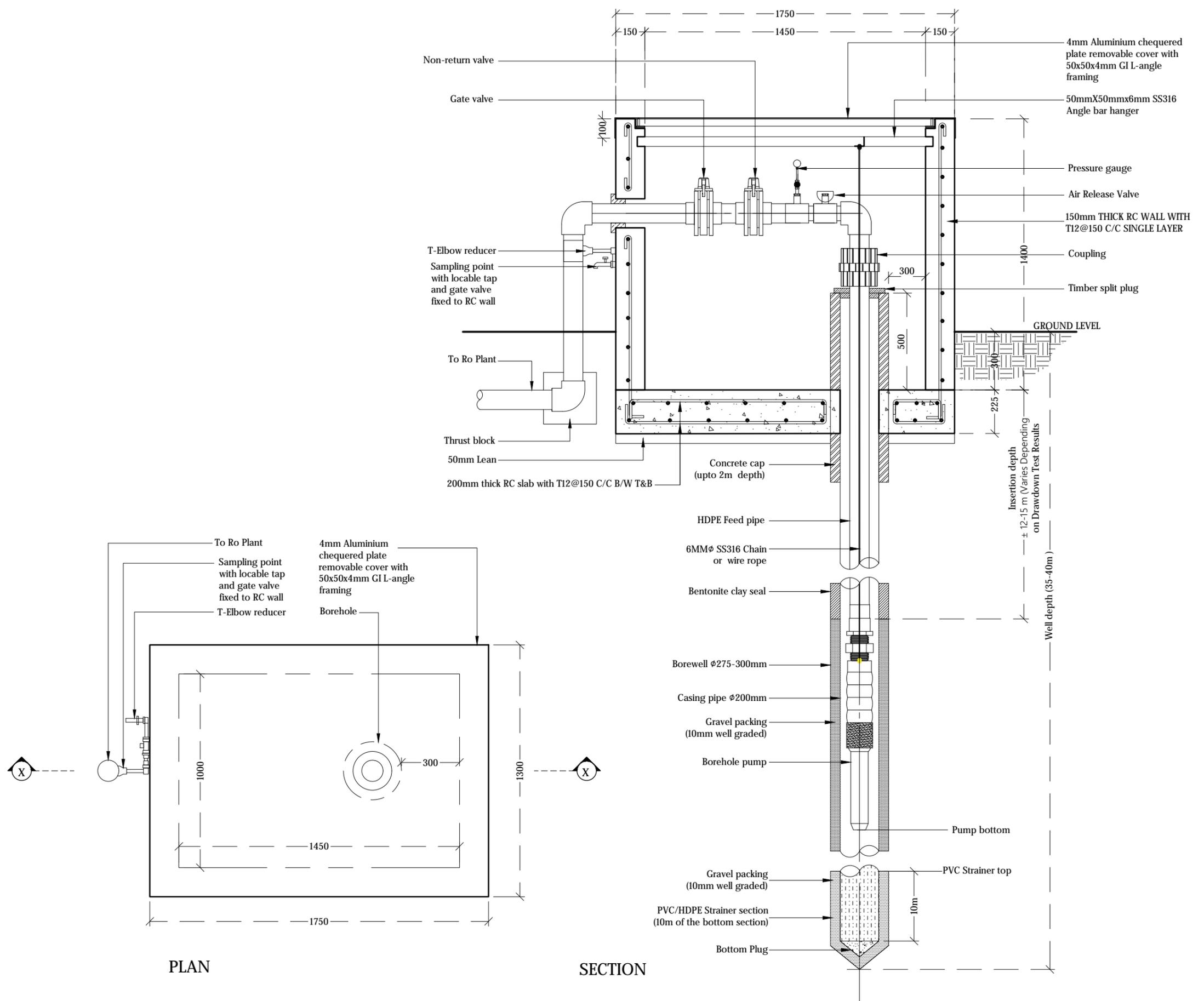
Sub Title:
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Date: Aug 2020	SCALE (A3): 1:20
Project No: EP-WS/2019/06	
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Legend

- 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 should 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.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Sub Title:
Water Supply System in L.Hithadhoo

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

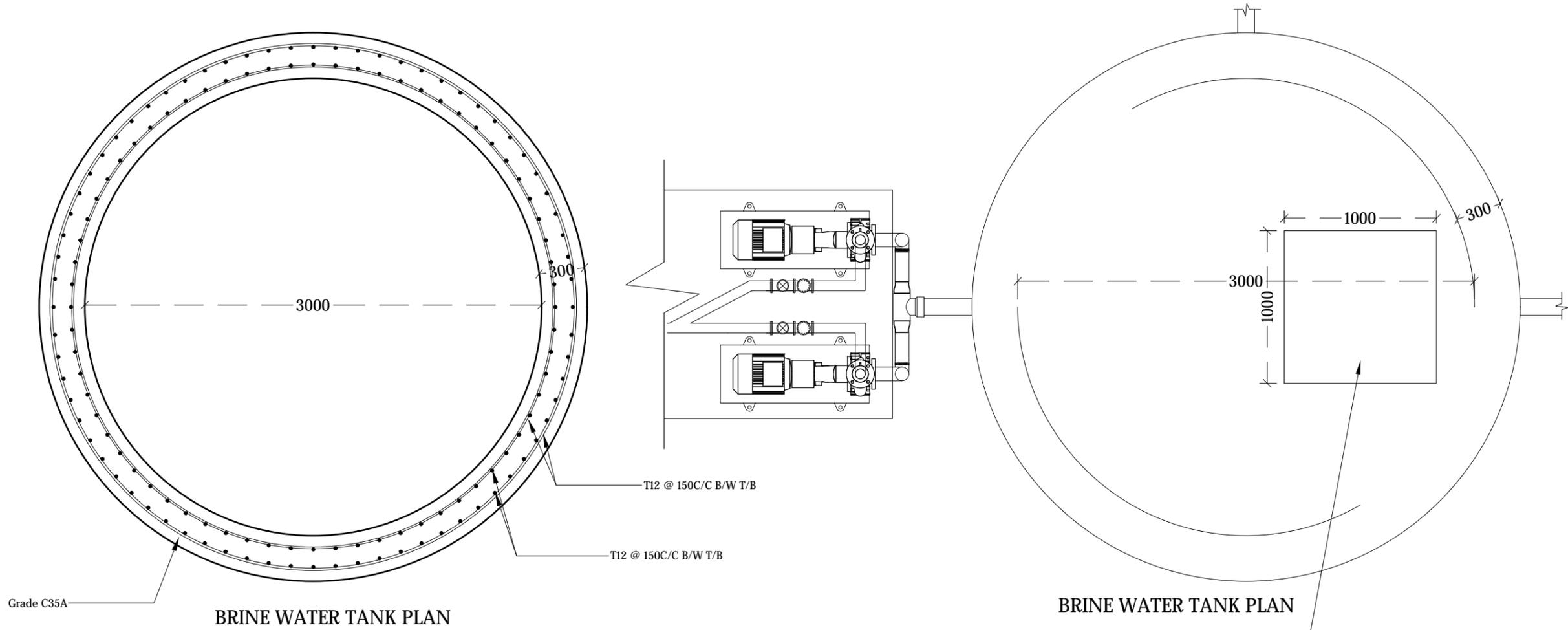
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Date: Aug 2020	SCALE (AS): NTS
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-13

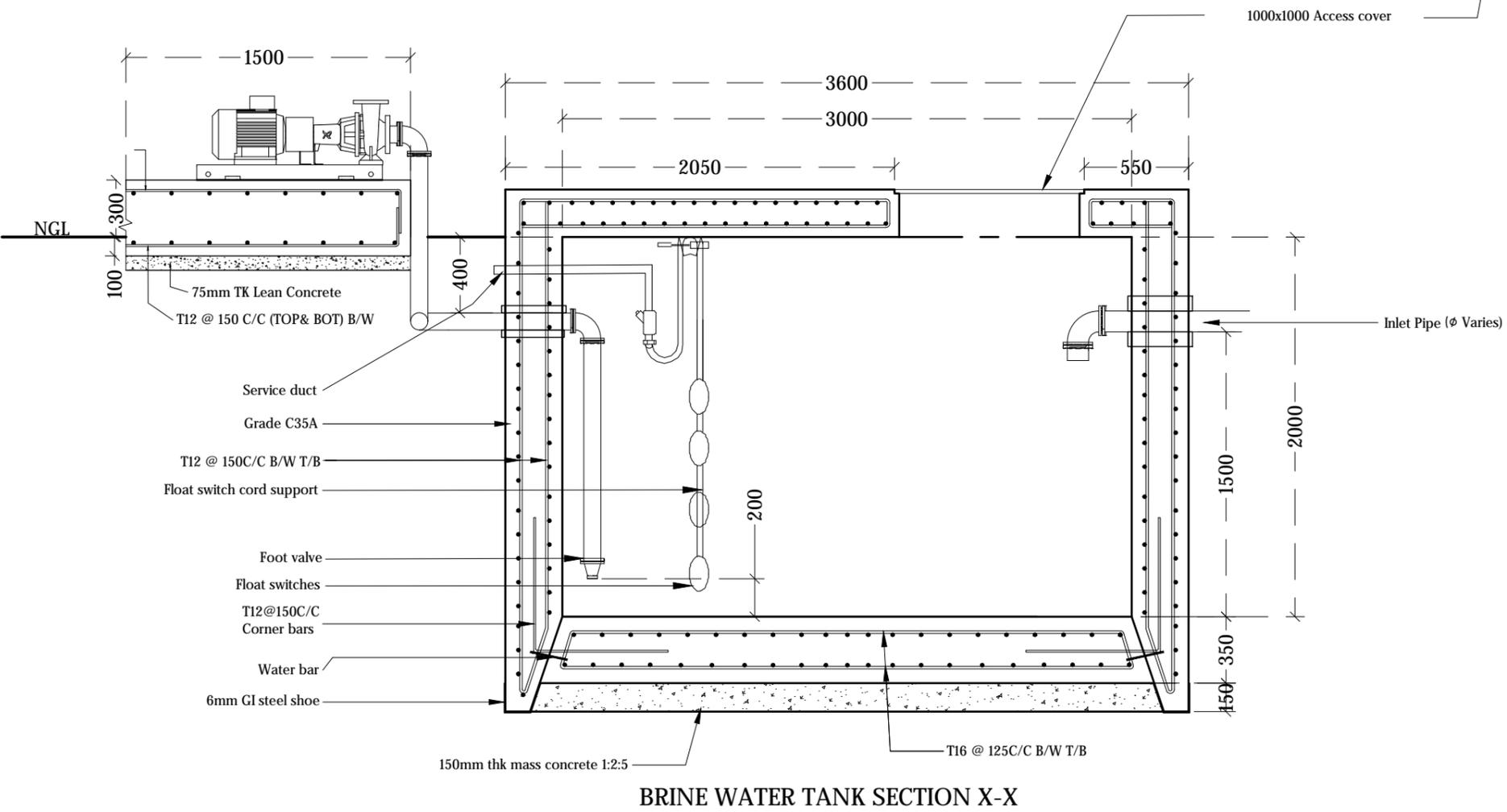
BOREHOLE DETAILS

NTS



BRINE WATER TANK PLAN

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

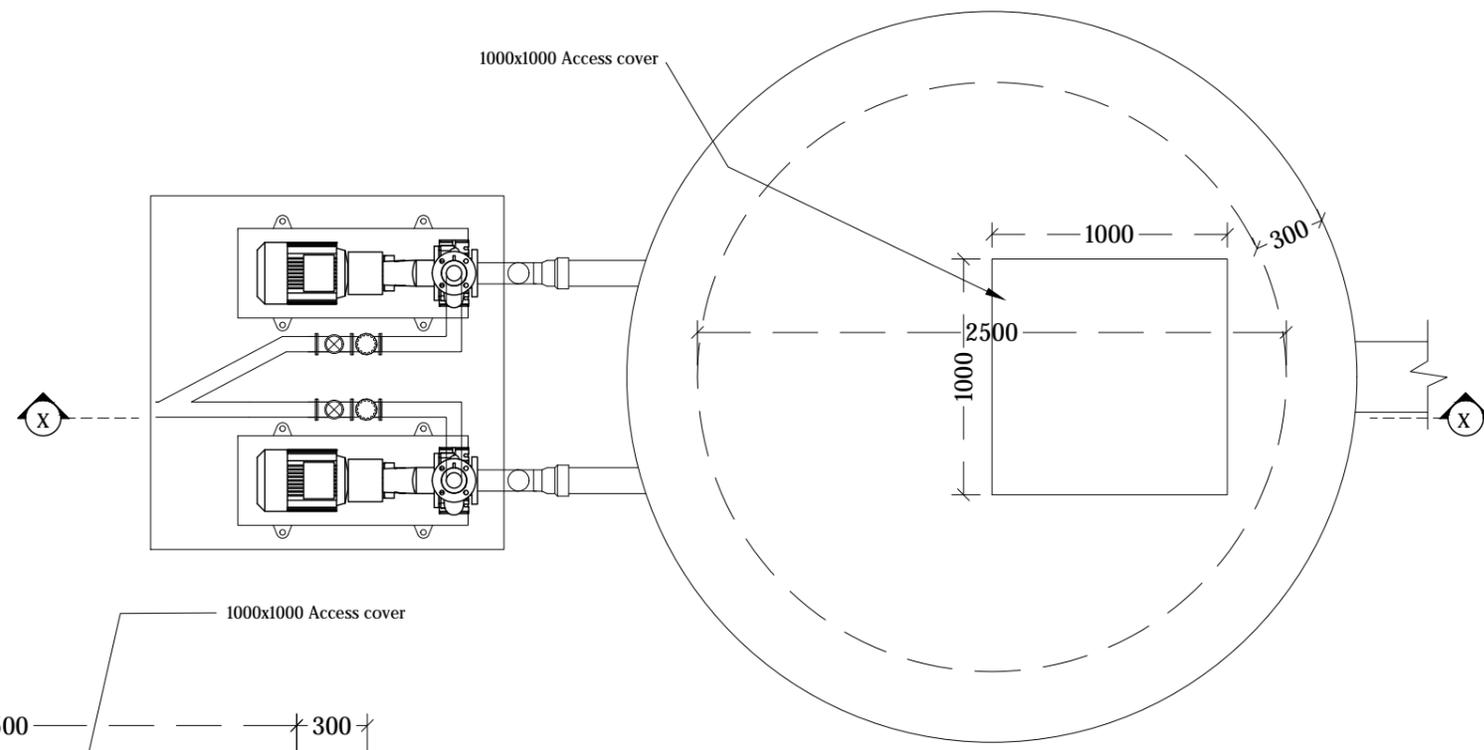
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Water Supply System in L.Hithadhoo

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

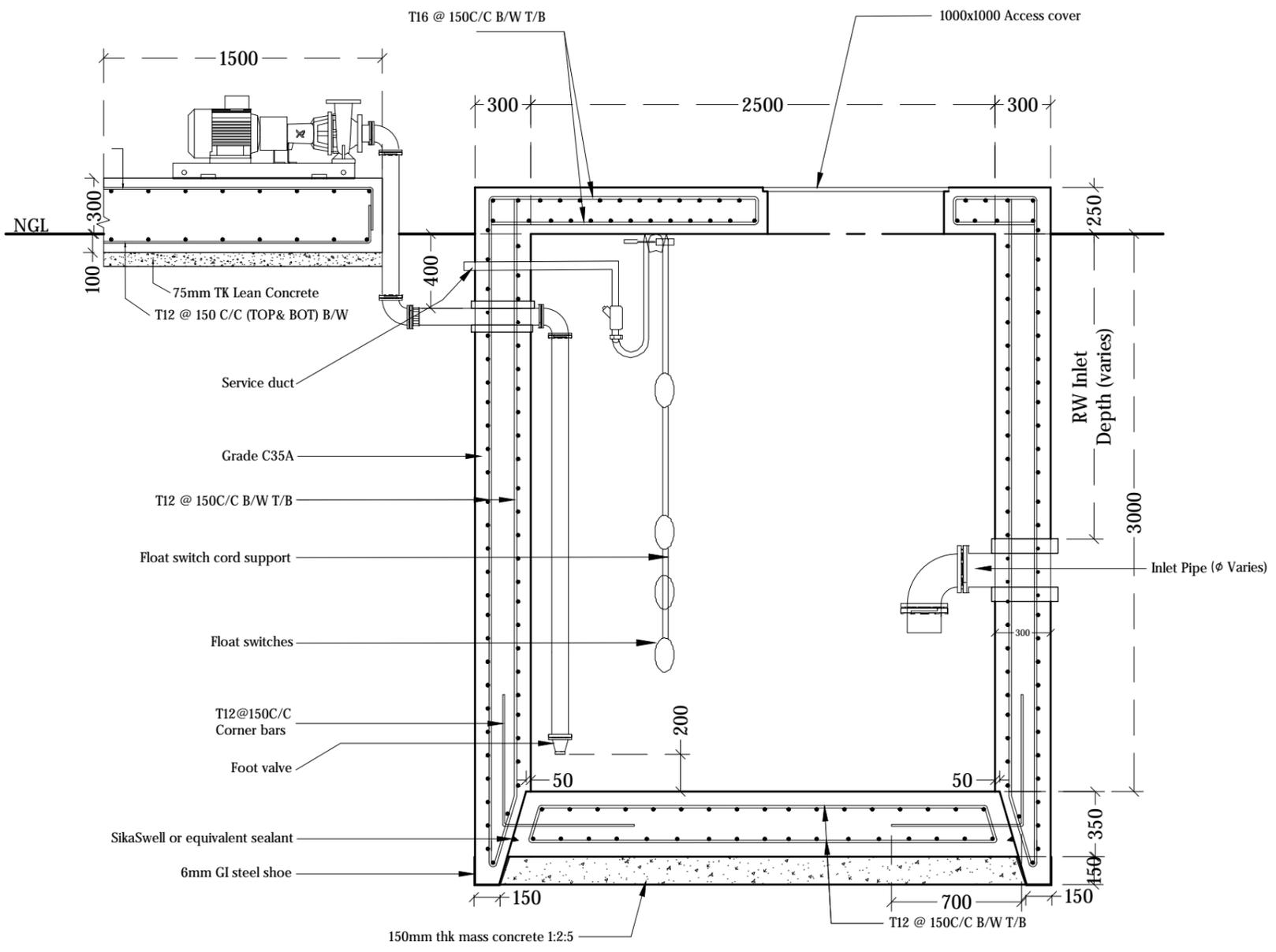
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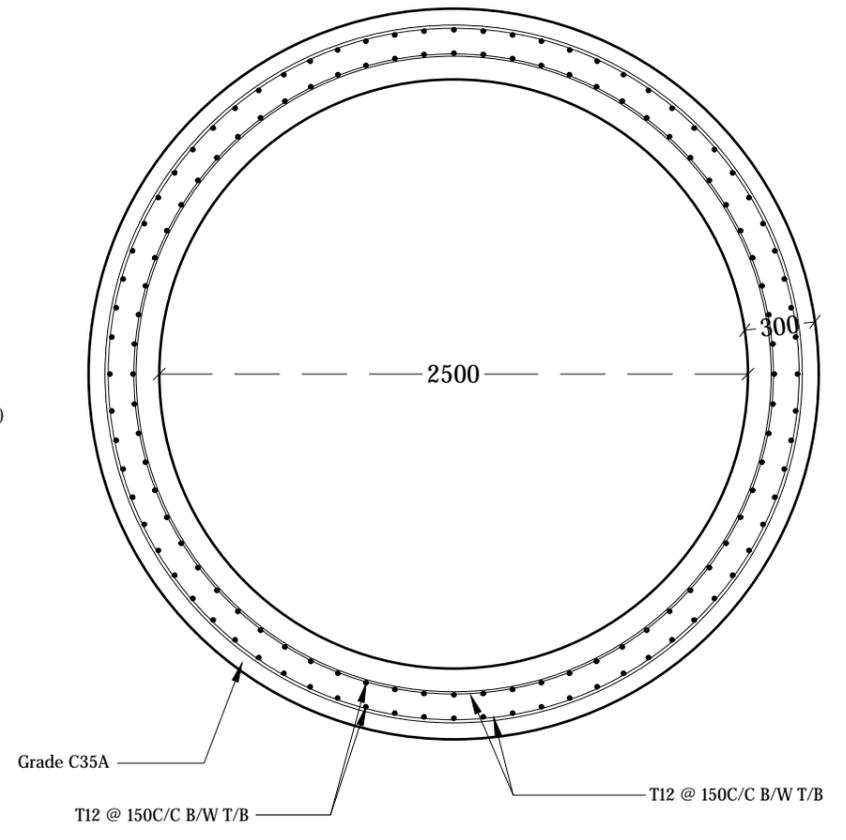
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Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (AS): 1:30
Project No: EP-WS/2019/06	
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RAIN WATER LIFT WELL PLAN



RAIN WATER LIFT WELL SECTION X-X



RAIN WATER LIFT WELL PLAN - STRUCTURAL

RAINWATER LIFT WELL DETAILS

Legend

- Note:
- Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
 - The rainwater lift well will have a filter to prevent entry of debris and dirt.
 - 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 polyethylene.
 - All concrete cold joints shall be casted with bonding agent.
 - Corner bars (4T16@75C/C T&B) shall be provided around top slab opening.

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

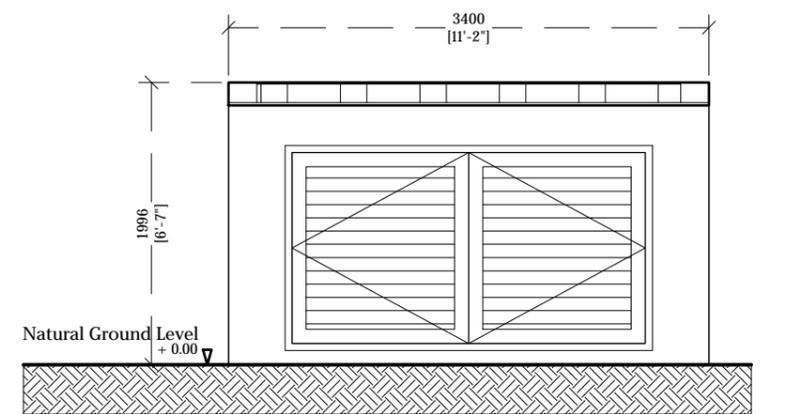
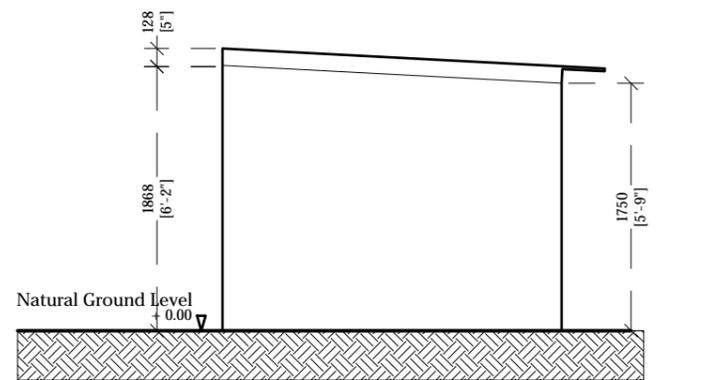
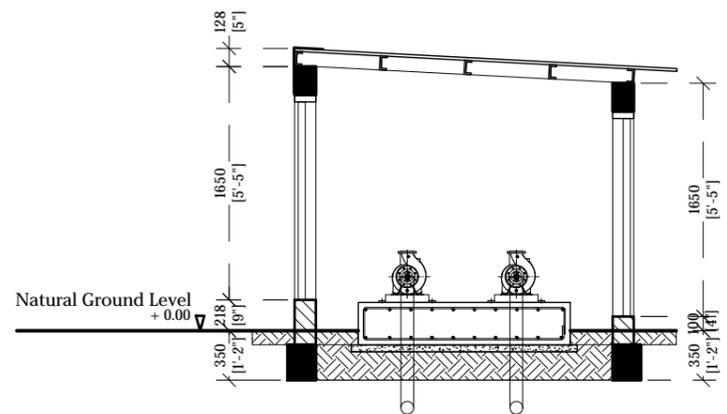
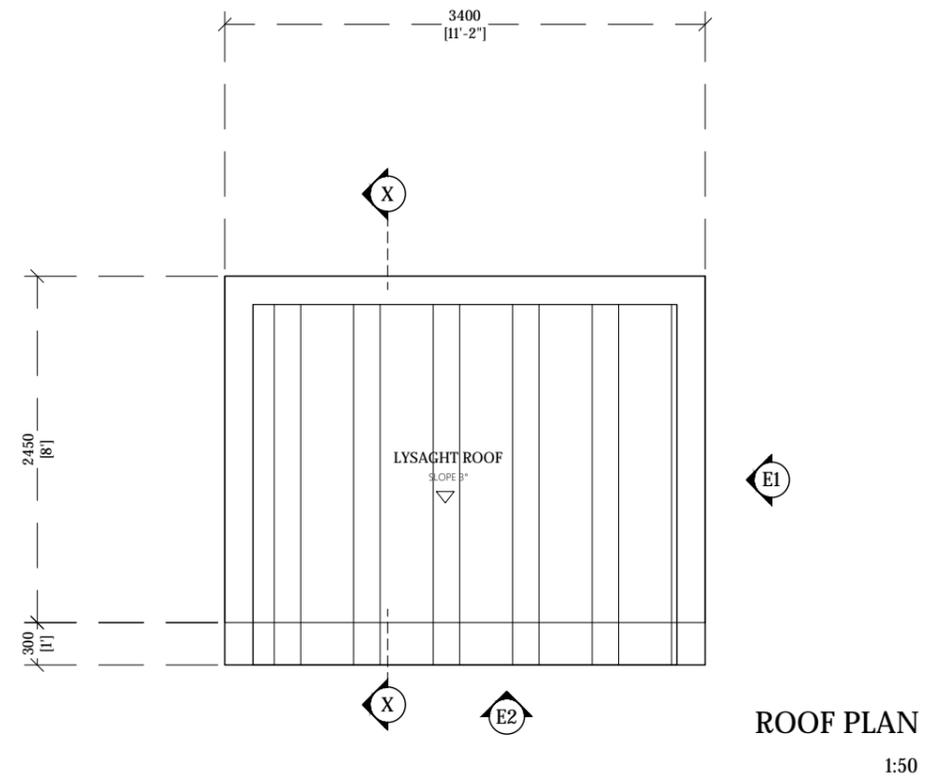
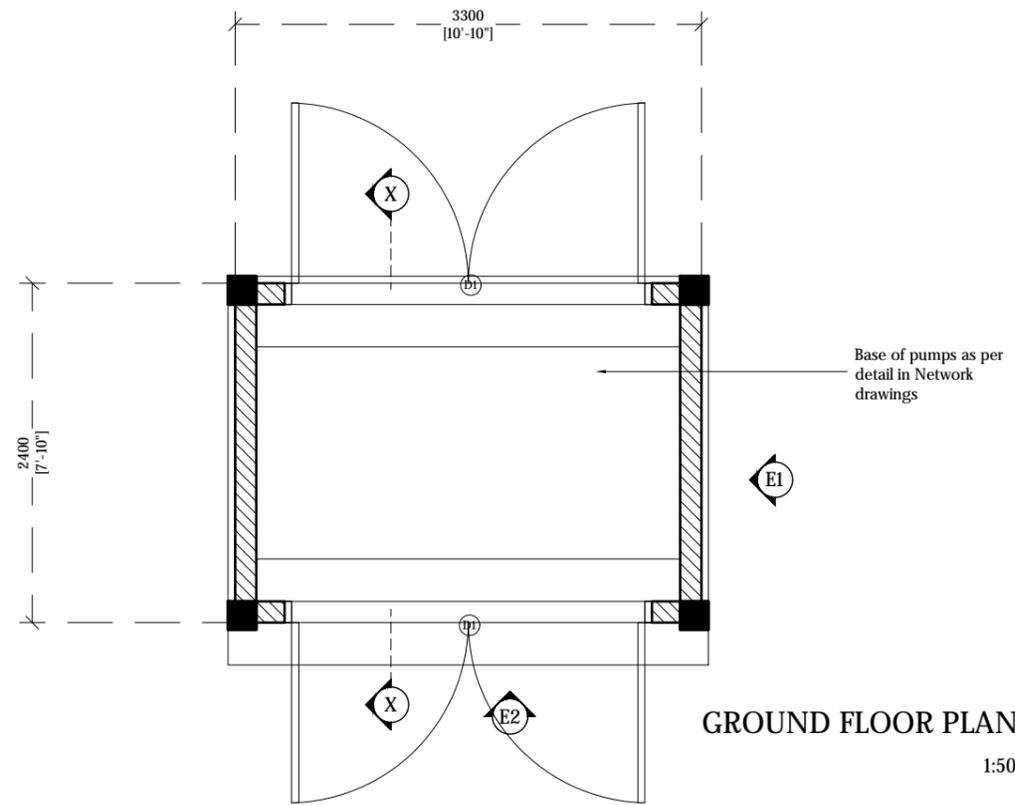
Sub Title:
Water Supply System in L.Hithadhoo

Client:
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 Building Self-Constructors Alliance

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Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (AS): 1:30
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-15



PUMP SHED DETAILS



Legend

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

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

Sub Title:
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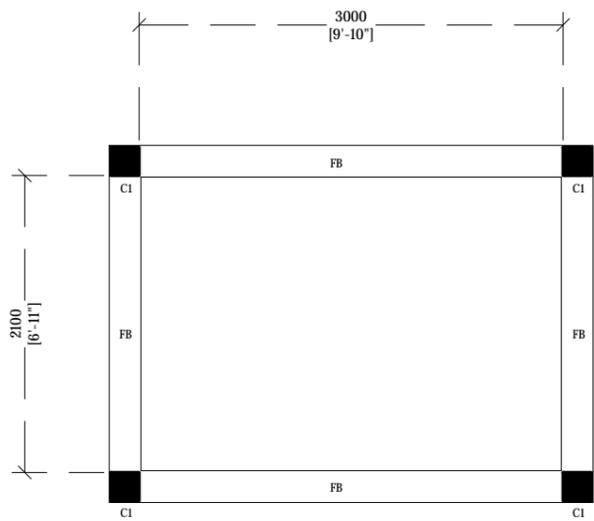
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Date: Aug 2020 SCALE (A3): -

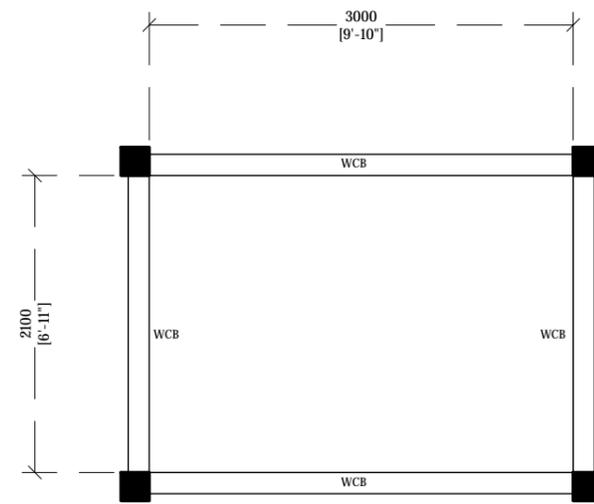
Project No: EP-WS/2019/06

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GROUND FLOOR PLAN

1:100



ROOF PLAN

1:100

Legend

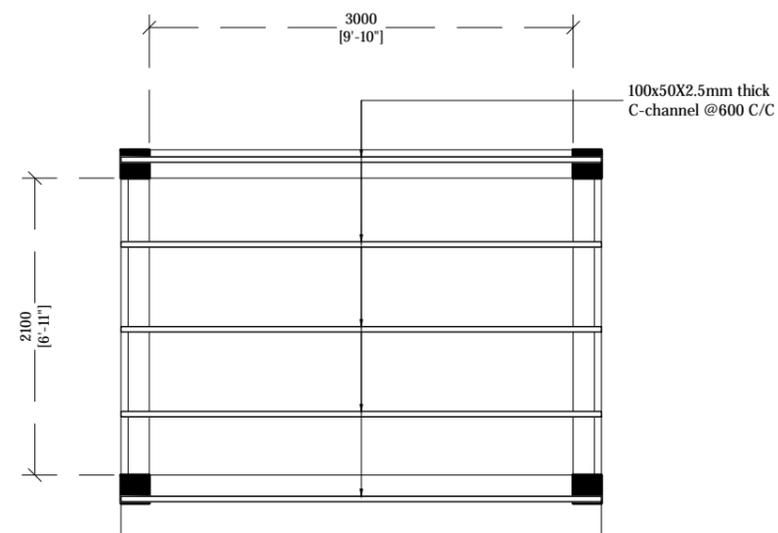
Notes:

- 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 be casted with bonding agent
- Roof purlins shall be fixed to roof beam with hot-dip galvanized bolts and GI cleats

Door ID		<p>General Door Notes:</p> <p>Dimensions shown on DWG indicate effective openings of frame</p> <p>All frame depths are 100mm All door panel thicknesses are 35mm All window panel thickness are 25mm Al frame edges shall be trimmed 3mm</p> <p>All wooden components should be wood stained finish</p> <p>All glazing should be of 6mm unless specified</p> <p>External units must comply the following weather conditions:- Wind pressure: 200 kg/sqm Water tightness: 25 kg/sqm</p> <p>All external frames / wall joints must be sealed with silicon sealant and the wedges trimmed with 12X12mm hardwood beading fixed to frames by brass nails</p> <p>All hardware should be provided for the performance of all functions of the units</p> <p>Hinges shall confirm to</p> <ol style="list-style-type: none"> 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 <p>Locks shall be cylindrical with master key sets</p> <p>Door knobs shall be 1000mm above FFL</p>
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	-	

Door Schedule

1:100



ROOF PLAN

1:100

PUMP SHED DETAILS

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Sub Title:
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Client:
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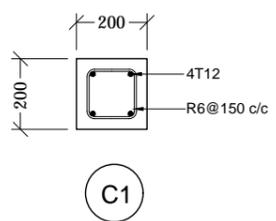


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Date: Aug 2020 SCALE (AS): 1:100

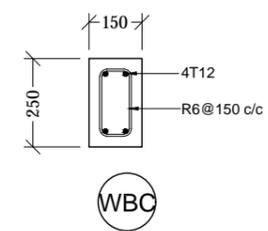
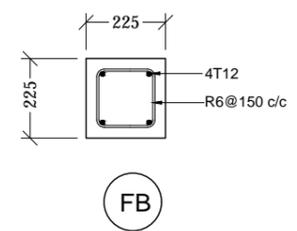
Project No: EP-WS/2019/06

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COLUMN DETAIL

1:20



BEAM DETAILS

1:20

Legend

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

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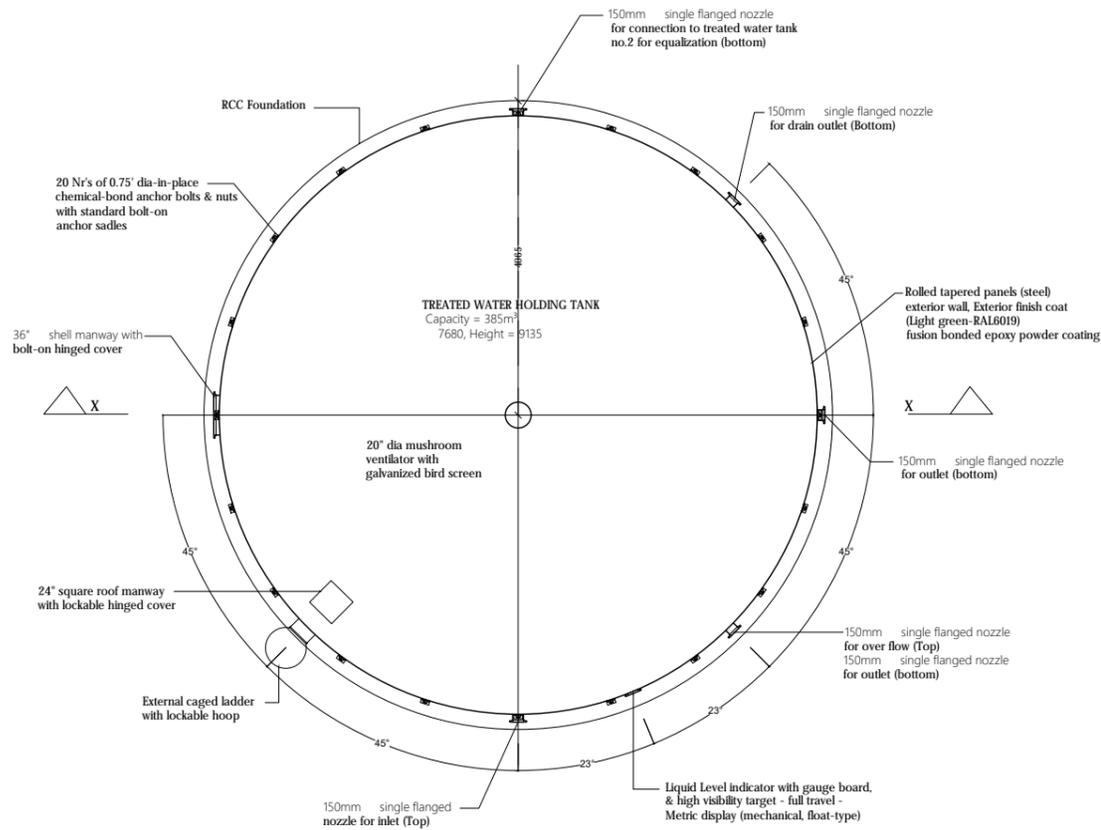


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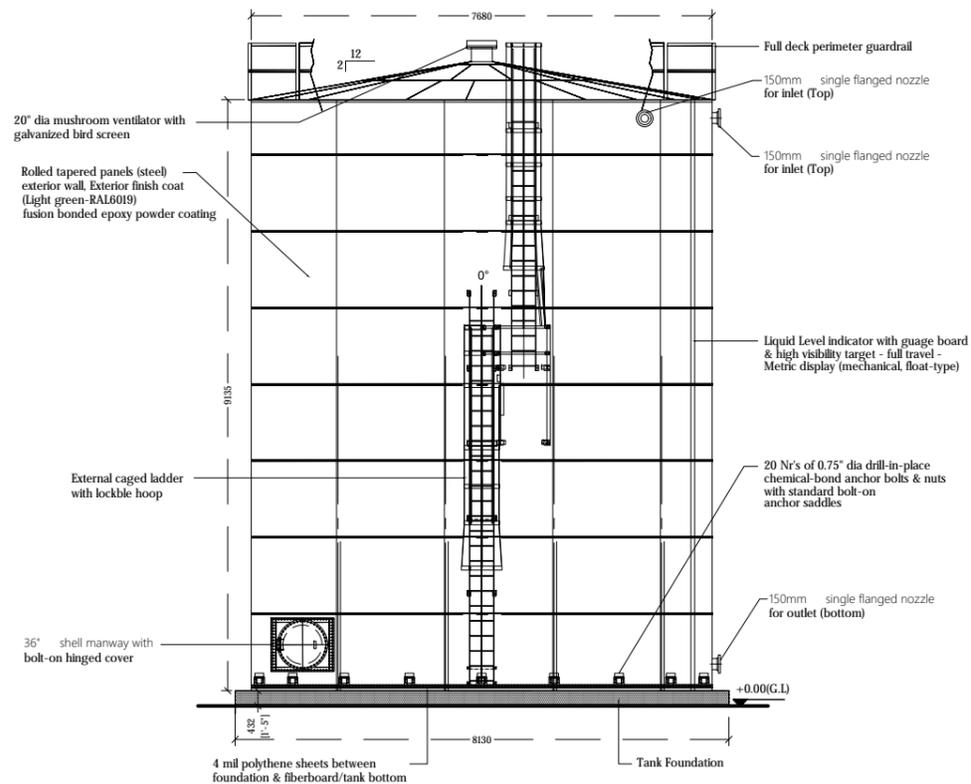


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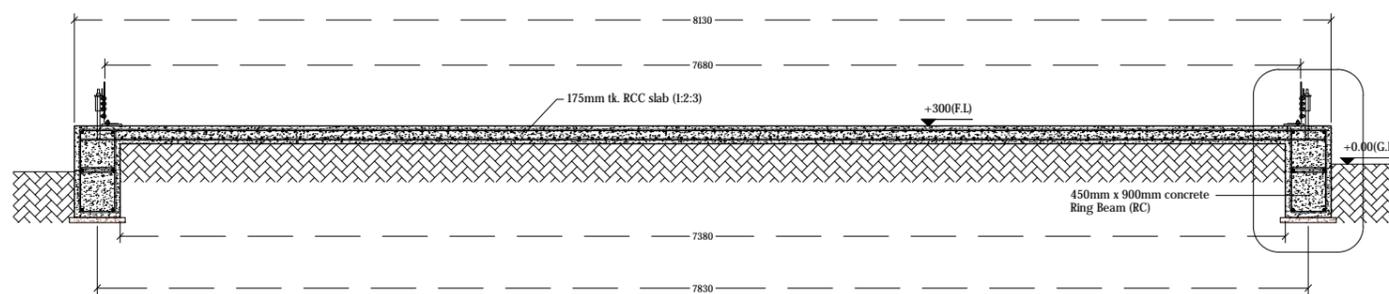
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Date: Aug 2020	SCALE (AS): 1:20
Project No: EP-WS/2019/06	
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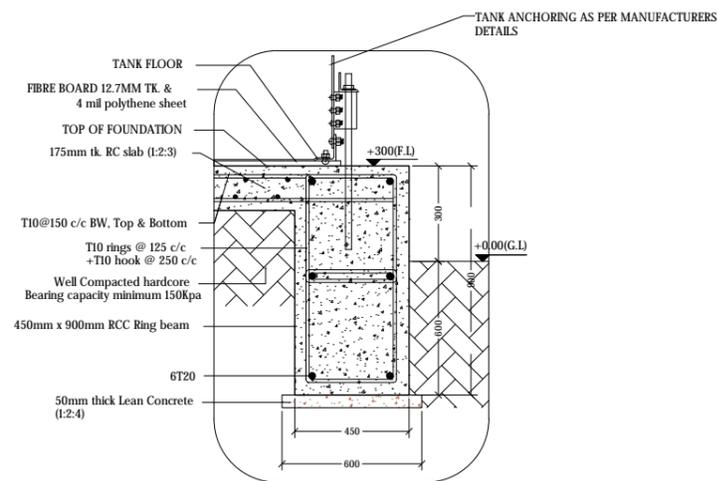
TREATED WATER HOLDING TANK AND FOUNDATION- PLAN



TREATED WATER HOLDING TANK AND FOUNDATION- ELEVATION



SECTION X-X



DETAIL

Note:-
Cover = 50mm
Lap length 50

TREATED WATER TANK DETAILS

Legend

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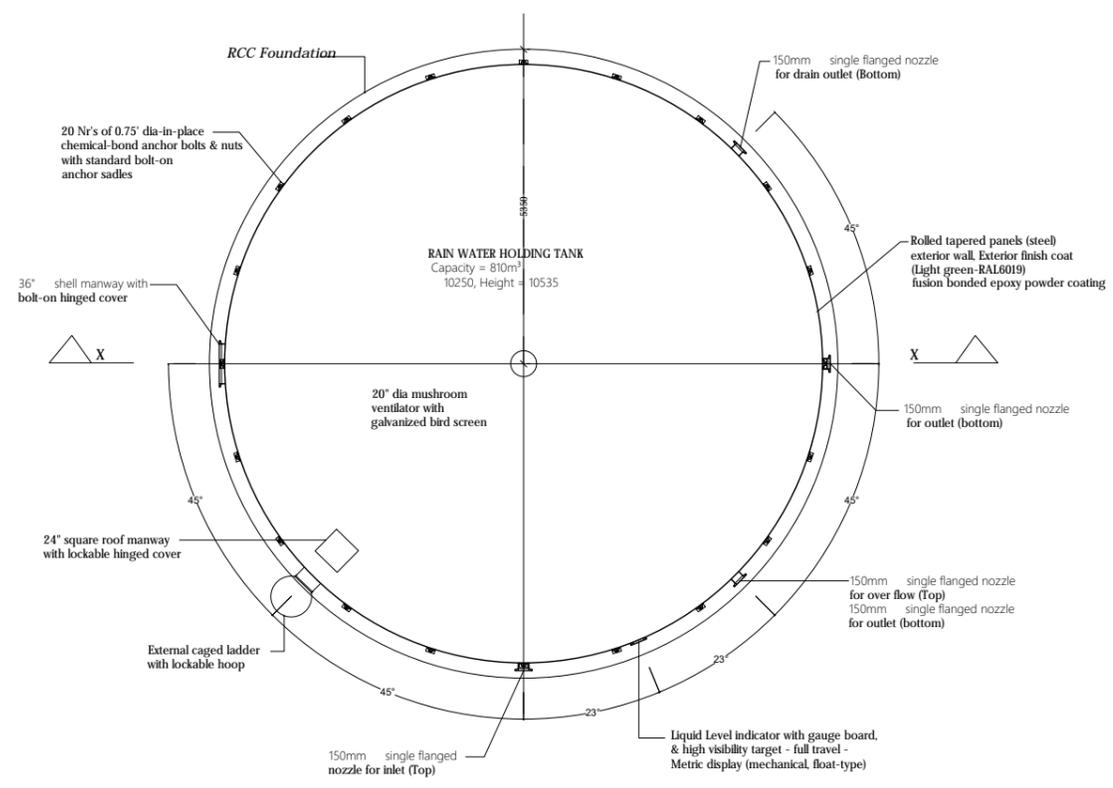
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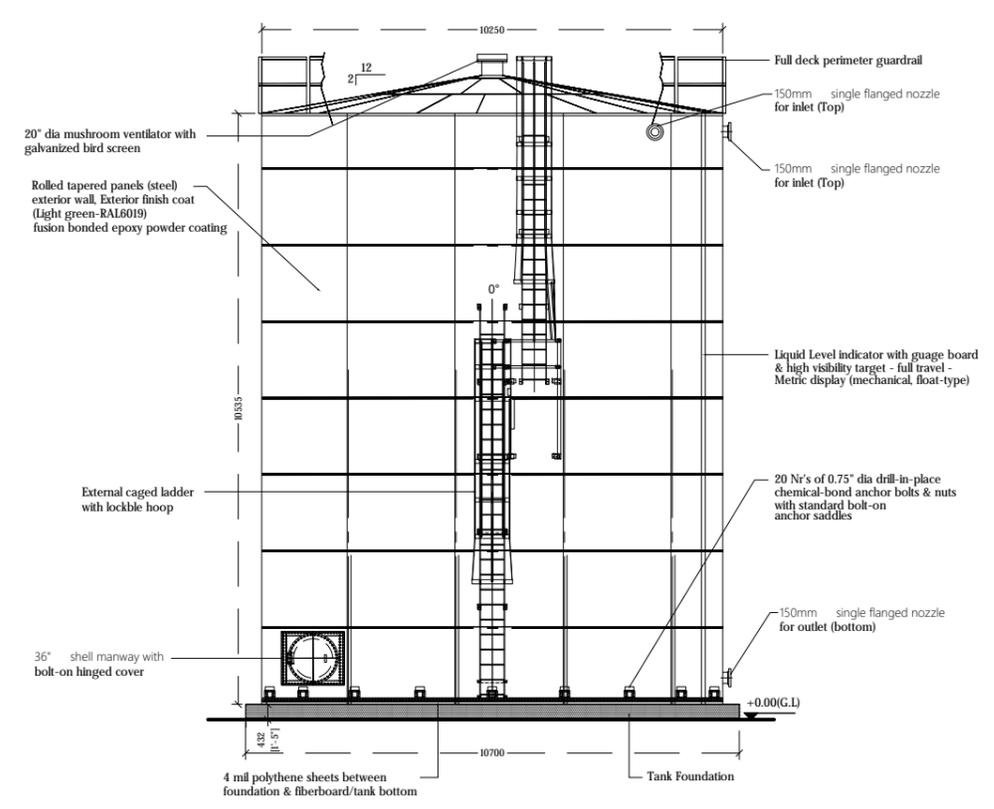
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Project No: EP-WS/2019/06

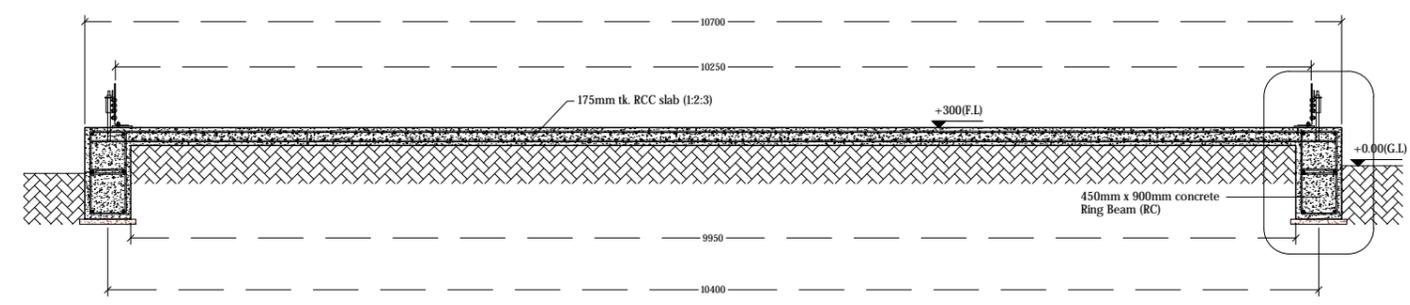
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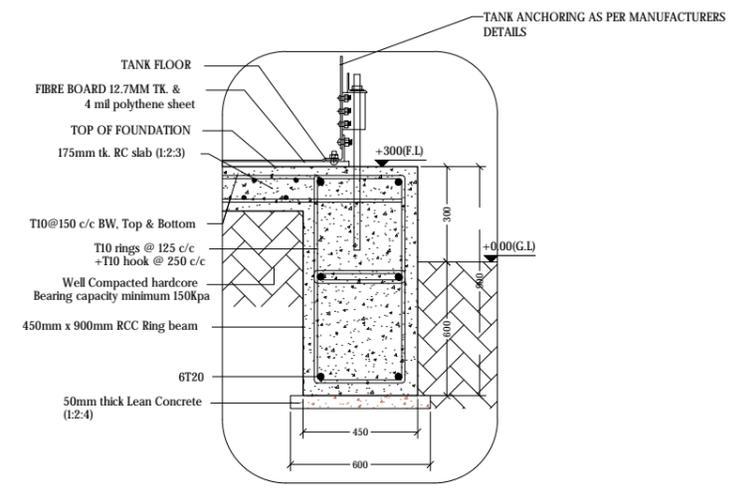
RAINWATER HOLDING TANK AND FOUNDATION- PLAN



RAINWATER HOLDING TANK AND FOUNDATION- ELEVATION



SECTION X-X



DETAIL

Note:-
Cover = 50mm
Lap length 50

RAINWATER HOLDING TANK DETAILS

Legend

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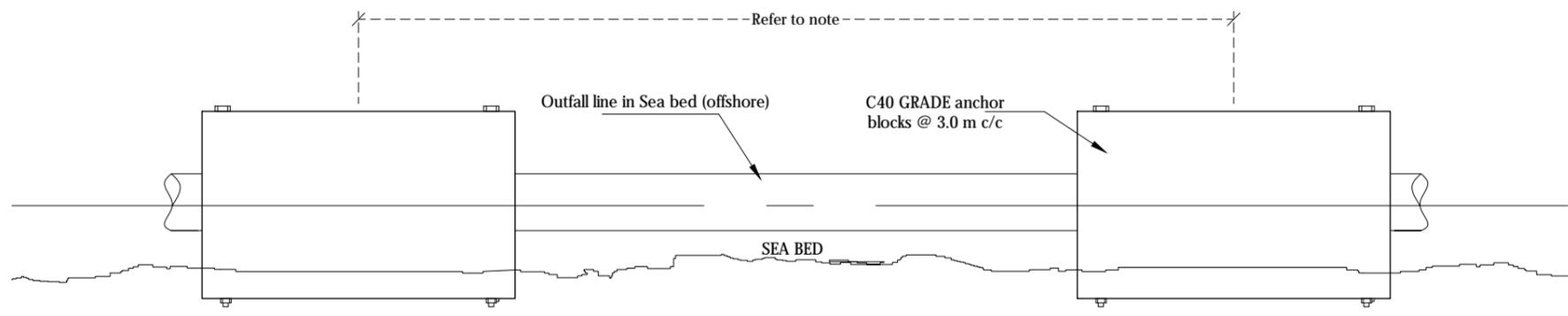
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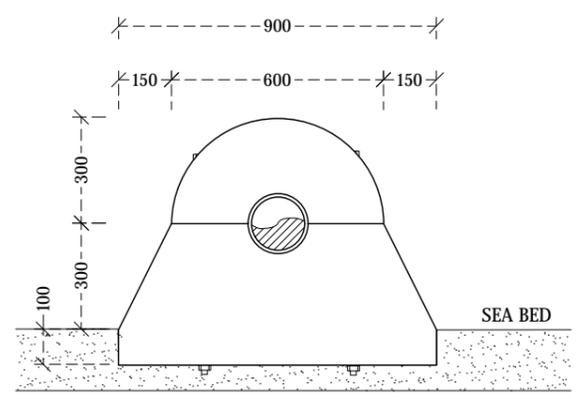
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Maldivian Infrastructure Developer

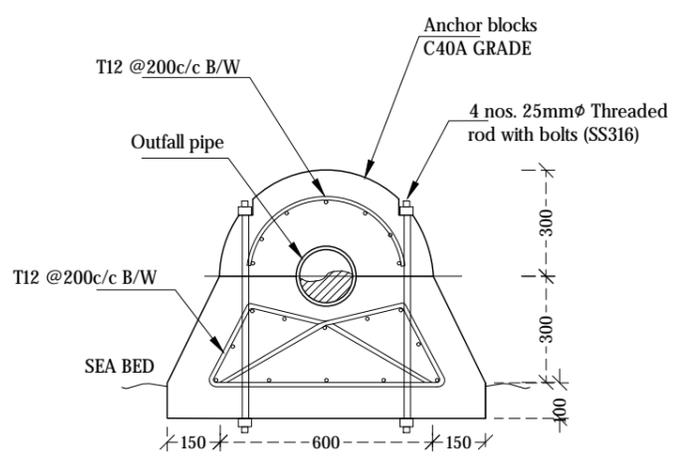
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Project No: EP-WS/2019/06	Page: R-01



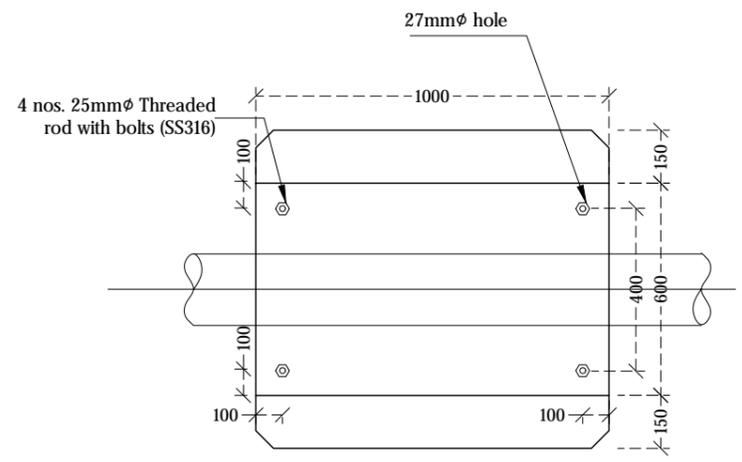
BALLAST BLOCK SIDE ELEVATION



BALLAST BLOCK FRONT ELEVATION



BALLAST BLOCK SECTION



BALLAST BLOCK PLAN

Legend

anges , nuts and bolts
steel.
ed on 10mm thick
nicircular recess

ps to provide firm
to pipe O.D.
be of grade C40A.
ing sulphate resistant
7:1996.
shall be epoxy coating
ement to

given for all

ere the depth is less
pacing is 3.5m. In
e the depth is greater
pacing is 2.0m. All
cks.
placed inside the ballast

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

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

Sub Title:
Water Supply System in L.Hithadhoo

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

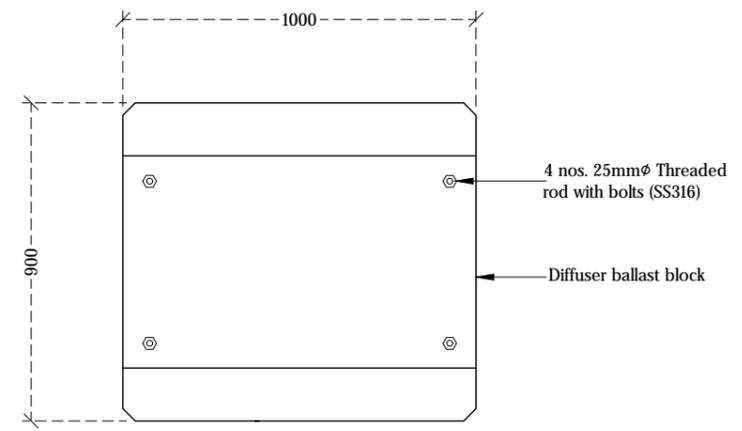
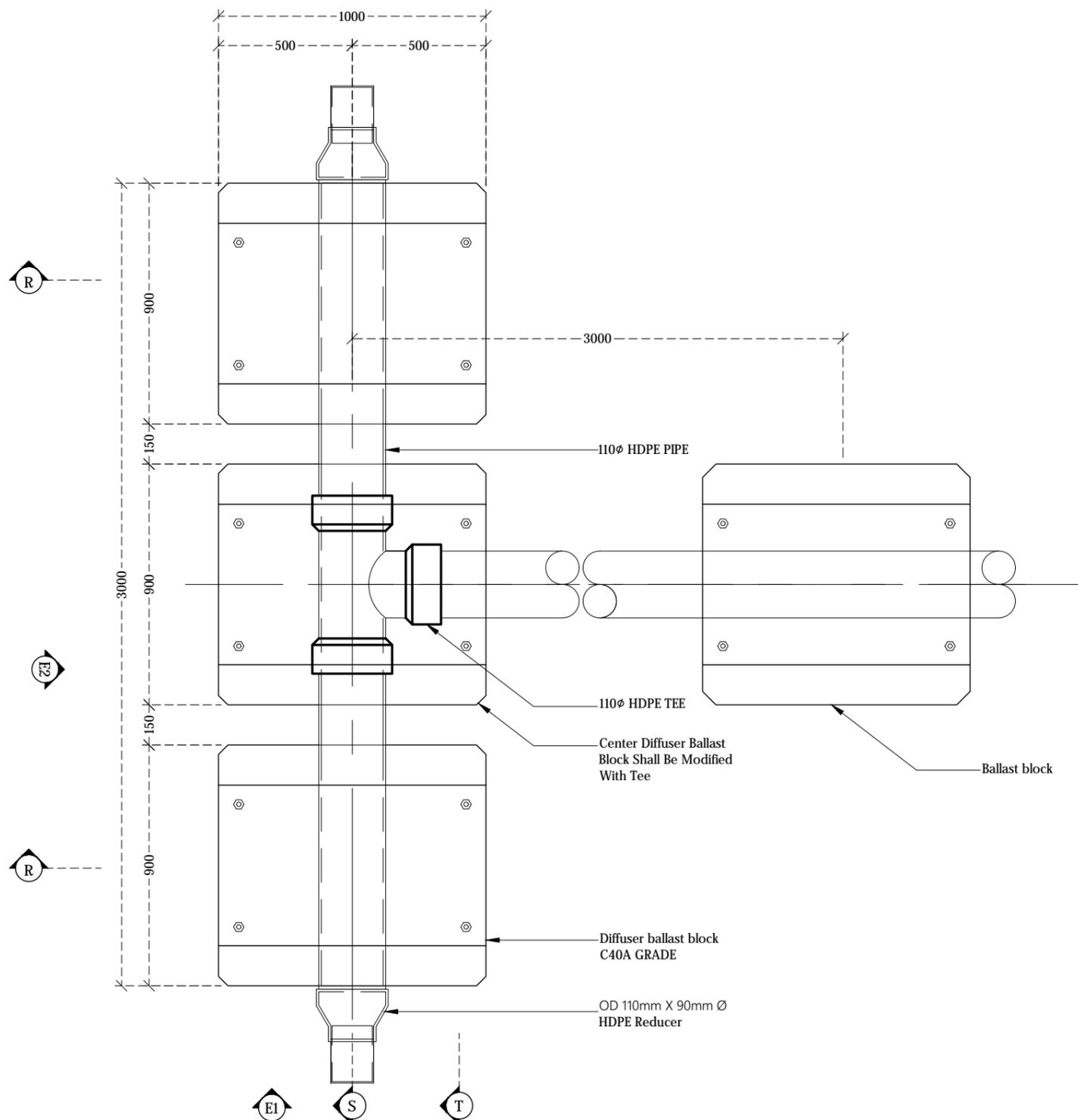
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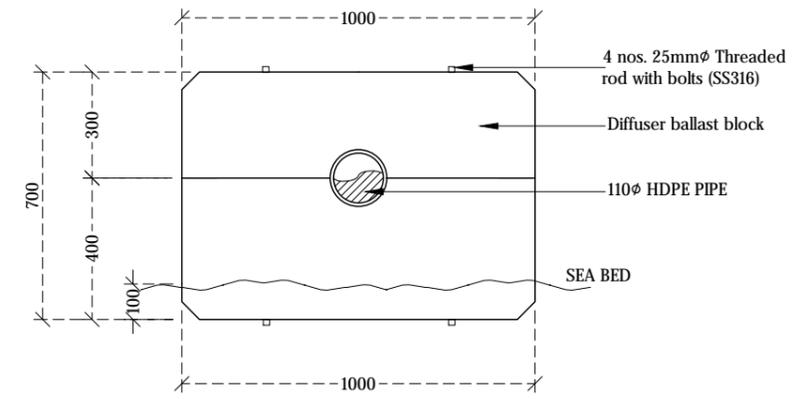
Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Aug 2020	SCALE (AS): NTS
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-21

BALLAST BLOCK DETAILS

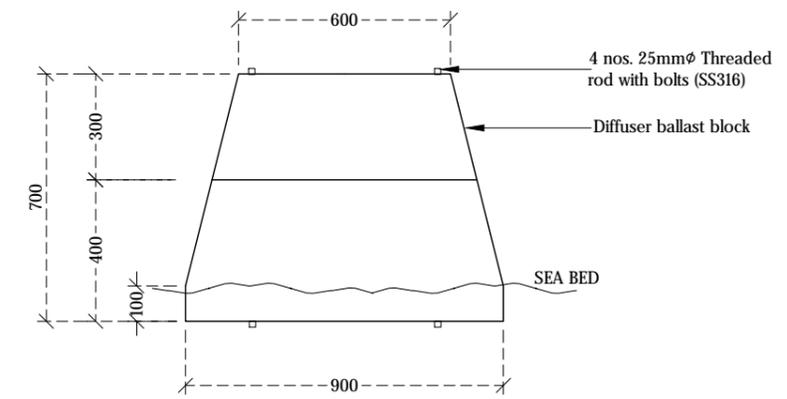
NTS



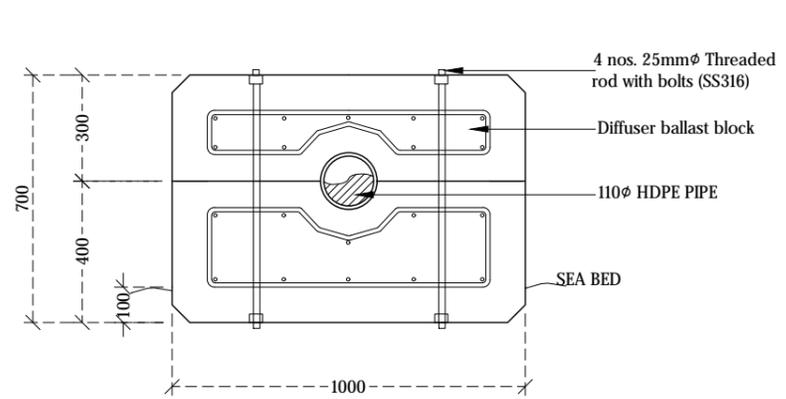
DIFFUSER BALLAST BLOCK PLAN



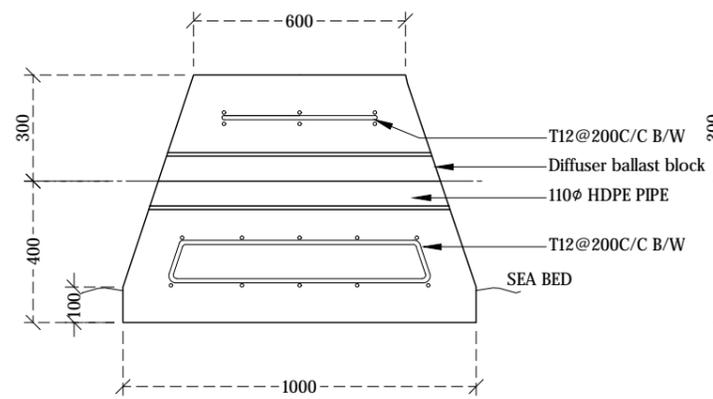
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E1



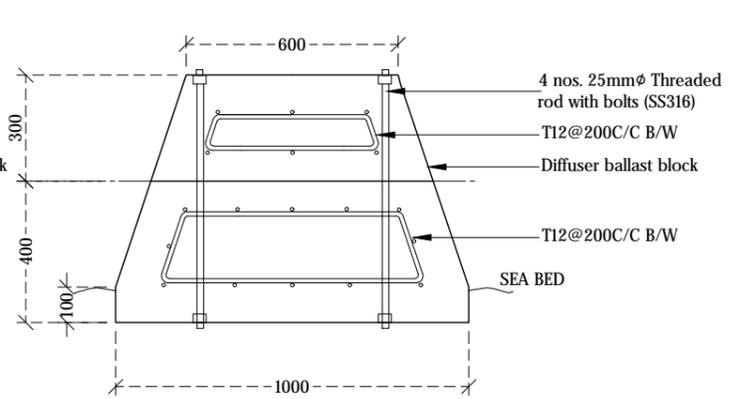
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E2



DIFFUSER BALLAST BLOCK SECTION - R



DIFFUSER BALLAST BLOCK SECTION - S



DIFFUSER BALLAST BLOCK SECTION - T

DIFFUSER DETAILS

NTS



Legend

...ges, nuts and bolts shall
...on 10mm thick
...circular recess matching
...to provide firm
...pipe O.D.
...e of grade C40A.
...ng sulphate resistant
...1996.
...shall be epoxy coating of
...ent to
...given for all
...ere the depth is less
...pacing is 3.5m. In
...e the depth is greater
...pacing is 2.0m. All
...cks.

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

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

Sub Title:
Water Supply System in L.Hithadhoo

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

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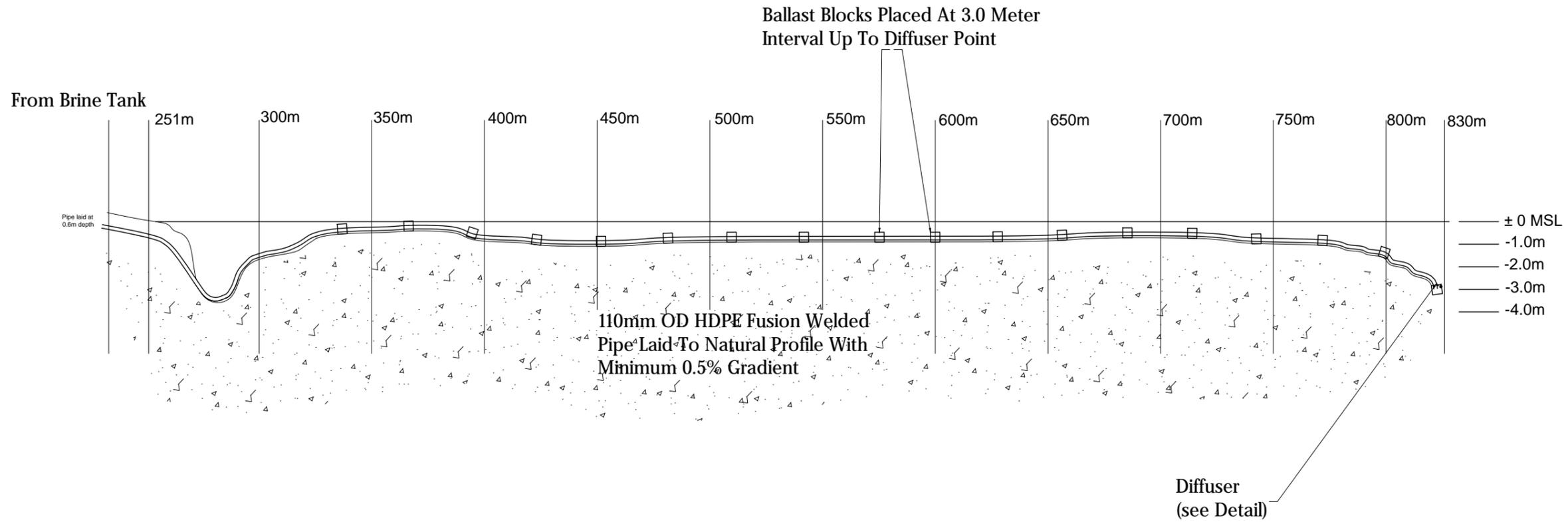
Drawn: F.I.A. Checked: M.S.S.

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

Date: Aug 2020 SCALE (AS): NTS

Project No: EP-WS/2019/06

Rev: R-01 Page: W-22



Legend

Put a detailed...
proposed area, revise...
ing for the outfall layout...
f outfall works.
where the depth is less...
k spacing is 3.5m. In...
ere the depth is...
ast block spacing is...
om c/c of blocks.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6

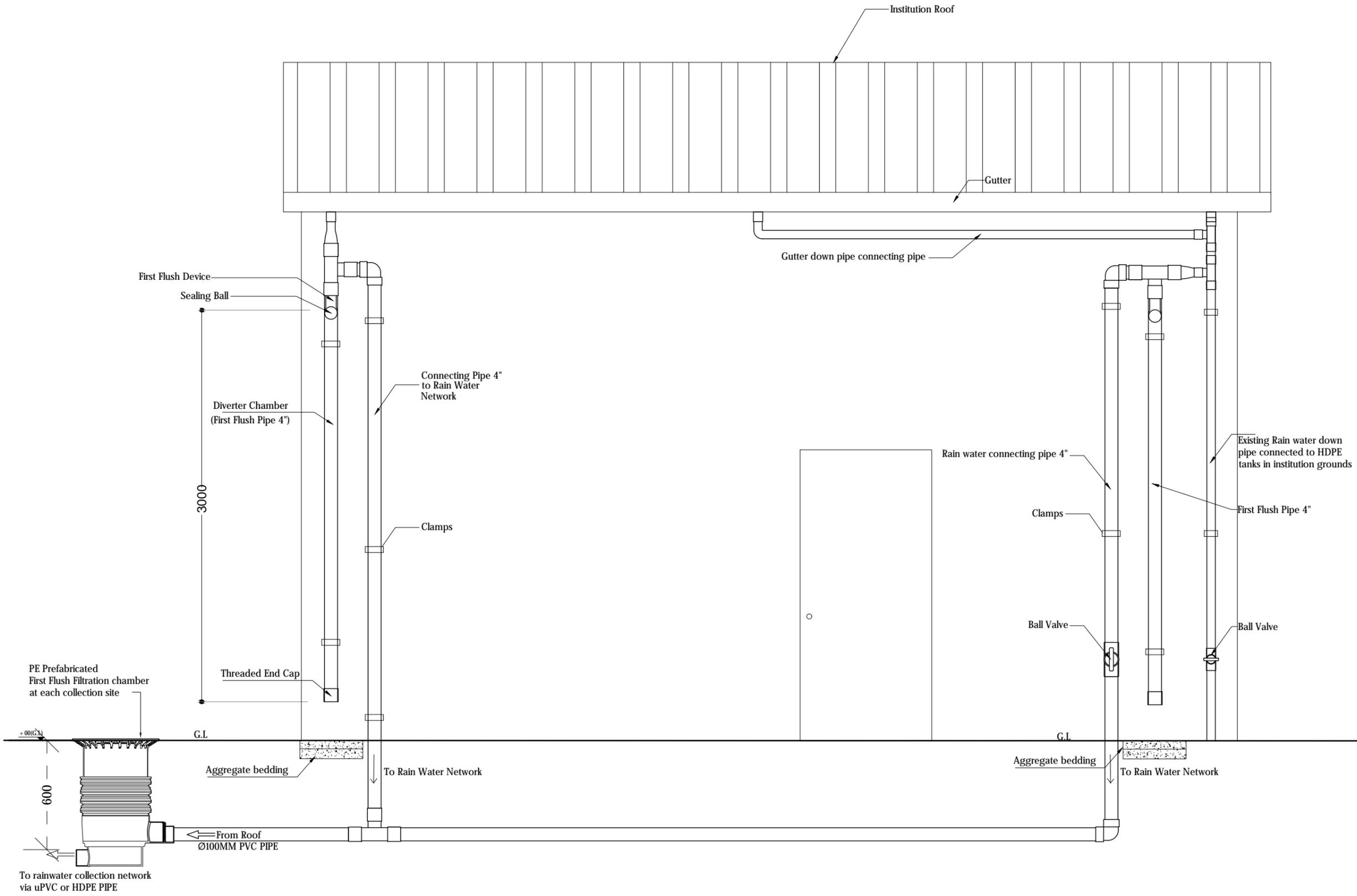
Sub Title:
Water Supply System in L.Hithadhoo

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

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Date: Aug 2020	SCALE (AS): NTS
Project No: EP-WS/2019/06	
Rev: R-01	Page: W-23



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.
 - Clamps and hangers shall be fixed at 1.5m intervals.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Sub Title:
Water Supply System in L.Hithadhoo

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

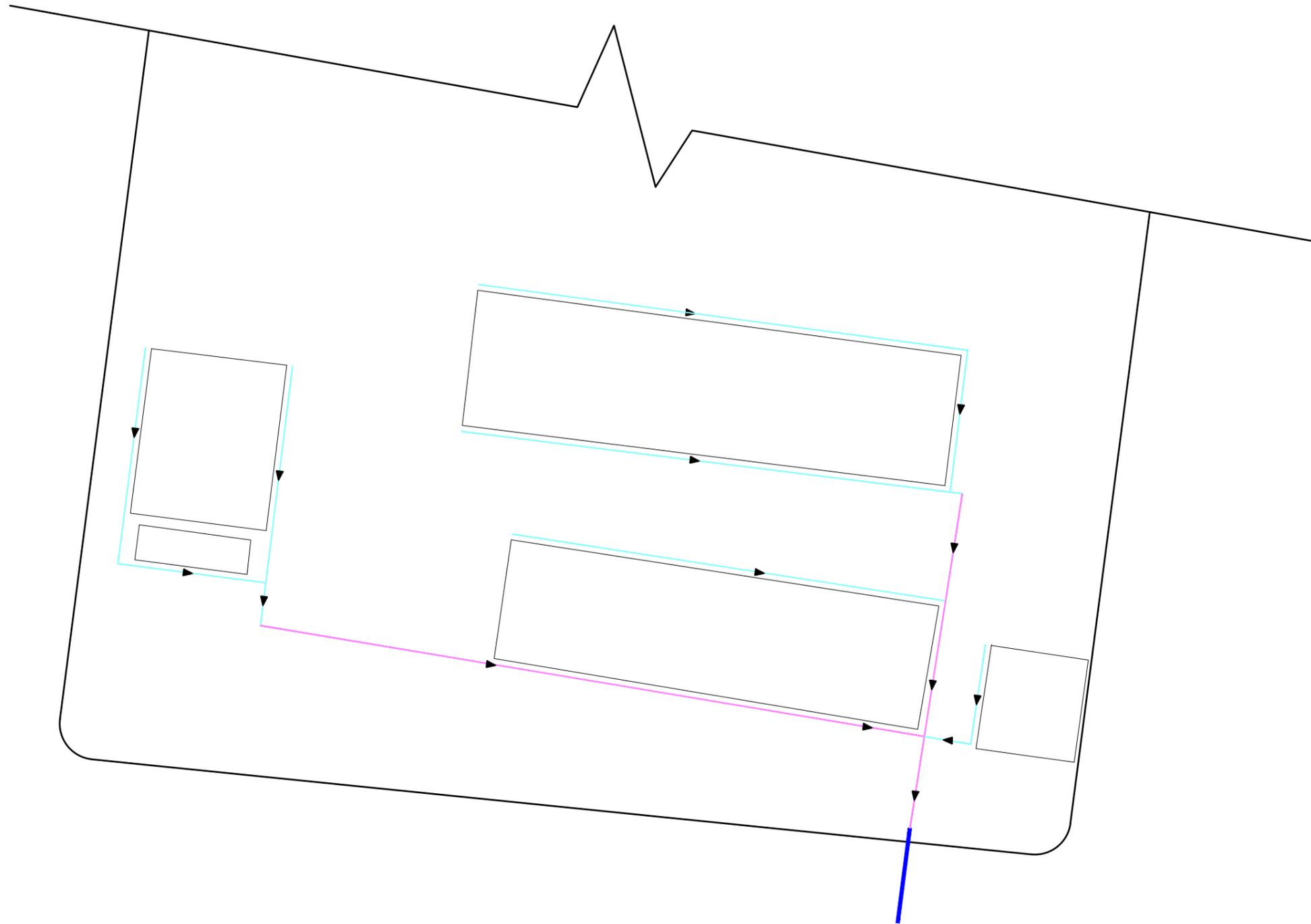
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Project No: EP-WS/2019/06	
Rev: R-01	Page: W-24

RAINWATER FIRST FLUSH MECHANISM

NTS



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

Notes:
 - Shop drawings to be produced based on site location for engineers approval.
 -Approximate Network Length = 282.8m
 -Approximate Gutter Length =200.9m
 -Approximate Pipe Network Length (Diameter 160mm) = 84.9m
 -Approximate Pipe Network Length (Diameter 110mm) = 197.9m

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

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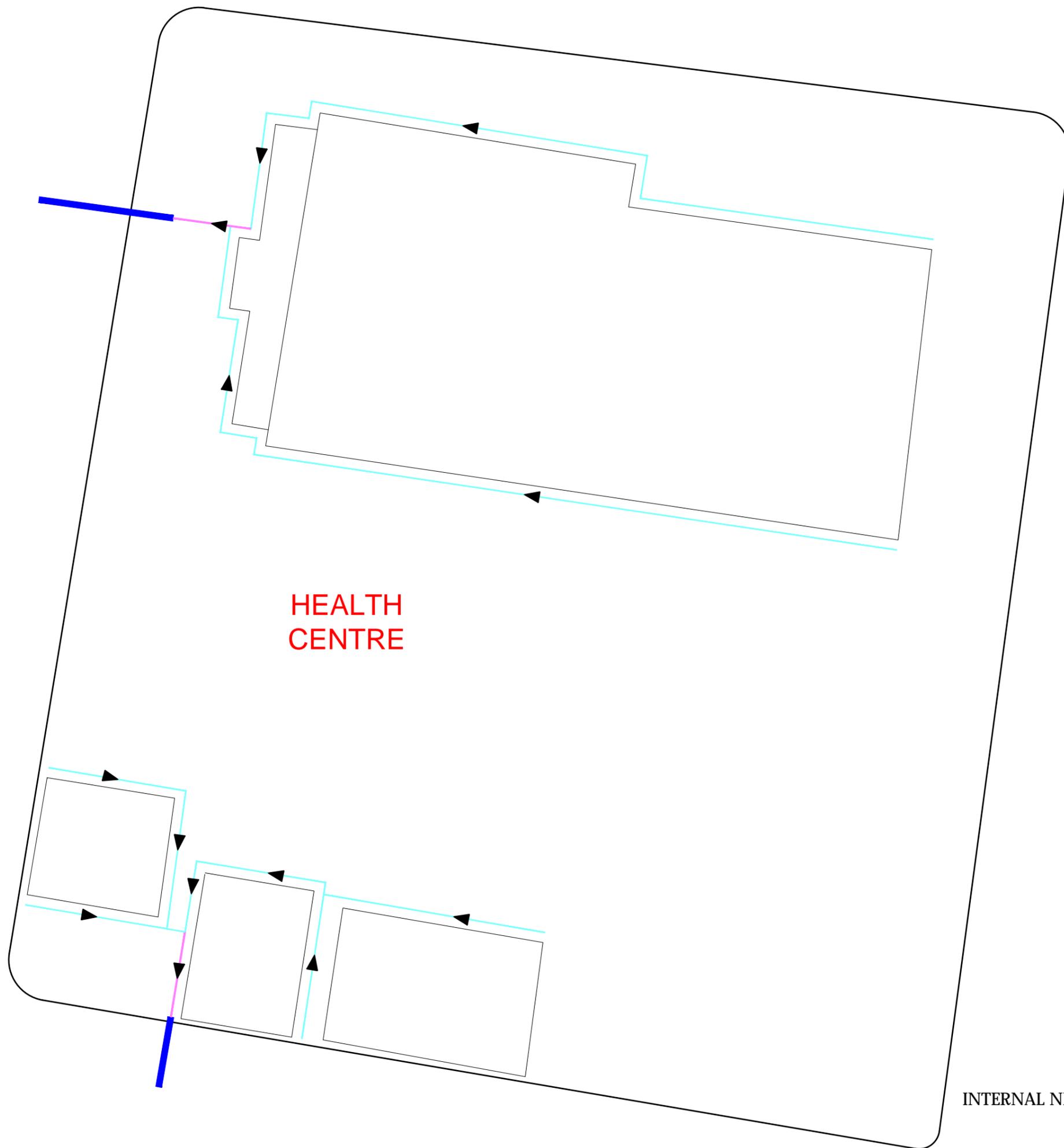


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Project No:	EP-WS/2019/06
Rev: R-01	Page: W-25

INTERNAL NETWORK LAYOUT- HITHADHOO SCHOOL

1:400



HEALTH CENTRE

INTERNAL NETWORK LAYOUT-HEALTH CENTRE

1:200



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

- Notes:
- Shop drawings to be produced based on site location for engineers approval.
 - Approximate Network Length = 141.6m
 - Approximate Gutter Length =98.3m
 - Approximate Pipe Network Length (Diameter 160mm) = 4m
 - Approximate Pipe Network Length (Diameter 110mm) = 137.6m

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

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

Sub Title:
Water Supply System in L.Hithadhoo

Client:
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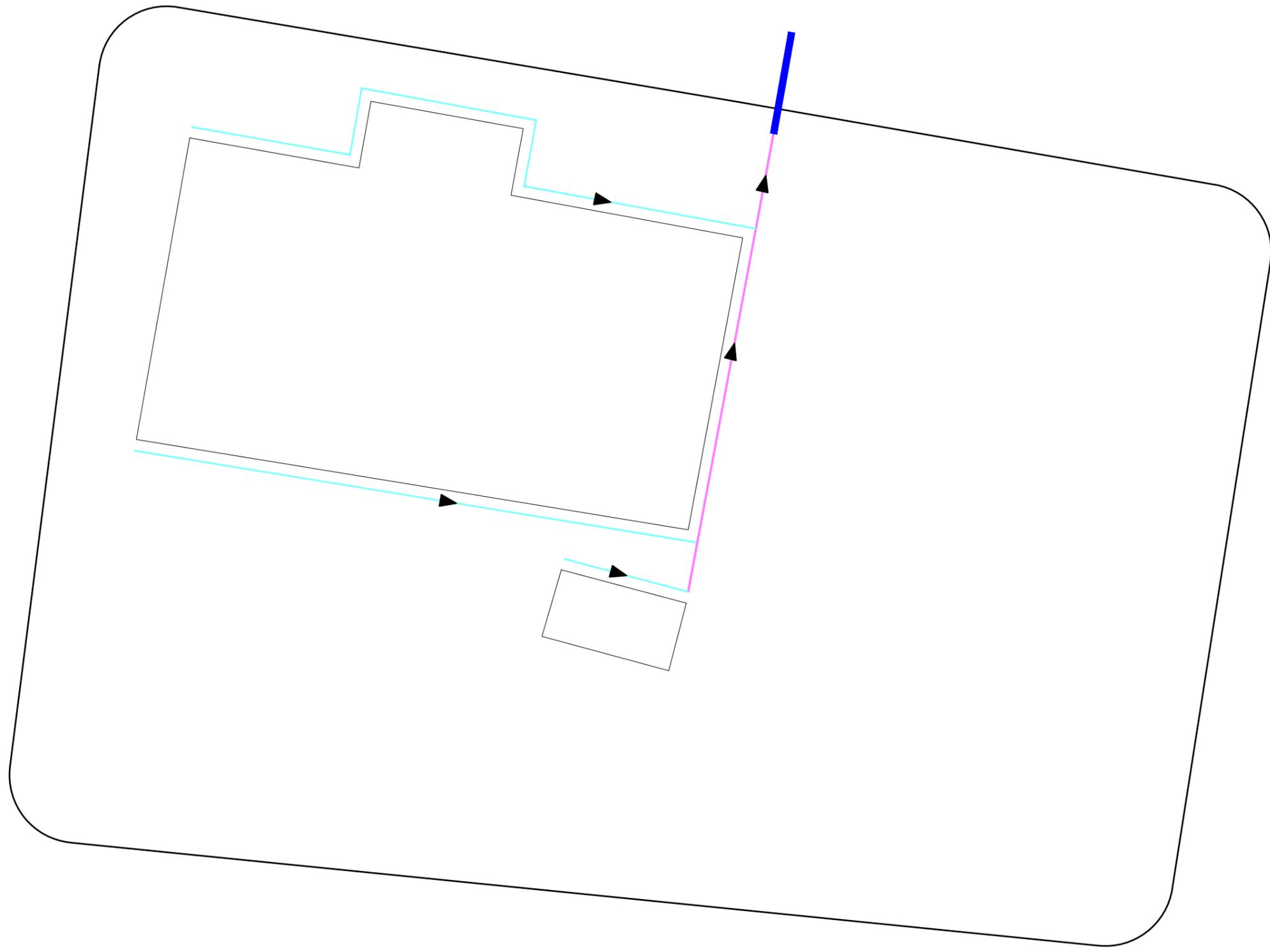
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Date: Aug 2020 SCALE (A3): 1:20

Project No: EP-WS/2019/06

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Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

Notes:
 - Shop drawings to be produced based on site location for engineers approval.
 -Approximate Network Length = 83m
 -Approximate Gutter Length =54.5m
 -Approximate Pipe Network Length (Diameter 160mm) = 20.6m
 -Approximate Pipe Network Length (Diameter 110mm) = 62.4m

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

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

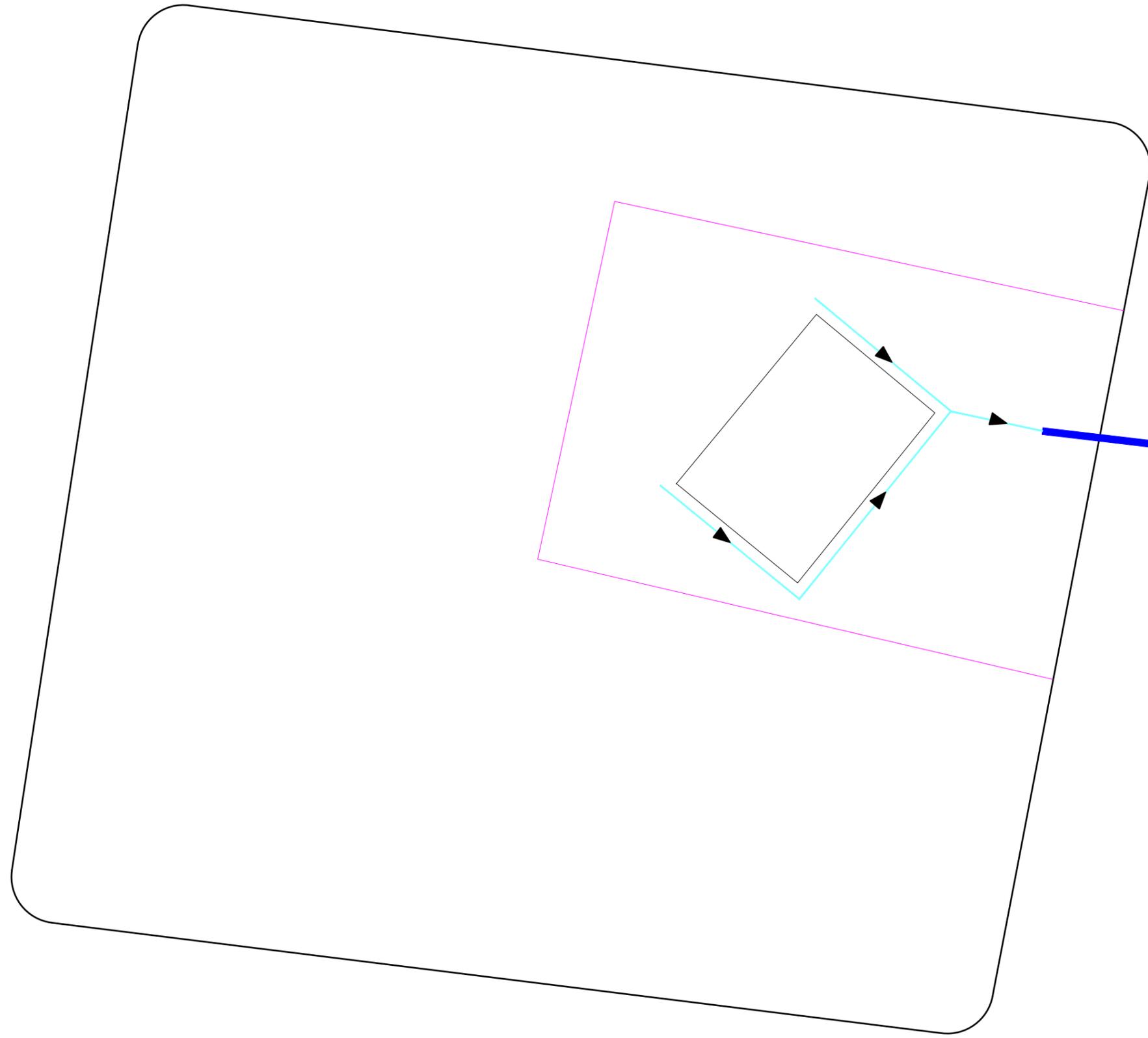


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Project No: EP-WS/2019/06	
Rev: R-01	Page: W-27



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

Notes:
 - Shop drawings to be produced based on site location for engineers approval.
 -Approximate Network Length = 30.1m
 -Approximate Gutter Length =32.6m
 -Approximate Pipe Network Length (Diameter 160mm) = 0m
 -Approximate Pipe Network Length (Diameter 110mm) = 30.11m

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

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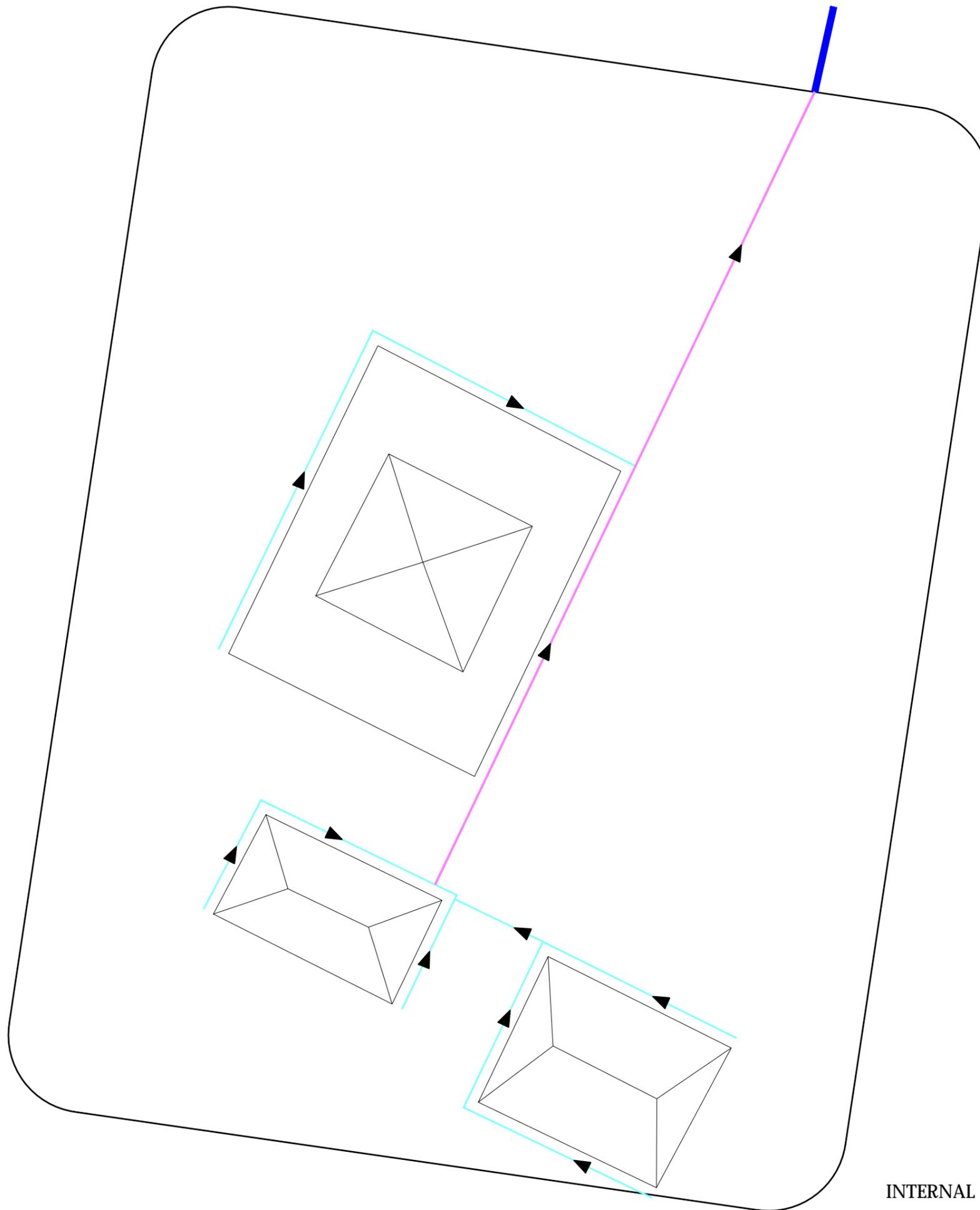


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Project No: EP-WS/2019/06	
Rev: R-01	Page: W-28



INTERNAL NETWORK LAYOUT-CEMETRY

1:200



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

- Notes:
- Shop drawings to be produced based on site location for engineers approval.
 - Approximate Network Length = 122.1m
 - Approximate Gutter Length =116.5m
 - Approximate Pipe Network Length (Diameter 160mm) = 39.7m
 - Approximate Pipe Network Length (Diameter 110mm) = 82.4m

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

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

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Water Supply System in L.Hithadhoo

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



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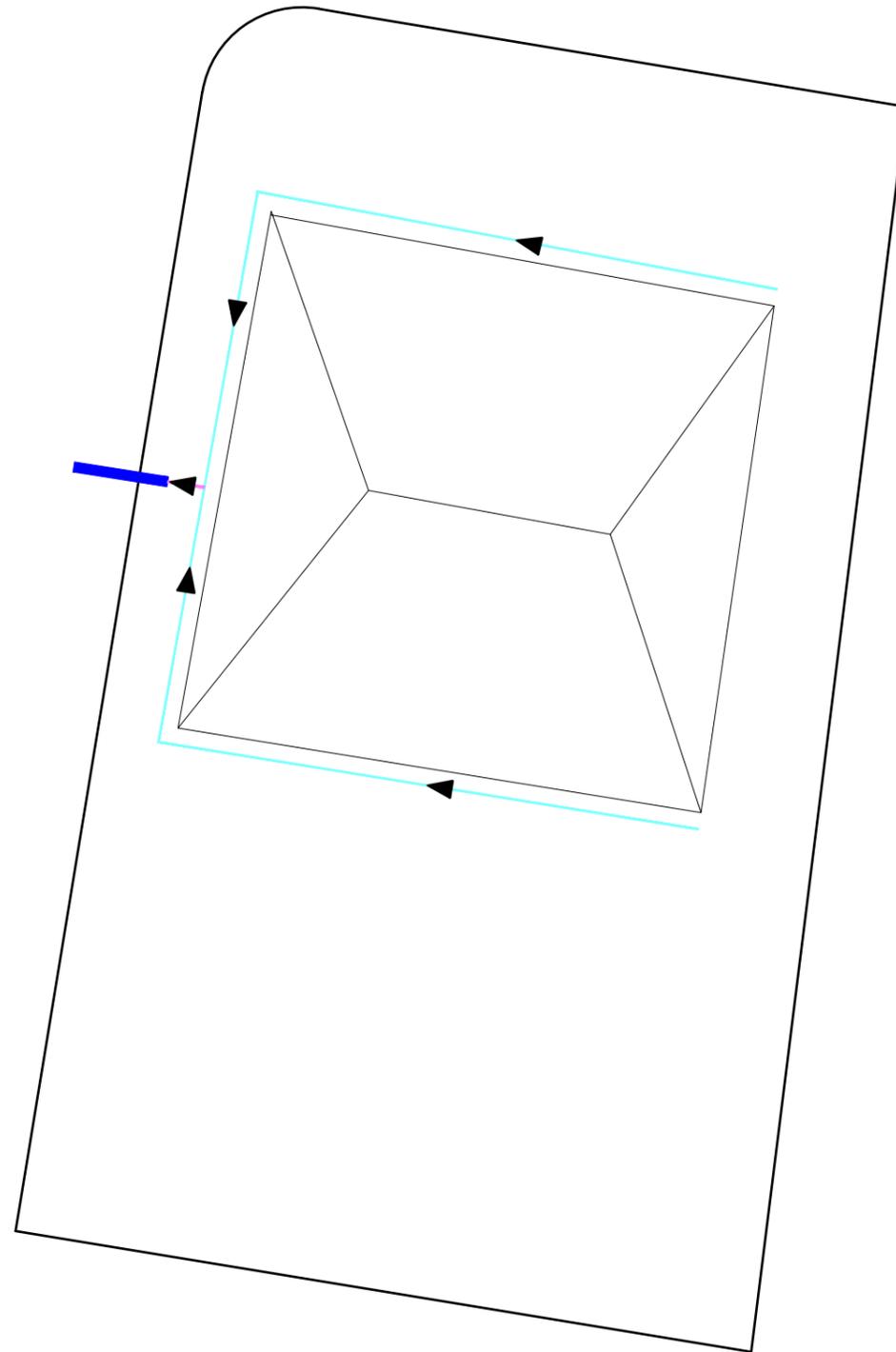
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Date: Aug 2020 SCALE (AS): 1:20

Project No: EP-WS/2019/06

Rev: R-01 Page: W-29



INTERNAL NETWORK LAYOUT-HITHADHOO COURT

1:200



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

- Notes:
- Shop drawings to be produced based on site location for engineers approval.
 - Approximate Network Length = 50.1m
 - Approximate Gutter Length =61.8m
 - Approximate Pipe Network Length (Diameter 160mm) = 1.5m
 - Approximate Pipe Network Length (Diameter 110mm) = 48.6m

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

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

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Water Supply System in L.Hithadhoo

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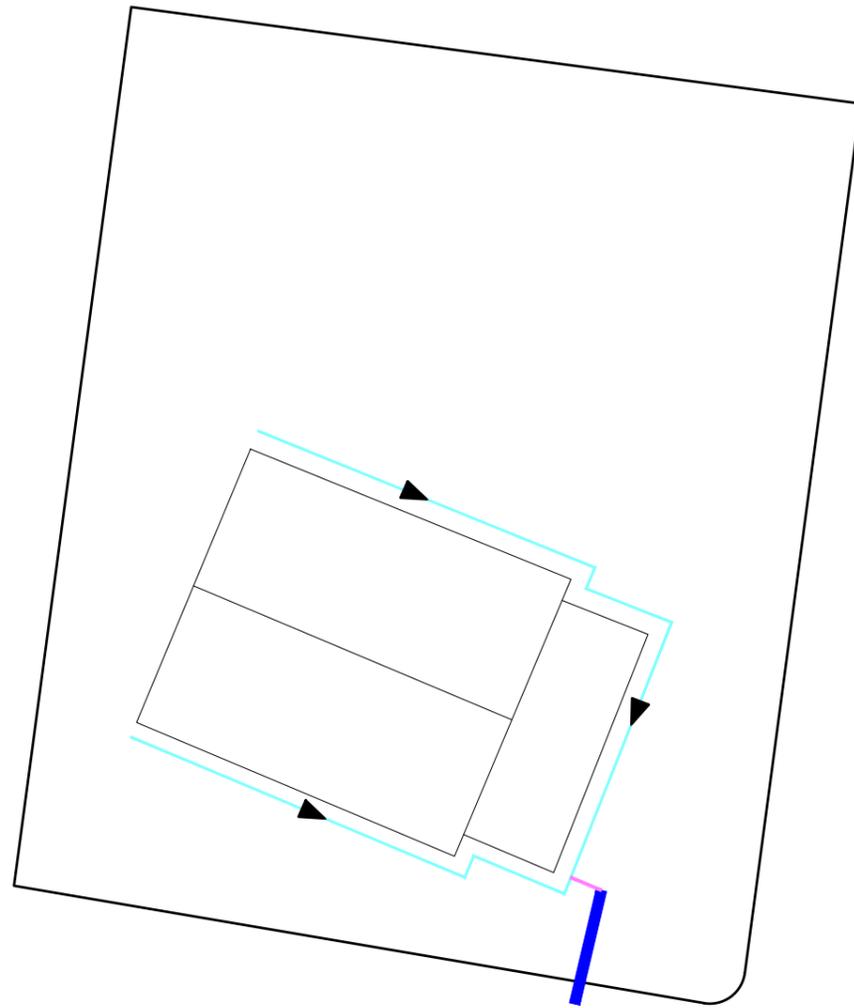
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Date: Aug 2020 SCALE (AS): 1:20

Project No: EP-WS/2019/06

Rev: R-01 Page: W-30



Legend

- = PVC PIPES Ø160mm
- = PVC PIPES Ø110mm

Notes:
 - Shop drawings to be produced based on site location for engineers approval.
 -Approximate Network Length = 36.5m
 -Approximate Gutter Length =26.8m
 -Approximate Pipe Network Length (Diameter 160mm) = 1m
 -Approximate Pipe Network Length (Diameter 110mm) = 35.5m

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 6

Sub Title:
Water Supply System in L.Hithadhoo

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



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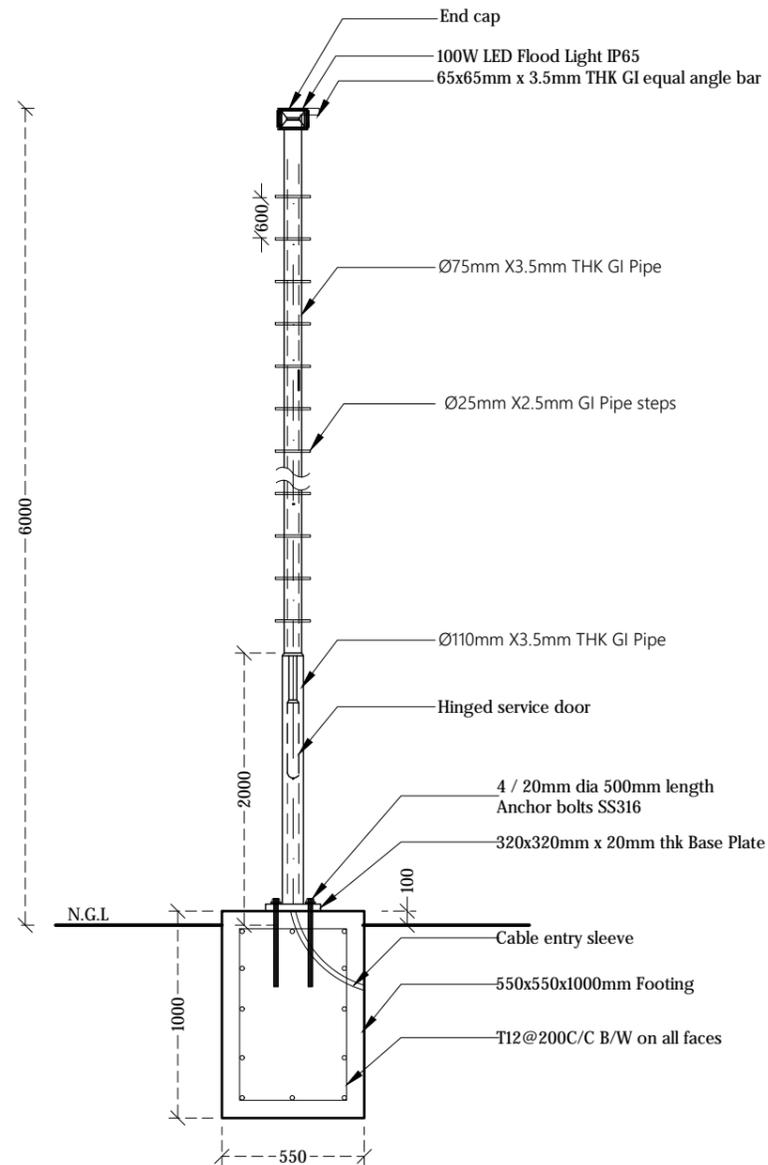
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Project No: EP-WS/2019/06

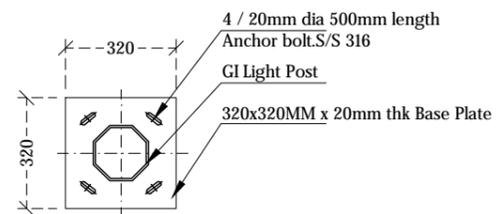
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INTERNAL NETWORK LAYOUT-AA MISKIY

1:200



LIGHT POST DETAILS FOR STP COMPOUND (LP1)



BASE PLATE (LP1)

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

LIGHT POST DETAILS

NTS



Legend

- Notes:
- Light posts shall be galvanized (minimum 200 micron) and finished with epoxy paint.
 - 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 50mm should be given for all reinforcements.
 - All steel members and GI SHS to be applied with 2 coats of anti-corrosive paint with epoxy finishing paint.
 - All anchor bolts shall be SS316

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
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Designed: F.I.A. Approved: I.W.

Date: Aug 2020 SCALE (AS): 1:20

Project No: EP-WS/2019/06

Rev: R-01 Page: W-32

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF

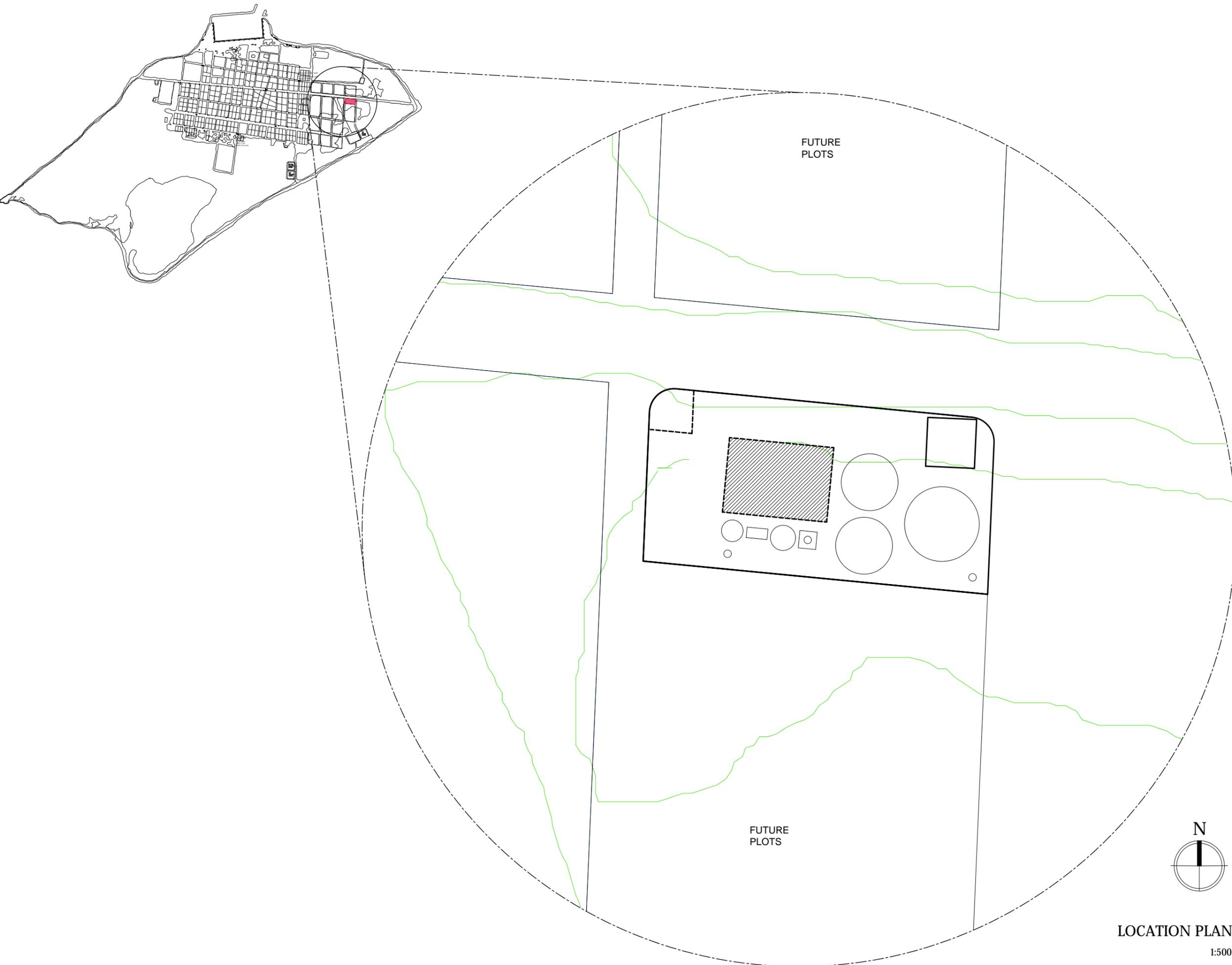
PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING & VEHICLE SHED, L.HITHADHOO

For Ministry of National Planning, Housing and Infrastructure

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Location Plan	A.1 (1)
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ARCHITECTURAL DRAWINGS (ADMIN BUILDING)	
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Roof Plan	A.2 (2)
Elevations	A.3 (1)
Section	A.4 (1)
Doors & Windows Schedule -1	A.5 (1)
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Typical Ground Slab Detail	A.D (1)
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STRUCTURAL DRAWINGS (ADMIN BUILDING)	
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Roof Plan	A.6 (1)
Elevations	A.6 (2)
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Foundation Plan	S.4 (1)
Roof Truss Plan	S.4 (2)
Roof Framing Plan	S.D (4)



Legend

Note:

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

Client:
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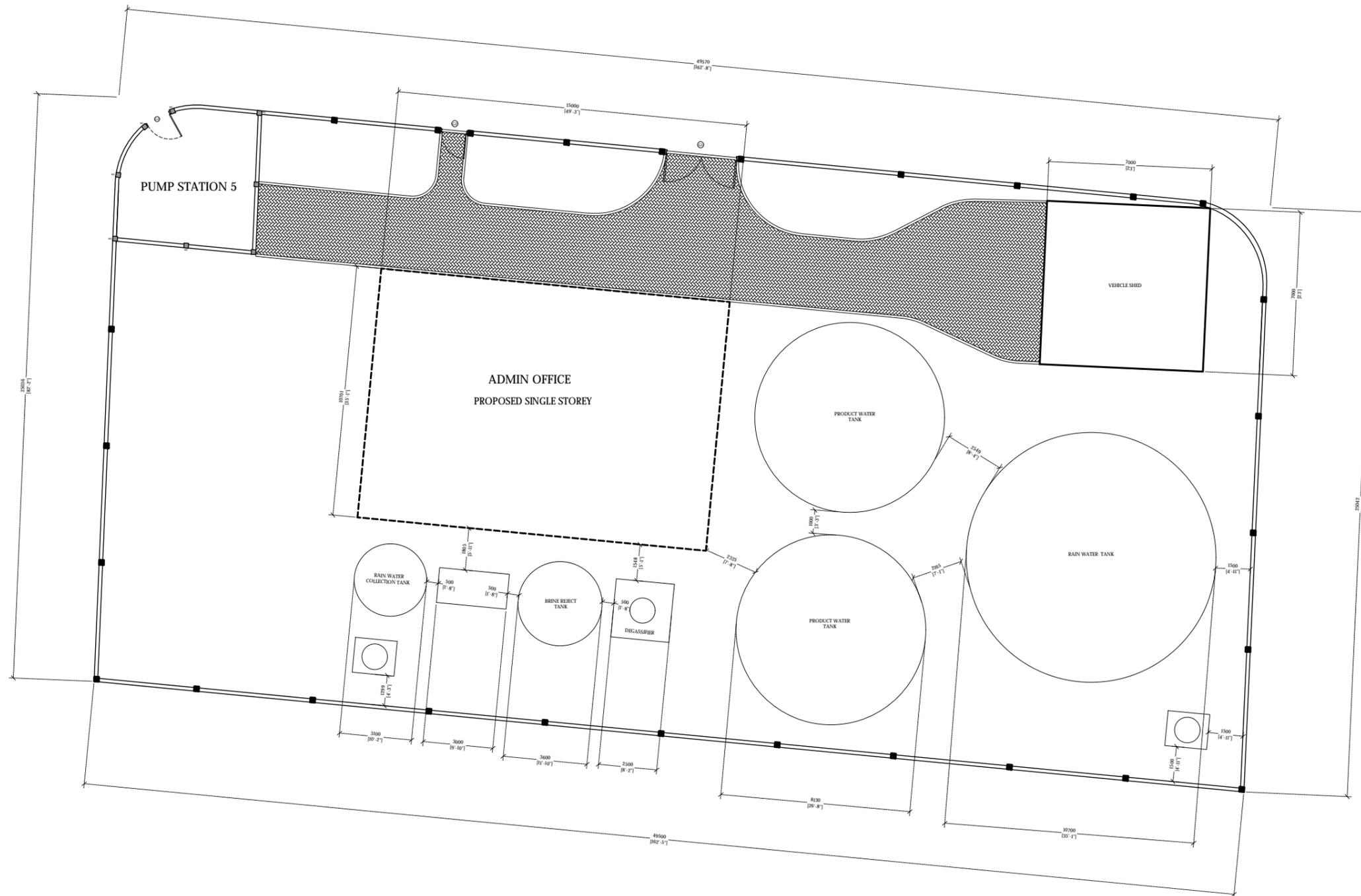
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Date: Nov 2020	SCALE (A3): 1:500
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LOCATION PLAN
 1:500



Legend

Note:

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R01	NOV 2020		A.S.A.	F.I.A.	M.H.

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**Consultancy Services for
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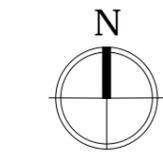


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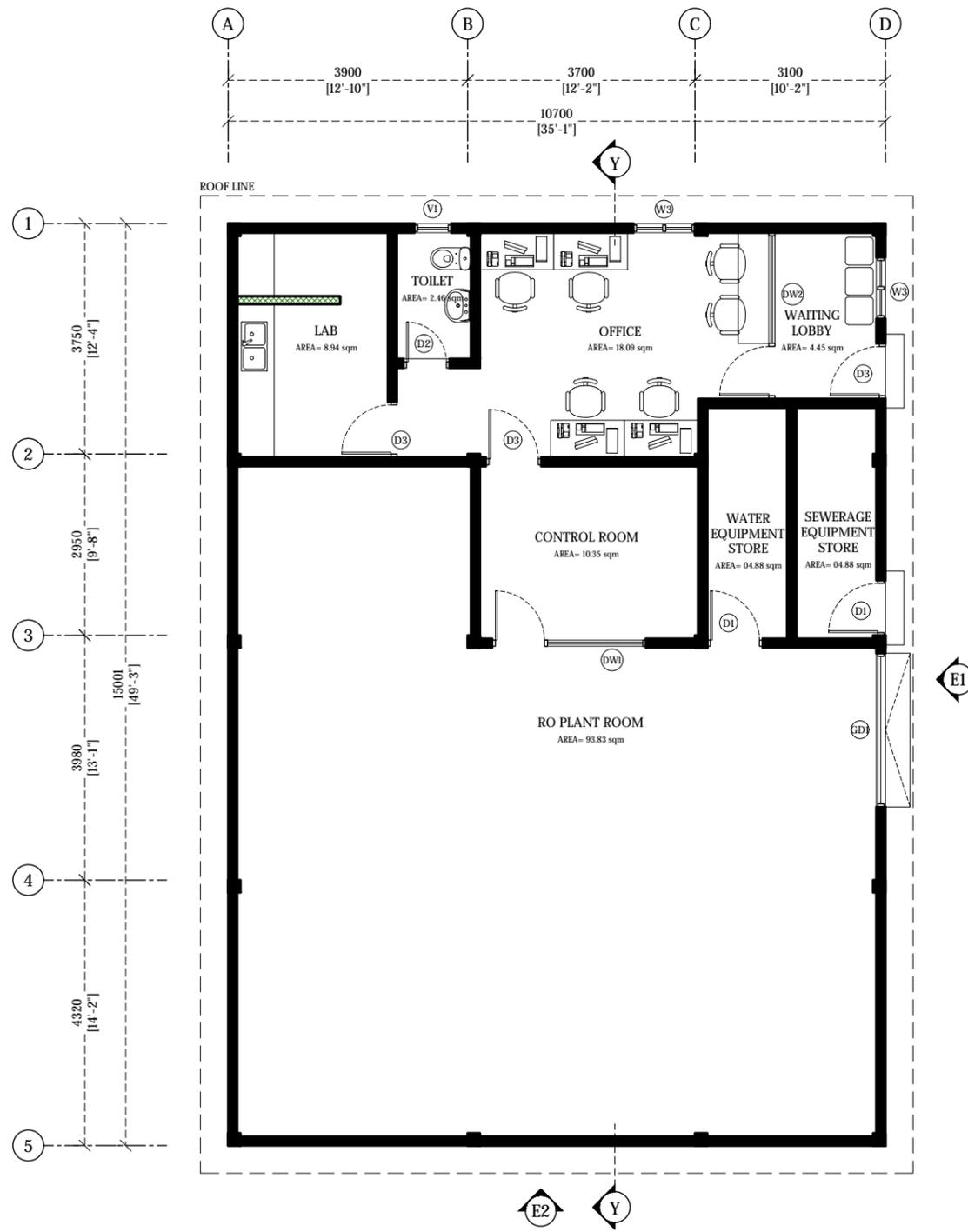
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Project No: EP-WS/2019/06	
Rev: R-01	Page: A.1 (2)



SITE PLAN
 1:200

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF
PROPOSED SINGLE STOREY BUILDING AT
RO PLANT ADMIN BUILDING, L.HITHADHOO



Wall Legend:

- 150mm thick masonry blocks with 20mm plaster on exterior and 12mm plaster on interior
- 100mm thick partition walls up to ceiling level

Wall Finish:

Internal Wall Finish: Easy to wash odour-less Nippon paint Ivory White

External Wall Finish: Weatherboard Algae guard Nippon September Cream

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

Floor Finish:

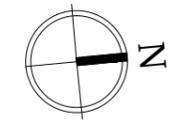
Floor Finishes: 600x600mm homogenous floor tiles with tile adhesive unless specified

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

Notes:

FFL of balconies and toilets should be 25mm lower than the FFL of respective floors

Water proofing to be applied in toilets, balconies and roof terrace prior to tiling



GROUND FLOOR PLAN
1:100

Legend

Note:

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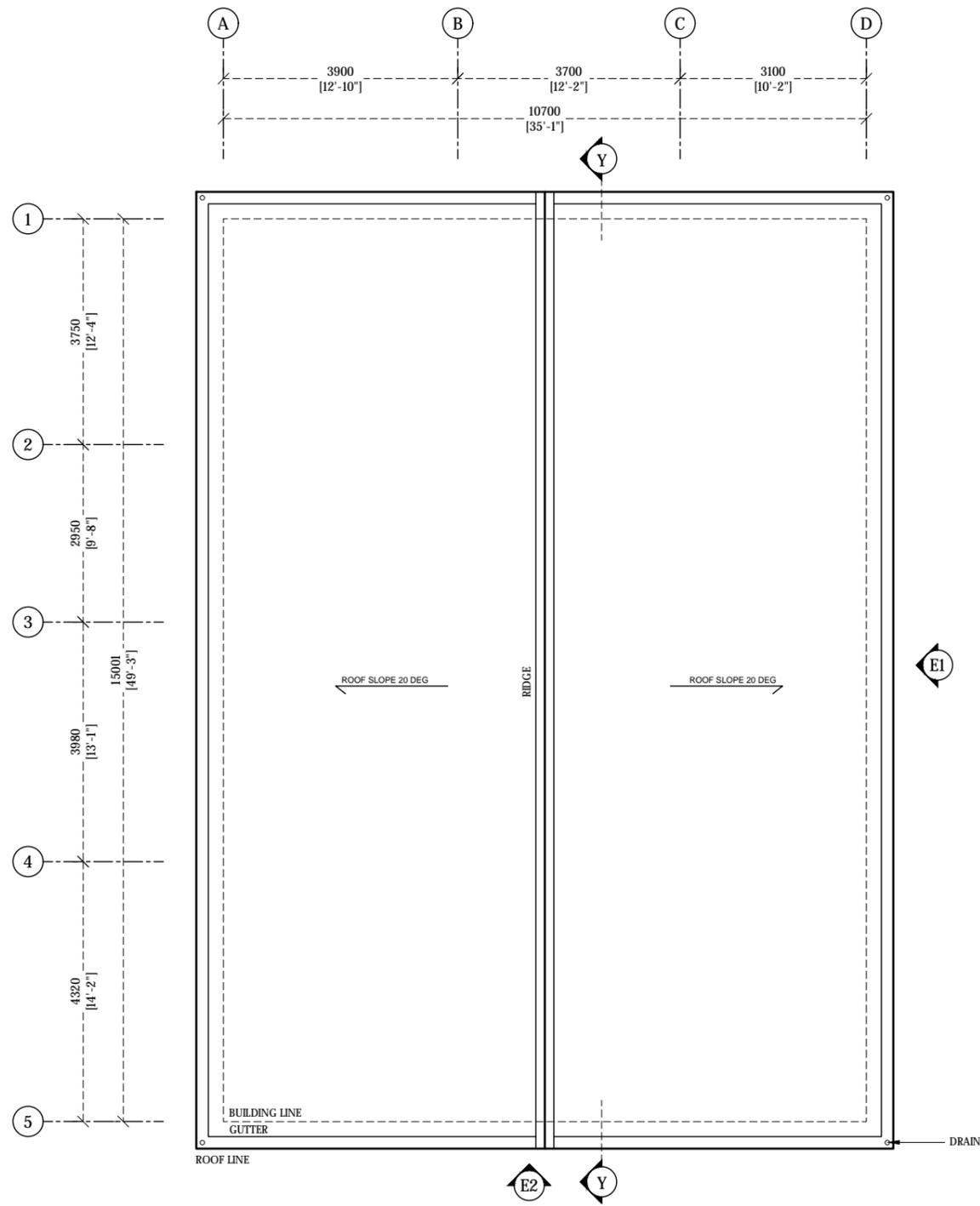
Title:
Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 6 Islands, Maldives – Package 6
Sub Title:
Water Supply System in L.Hithadhoo

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

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Drawn: A.S.A.	Checked: F.L.A.
Designed: A.S.A.	Approved: M.H.
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Project No: EP-WS/2019/06	
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Legend

Note:

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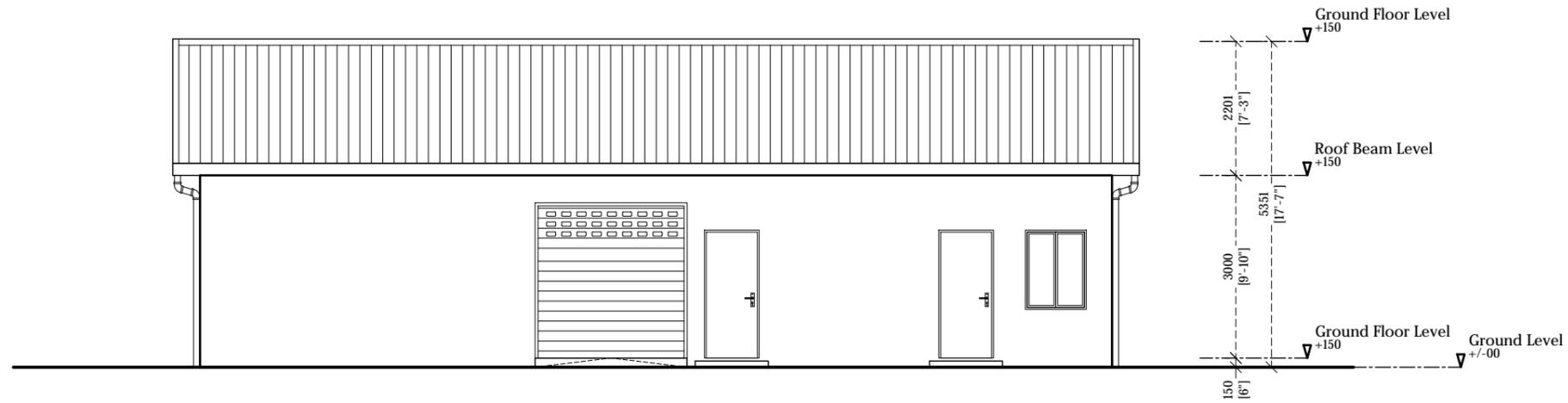
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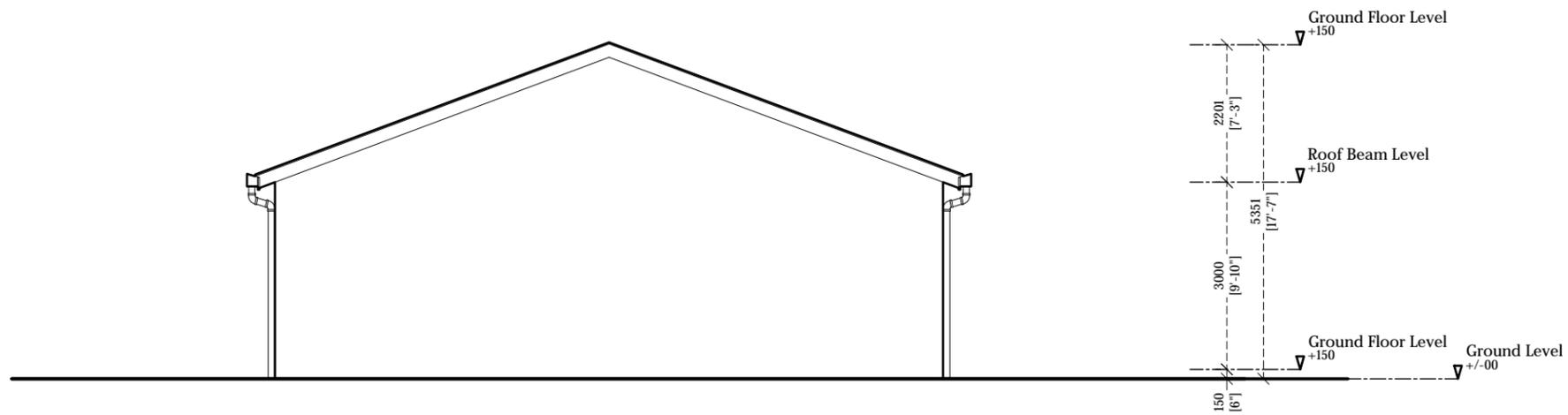
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ELEVATION E1

1:100



ELEVATION E2

1:100

Legend

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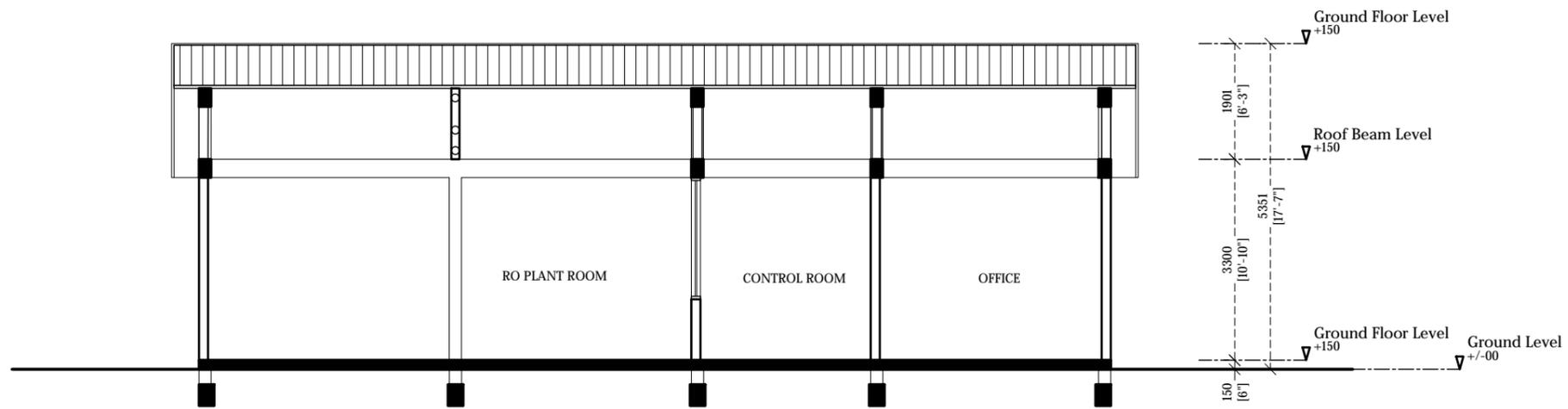
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ELEVATIONS

1:100



SECTION XX
1:100

Legend

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

General Notes:

Dimensions shown on DWG indicate effective openings of frame

All frame depths are 100mm
 All door 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 conform to
- Door size more than 700X1900mm
 WD: 125mm X2 sets
 SD: 150mm X3 sets
 - Door size less than 700X1900mm
 WD: 100mm X2 sets
 SD: 125mm X2 sets

Locks shall be cylindrical with master key sets

Door knobs shall be 1000mm above FFL

Legend

Note:

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DOOR & WINDOW SCHEDULE -1

1:50

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

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

General Notes:

Dimensions shown on DWG indicate effective openings of frame

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

All wooden components should be wood stained finish

All glazing should be of 6mm unless specified

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

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

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

Hinges shall conform to

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

Locks shall be cylindrical with master key sets

Door knobs shall be 1000mm above FFL

DOOR & WINDOW SCHEDULE -2

1:50

Legend

Note:

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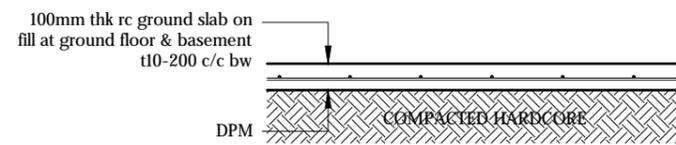
Title:
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Sub Title:
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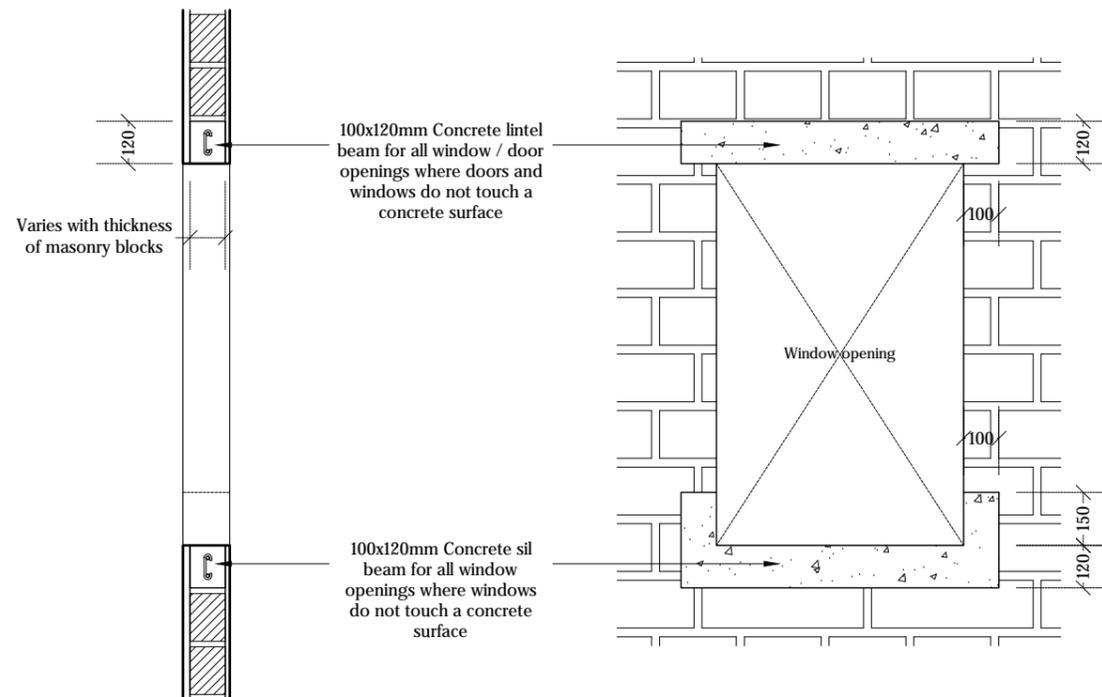


Note:

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

TYPICAL GROUND SLAB DETAIL

1:20



TYPICAL OPENING DETAIL

1:20

Legend

Note:

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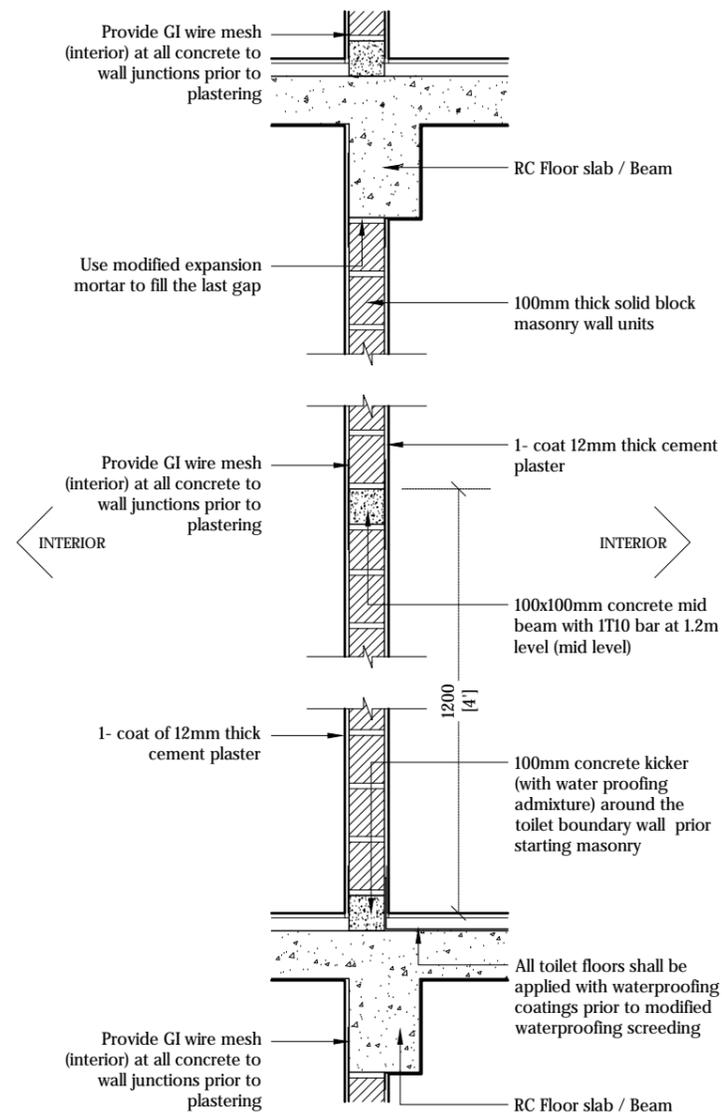
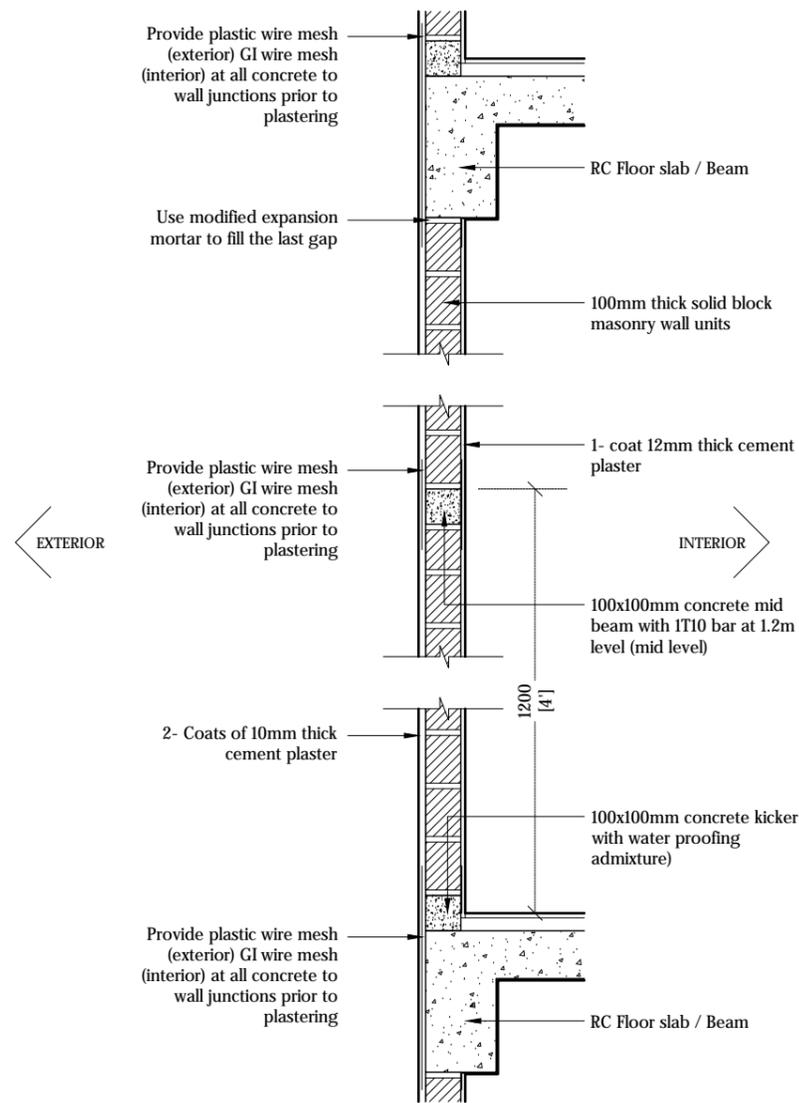
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Note:

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

Legend

Note:

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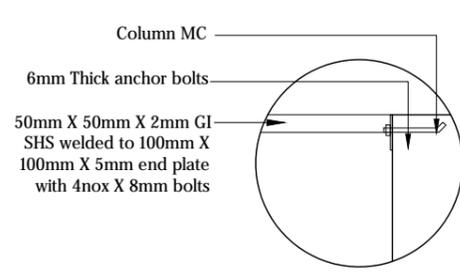
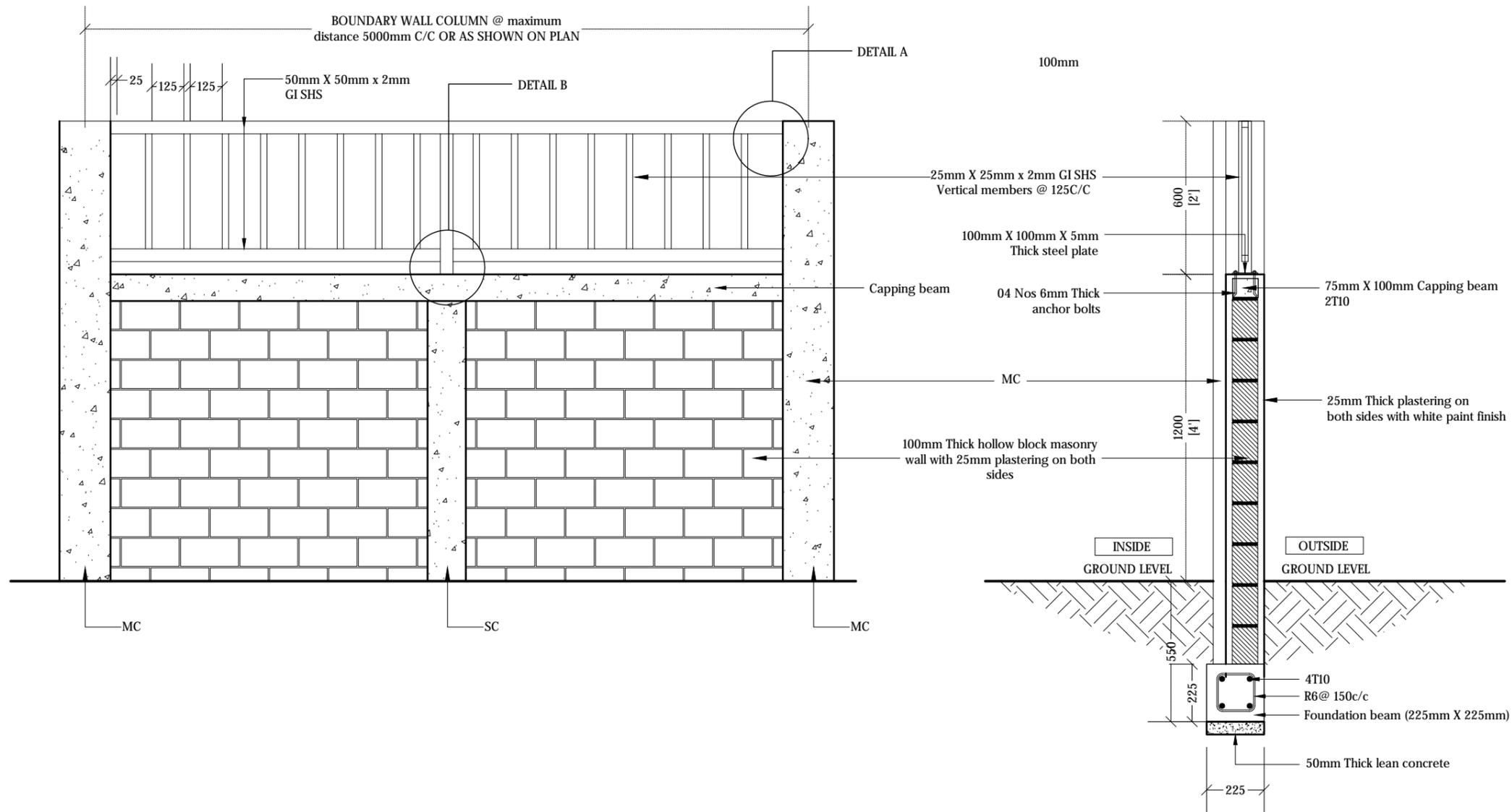
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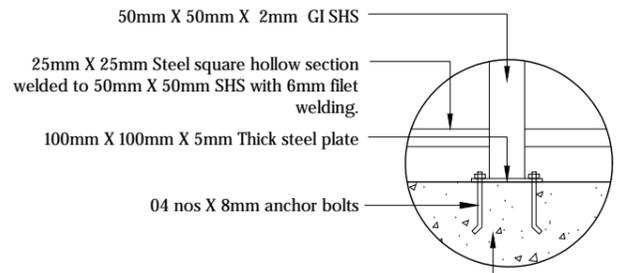
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Date: Nov 2020	SCALE (A3): 1:20
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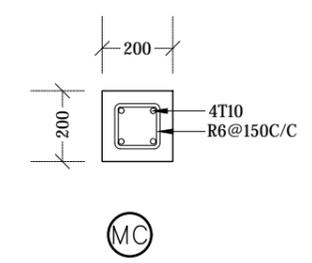
TYPICAL WALL CONSTRUCTION DETAIL



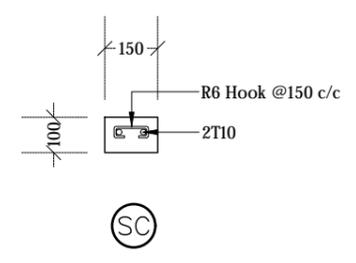
DETAIL A
1:10



DETAIL B
1:10



MC
MAIN COLUMN
@ maximum distance 5000mm C/C



SC
STIFFENER COLUMN
(in between two main columns)

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

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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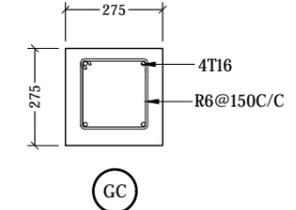
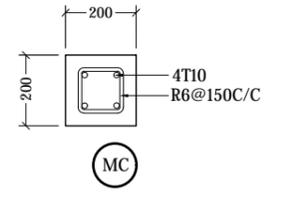
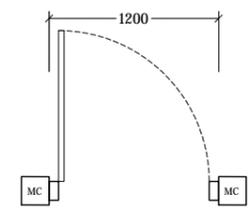
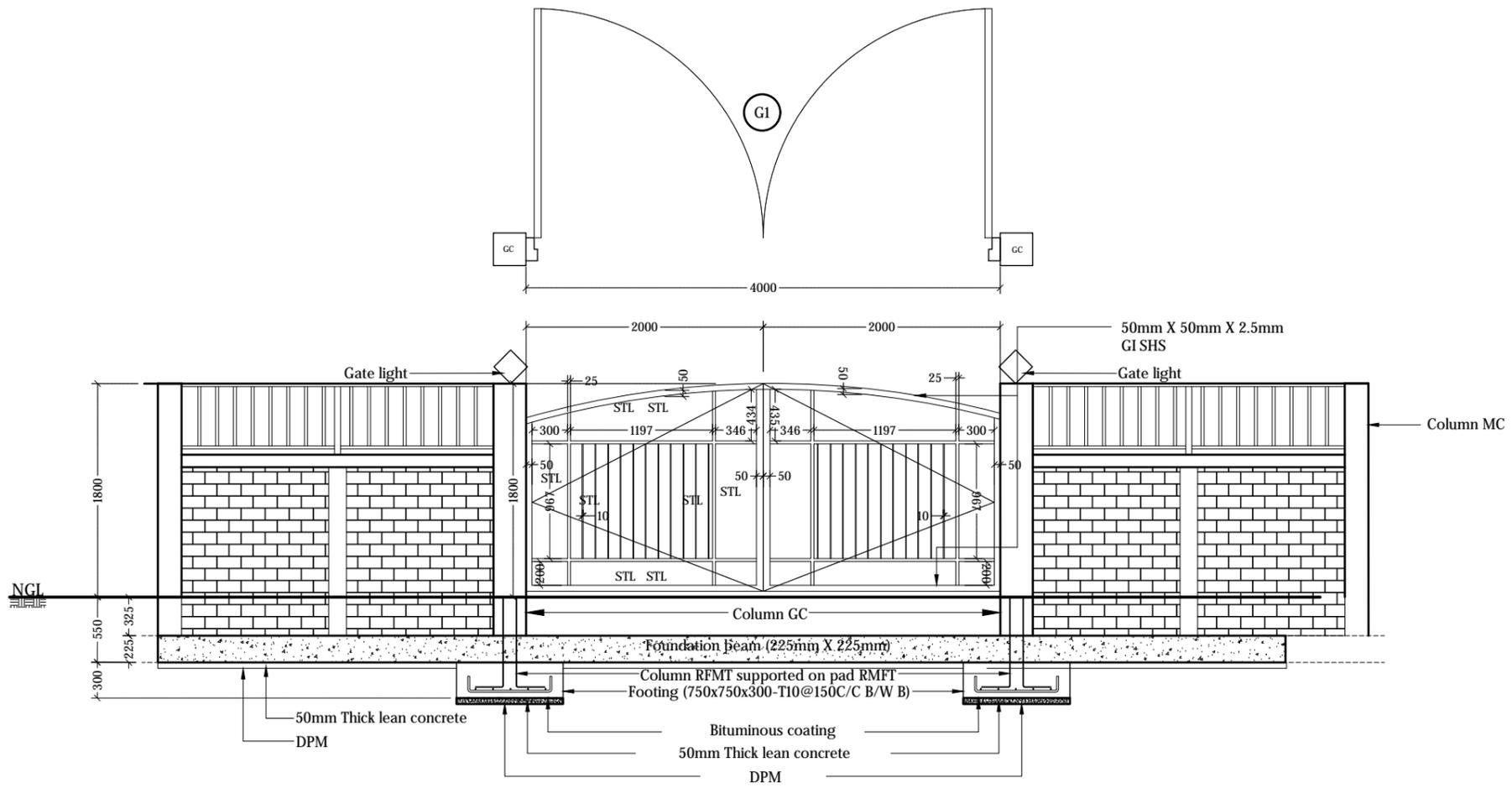
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Sub Title:
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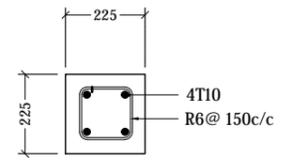
Building Self-Constructive Solutions

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Project No: EP-WS/2019/06	
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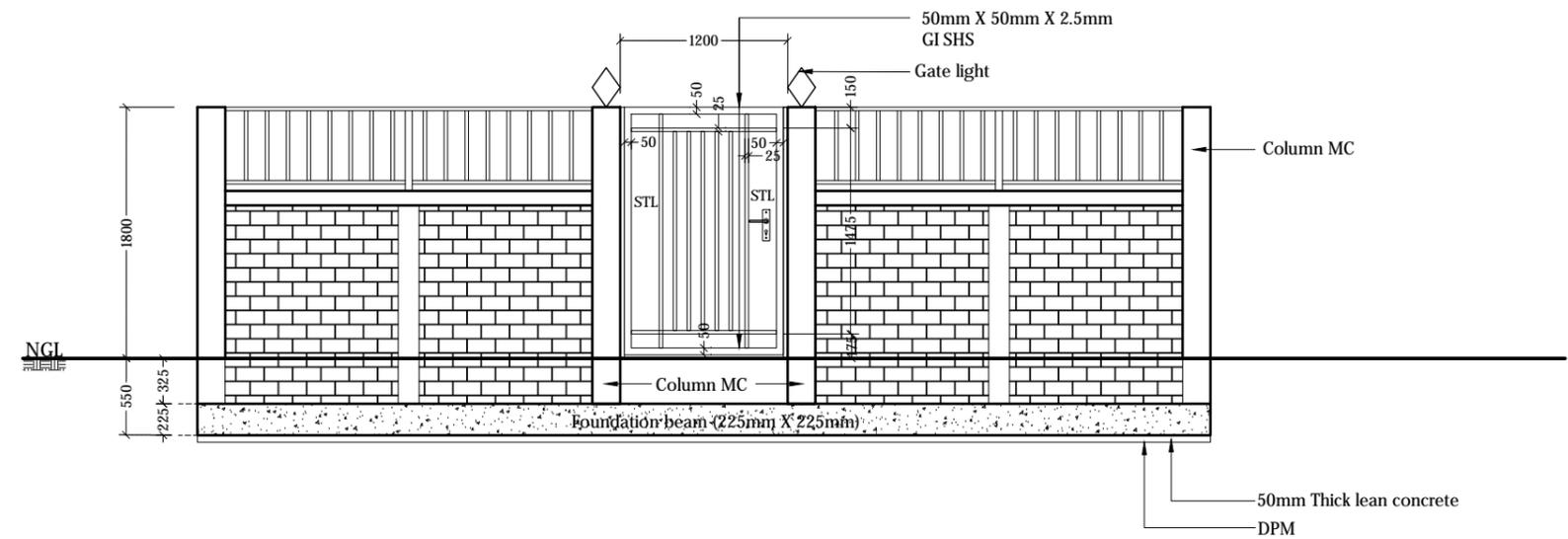
BOUNDARY WALL DETAIL



COLUMN DETAILS
1:20



FOUNDATION BEAM DETAIL
1:20



GATE DETAILS
1:50

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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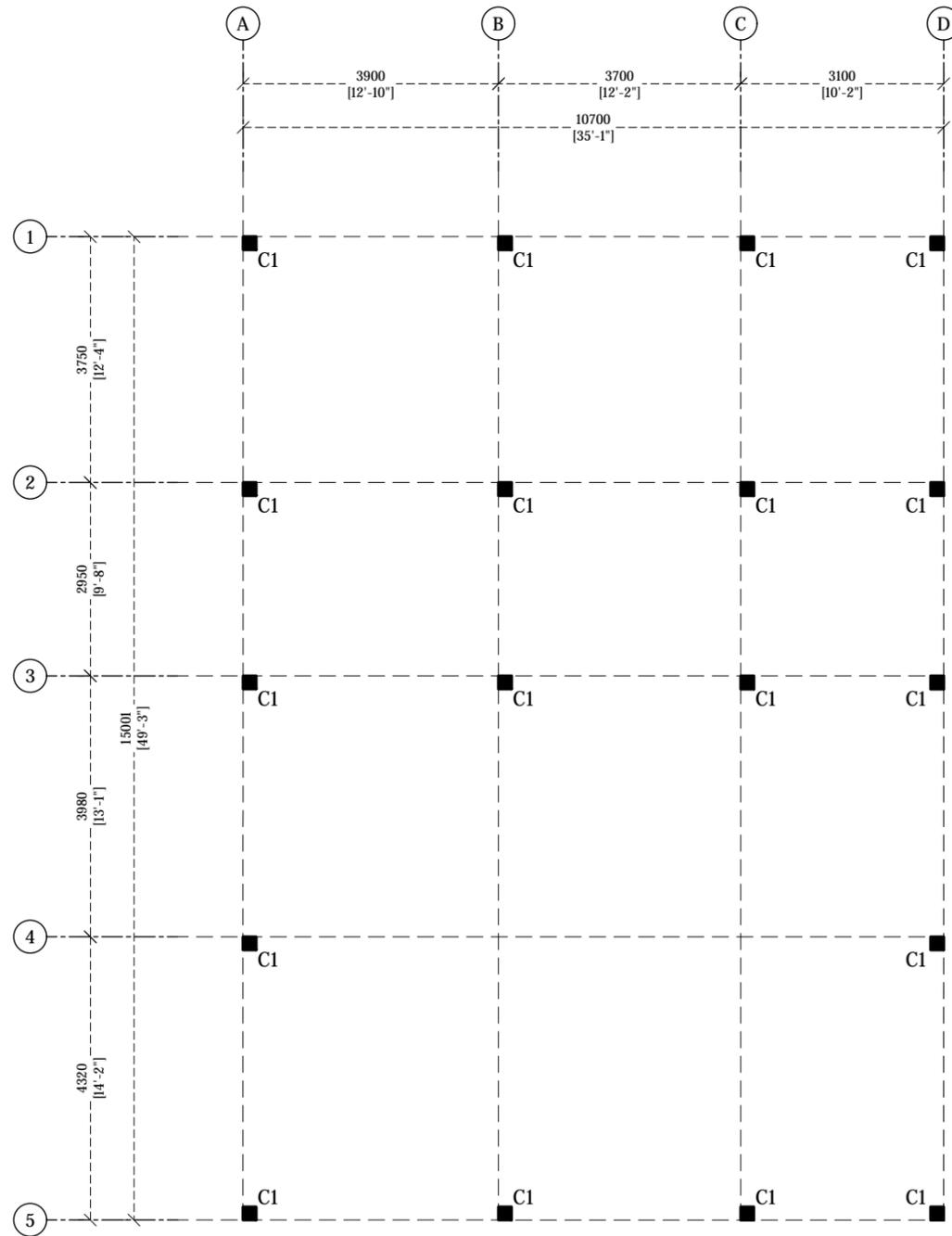
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COLUMN LAYOUT PLAN

1:100

Legend

Note:

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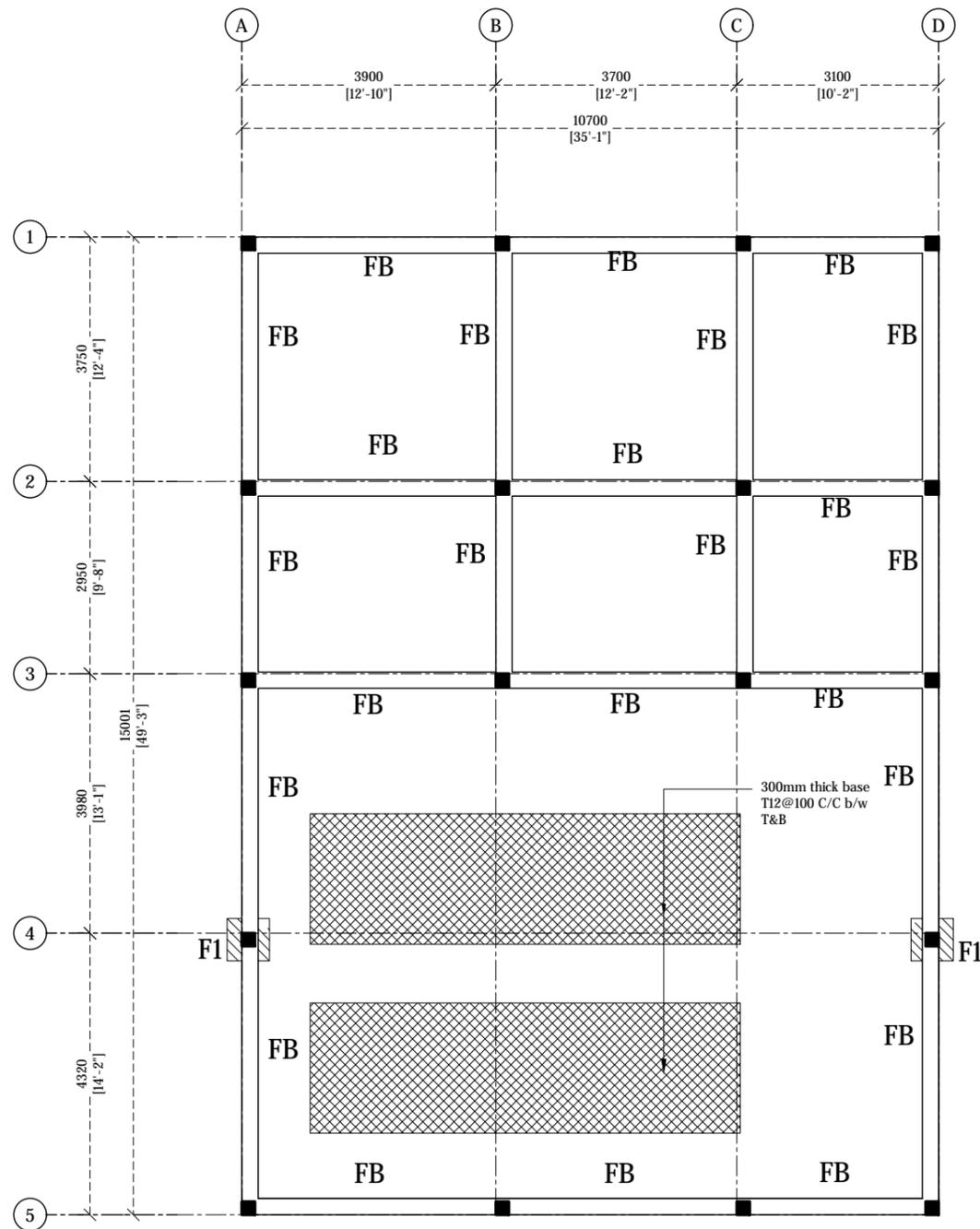
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FOUNDATION PLAN
 1:100

Legend

Note:

- Foundation Footing Depth : 850mm
- Foundation Beam Depth : 600mm

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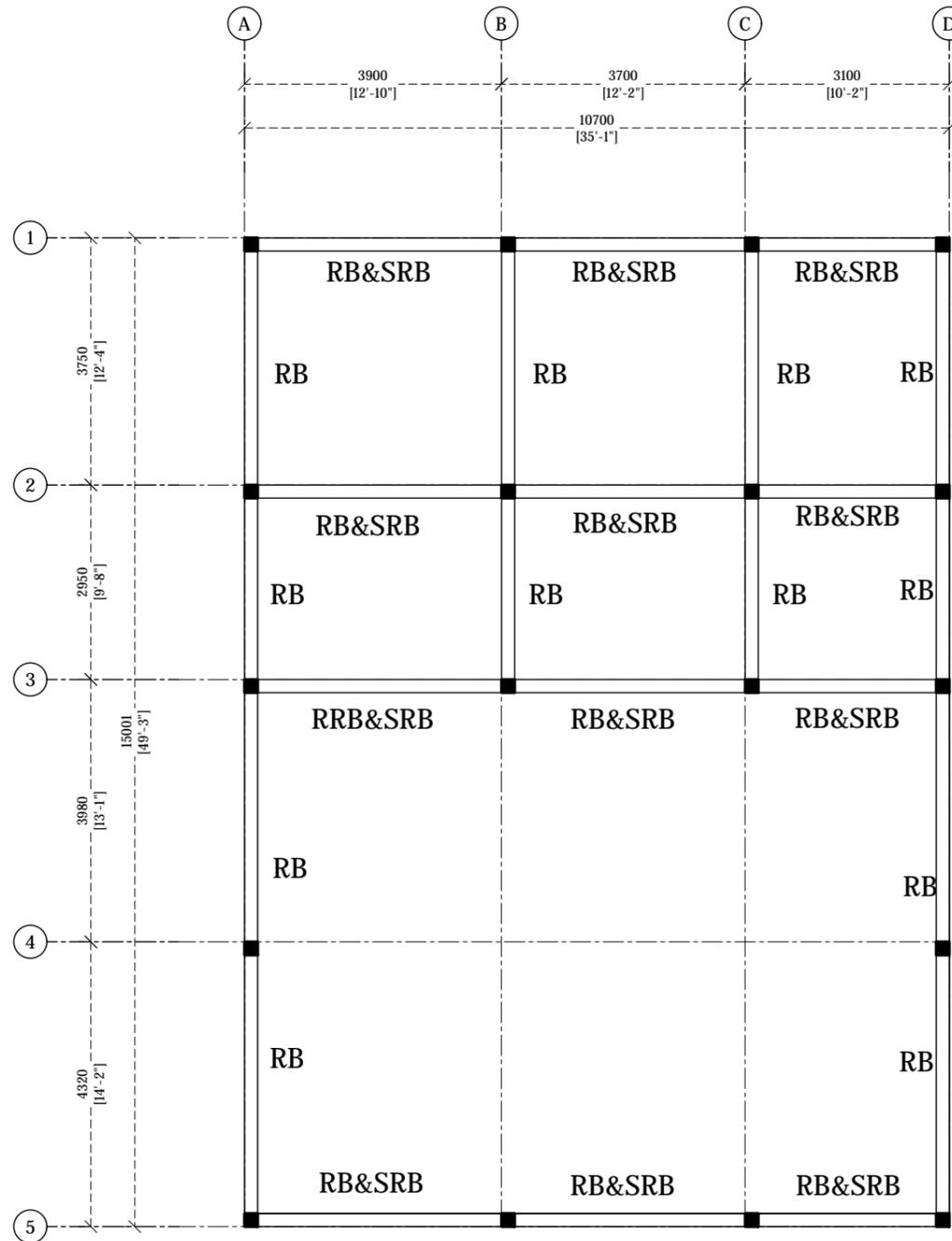


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ROOF BEAM PLAN

1:100

Legend

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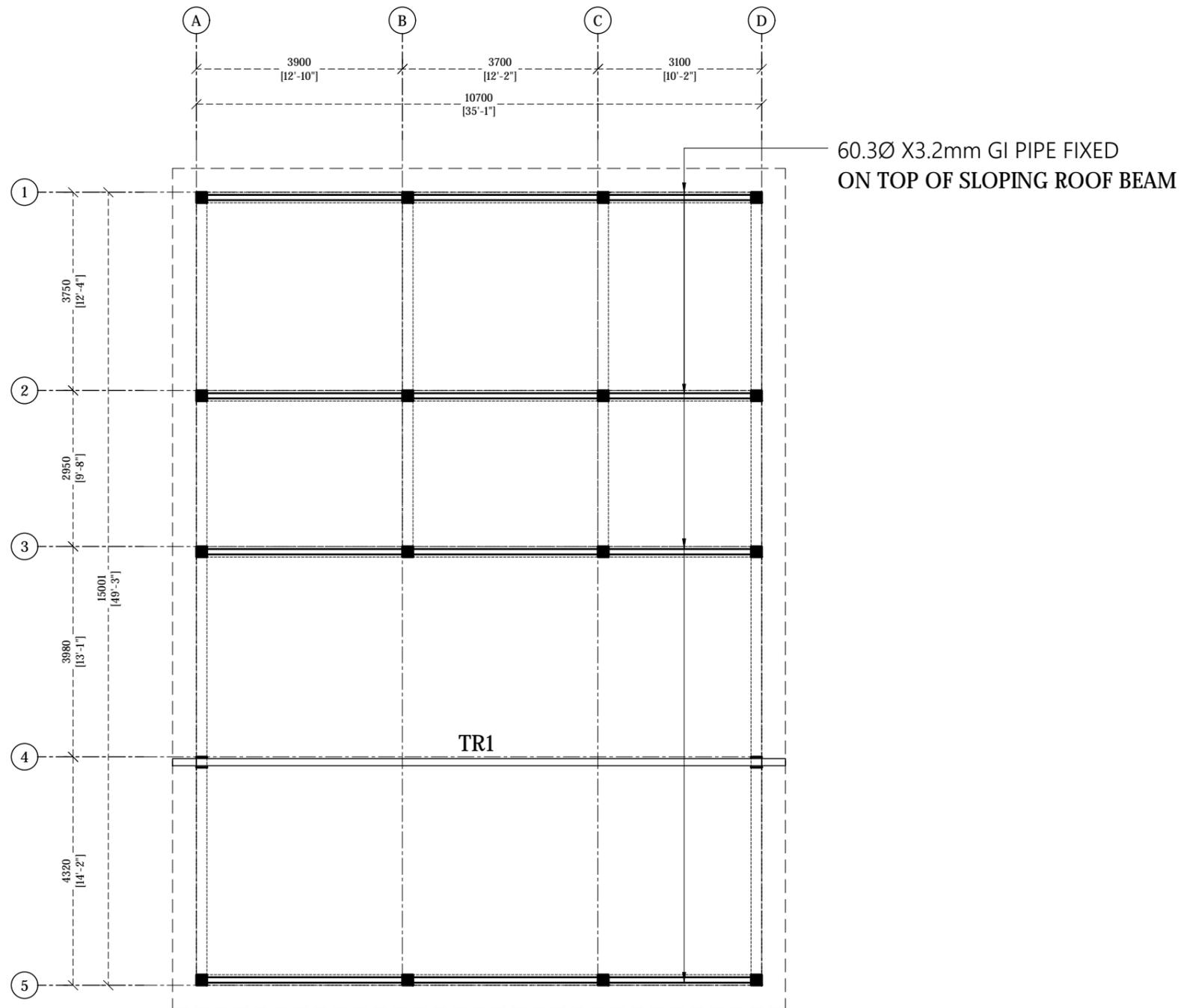


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ROOF TRUSS PLAN

1:100

Legend

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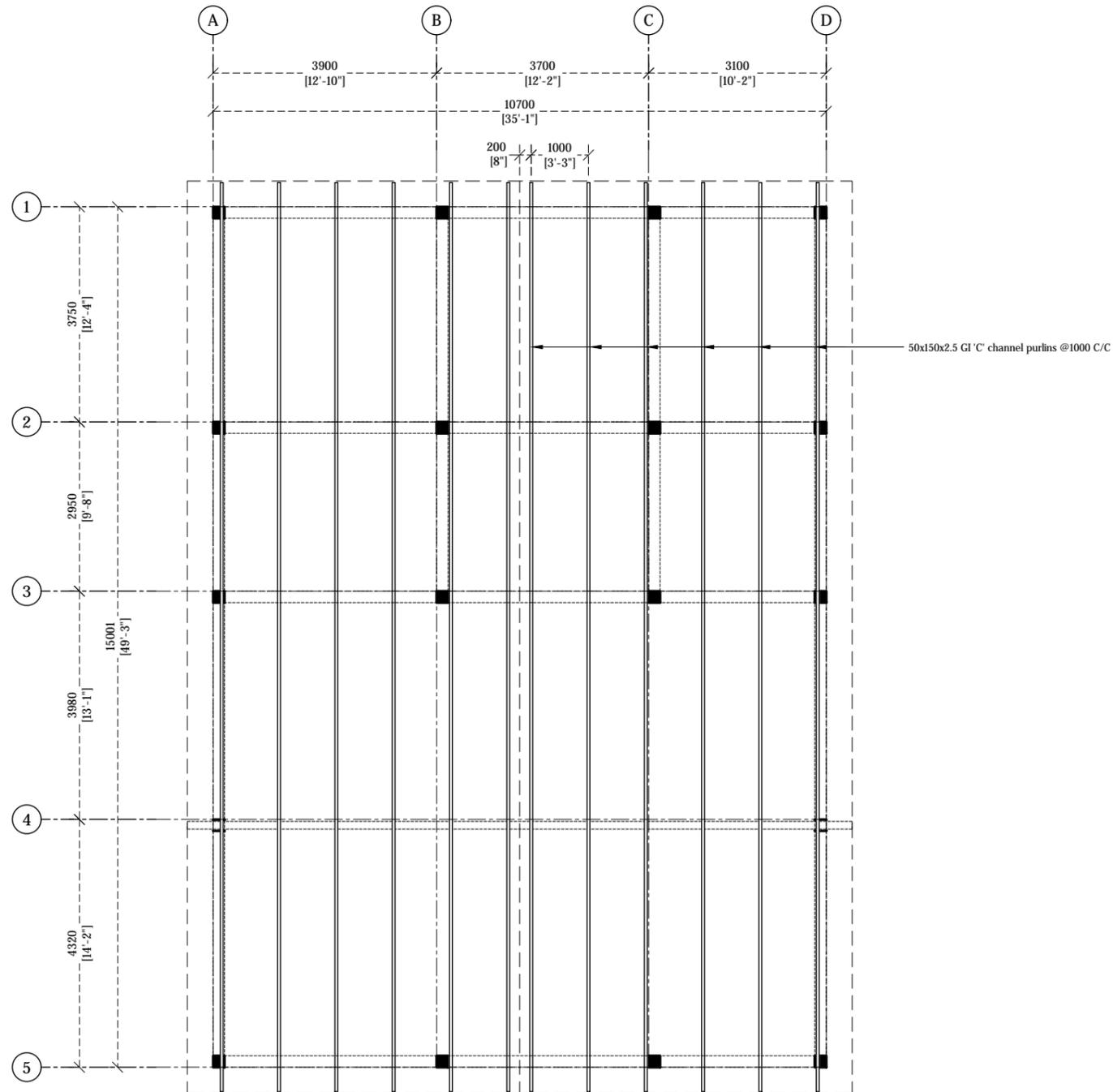


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ROOF FRAMING PLAN

1:100

Legend

Note:

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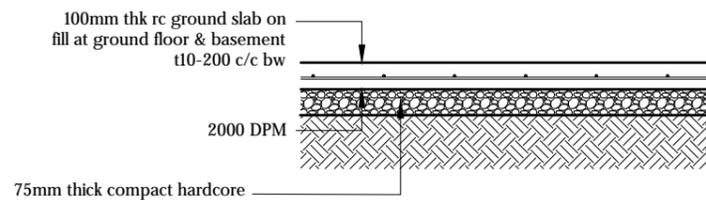


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Date: Nov 2020	SCALE (A3): 1:100
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Rev: R-01	Page: S.3 (3)

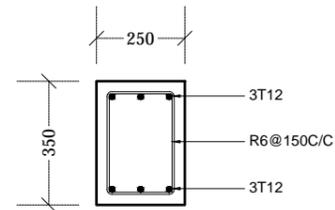


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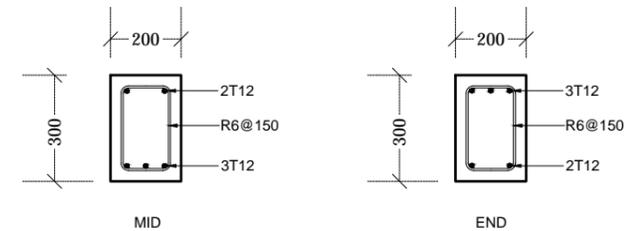
- All cover blocks shall be casted using grade C25/30 concrete with 5-10mm aggregates
- For slab, rebar spacer chairs spacing shall be minimum 1m spacing or 1 no. per 1 sqm

TYPICAL GROUND SLAB DETAIL

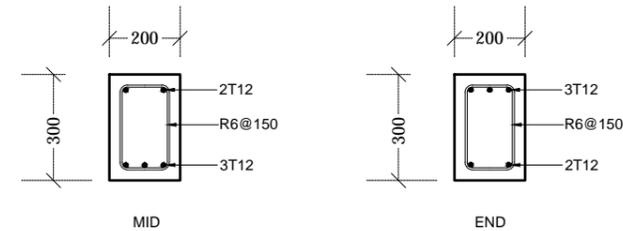
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FOUNDATION BEAM (FB)



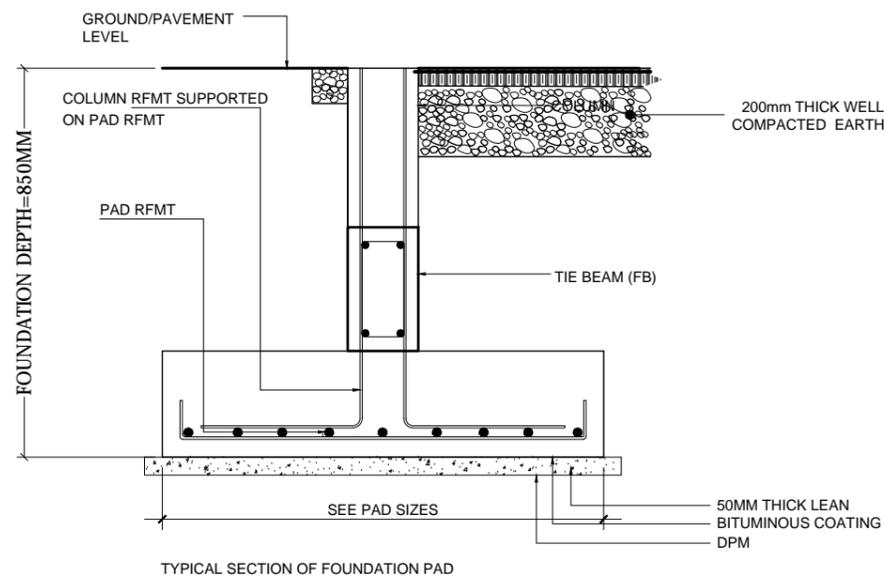
ROOF BEAM (RB)



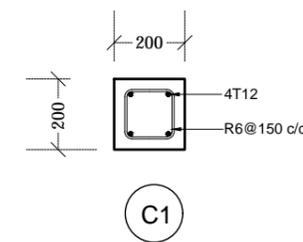
SLOPING ROOF BEAM (SRB)

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

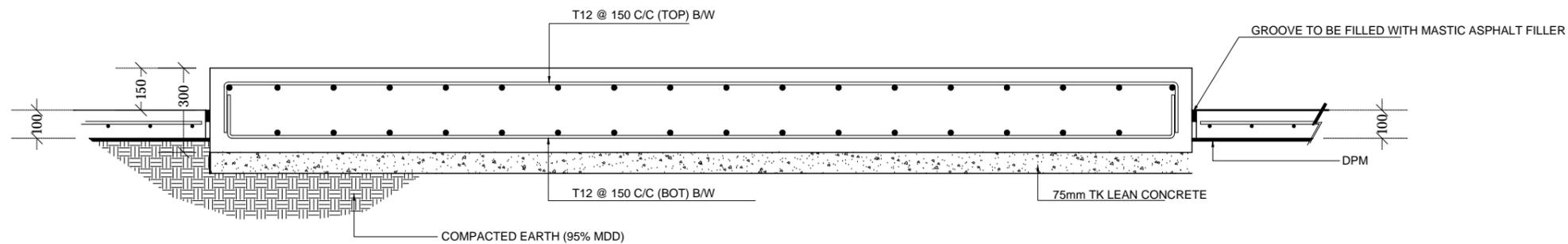
FOUNDATION PAD DETAILS



TYPICAL COLUMN SECTION



COLUMN DETAIL



RO PLANT BASE DETAIL

Legend

Note:

- 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 x span
- sup bars = 1/3 x span
- concrete mix = 1:2:3 (C:S:A)
- lean concrete mix = 1:2:5

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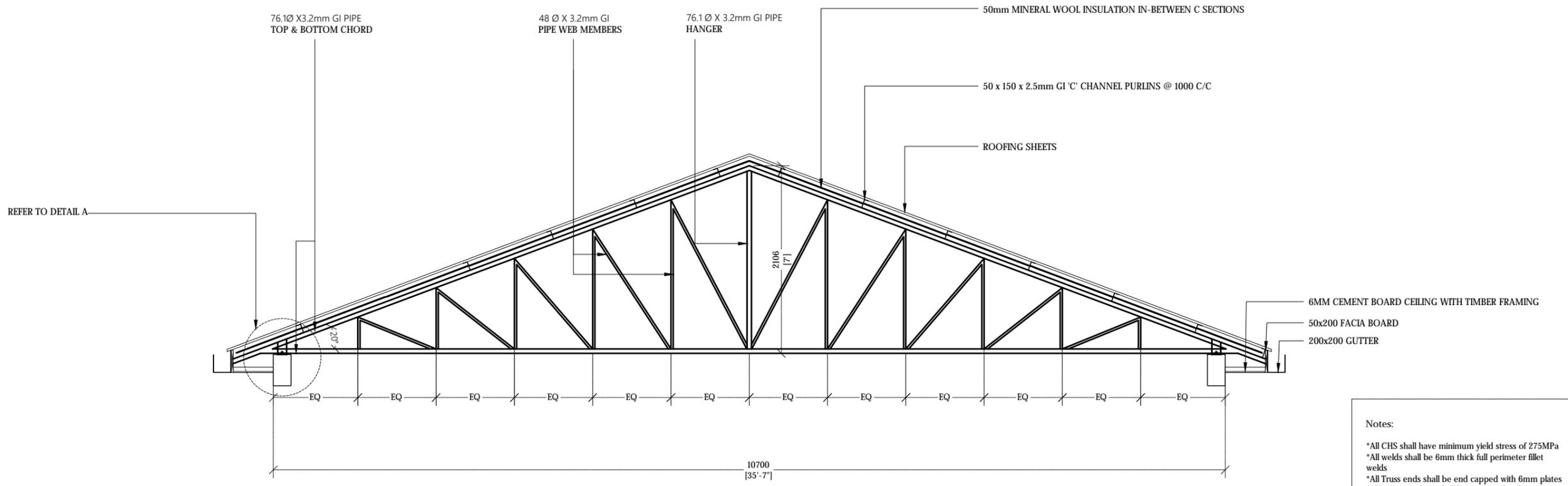
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STRUCTURAL DETAILS

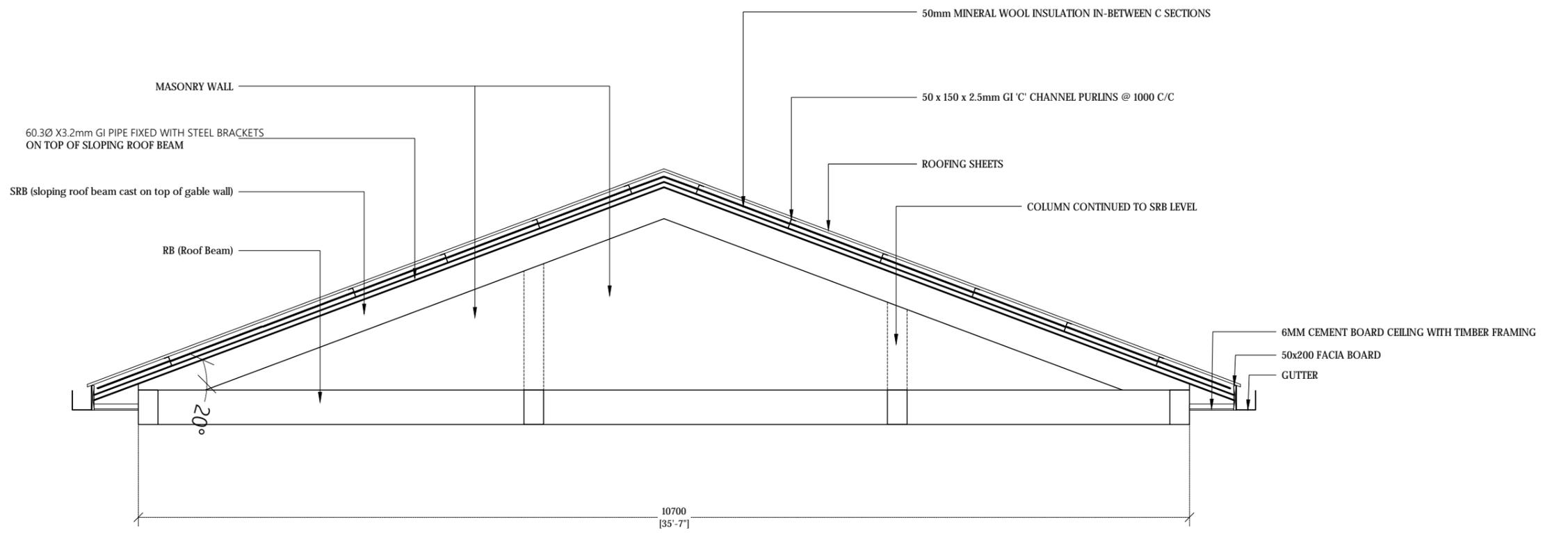
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TRUSS DETAIL TR1 @ GRID 2

1:50

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



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

1:50

Legend

Note:

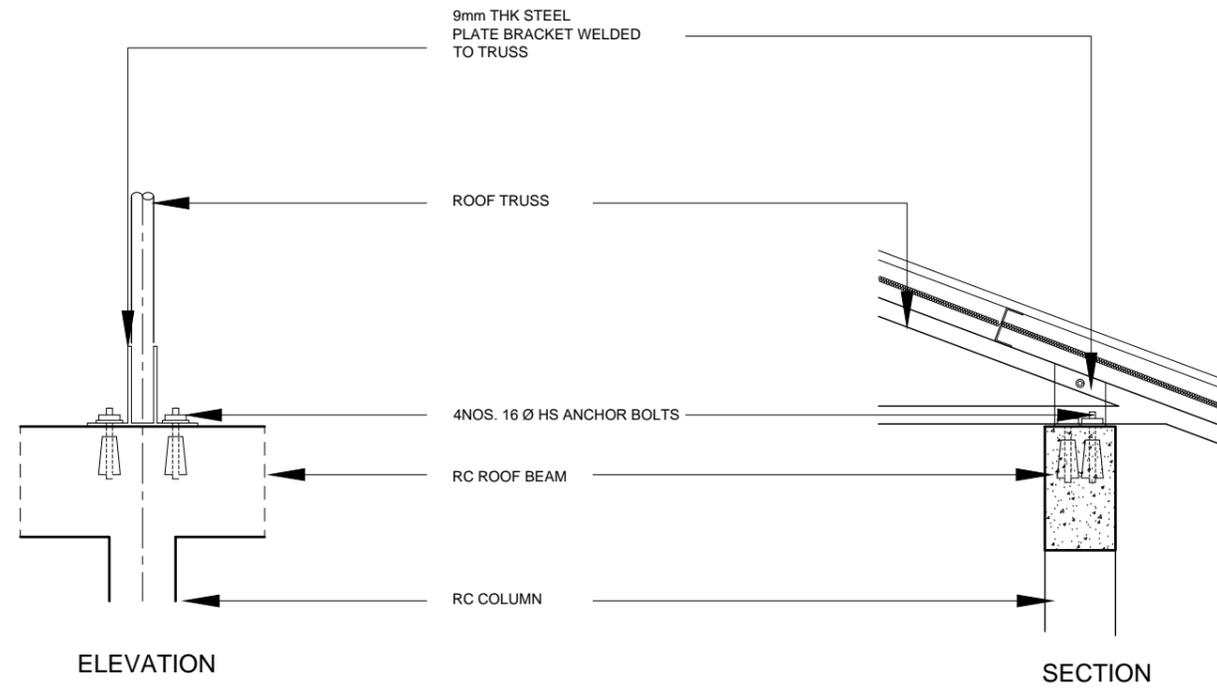
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ELEVATION

SECTION

Legend

Note:

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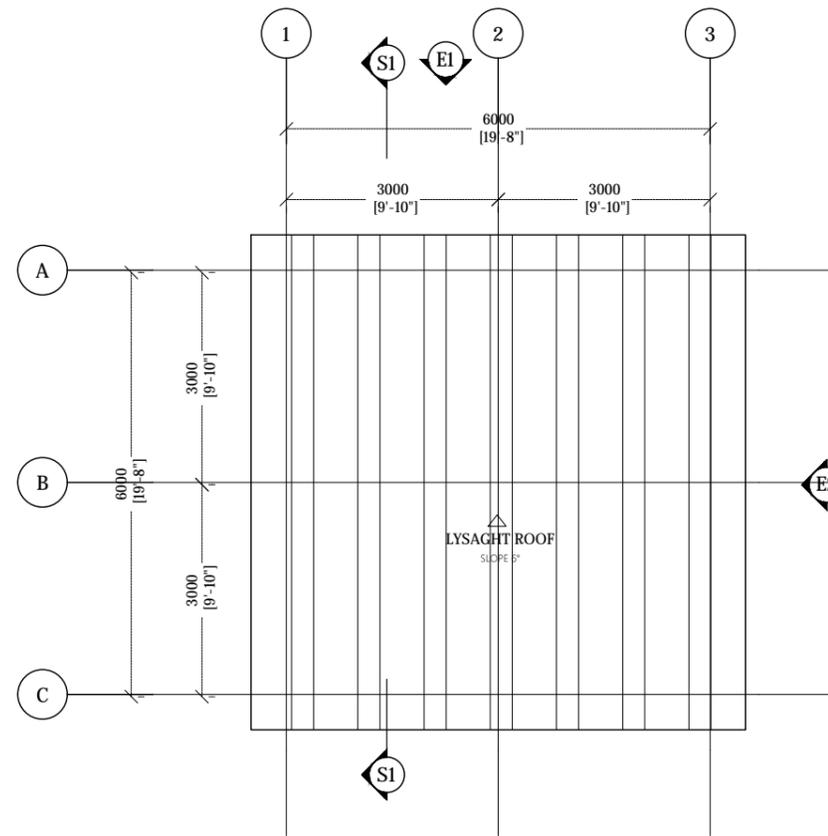
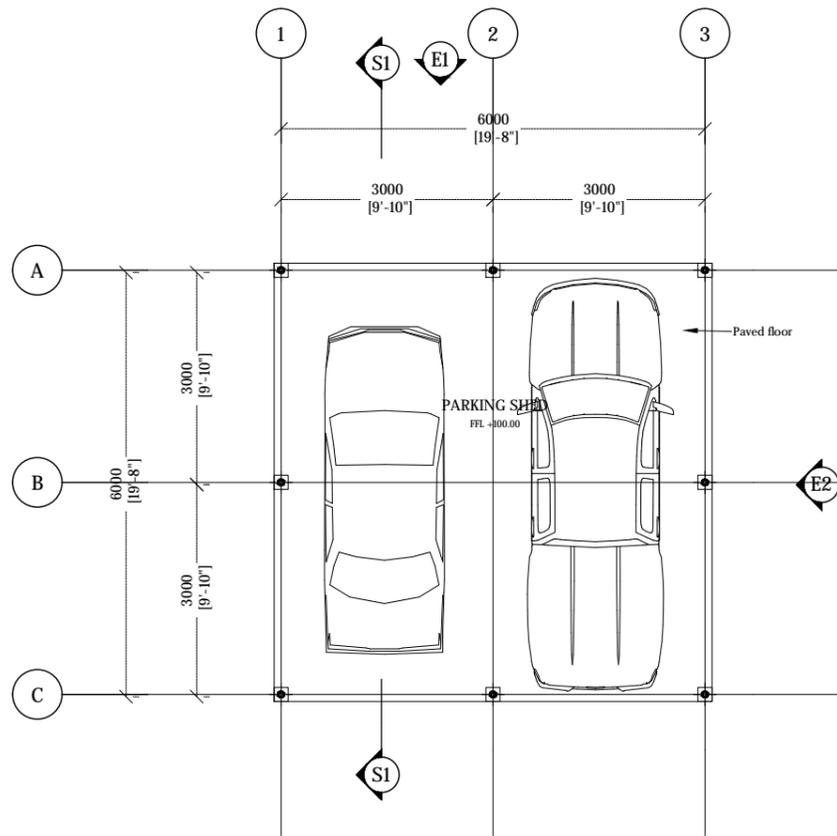
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DETAIL A

1:20

ARCHITECTURAL AND STRUCTURAL DRAWINGS OF
PROPOSED SINGLE STOREY BUILDING AT
RO PLANT VEHICLE SHED, L.HITHADHOO



Legend

Note:

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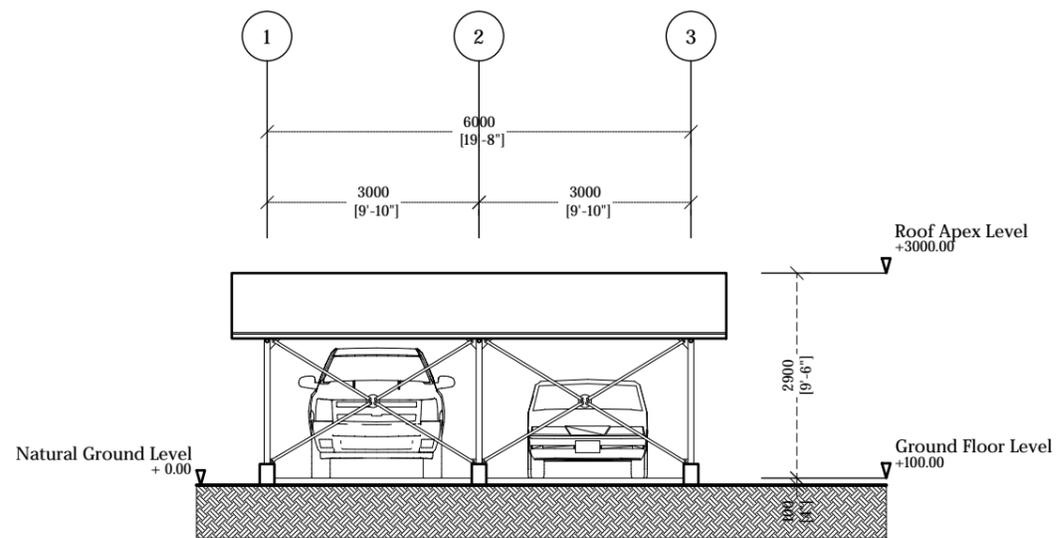


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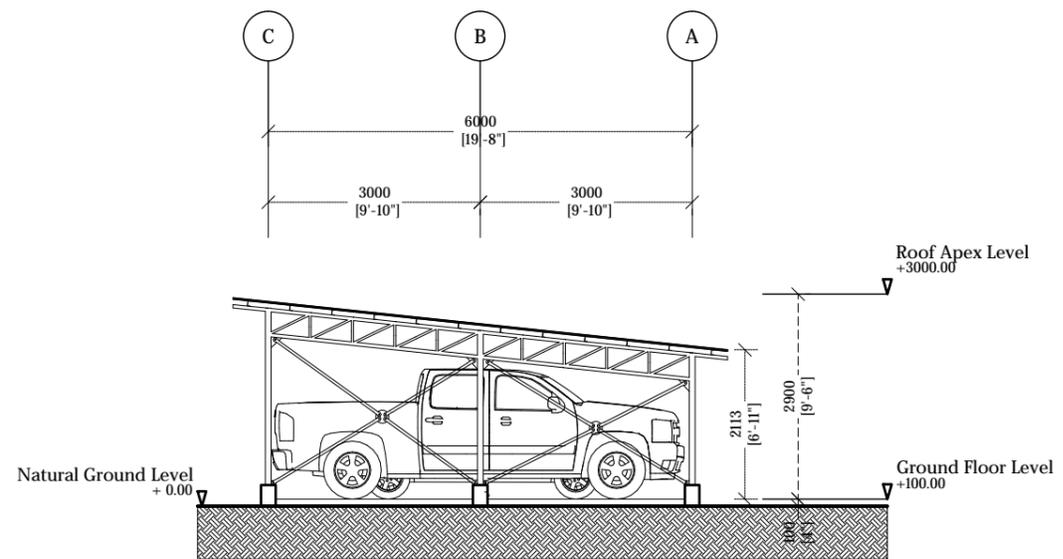


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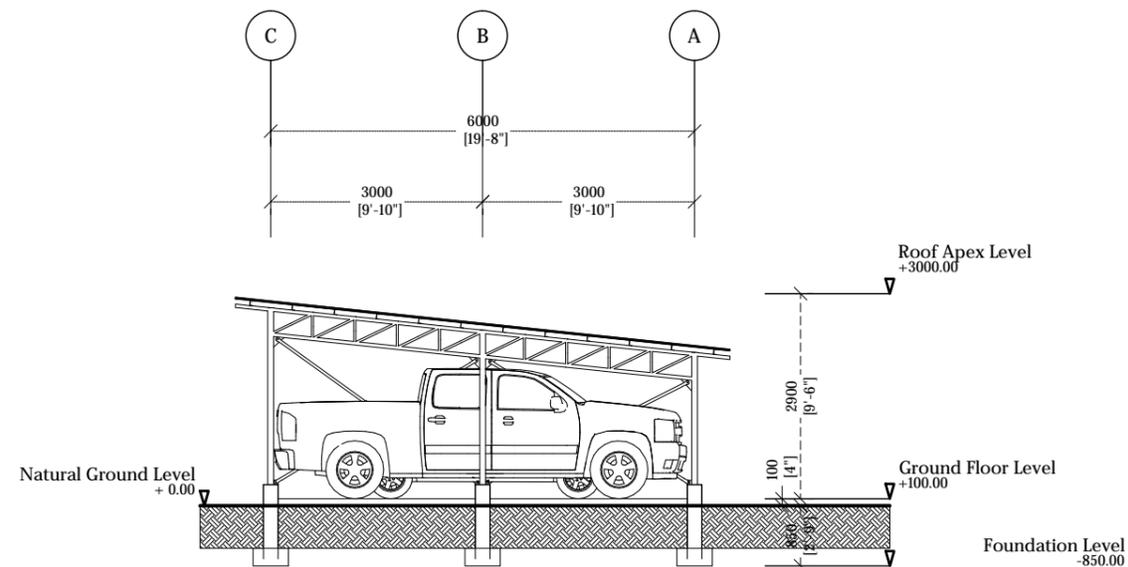
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ELEVATION E1
1:100



ELEVATION E2
1:100



SECTION S1
1:100

Legend

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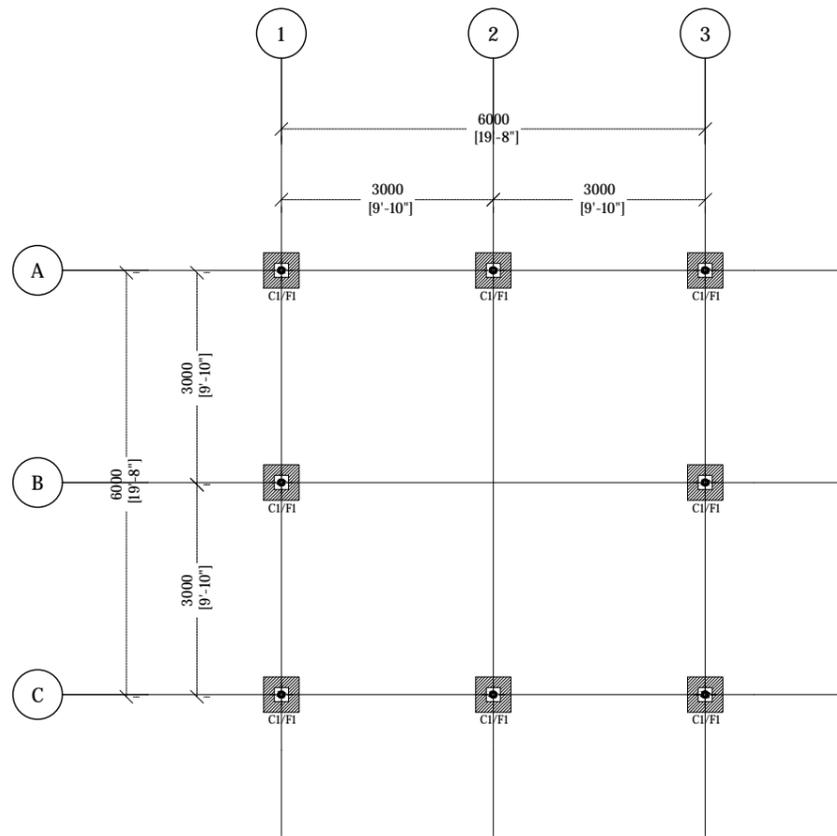
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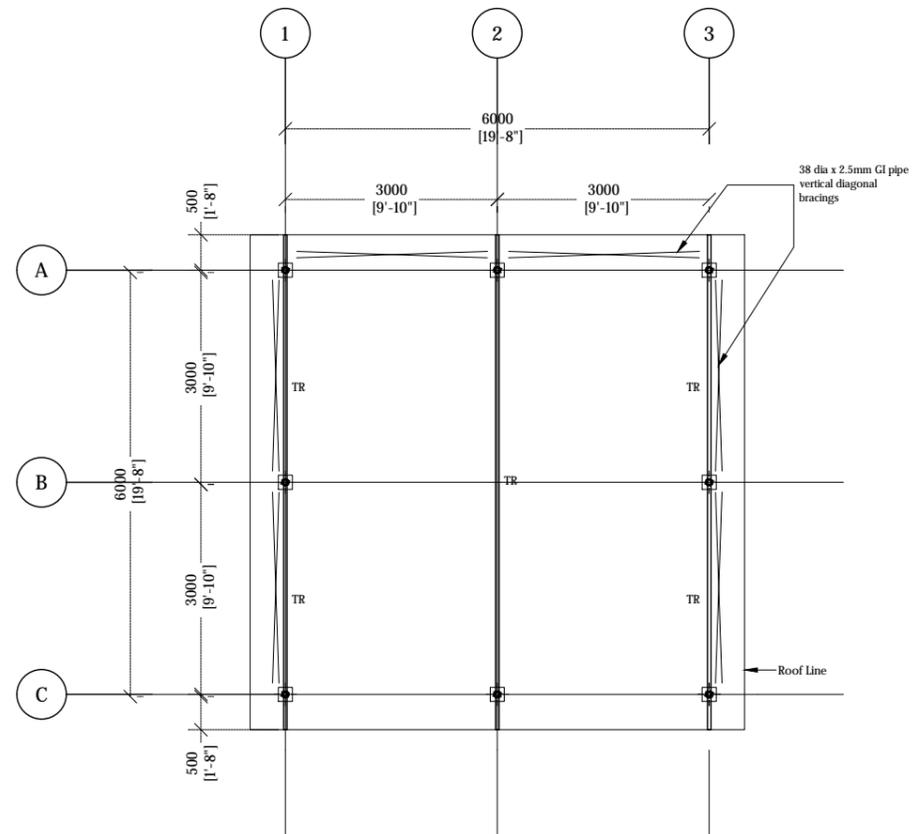
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FOUNDATION PLAN
1:100



ROOF TRUSS PLAN
1:100

Legend

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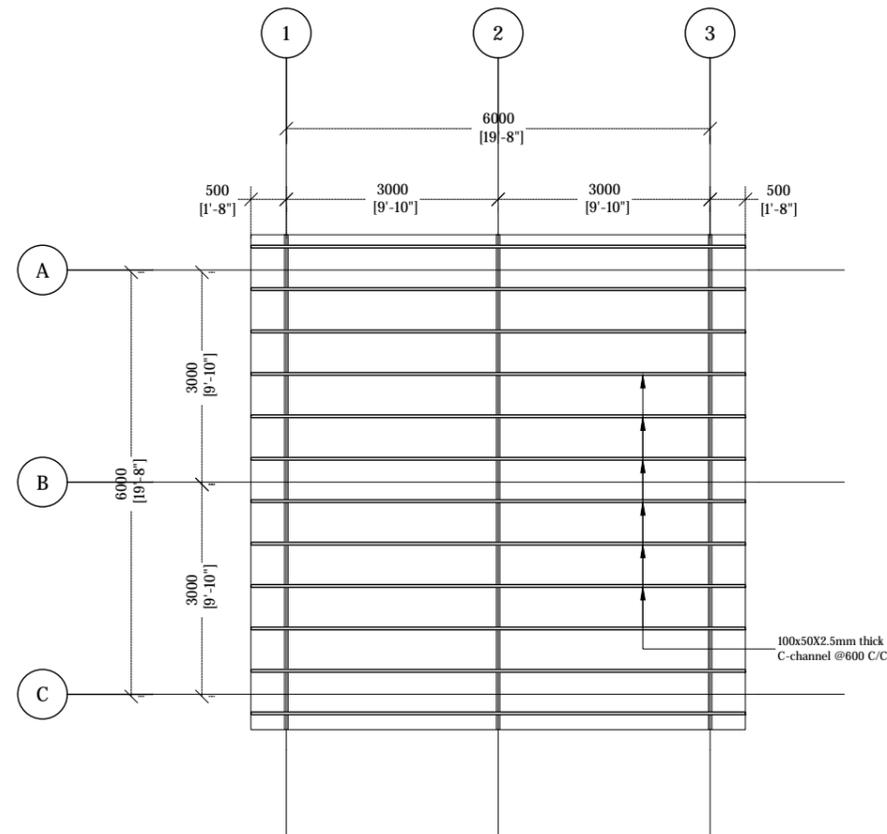


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ROOF FRAMING PLAN

1:100

Legend

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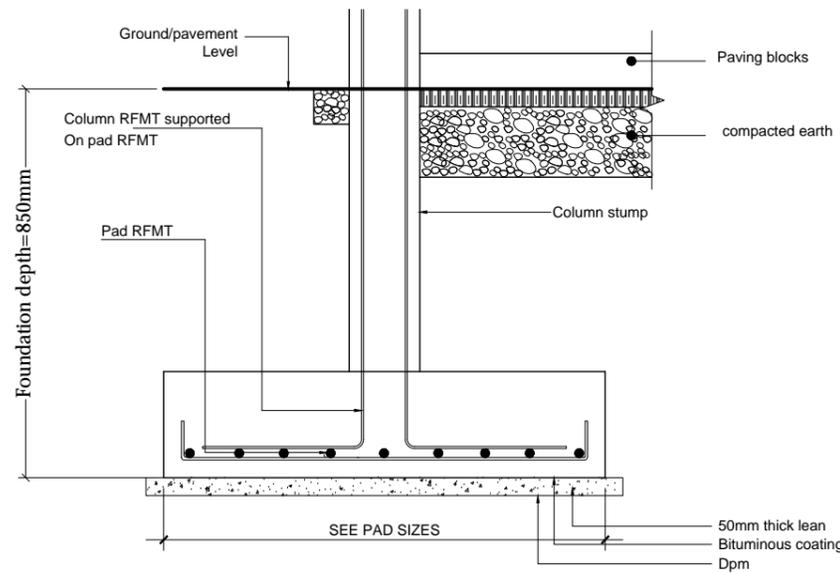


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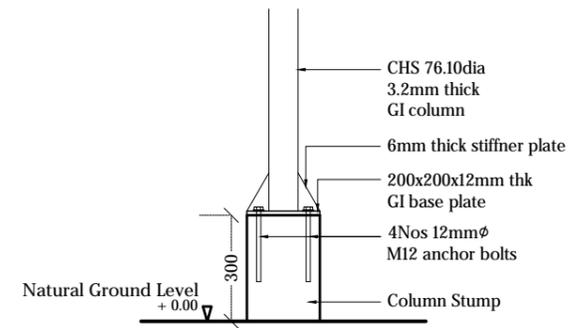
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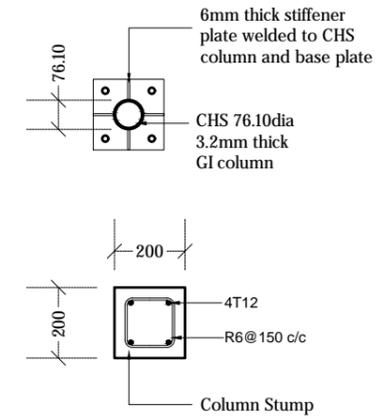
F1 - 500x500x250 - T10@150C/C B/W (B)

FOUNDATION PAD DETAILS



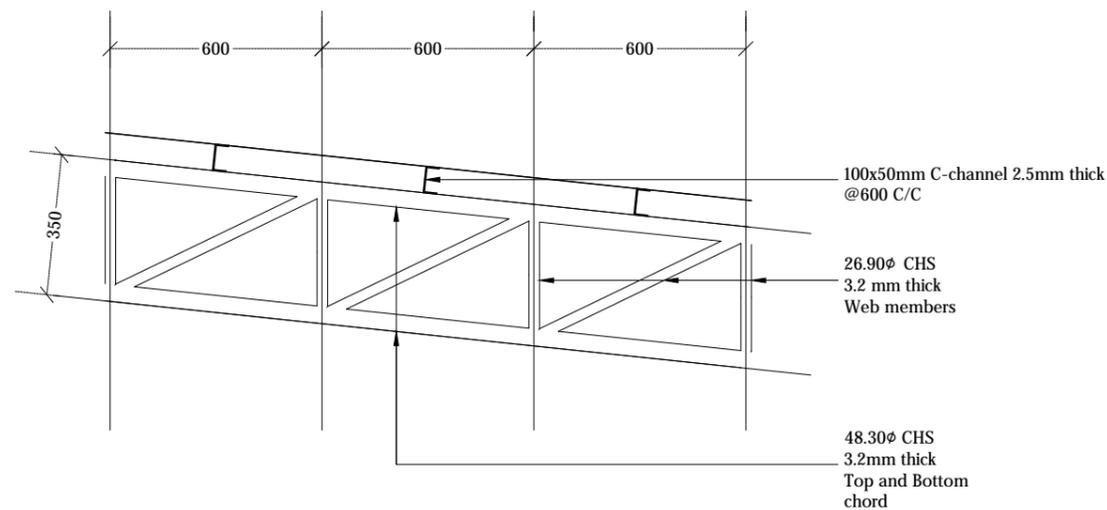
VEHICLE SIDE FOOTING DETAIL

1:20



COLUMN DETAIL

1:20



TRUSS DETAIL

1:20

Legend

Note:

- *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
- *38 dia x 2.5mm GI pipe to be used for all bracings.
- *Cover for footings shall be 50mm.
- *Cover for columns shall be 40mm.
- *Concrete shall be of grade C25.

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 Building Sustainable Infrastructure

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BUILDING SERVICES DRAWINGS OF

PROPOSED SINGLE STOREY BUILDING AT

RO PLANT ADMIN BUILDING, L.HITHADHOO

For Ministry of National Planning, Housing and Infrastructure

CONTENTS

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

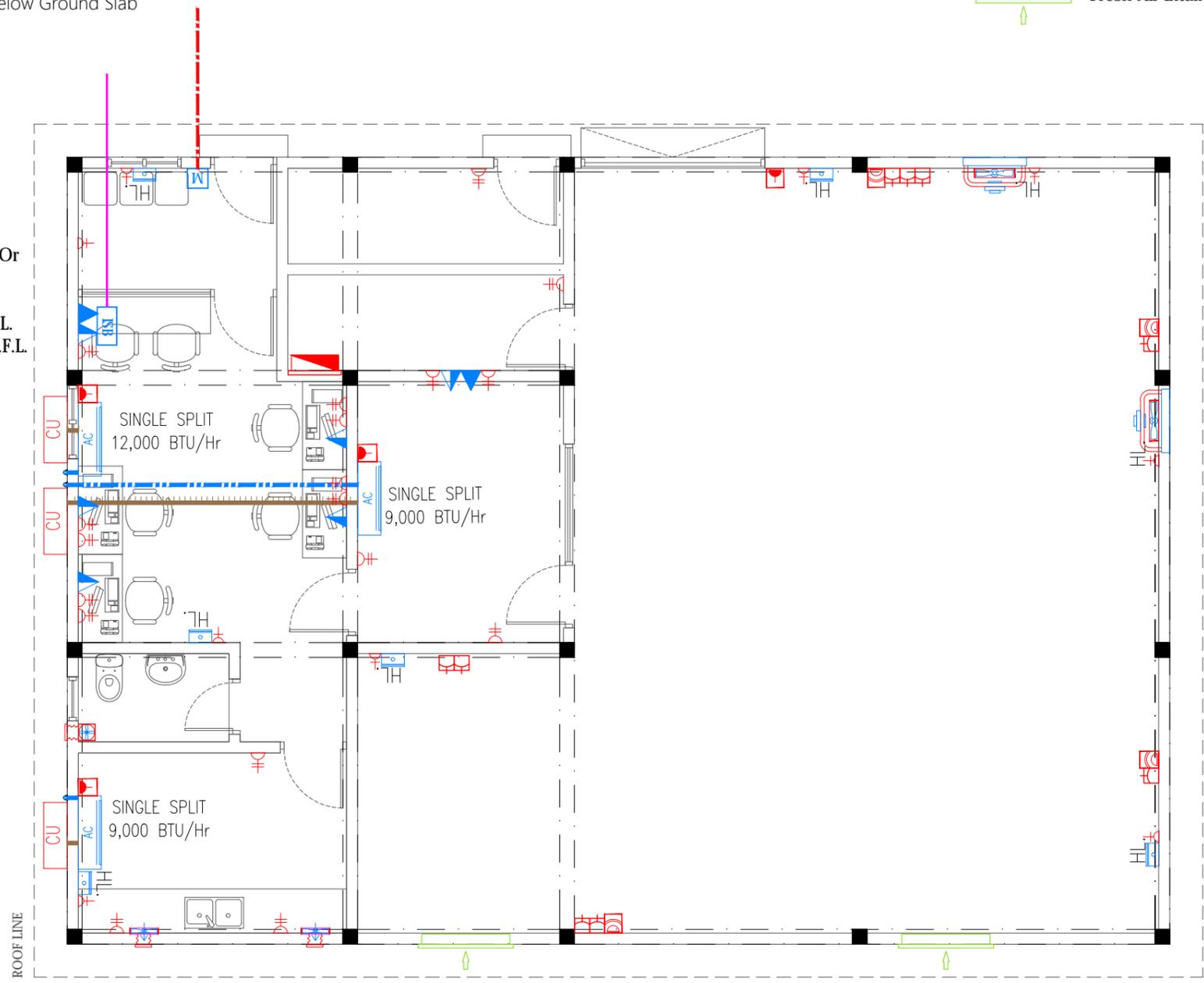
Legend

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

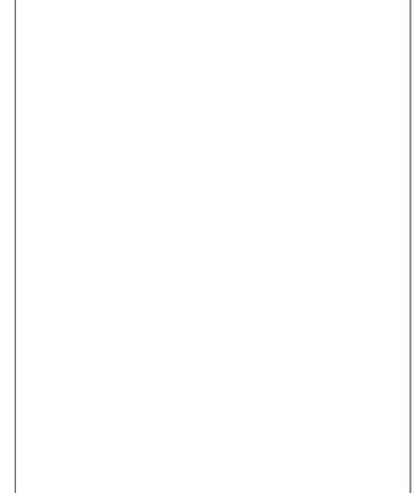
- Notes: -**
- All 13A Power Outlets For Kitchen Hood Or Under Cabinet Or Wardrobe Lights At 1800mm From F.F.L.
 - All Twin Sockets At 300mm From F.F.L. Except Located At Kitchen Cupboard Area Which Shall Be At 1200mm From F.F.L.
 - All Computer, TV And Telephone Points At 300mm From F.F.L.
 - All 20A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

Legend

-  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



Legend



- Note:**
- All 13A Power Outlets For Kitchen Hood Or Under Cabinet Or Wardrobe Lights At 1800mm From F.F.L.
 - All Twin Sockets At 300mm From F.F.L. Except Located At Kitchen Cupboard Area Which Shall Be At 1200mm From F.F.L.
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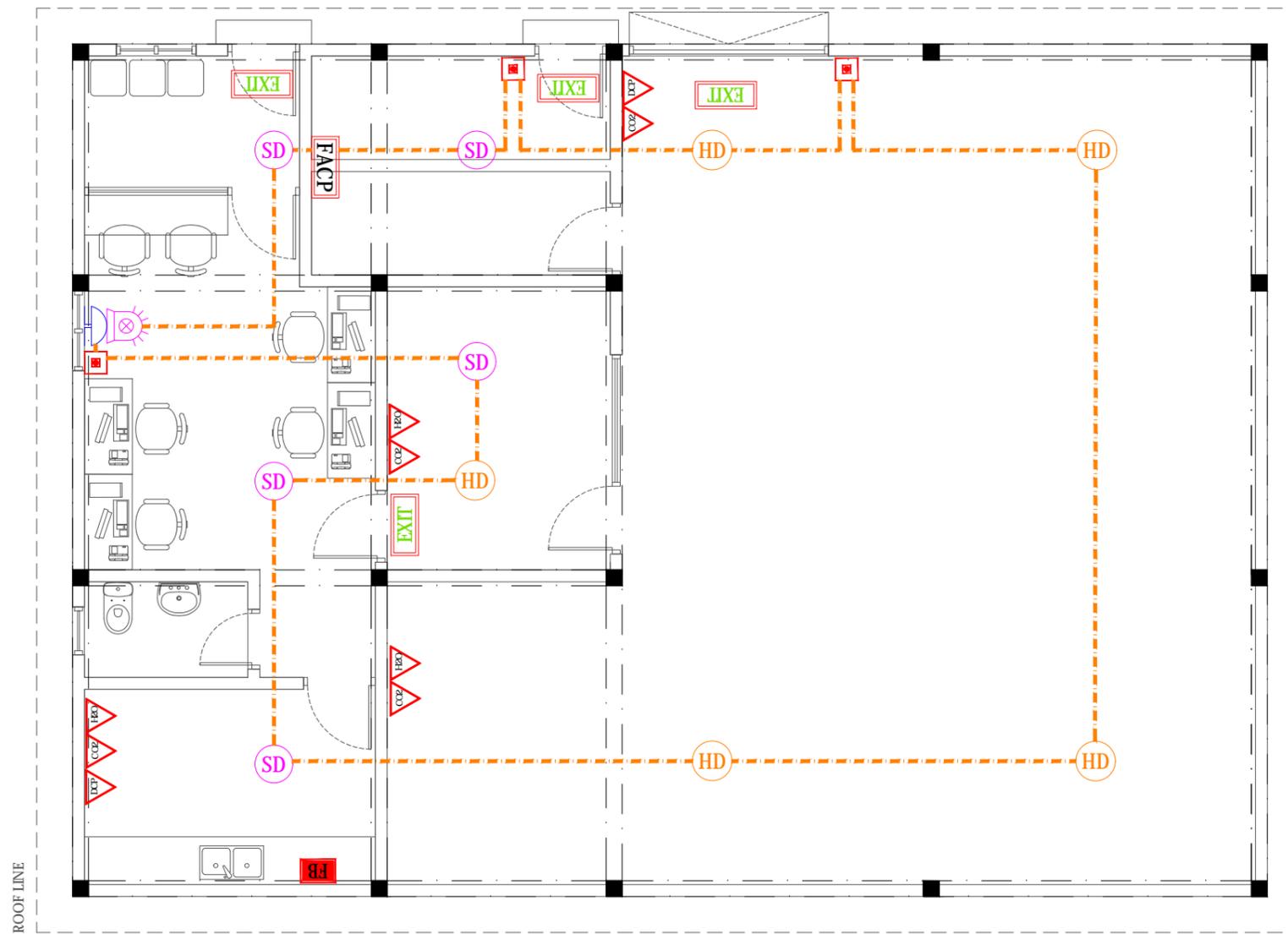
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GROUND FLOOR POWER AND ACV LAYOUT

Legend

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



GROUND FLOOR FDP LAYOUT

1:75

Legend

Note:

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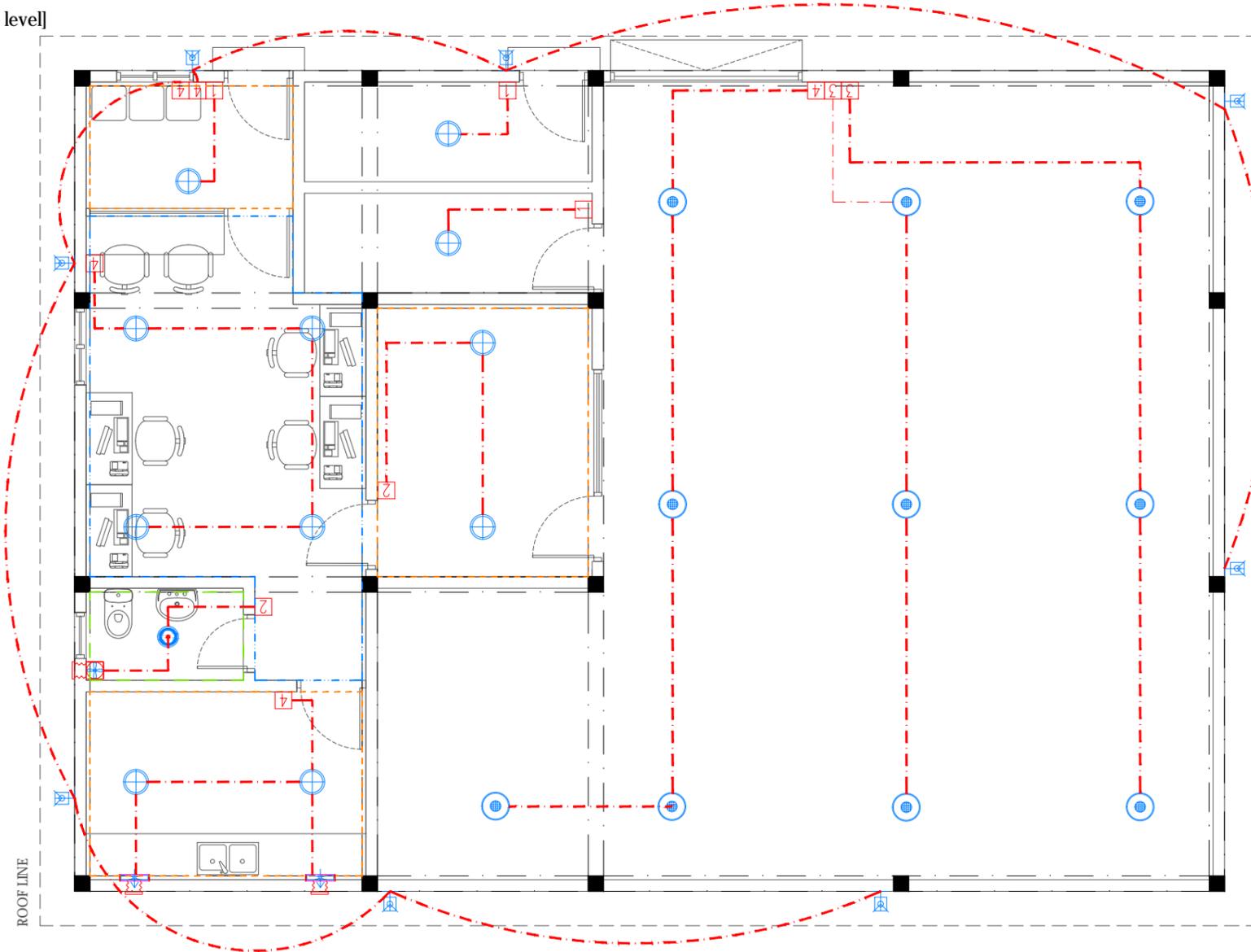
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Legend

-  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]



ROOF LINE



GROUND FLOOR LIGHTING LAYOUT

1:75

Legend

Note:

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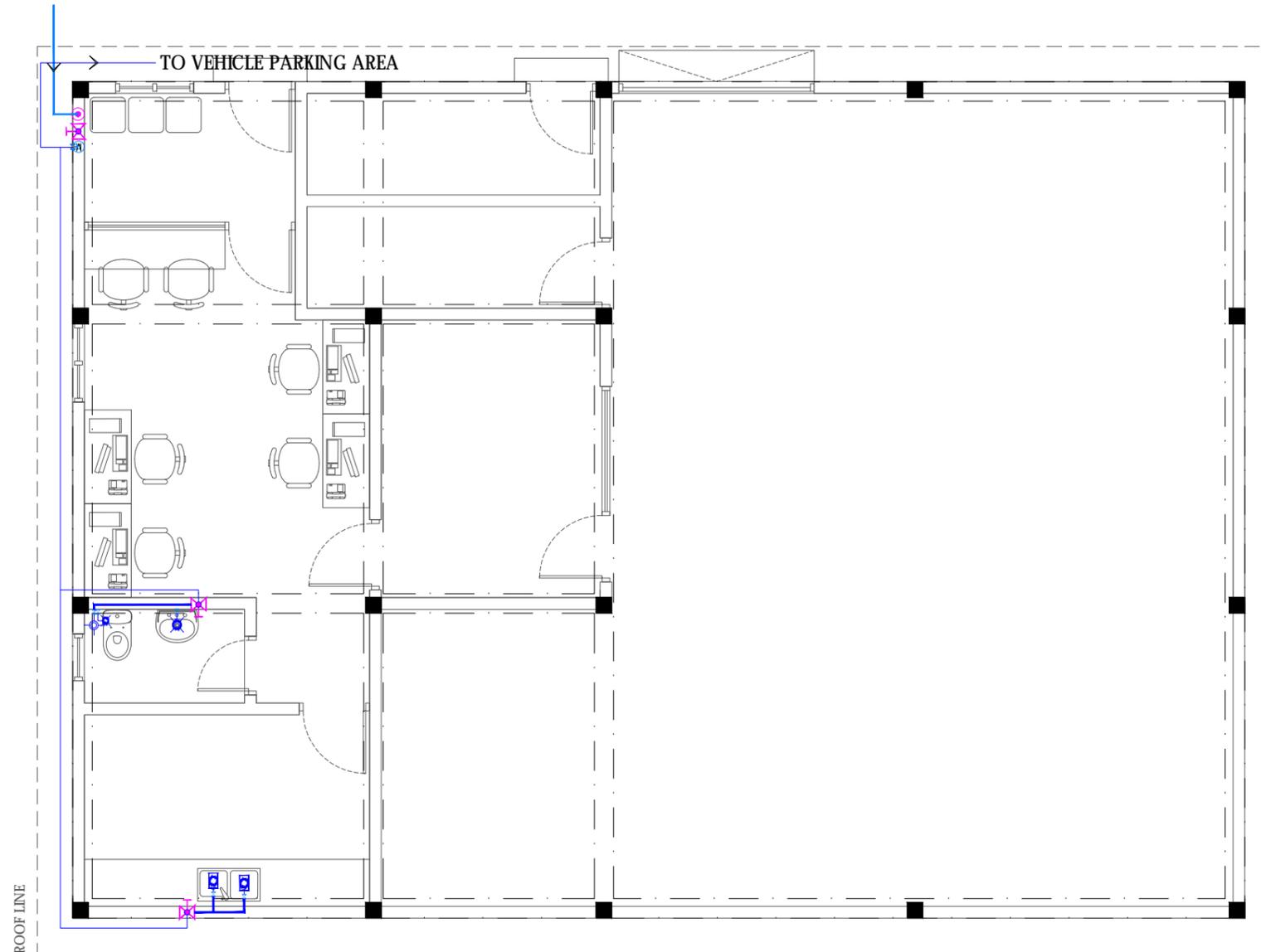
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Legend

-  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

PIPE FROM MAINS SUPPLY



GROUND FLOOR PLUMBING LAYOUT

1:75

Legend

Note:

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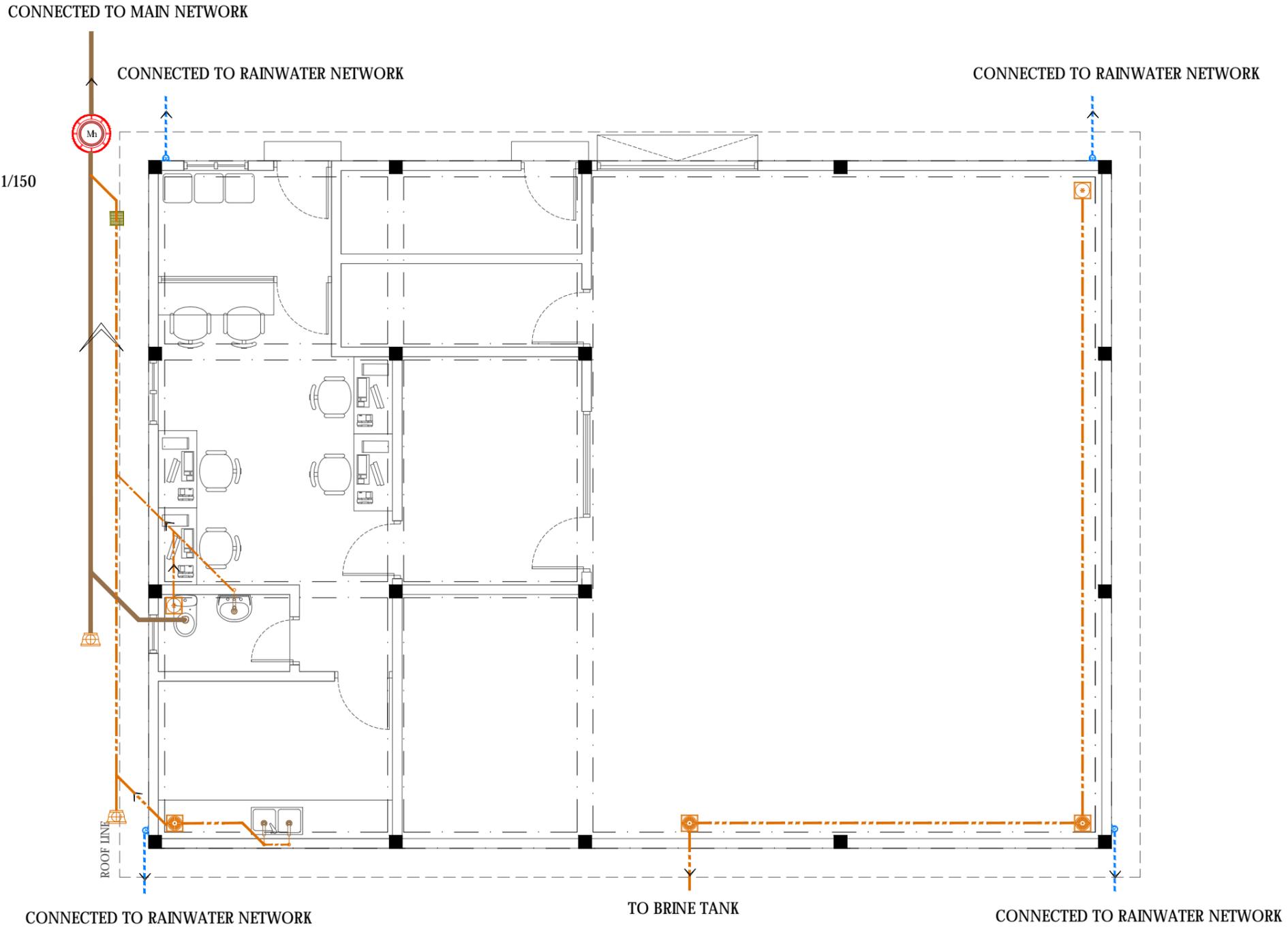
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Legend

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

Notes: -

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



GROUND FLOOR DRAINAGE LAYOUT

1:75

Legend

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

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
R01	NOV 2020		H.R.	M.R.	M.R.

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

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



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Working Infrastructure Happier

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

Legend

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

Notes: -

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



ROOF 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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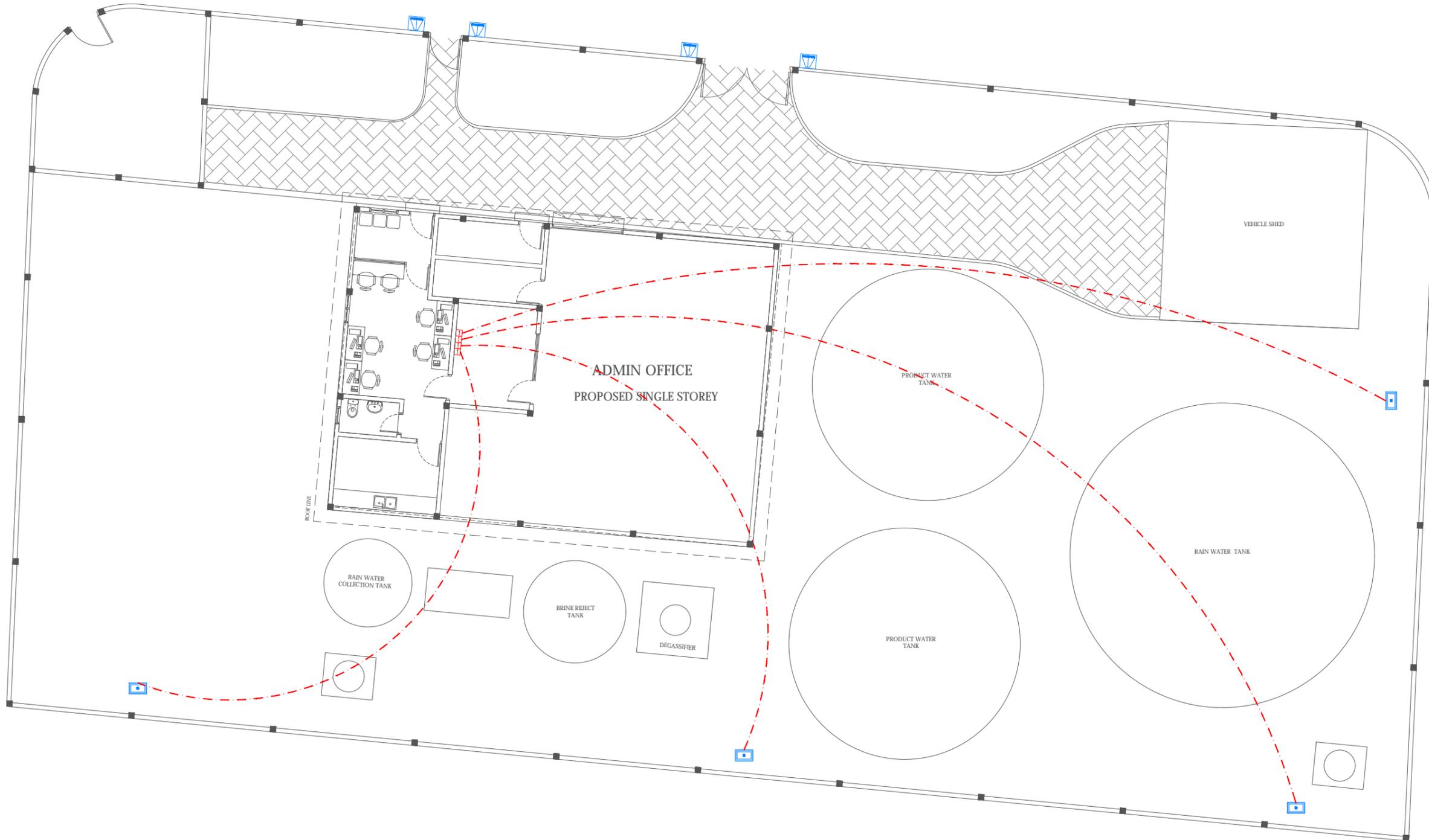


DBAC INFRA
 Making Infrastructure Happen

Drawn: H.R.	Checked: M.R.
Designed: H.R.	Approved: M.R.
Date: Nov 2020	SCALE (A3): 1:75
Project No: EP-WS/2019/06	
Rev: R-01	Page: DR-02

Legend

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



Legend

Note:

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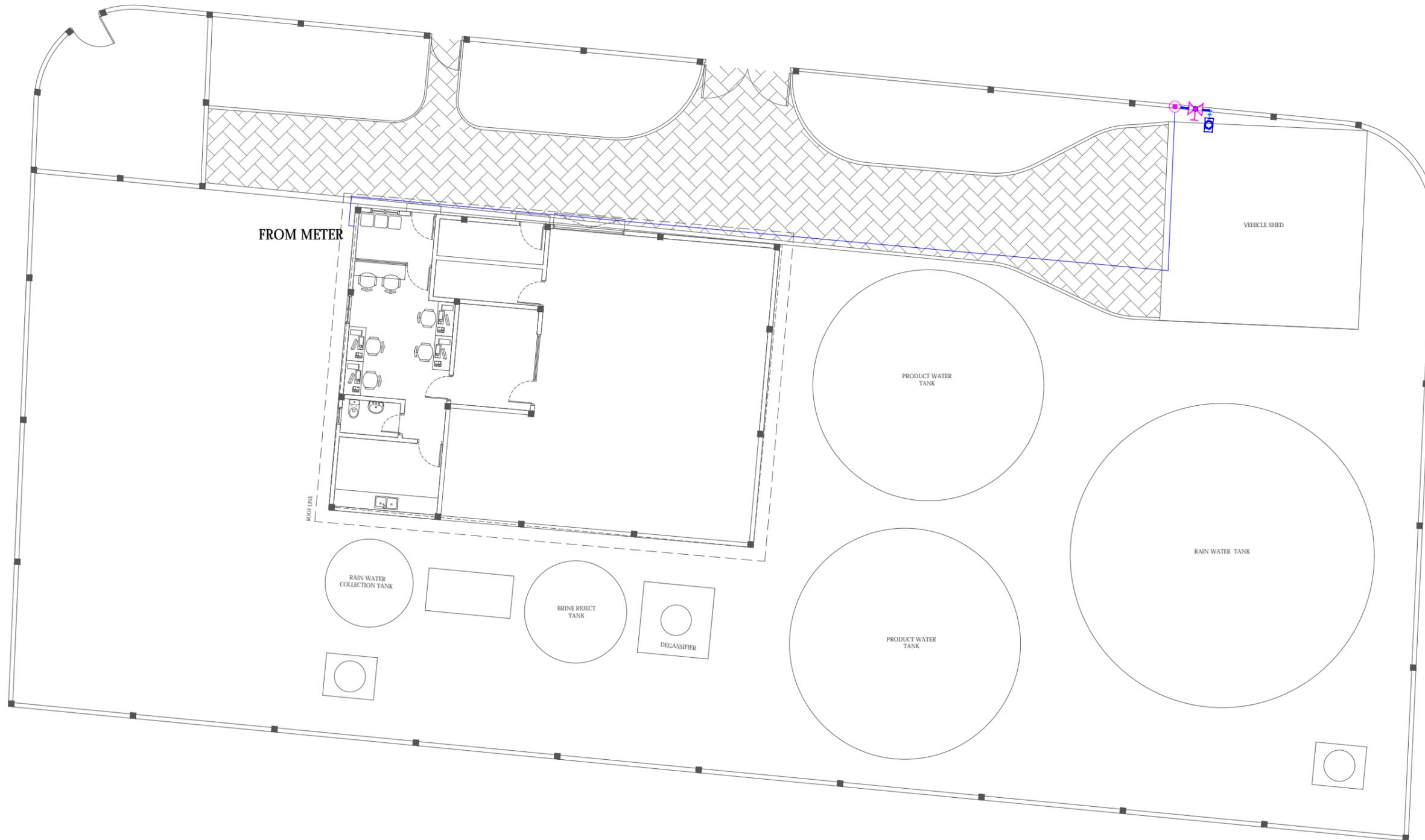
Drawn: H.R.	Checked: M.R.
Designed: H.R.	Approved: M.R.
Date: Nov 2020	SCALE (A3): 1:150
Project No: EP-WS/2019/06	
Rev: R-01	Page: EL-02

SITE LIGHTING LAYOUT
 1:150



Legend

-  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



VEHICLE PARKING AREA - PLUMBING LAYOUT

1:150

Legend

Note:

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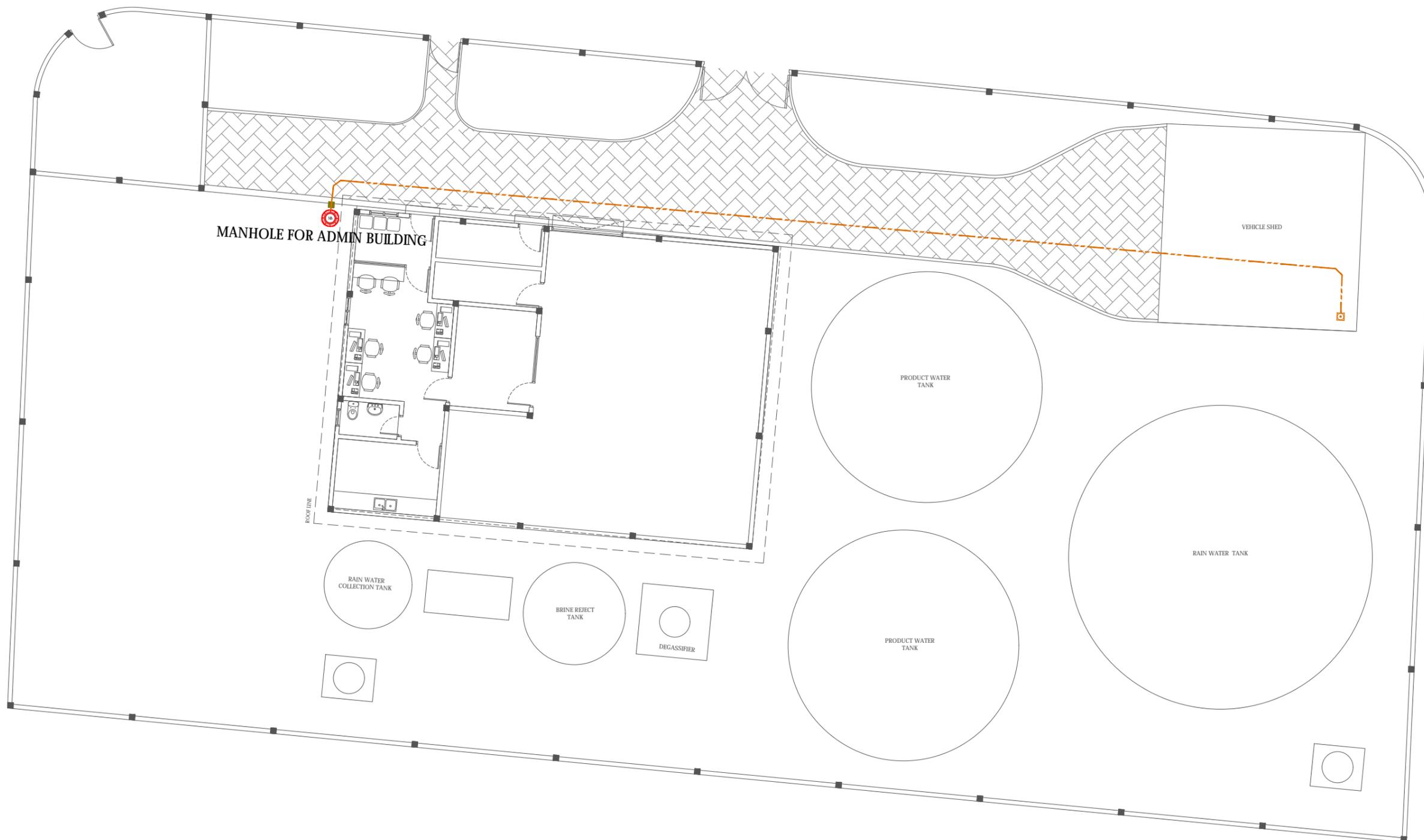


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Date: Nov 2020	SCALE (A3): 1:150
Project No: EP-WS/2019/06	
Rev: R-01	Page: PL-02



Legend

- Floor Drain
- 40Ø Stub For Washing Machine Or Tub
- 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
- Clean Out Point

Note:

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DBACK INFRA
 Working Infrastructure - Shaping

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Rev: R-01	Page: DR-03

VEHICLE PARKING AREA - DRAINAGE LAYOUT
 1:150