

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

PACKAGE 5

SEWERAGE SYSTEM OF M. RAIYMANDHOO, MALDIVES

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

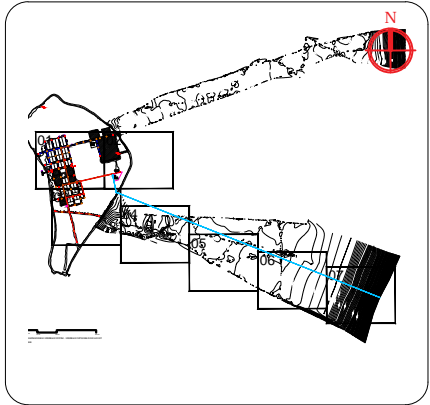
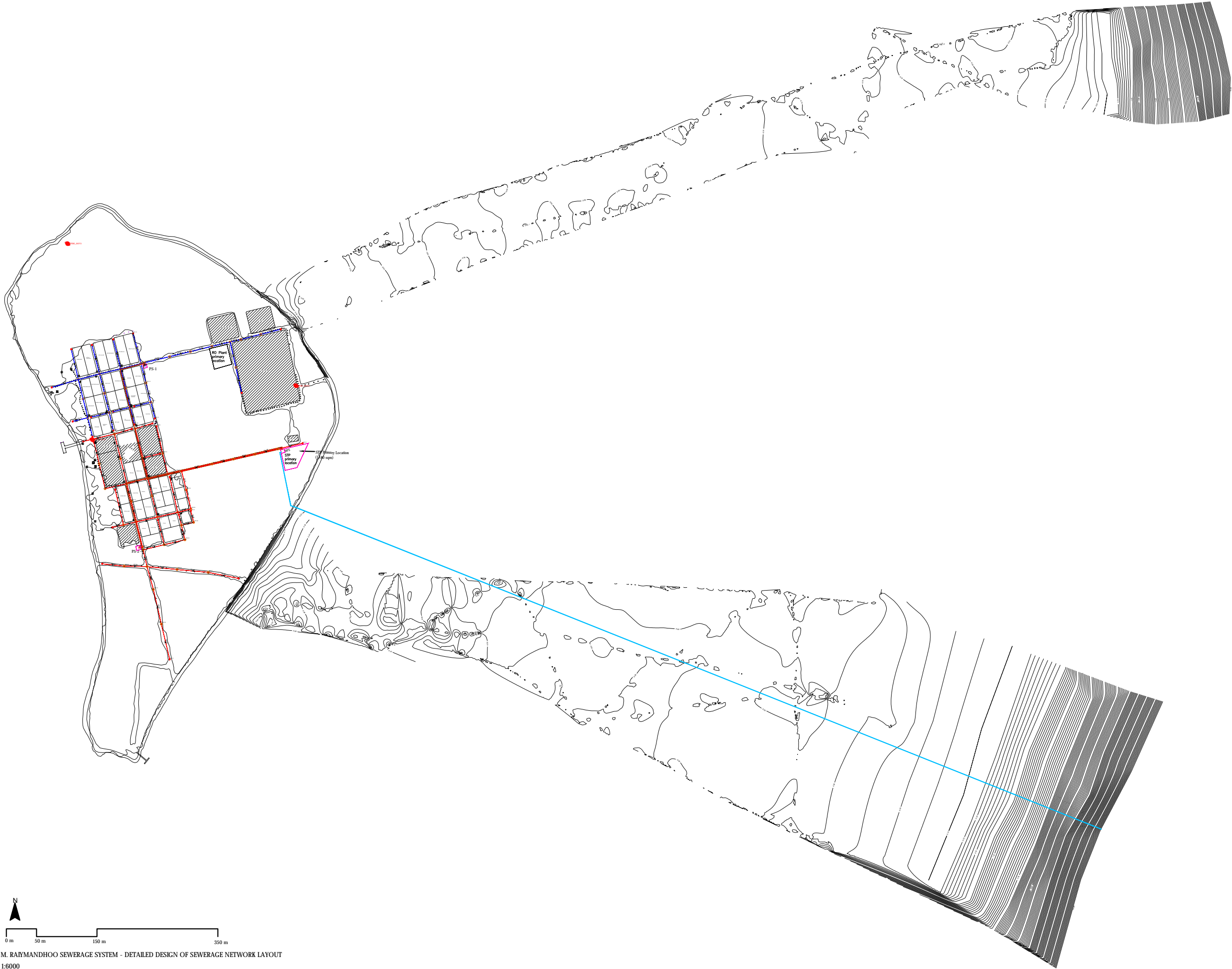


T: +960 333 3528 E: info@epoch.associates W: www.epoch.associates
A: 4A, 4th Floor, M. Ahigasdhoshuge, Fareedhee Magu Male' Republic of Maldives



CONTENTS

OVERALL LAYOUT	
Sewerage Network Layout	A-(1)
Sewerage Network Layout	A-(2)
Sewerage Network Catchment Areas	A-(3)
Sewerage Network Zone Layout	A-(4)
Sewerage Network Layout - Zone 01	05
Sewerage Network Layout - Zone 02	06
Sewerage Network Layout - Zone 03	07
Sewerage Network Layout - Zone 04	08
Sewerage Network Layout - Zone 05	09
Sewerage Network Layout - Zone 06	10
Sewerage Network Layout - Zone 07	11
DETAILED DRAWINGS FOR SPECIFIC COMPONENTS	
PUMP STATION 1 LAYOUT	W-(1)
PUMP STATION 2 LAYOUT	W-(2)
STP/ DPS LAYOUT	W-(3)
STP VEHICLE SHED ARCHITECTURAL DRAWINGS	VS-A(1) - VS-A(2)
STP VEHICLE SHED STRUCTURAL DRAWINGS	VS-S(1) - VS-A(3)
PUMP STATION DETAILS	W-(4) - W-(6)
DISCHARGE PUMP STATION DETAILS	W-(24) - W-(26)
GATE DETAILS	W-(7)
BOUNDARY WALL AND FENCING DETAILS	W-(8)
VENT STACK DETAILS	W-(9)
VENT STACK AND AIR BLOWER DETAILS	W-(10)
CONTROL PANEL BOARD DETAILS	W-(11)
LIGHT POST DETAILS	W-(12)
SAMPLING WELL DETAILS	W-(23)
TRENCH & BEDDING DETAILS	W-(13)
MAINTENANCE SHAFT (MH) DETAILS	W-(14)
TYPICAL MANHOLE BASE DETAILS	W-(15)
CLEANOUT DETAILS	W-(16)
TYPICAL HOUSE CONNECTION DETAILS	W-(17)
THRUST BLOCK DETAILS	W-(18)
BALLAST BLOCK DETAILS	W-(19)
T-HEAD DIFFUSER DETAILS	W-(20)
SEA OUTFALL DETAILS	W-(21)
PRESSURE NETWORK LAYOUT	W-(22)
PROFILE DIAGRAMS - PUMP STATION 01	PS1-01 - PS1-06
PROFILE DIAGRAMS - PUMP STATION 02	PS2-01 - PS2-09



Legend

- 160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41)
- 160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41)
- 600mm Ø PE/PP Maintenance Shaft
- 160mm Ø uPVC Clean Out
- 110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11)
- 160 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11)

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 5

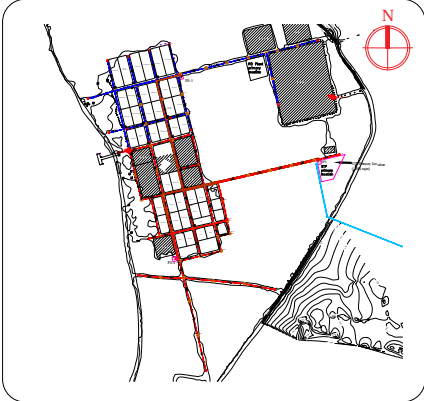
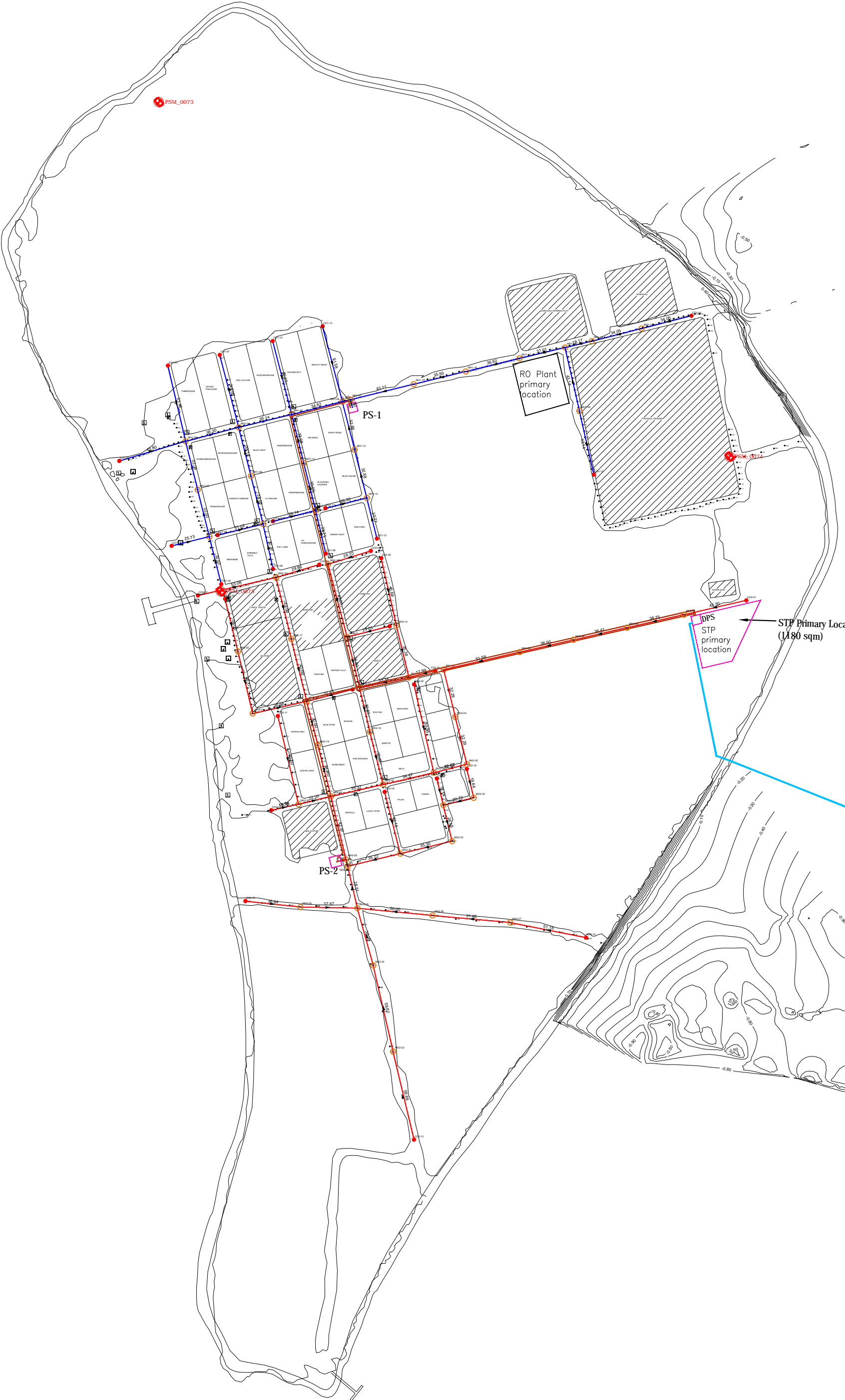
Sub Title:
Sewerage System in M. Raiymandhoo

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

EPOCH
T: +960 333 3528
E: info@epochassociates
W: www.epochassociates
A: G. Rosary West,
Husnuheemaa Magu, Male', Maldives

FOODBACK INFRA
Making Infrastructure Happen

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Nov 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/05	
Rev: R01	Page: A-(1)



Legend

- 160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41) - 1182 m
- 160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41) - 1907 m
- 110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11) - 840 m
- 160 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11) - 169 m on land, 1445 m offshore, 1614 m total
- 600mm Ø PE/PP Maintenance Shaft - 55 nos
- 160mmØ uPVC Clean Out - 33 nos
- PERMANENT SURVEY MARK PSM_0073 348605.039E, 341941.941N 1.095m From MSL
- PERMANENT SURVEY MARK PSM_0074 34982.936E, 341707.087N 0.879m From MSL
- PERMANENT SURVEY MARK PSM_0075 348645.996E, 341617.835N 0.706m 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 6 islands, Maldives – Package 5
Sewerage System in M. Raiymandhoo

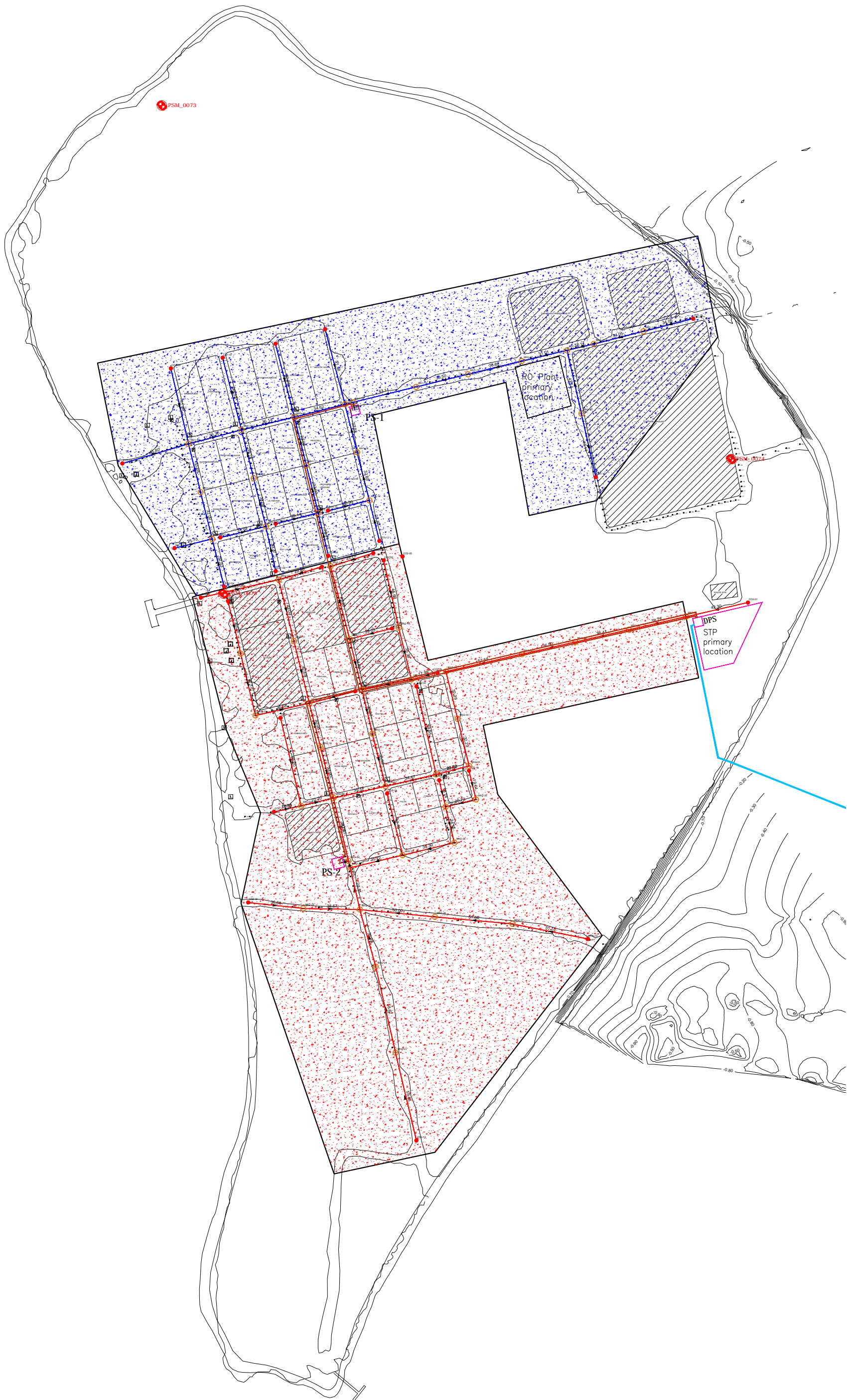
Client:
Ministry of National Planning, Housing and
Infrastructure, Republic of Maldives

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

DBACK INFRA
Building Infrastructure for a
Better Tomorrow

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Sep 2020	SCALE (A3): 1:2500
Project No: EP-WS/2019/05	Page:

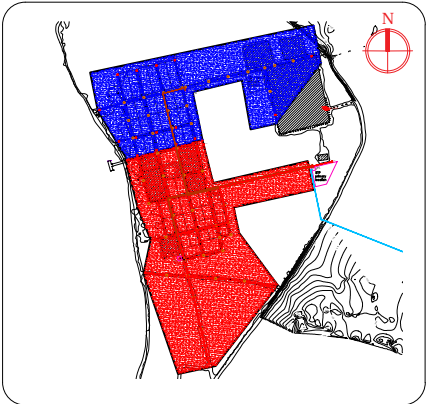
A-(2)



0 m 50 m 150 m 350 m

M. RAYMANDHOO SEWERAGE SYSTEM - SEWERAGE NETWORK CATCHMENT AREAS

1:2500



Legend

- PS-1 Catchment Area
- PS-2 Catchment Area

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

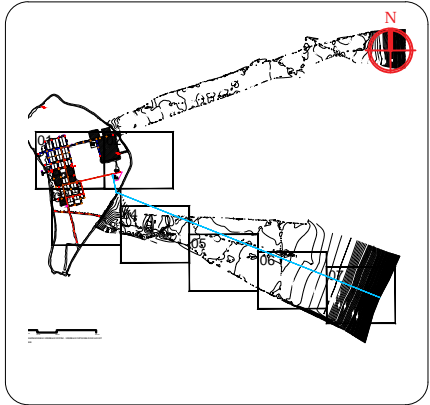
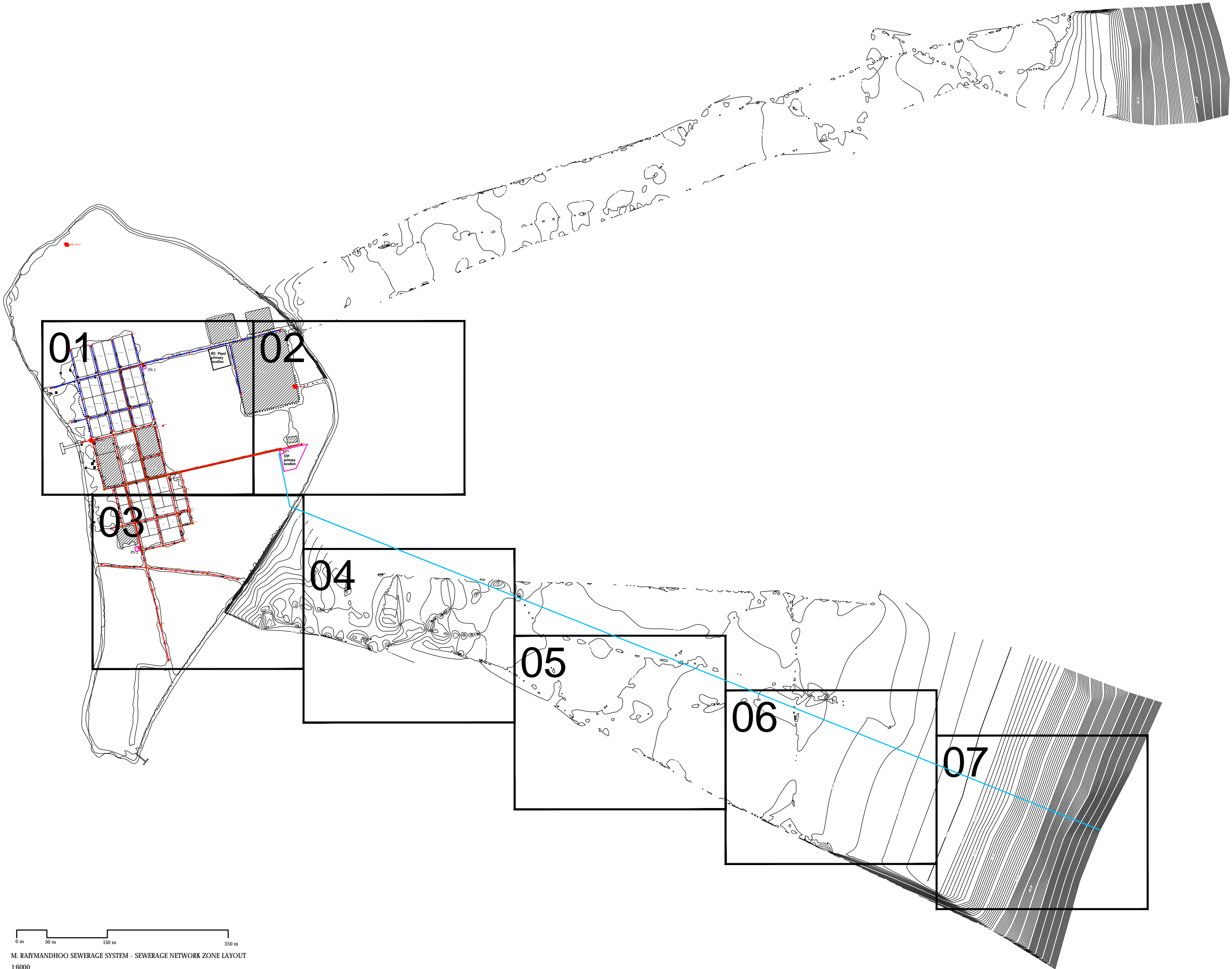
Title:
Consultancy Services for
Survey, Design and EIA works of
Water Supply and Sewerage
Facilities
in 6 islands, Maldives – Package 5
Sewerage System in M. Raiymandhoo

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

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

DBACK INFRA
Water Supply and Sewerage

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Sep 2020	SCALE (A3): 1:2500
Project No: EP-WS/2019/05	Page:



Legend

- 160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41)
- 160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41)
- 600mm Ø PE/PP Maintenance Shaft
- 160mmØ uPVC Clean Out
- 110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11)
- 160 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11)

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 5

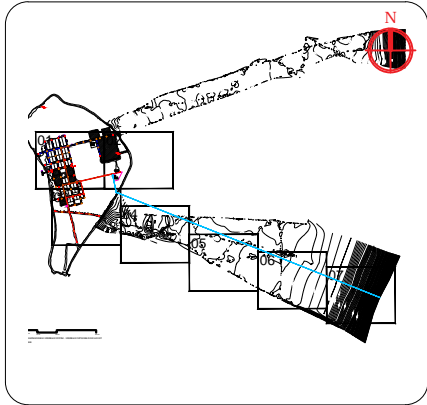
Sub Title:
Sewerage System in M. Raiymandhoo



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



EPOCH
T: +960 333 3528
E: info@epochassociates
W: www.epochassociates
A: G. Rosary West,
Husnuheemaa Magu, Male', Maldives



FOODBACK INFRA
Maldivian Infrastructure Development

Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Nov 2020	SCALE (A3): 1:1000
Project No:	EP-WS/2019/05
Rev: R01	Page: A-(4)



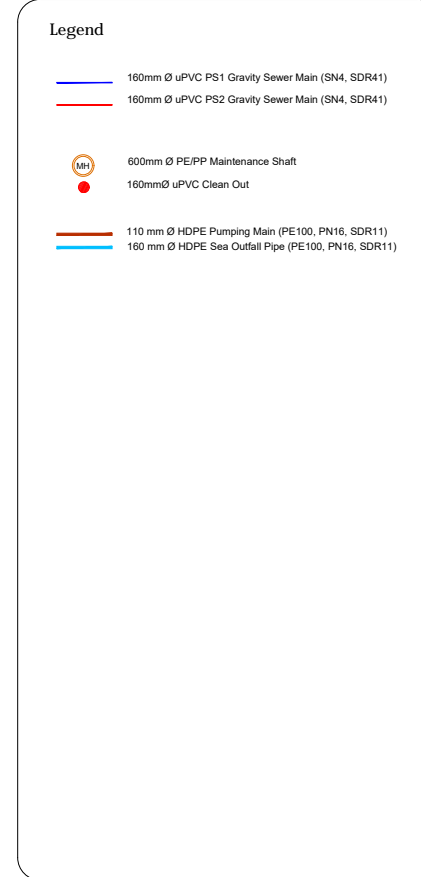
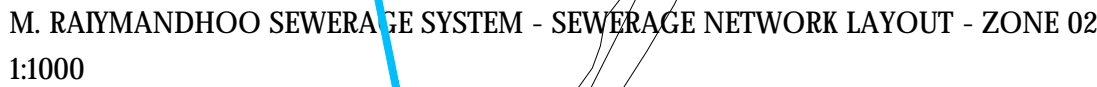
 160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41)
 160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41)



 600mm Ø PE/PP Maintenance Shaft
 160mm Ø uPVC Clean Out

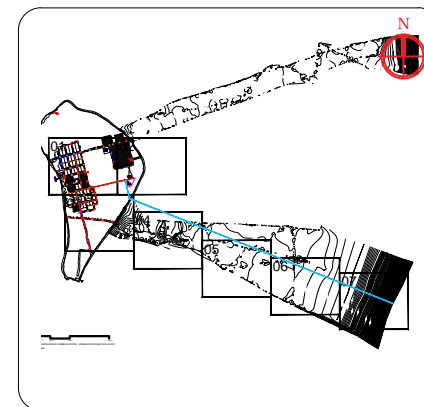
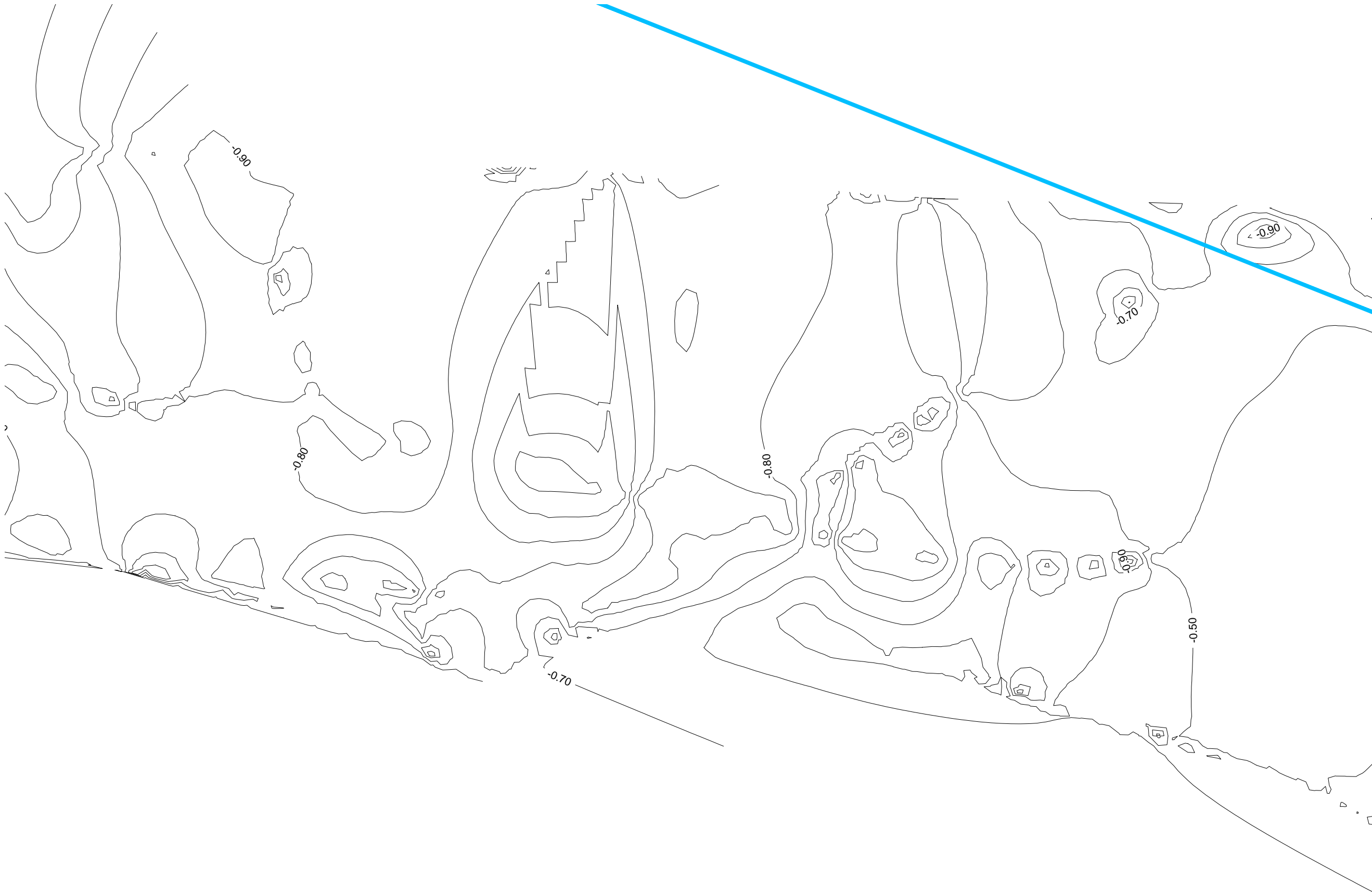
 110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11)
 160 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11)

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.



Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Nov 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/05	
Rev: R01	Page:







Title: Consultancy Services for Survey, Design and EIA works of Water Supply and Sewerage Facilities in 5 islands, Maldives - Package 5	
Sub Title: Sewerage System in M. Raiymandhoo	
Client: Ministry of National Planning, Housing and Infrastructure, Republic of Maldives	
 EPOCH ASSOCIATES	 FEDBACK INFRA <i>Making Infrastructure Happen</i>
T: +960 333 3528 E: info@epoch.associates W: www.epoch.associates A: G. Rosary West, Husumheenna Magu, Male', Maldives	
Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Nov 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/05	
Rev: R01	Page: 06



Legend

-  160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41)
 160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41)

 600mm Ø PE/PP Maintenance Shaft
 160mmØ uPVC Clean Out

 110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11)
 160 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11)

REV. NO.	Date	Revision Description	Drawn	Chkd	App

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

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

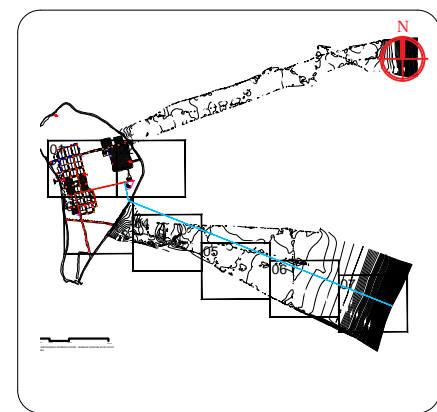
Date: Nov 2020	SCALE (A3): 1:1000
----------------	--------------------

Project No: EP-WS/2019/05







Rev: R01	Page:
-----------------	-------

M. RAIYMANDHOO SEWERAGE SYSTEM - SEWERAGE NETWORK LAYOUT - ZONE 04

1:1000



Legend

-  160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41)
 160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41)
 600mm Ø PE/PP Maintenance Shaft
 160mm Ø uPVC Clean Out
 110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11)
 160 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11)

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 5

Sub Title:
Sewerage System in M. Raiymandhoo

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



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

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

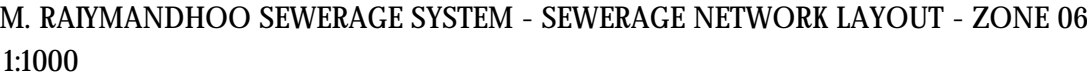
Date: Nov 2020	SCALE (A3): 1:1000
----------------	--------------------



Project No: EP-WS/2019/05



Rev: R01	Page:
-----------------	-------


M. RAIYMANDHOO SEWERAGE SYSTEM - SEWERAGE NETWORK LAYOUT - ZONE 05

1:1000



-  160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41)
 160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41)

 600mm Ø PE/PP Maintenance Shaft
 160mm Ø uPVC Clean Out

 110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11)
 160 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11)

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

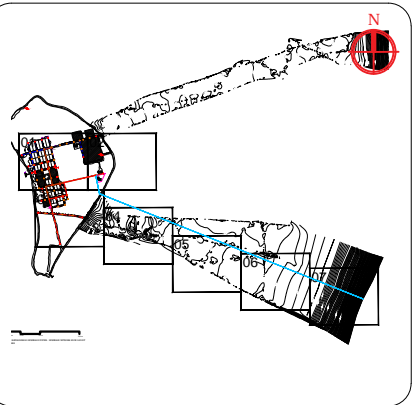
Title:
Consultancy Services for Survey,
Design and EIA works of Water
Supply and Sewerage Facilities in
5 islands, Maldives - Package 5

Sub Title:
Sewerage System in M. Raiymandhoo







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



Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Nov 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/05	
Rev: R01	Page: 10



Legend

- | | |
|---|---|
|  | 160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41) |
|  | 160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41) |
|  | 600mm Ø PE/PP Maintenance Shaft |
|  | 160mm Ø uPVC Clean Out |
|  | 110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11) |
|  | 160 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11) |

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

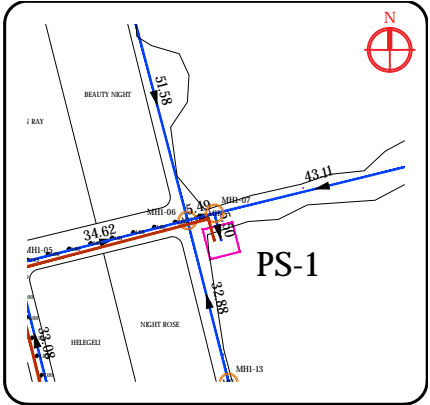
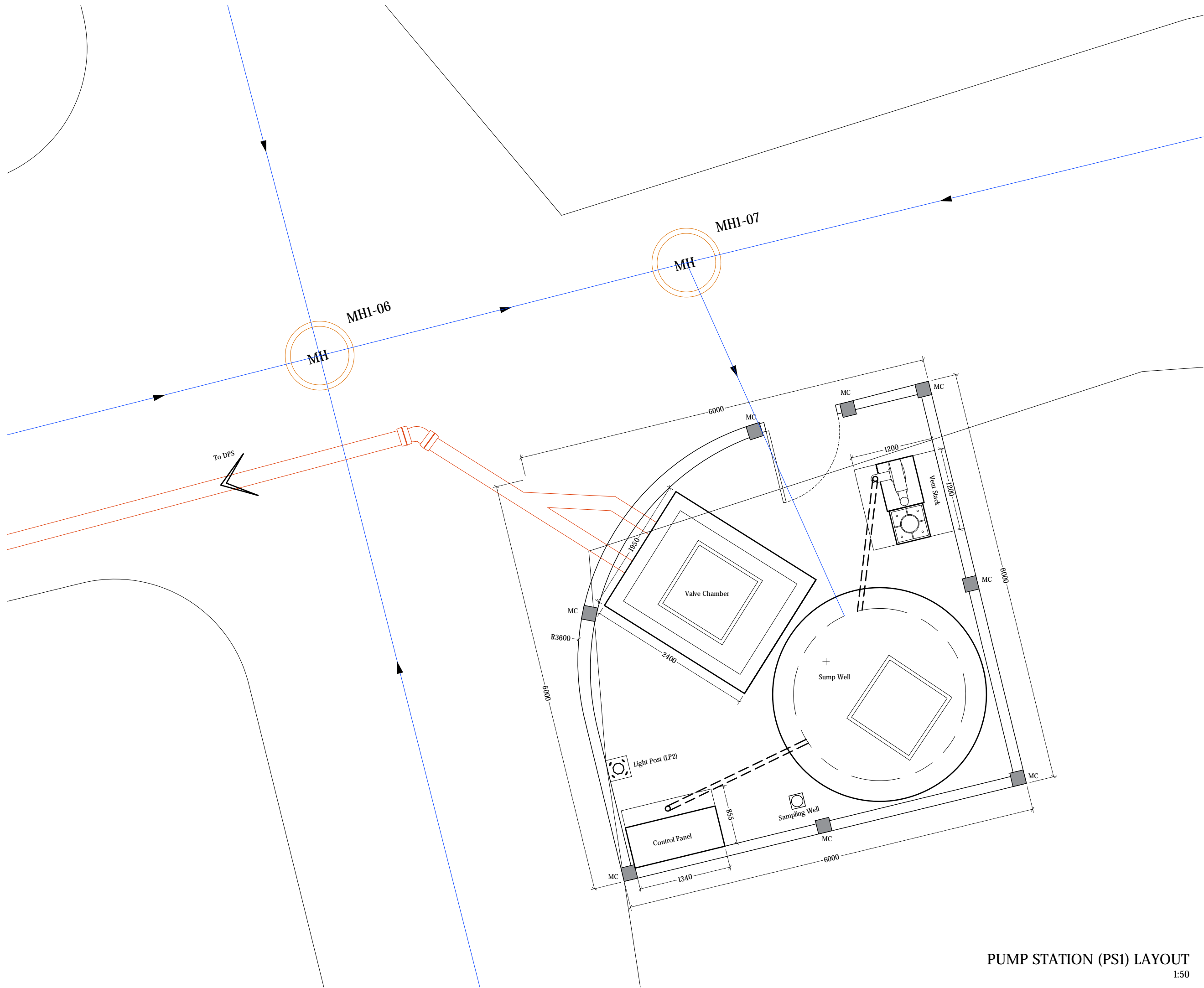
Title:
Consultancy Services for Survey,
Design and EIA works of Water
Supply and Sewerage Facilities in
5 islands, Maldives - Package 5

Sub Title:
Sewerage System in M. Raiymandhoo

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



Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: LW.
Date: Nov 2020	SCALE (A3): 1:1000
Project No: EP-WS/2019/05	
Rev: R01	Page: 4



Legend

160mm Ø uPVC PS1 Gravity Sewer Main (SN4, SDR41)

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



Working Safely & Sustainably

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

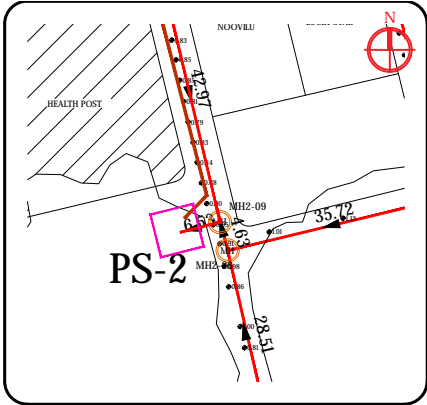
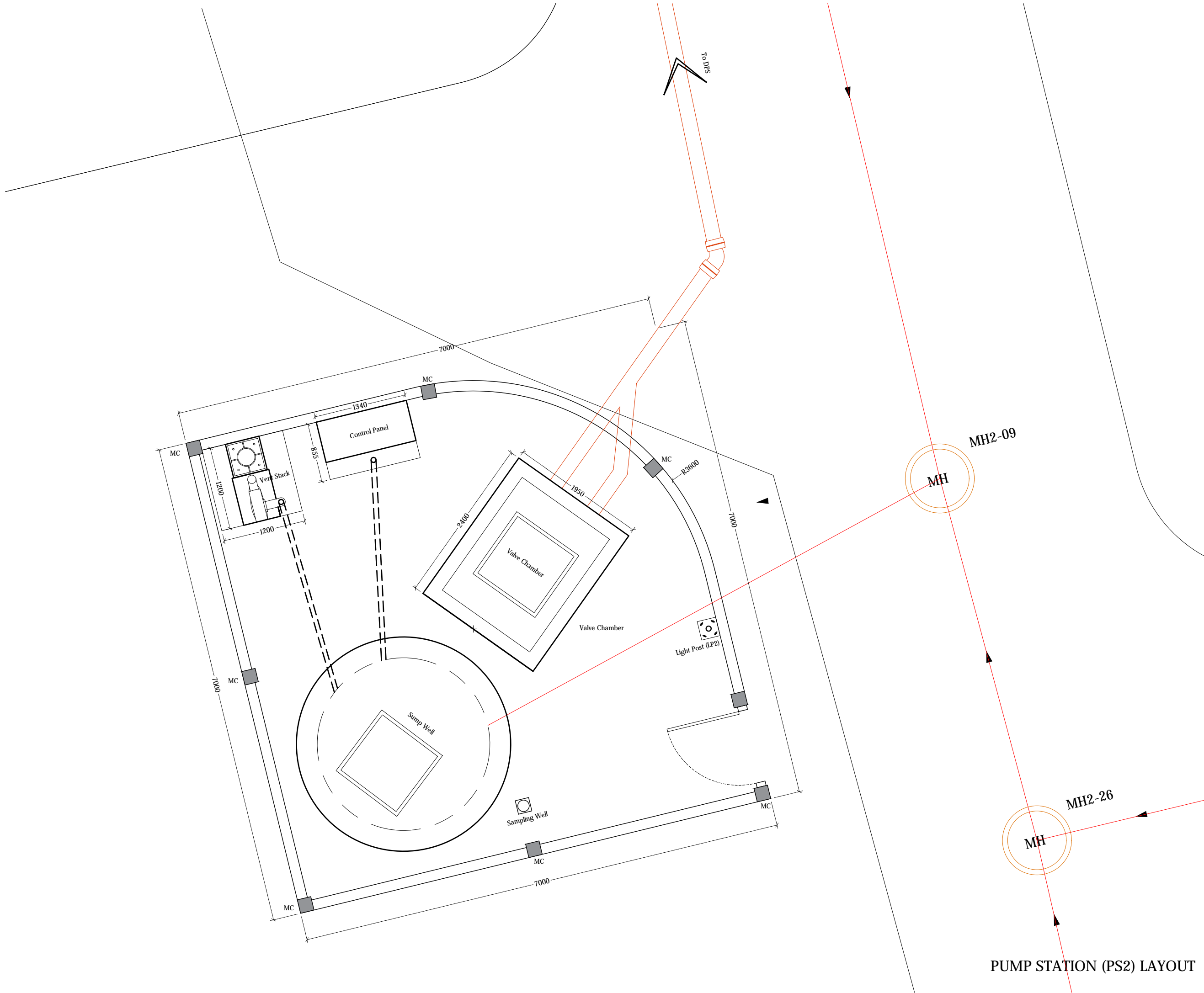
Designed: F.I.A. Approved: I.W.

Date: Sep 2020 SCALE (A3): 1:50

Project No: EP-WS/2019/05

Rev: Page: W-(1)

PUMP STATION (PS1) LAYOUT
1:50



Legend

160mm Ø uPVC PS2 Gravity Sewer Main (SN4, SDR41)

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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

EPOCH
T: +960 333 3528
E: info@epochassociates
W: www.epochassociates
A: G. Rosary West,
Husnuheena Magu, Male', Maldives

DBACK INFRA
Building Infrastructure Happen

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

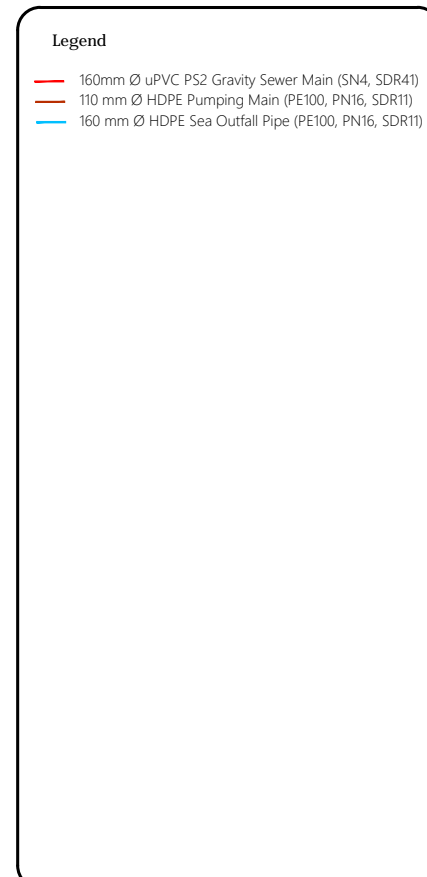
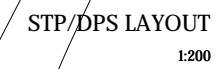
Designed: F.I.A. Approved: I.W.

Date: Sep 2020 SCALE (A3): 1:50

Project No: EP-WS/2019/05

Rev: Page: W-(2)

PUMP STATION (PS2) LAYOUT





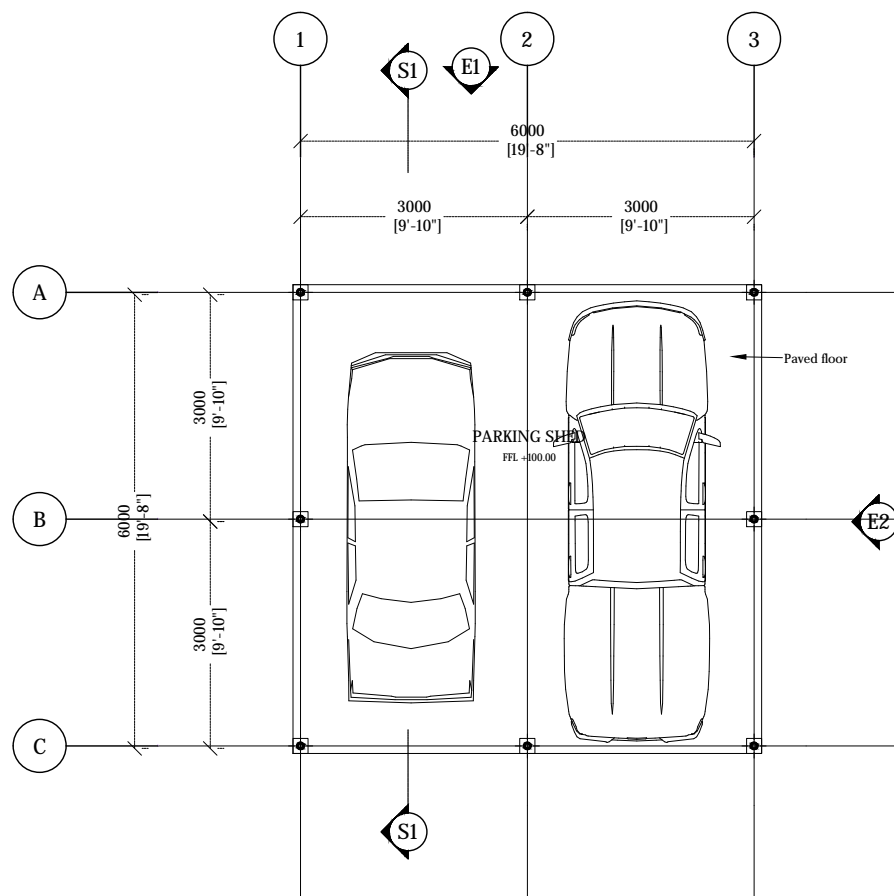
REV. NO.	Date	Revision Description	Drawn	Chkd	Appr.

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

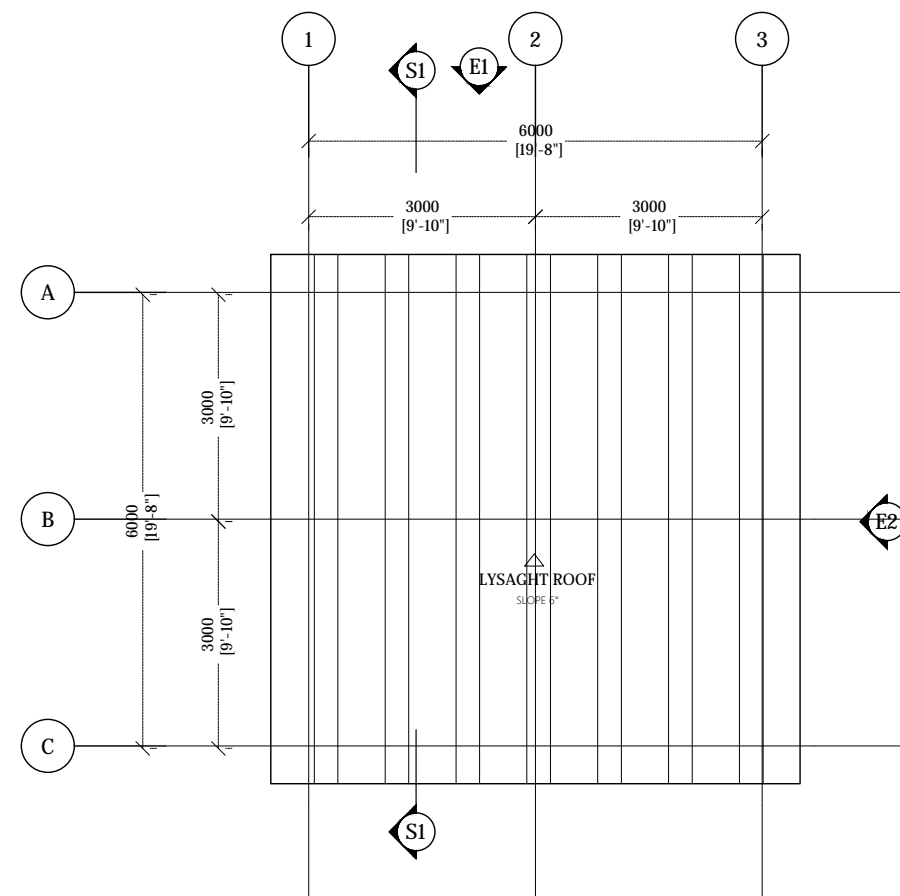
Sub Title:
Sewerage System in M. Raiymandhoo

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

 EPOCH ASSOCIATES	 FEDBACK INFRA Maldivian Infrastructure Develop
T: +960 333 3528 E: info@epoch.associates W: www.epoch.associates A: G. Rosary West, Husumheemaa Magu, Male', Maldives	
Drawn: F.I.A.	Checked: M.S.S.
Designed: F.I.A.	Approved: I.W.
Date: Sep 2020	SCALE (A3): 1:200
Project No: EP-WS/2019/05	
Rev:	Page: W-(3)



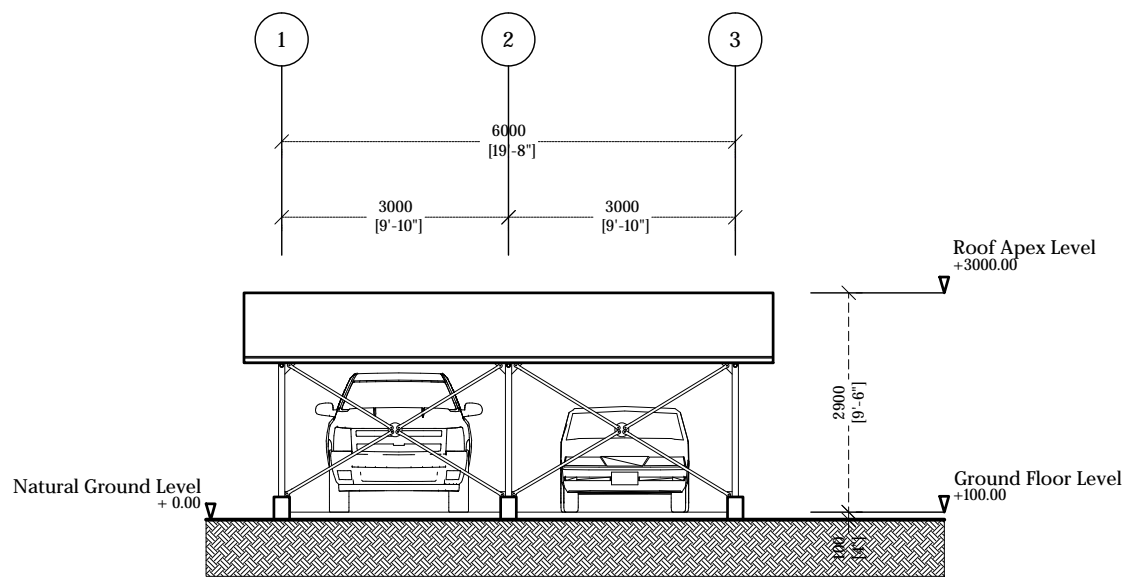
1:100



1:100

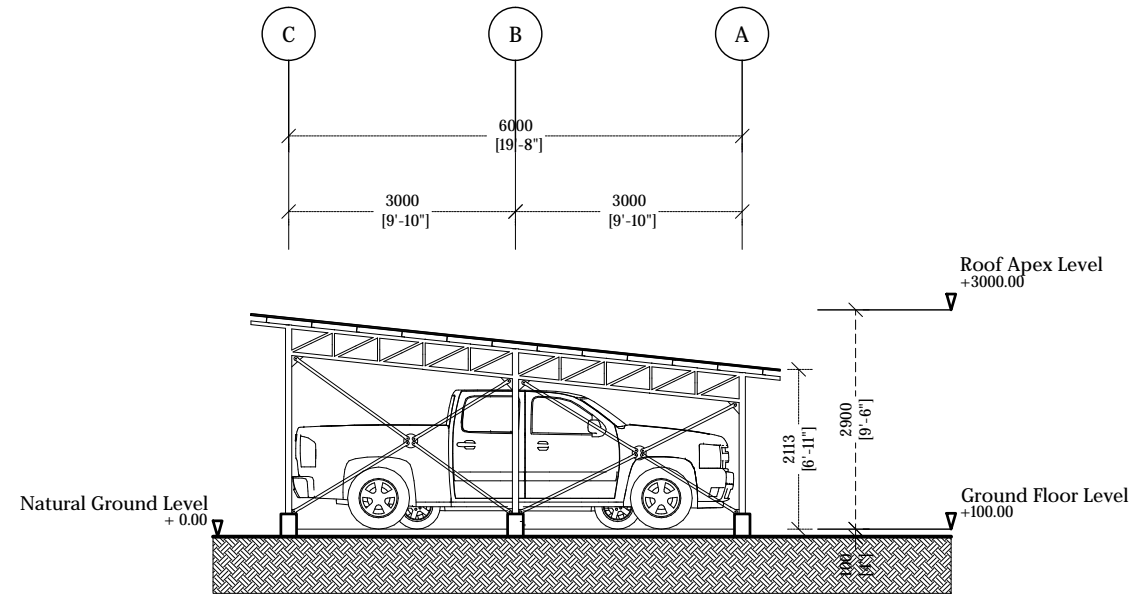
REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

VS-A(1)



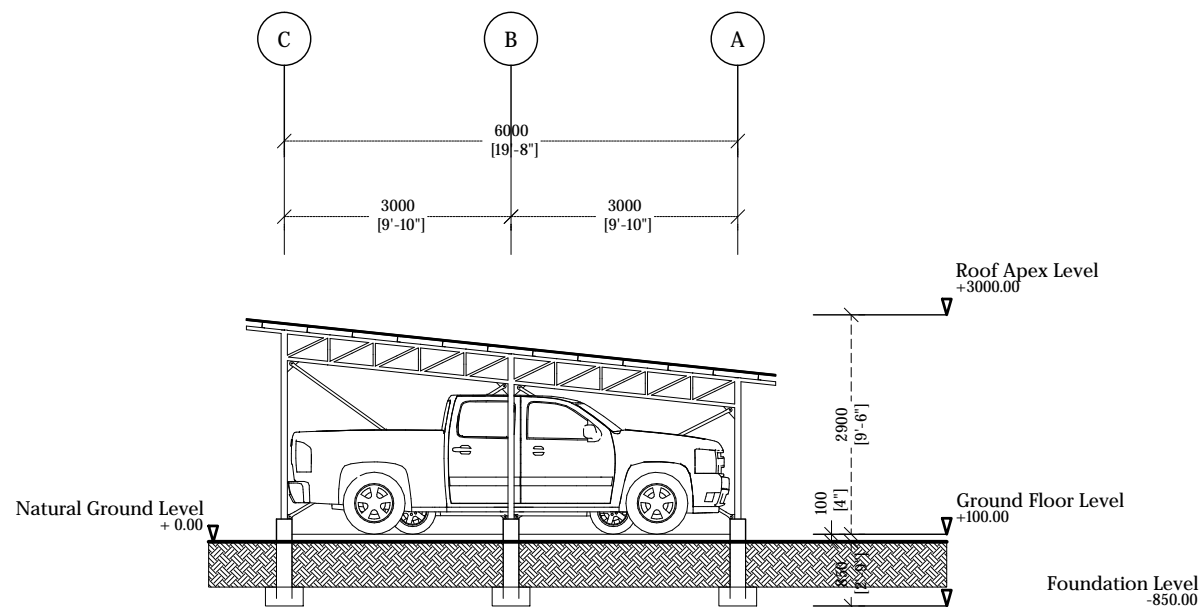
VEHICLE SHED ELEVATION E1

1:100



VEHICLE SHED ELEVATION E2

1:100



VEHICLE SHED SECTION S1

1:100



Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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

EPOCH
T: +960 333 3528
E: info@epochassociates
W: www.epochassociates
A: G. Rosary West,
Hunnuheena Magu, Male', Maldives

DBACK INFRA
Maldivian Infrastructure Development

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

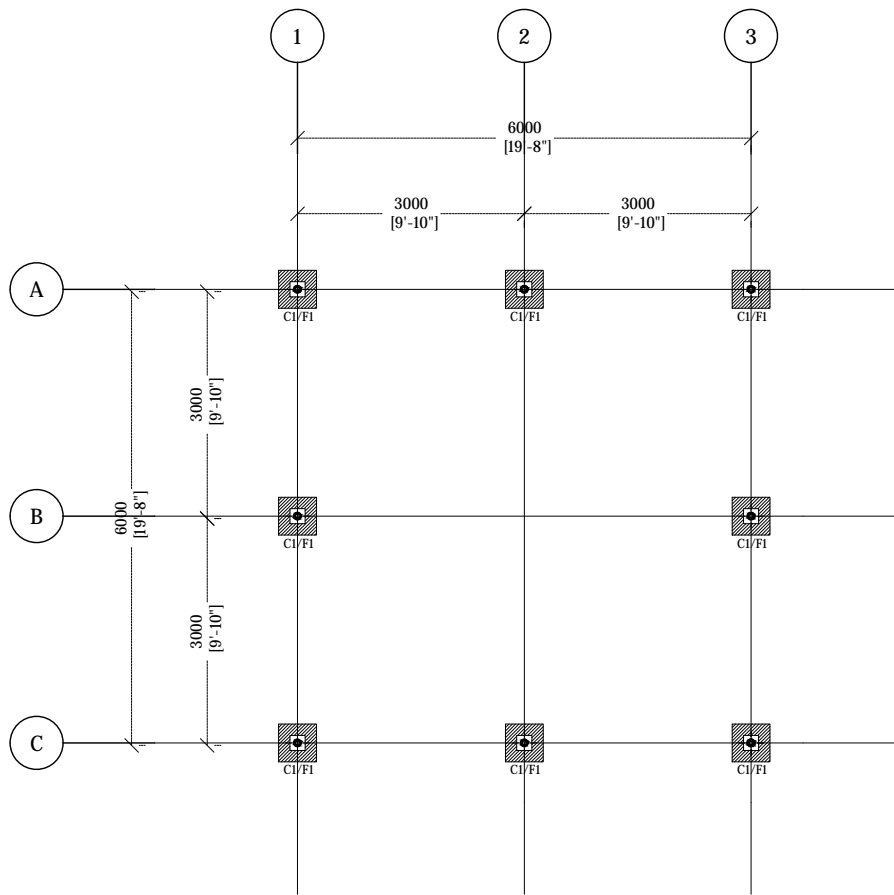
Designed: F.I.A. Approved: I.W.

Date: Sep 2020 SCALE (A3): 1:100

Project No: EP-WS/2019/05

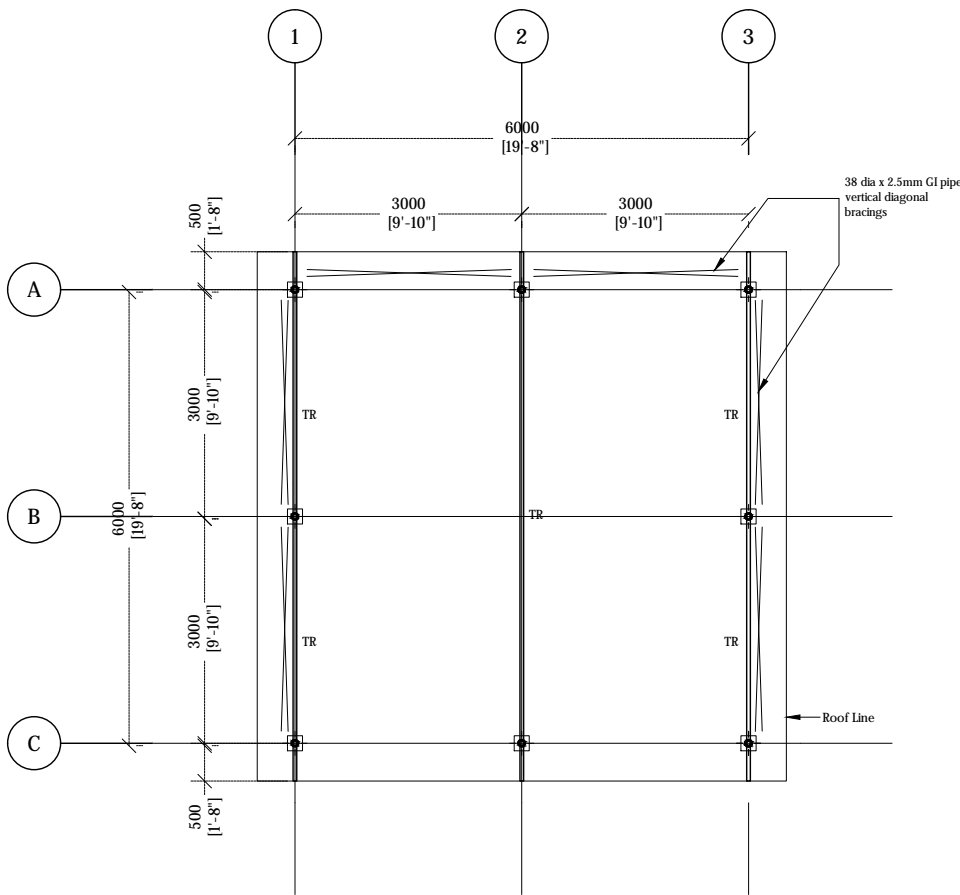
Rev: Page:

VS-A(2)



VEHICLE SHED FOUNDATION PLAN

1:100



VEHICLE SHED ROOF TRUSS PLAN

1:100



Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



Maldivian Infrastructure Development

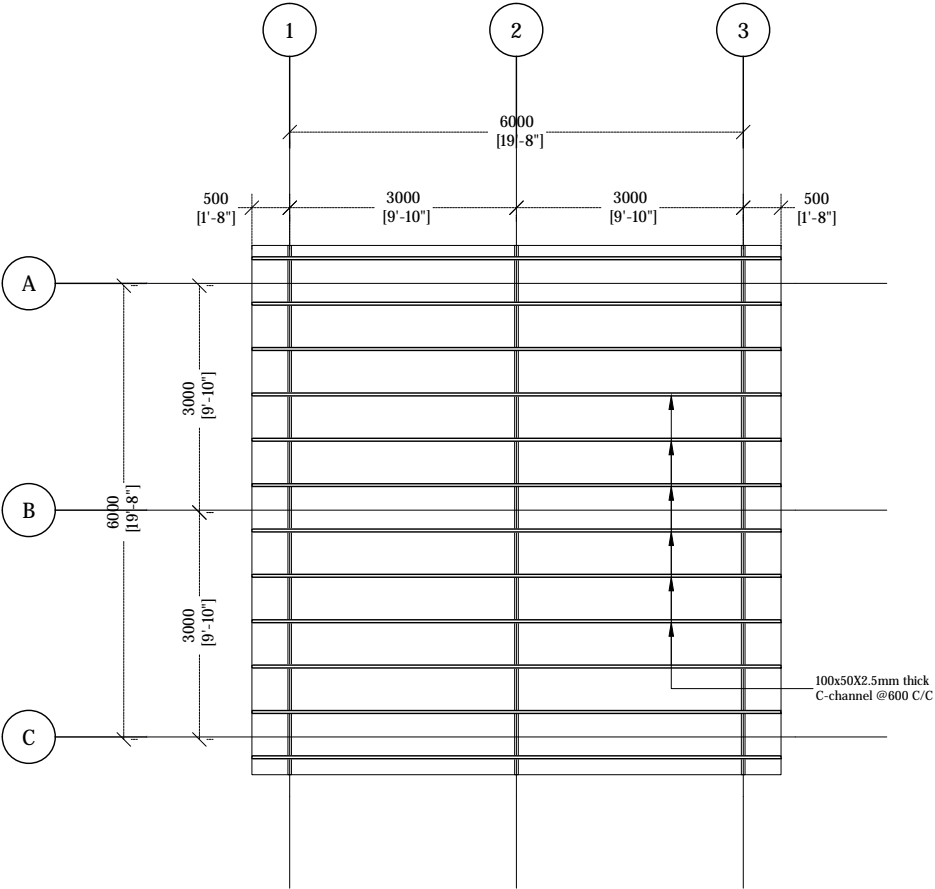
Drawn: F.I.A. Checked: M.S.S.

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

Date: Sep 2020 SCALE (A3): 1:100

Project No: EP-WS/2019/05

Rev: Page: VS-S(1)



VEHICLE SHED ROOF FRAMING PLAN

1:100



Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



Maldivian Infrastructure Development

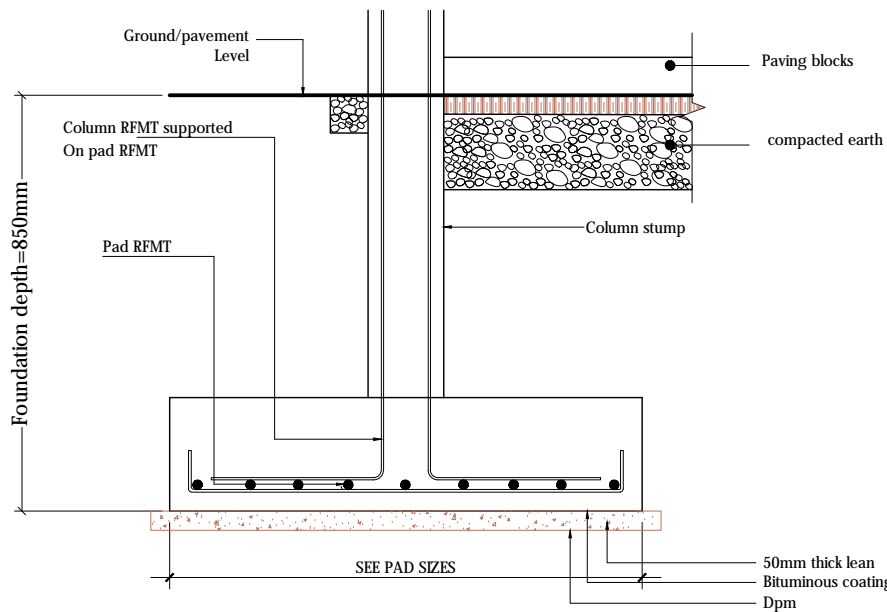
Drawn: F.I.A. Checked: M.S.S.

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

Date: Sep 2020 SCALE (A3): 1:100

Project No: EP-WS/2019/05

Rev: Page: VS-S(2)

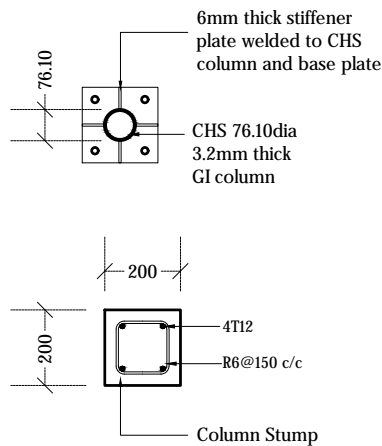
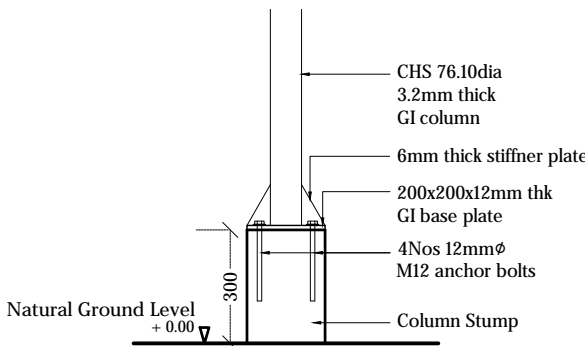


VEHICLE SHED FOOTING DETAIL

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

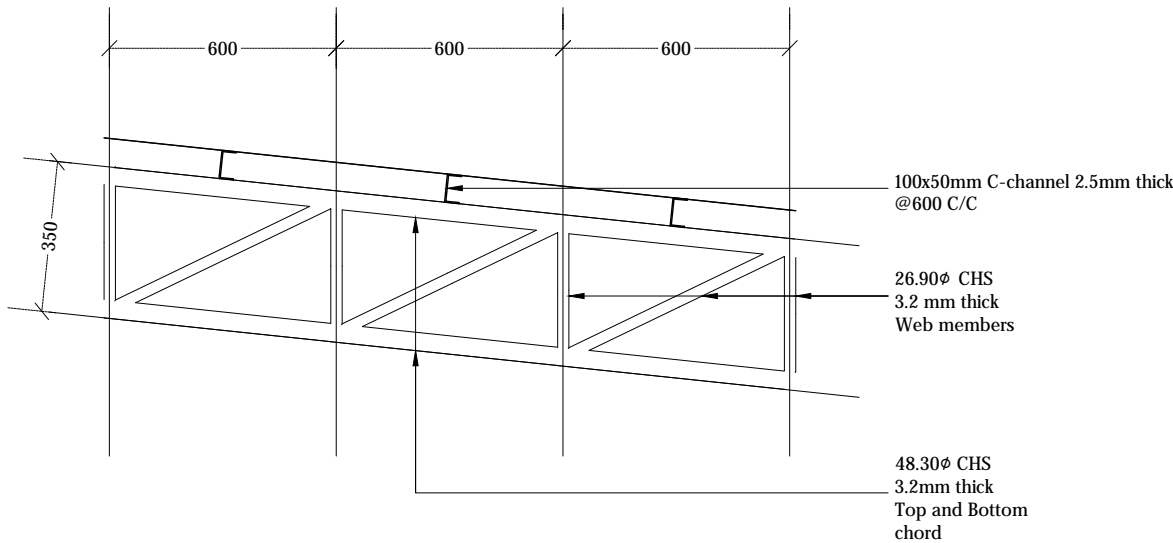
1:20

FOUNDATION PAD DETAILS



VEHICLE SHED COLUMN DETAIL

1:20



VEHICLE SHED TRUSS DETAIL

1:20



Legend

Notes:

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

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

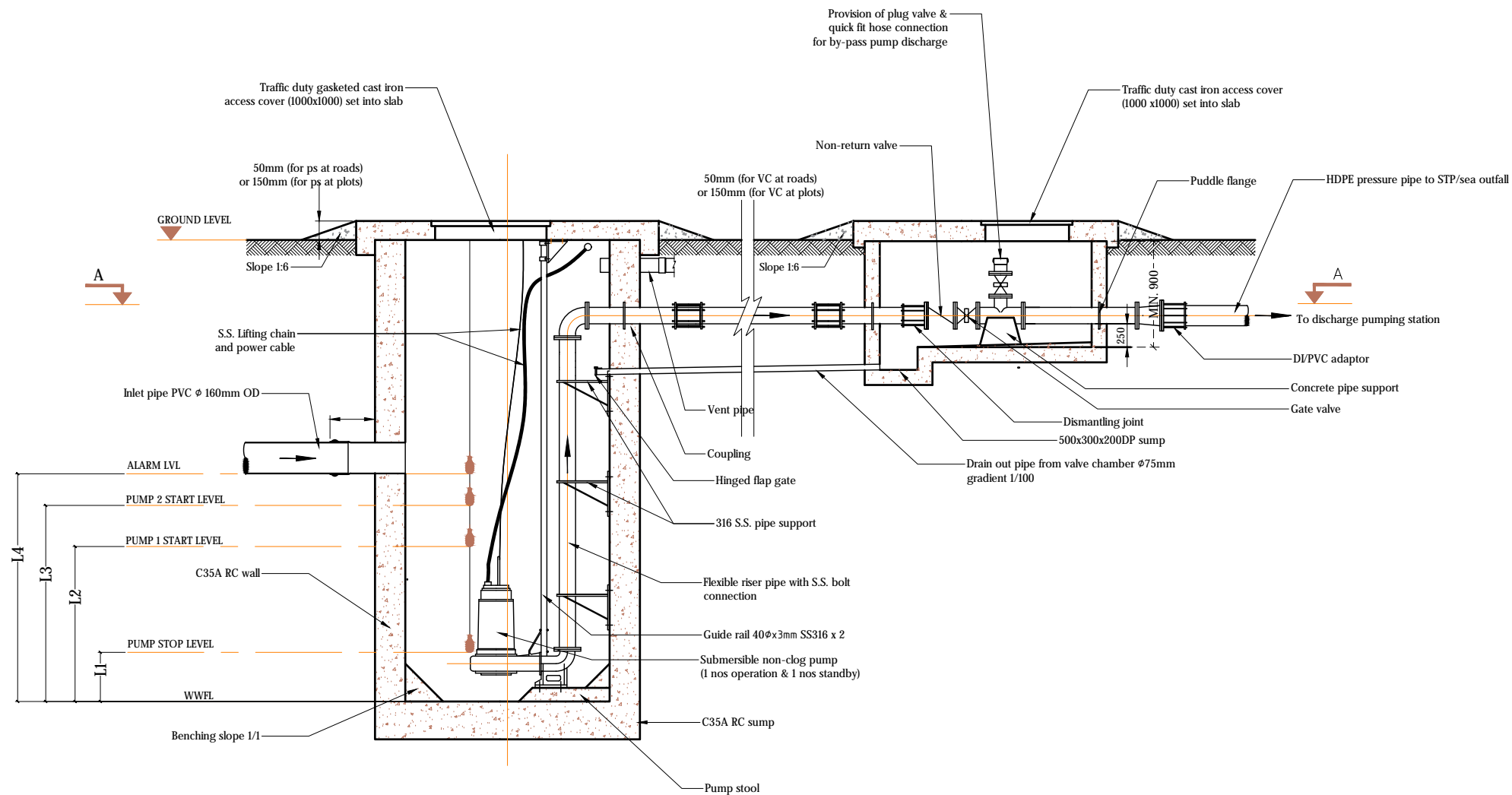
Designed: F.I.A. Approved: I.W.

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

Project No: EP-WS/2019/05

Rev: Page:

VS-S(3)



PUMP STATION DESIGN DETAILS

(15 YEARS)

Pump Station	Diameter (ϕ)	Depth (D)	Inlet Depth	Pump Capacity	Head	Levels			
						L1	L2	L3	L4
PS1	2.0m	2.70m	1.445m	0.8 l/s	11.2 m	0.300m	0.563m	0.713m	0.863m
PS2	2.0m	3.20m	2.358m	1.3 l/s	10.6 m	0.300m	0.633m	0.783m	0.933m

PUMP STATION DETAILS - LONGITUDINAL SECTION
NTS



Legend

Notes:

- Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
- Orientation of valve chamber pipework 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 polythene.
- All concrete cold joints shall casted with bonding agent

List of main instruments of pumping station:

1. Sewage pumps (1 duty & 1 standby)
2. Power cable
3. Auto-coupling with 40 ϕ x3mm SS316 guide rails
4. Stainless steel (316) suspension chain
5. Cable with float control and weight
6. Discharge pipe
7. Puddle flange
8. Bitumen emulsion and 500 micron polythene sheet protection to external concrete surfaces
9. Construction joint / water bars
10. Manhole cover double seal ductile heavy duty cast iron / SS 316 cover
11. Vent pipe with vent cowl

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
----------	------	----------------------	-------	------	-------

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



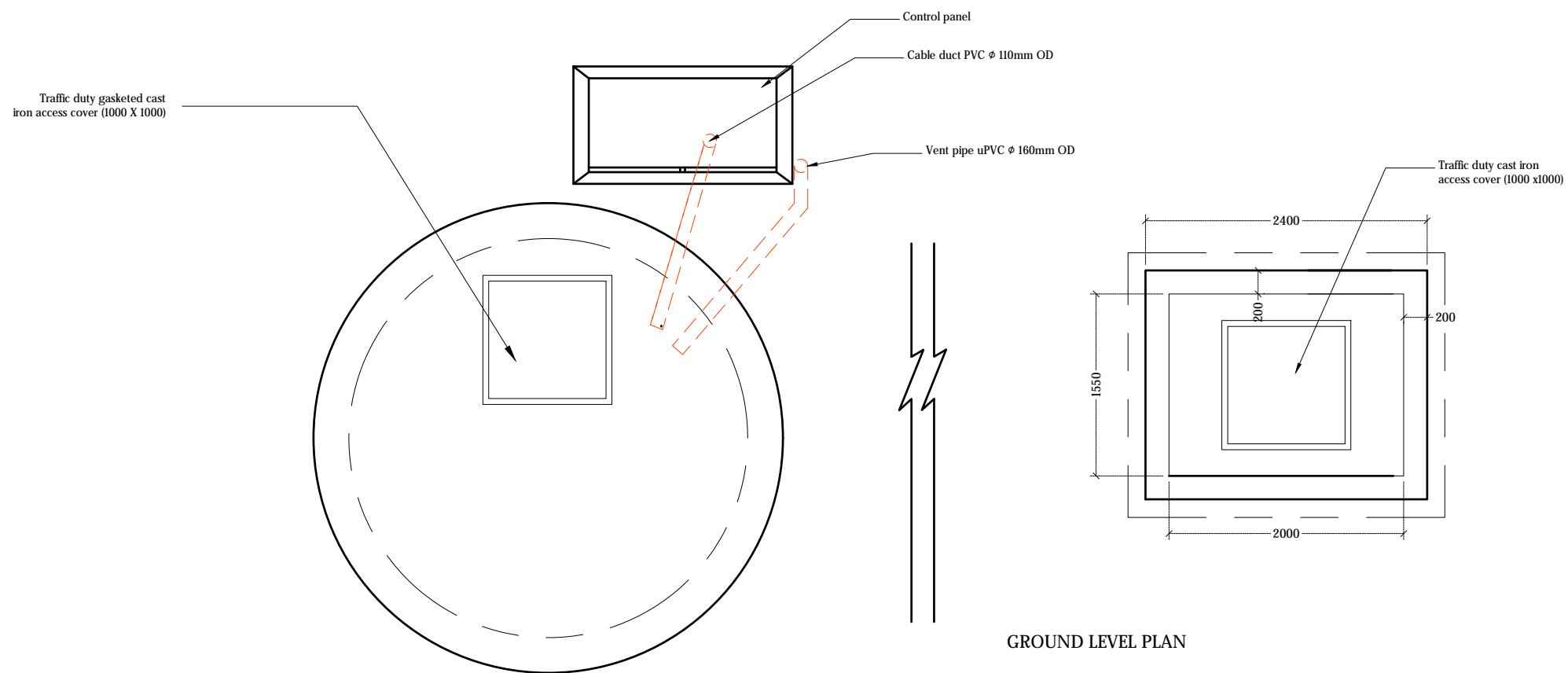
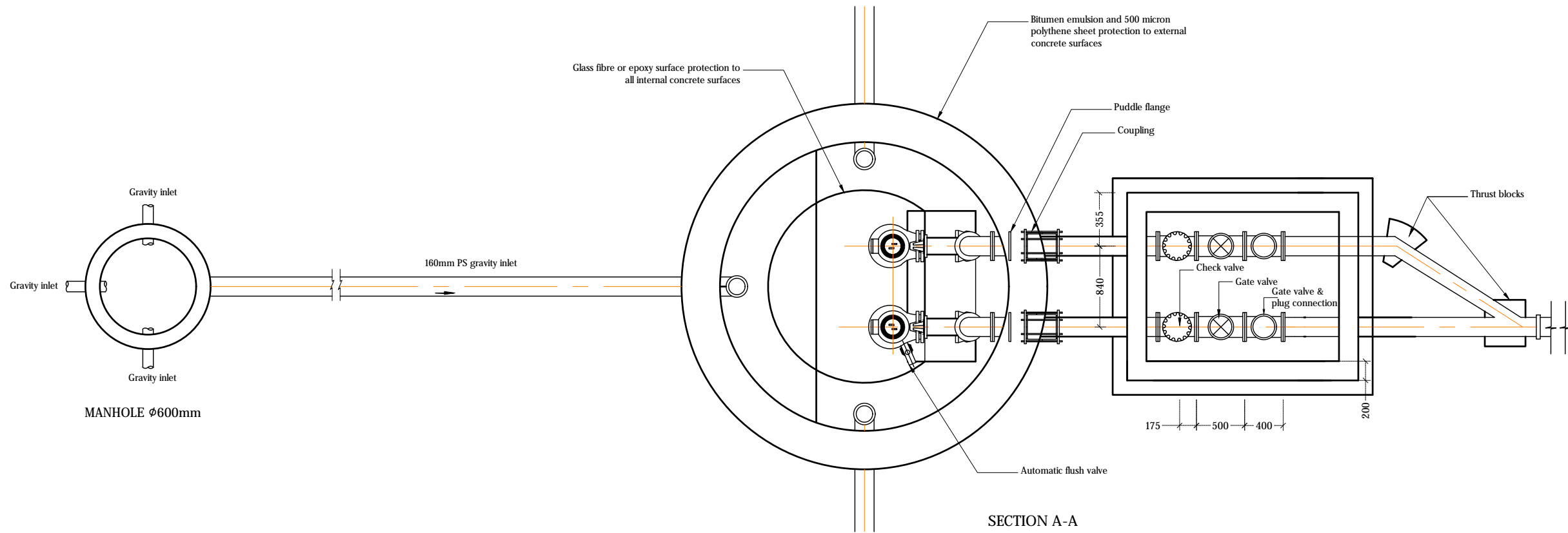
Drawn: F.I.A. Checked: M.S.S.

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

Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

Rev: Page: W-(4)



PUMP STATION DETAILS - PLAN VIEW
NTS



Legend

Notes:

- Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
- Orientation of valve chamber pipework 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 polythene.
- All concrete cold joints shall be casted with bonding agent

List of main instruments of pumping station:

1. Sewage pumps (1 duty & 1 standby)
2. Power cable
3. Auto-coupling with 400x3mm SS316 guide rails
4. Stainless steel (316) suspension chain
5. Cable with float control and weight
6. Discharge pipe
7. Puddle flange
8. Bitumen emulsion and 500 micron polythene sheet protection to external concrete surfaces
9. Construction joint / water bars
10. Manhole cover double seal ductile heavy duty cast iron / SS 316 cover
11. Vent pipe with vent cowl

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

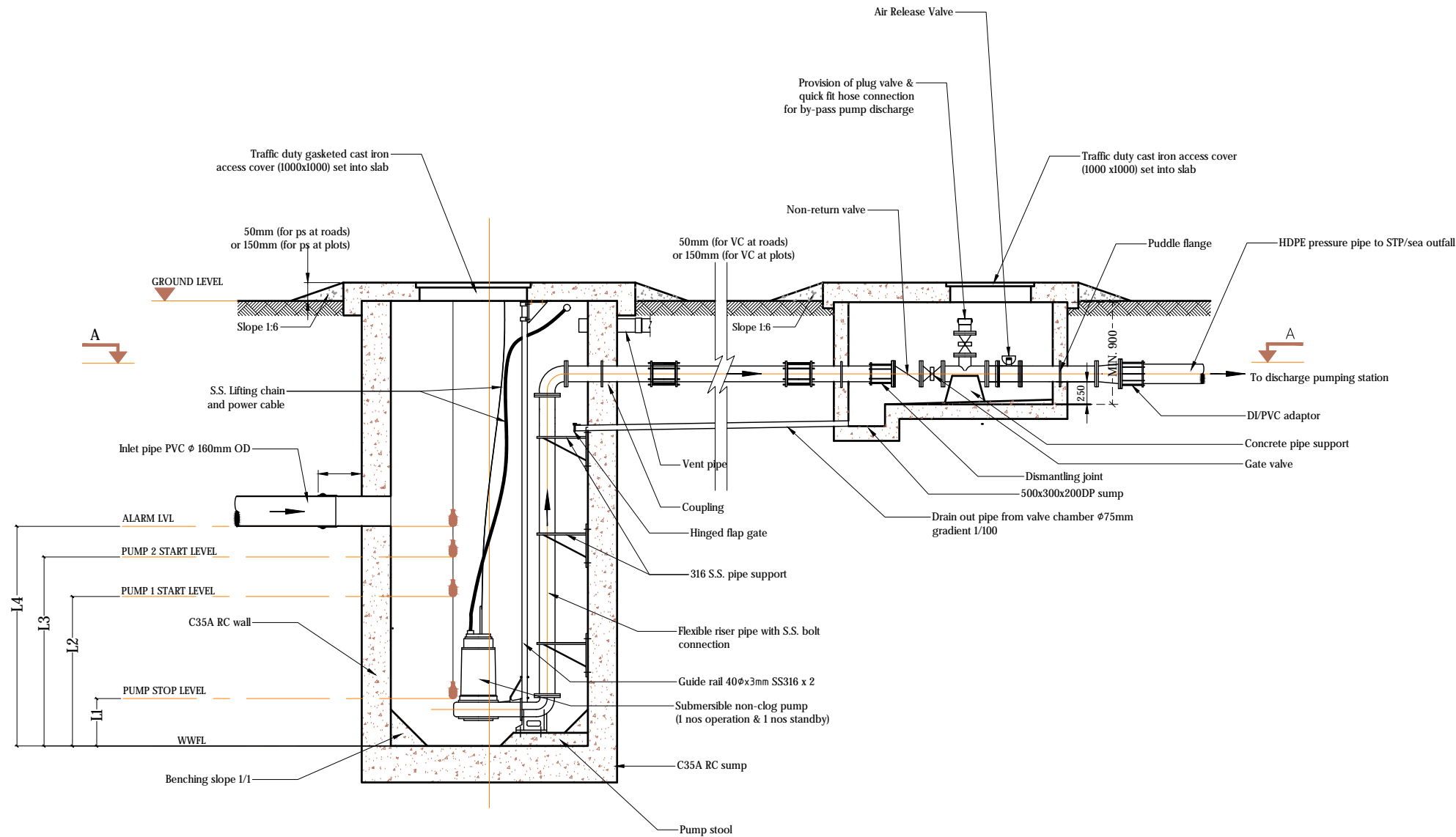
Designed: F.I.A. Approved: I.W.

Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

Rev: Page: W-(5)

W-(6)



DISCHARGE PUMP STATION DESIGN DETAILS (15 YEARS)

Pump Station	Diameter (Ø)	Depth (D)	Inlet Depth	Pump Capacity	Head	Levels			
						L1	L2	L3	L4
DPS	2.5m	2.70m	0.8m	2.0 l/s	36.7 m	0.300m	0.577m	0.727m	0.877m

DISCHARGE PUMP STATION DETAILS - LONGITUDINAL SECTION

NTS

Legend

Notes:

- Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
- Orientation of valve chamber pipework 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 polythene.
- All concrete cold joints shall casted with bonding agent

List of main instruments of pumping station:

1. Sewage pumps (1 duty & 1 standby)
2. Power cable
3. Auto-coupling with 40Øx3mm SS316 guide rails
4. Stainless steel (316) suspension chain
5. Cable with float control and weight
6. Discharge pipe
7. Puddle flange
8. Bitumen emulsion and 500 micron polythene sheet protection to external concrete surfaces
9. Construction joint / water bars
10. Manhole cover double seal ductile heavy duty cast iron / SS 316 cover
11. Vent pipe with vent cowl

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.
----------	------	----------------------	-------	------	-------

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

Sub Title:
Sewerage System in M. Raiymandhoo

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

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

Feedback Infrastructure

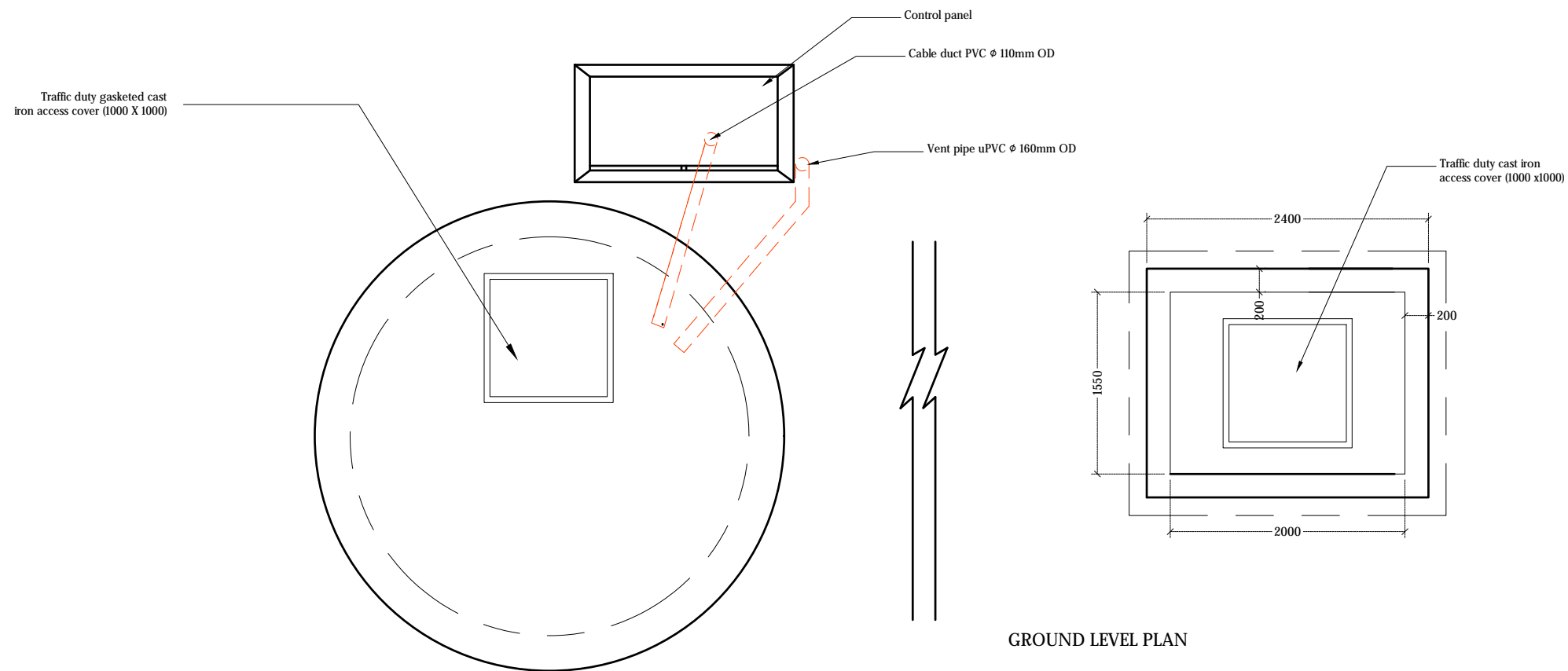
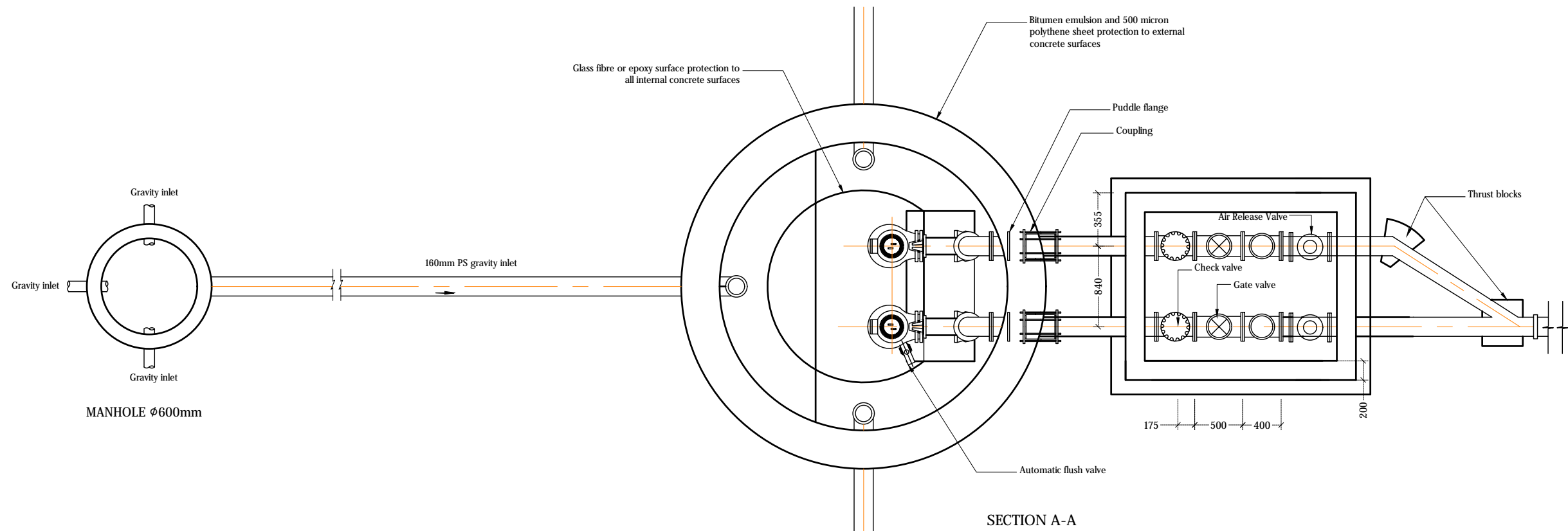
Drawn: F.I.A. Checked: M.S.S.

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

Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

Rev: Page: W-(24)



DISCHARGE PUMP STATION DETAILS - PLAN VIEW

NTS



Legend

Notes:

- Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
- Orientation of valve chamber pipework 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 polythene.
- All concrete cold joints shall casted with bonding agent

- List of main instruments of pumping station:
1. Sewage pumps (1 duty & 1 standby)
 2. Power cable
 3. Auto-coupling with 400x3mm SS316 guide rails
 4. Stainless steel (316) suspension chain
 5. Cable with float control and weight
 6. Discharge pipe
 7. Puddle flange
 8. Bitumen emulsion and 500 micron polythene sheet protection to external concrete surfaces
 9. Construction joint / water bars
 10. Manhole cover double seal ductile heavy duty cast iron / SS 316 cover
 11. Vent pipe with vent cowl

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

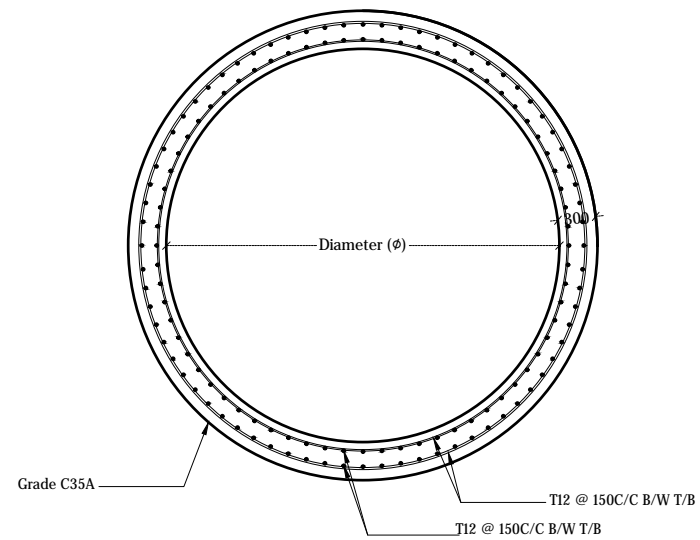
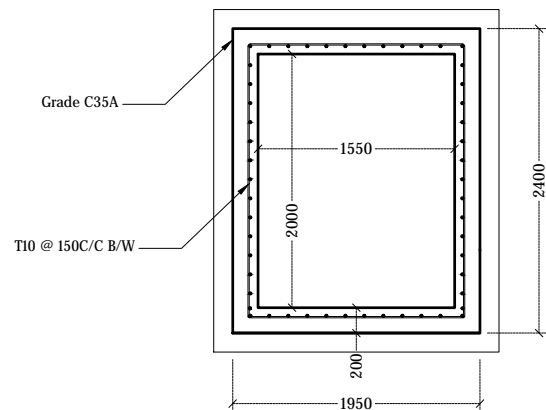
Designed: F.I.A. Approved: I.W.

Date: Sep 2020 SCALE (A3): NTS

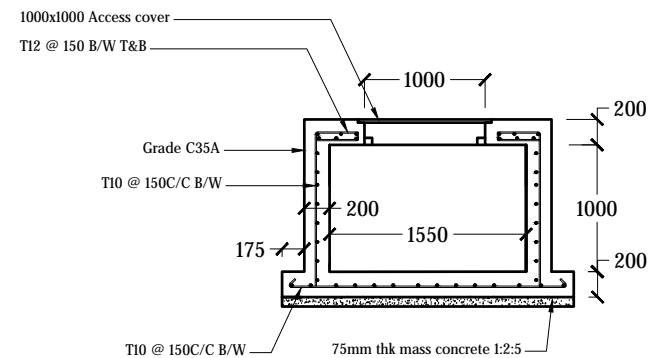
Project No: EP-WS/2019/05

Rev: Page: W-(25)

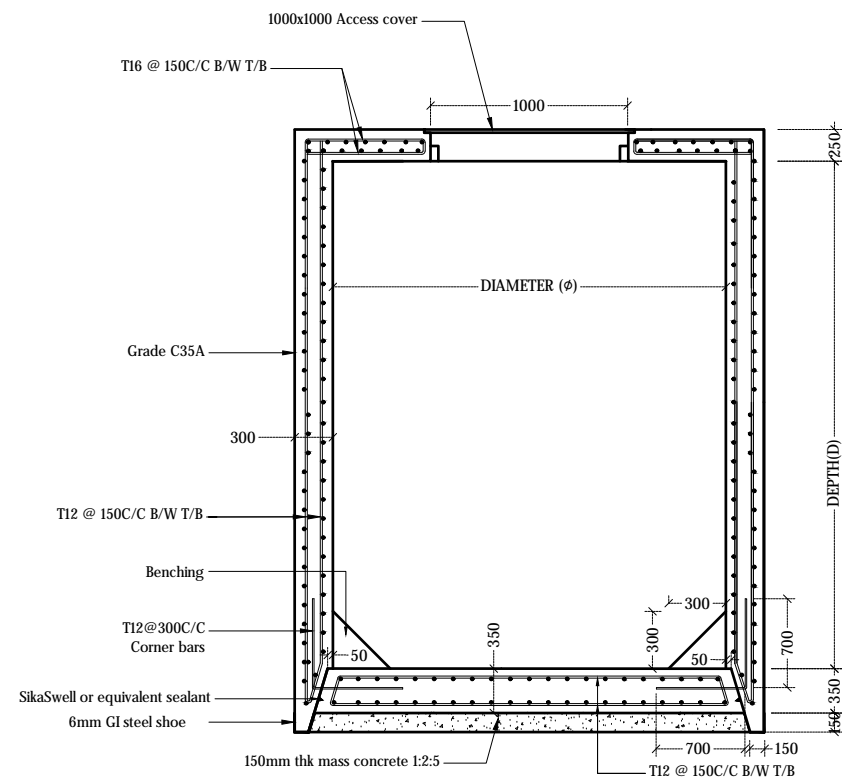
PLAN VIEW



SECTION



VALVE CHAMBER DETAIL



PUMP STATION DETAIL

Pump Station	Diameter (ϕ)	Depth (D)	Inlet Depth
DPS	2.5m	2.70m	0.8m

Legend

Notes:

- Pumps, pipe work, fittings and control panel shall be installed in accordance with manufacturers recommendations.
- Orientation of valve chamber pipework 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 polyethylene.
- All concrete cold joints shall casted with bonding agent
- Corner bars (3T16 @ 75C/C T/B) shall be provided around top slab openings

List of main instruments of pumping station:

1. Sewage pumps (1 duty & 1 standby)
2. Power cable
3. Auto-coupling with 400x3mm SS316 guide rail
4. Stainless steel (316) suspension chain
5. Cable with float control and weight
6. Discharge pipe
7. Puddle flange
8. Bitumen emulsion and 500 micron polythene sheet protection to external concrete surfaces
9. Construction joint / water bars
10. Manhole cover double seal ductile heavy duty cast iron / SS 316 cover
11. Vent pipe with vent cowl

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

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

Date: Sep 2020	SCALE (A3): NTS
----------------	-----------------

Project No: EP-WS/2019/05

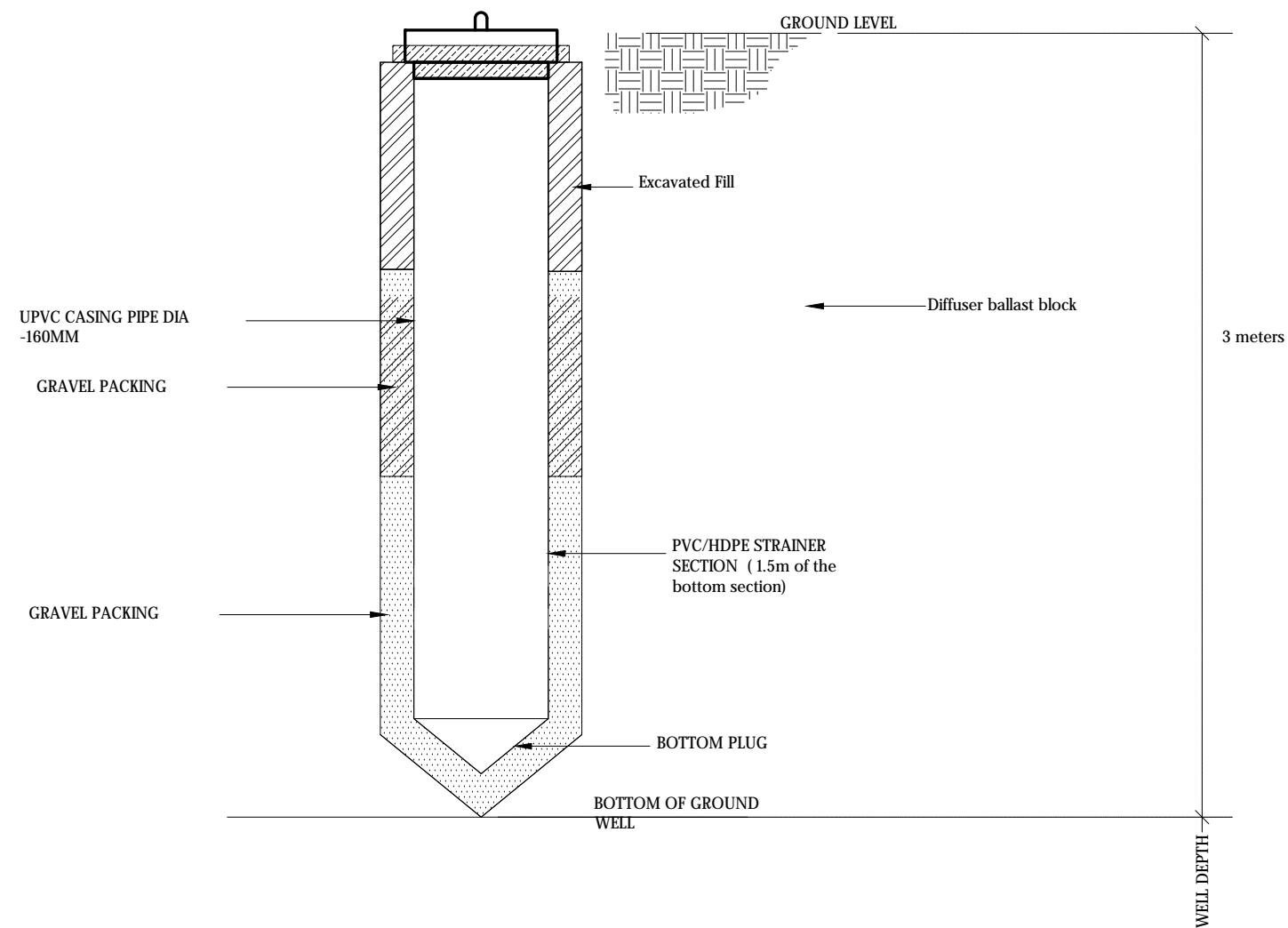
Rev:	Page:
------	-------

W-(26)

DISCHARGE PUMP STATION STRUCTURAL DETAILS

NTS

W-(26)



SAMPLING WELL SECTION

NTS



Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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

EPOCH
T: +960 333 3528
E: info@epochassociates
W: www.epochassociates
A: G. Rosary West,
Husnuheena Magu, Male', Maldives

FDBACK INFRA
Maldivian Infrastructure Development

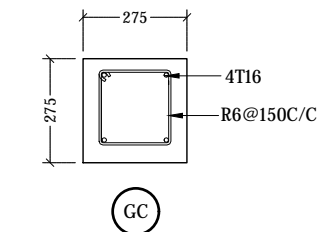
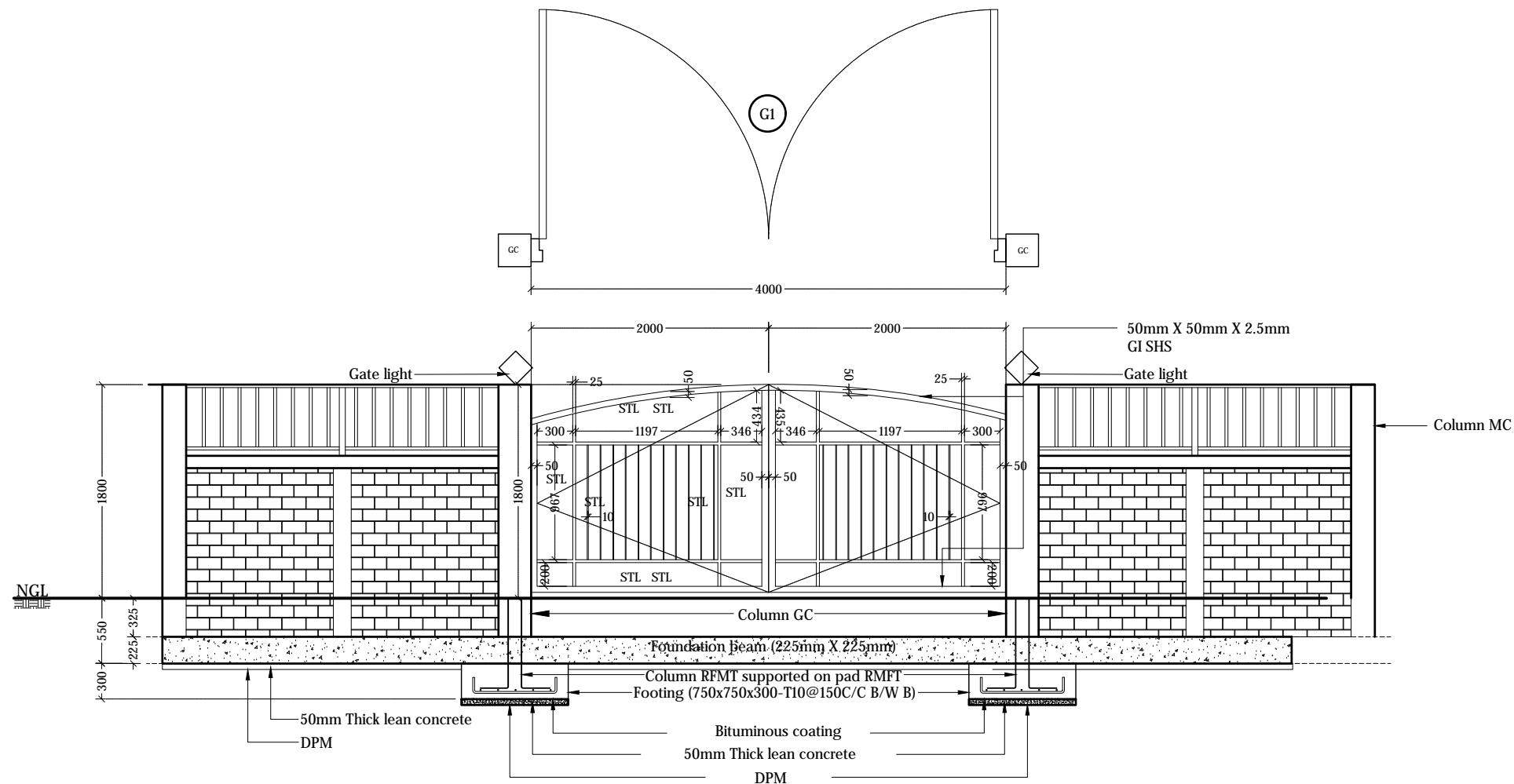
Drawn: F.I.A. Checked: M.S.S.

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

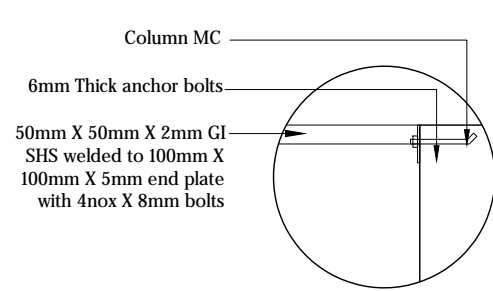
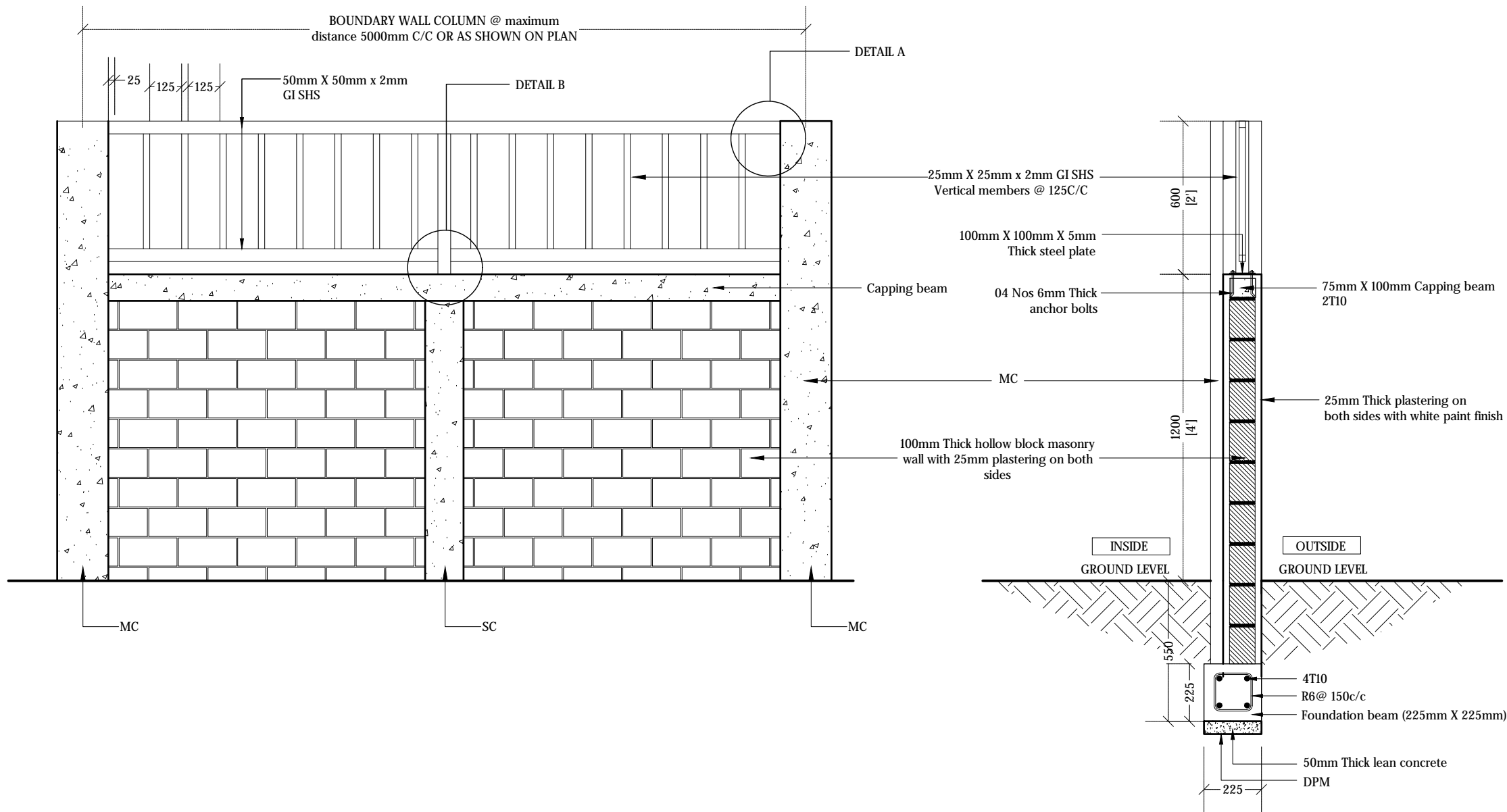
Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

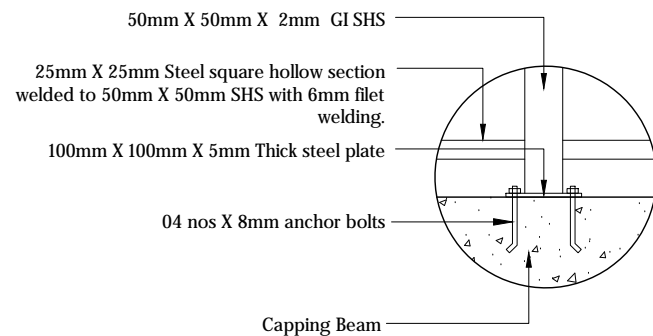
Rev: Page: W-(23)



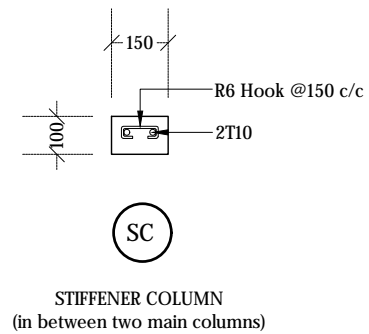
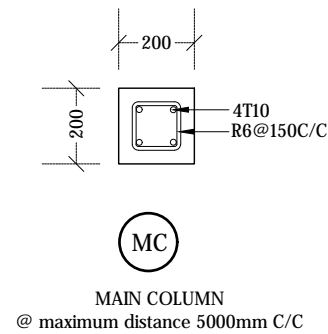
W-(7)



DETAIL A
1:10



DETAIL B
1:10



Legend

Notes:

- 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 be casted with bonding agent

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

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

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

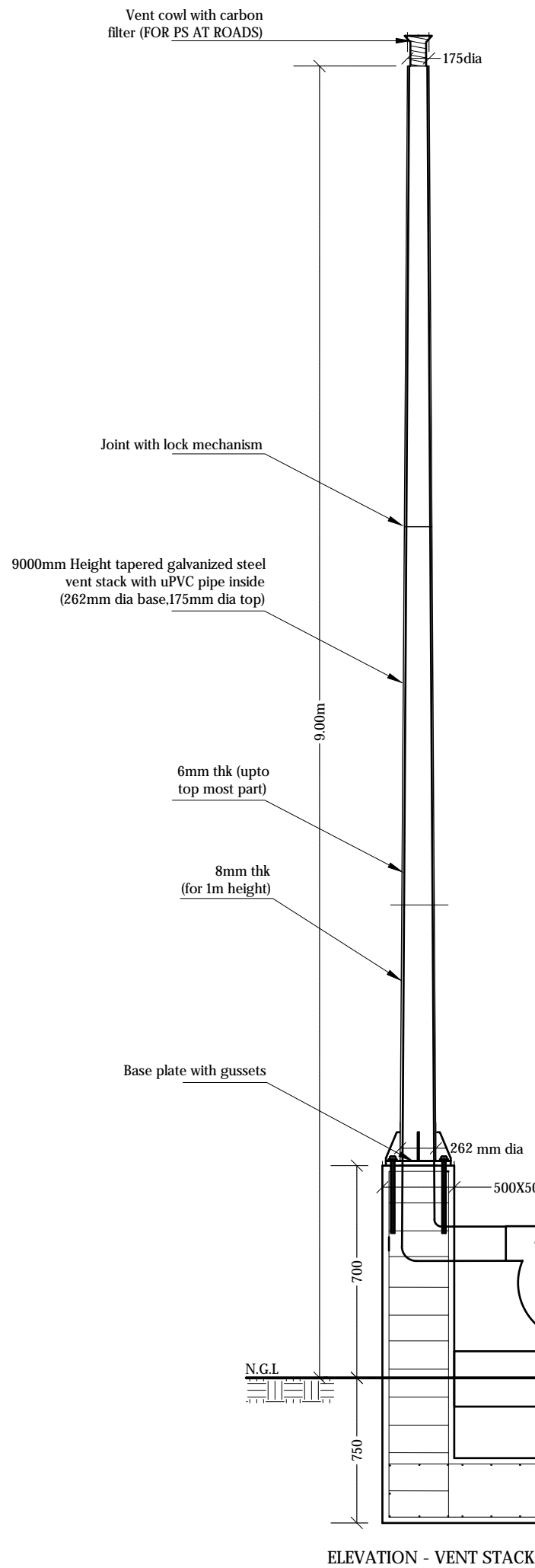
Project No: EP-WS/2019/05

Rev: Page:

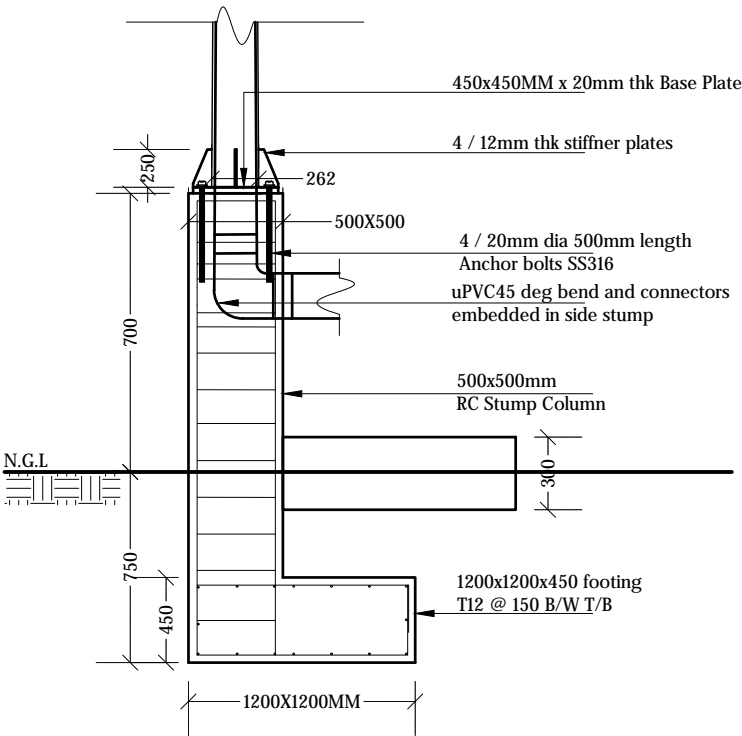
W-(8)

PS & STP BOUNDARY WALL AND FENCING DETAILS

1:20



ELEVATION - VENT STACK



SECTION - S

VENT STACK DETAILS

NTS



Legend

Notes:

- Vent stack shall be galvanized (minimum 250 micron) and finished with epoxy paint
- All anchor bolts shall be SS316
- Cover for footings shall be 50mm
- Cover for stump shall be 40mm
- Concrete shall be of grade C25
- All concrete cold joints shall be casted with bonding agent

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

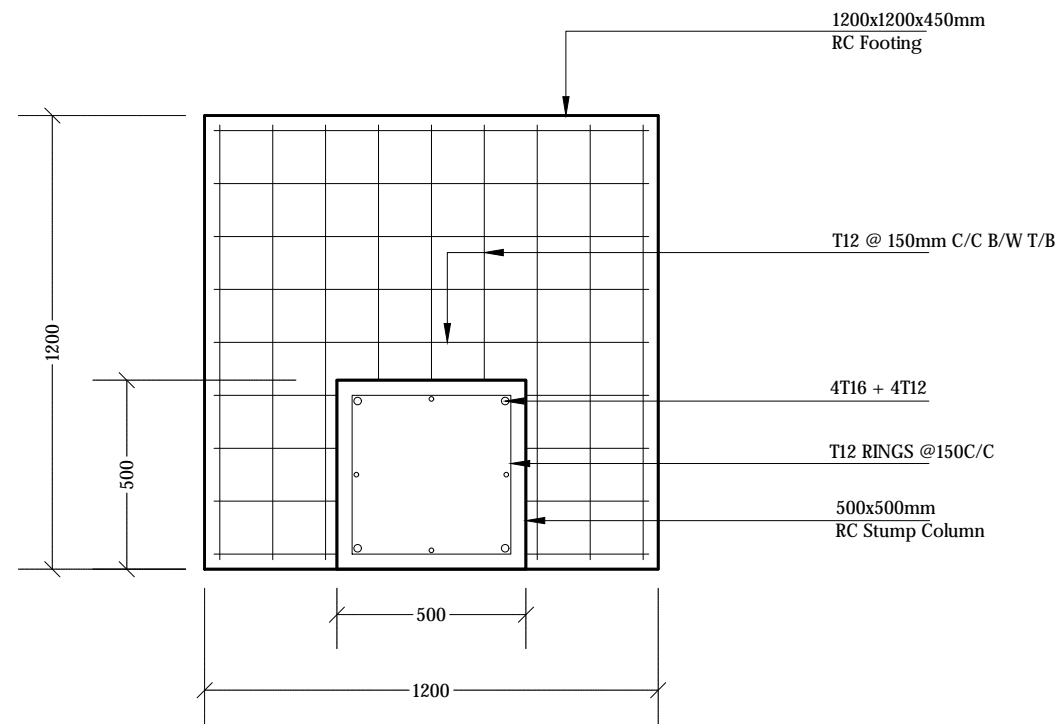
Designed: F.I.A. Approved: I.W.

Date: Sep 2020 SCALE (A3): NTS

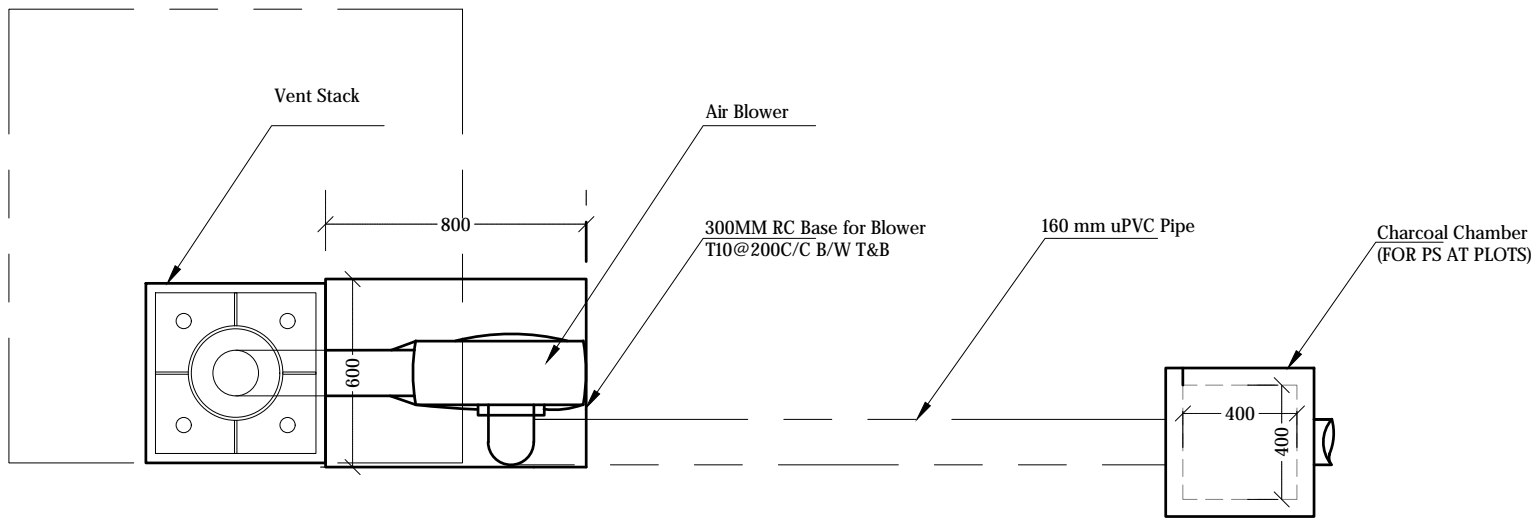
Project No: EP-WS/2019/05

Rev: Page:

W-(9)



FOOTING & STUMP DETAILS OF VENT STACK



AIR BLOWER DETAILS (Plan View)

VENT STACK AND AIR BLOWER DETAILS

NTS



Legend

Notes:

- All anchor bolts shall be SS316
- Cover for footings shall be 50mm
- Cover for stump shall be 40mm
- Concrete shall be of grade C25
- All concrete cold joints shall be casted with bonding agent

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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

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

FEDBACK INFRA
Maldivian Infrastructure Development

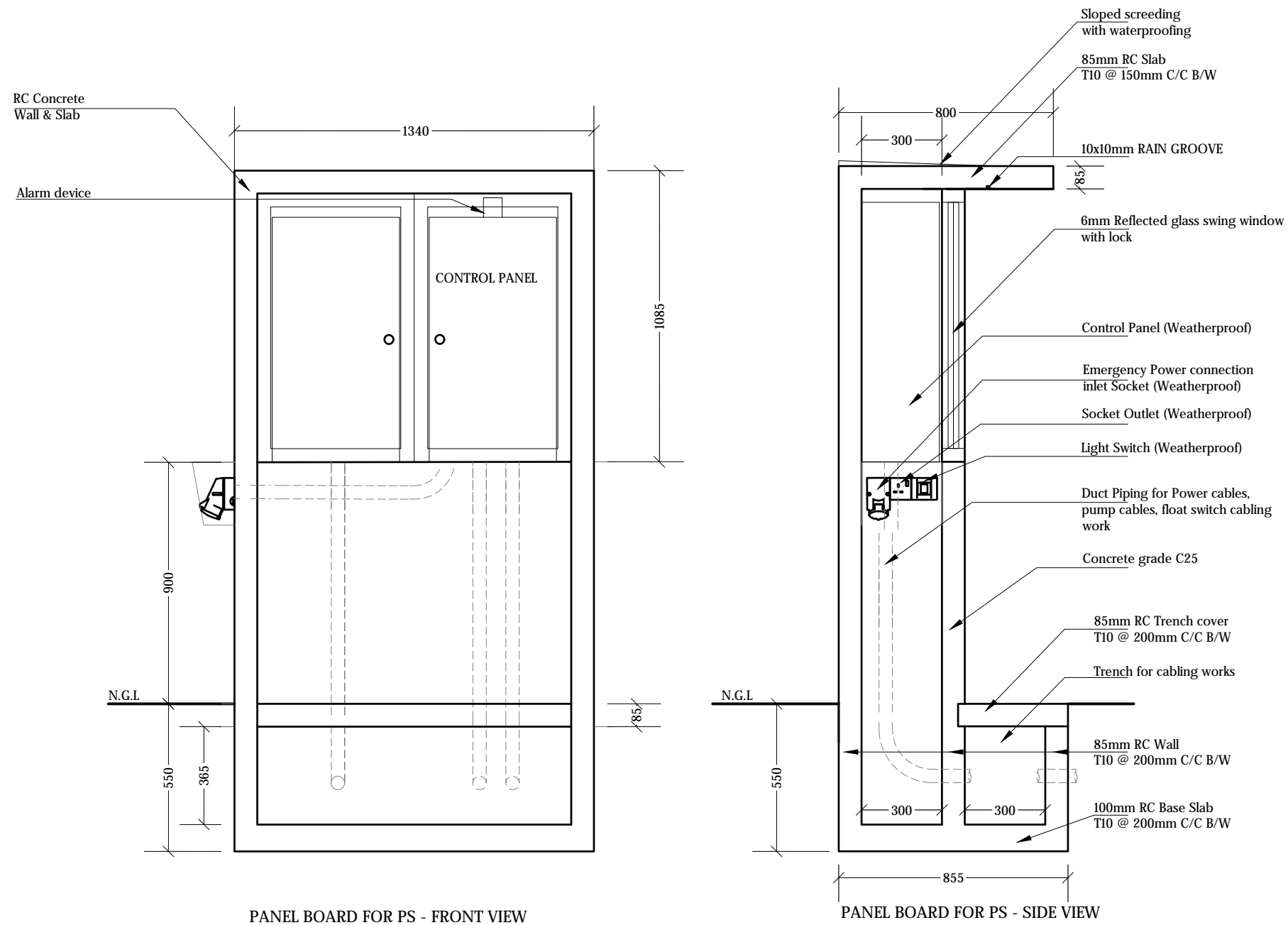
Drawn: F.I.A. Checked: M.S.S.

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

Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

Rev: Page: W-(10)



CONTROL PANEL BOARD DETAILS

NTS

Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

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

Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

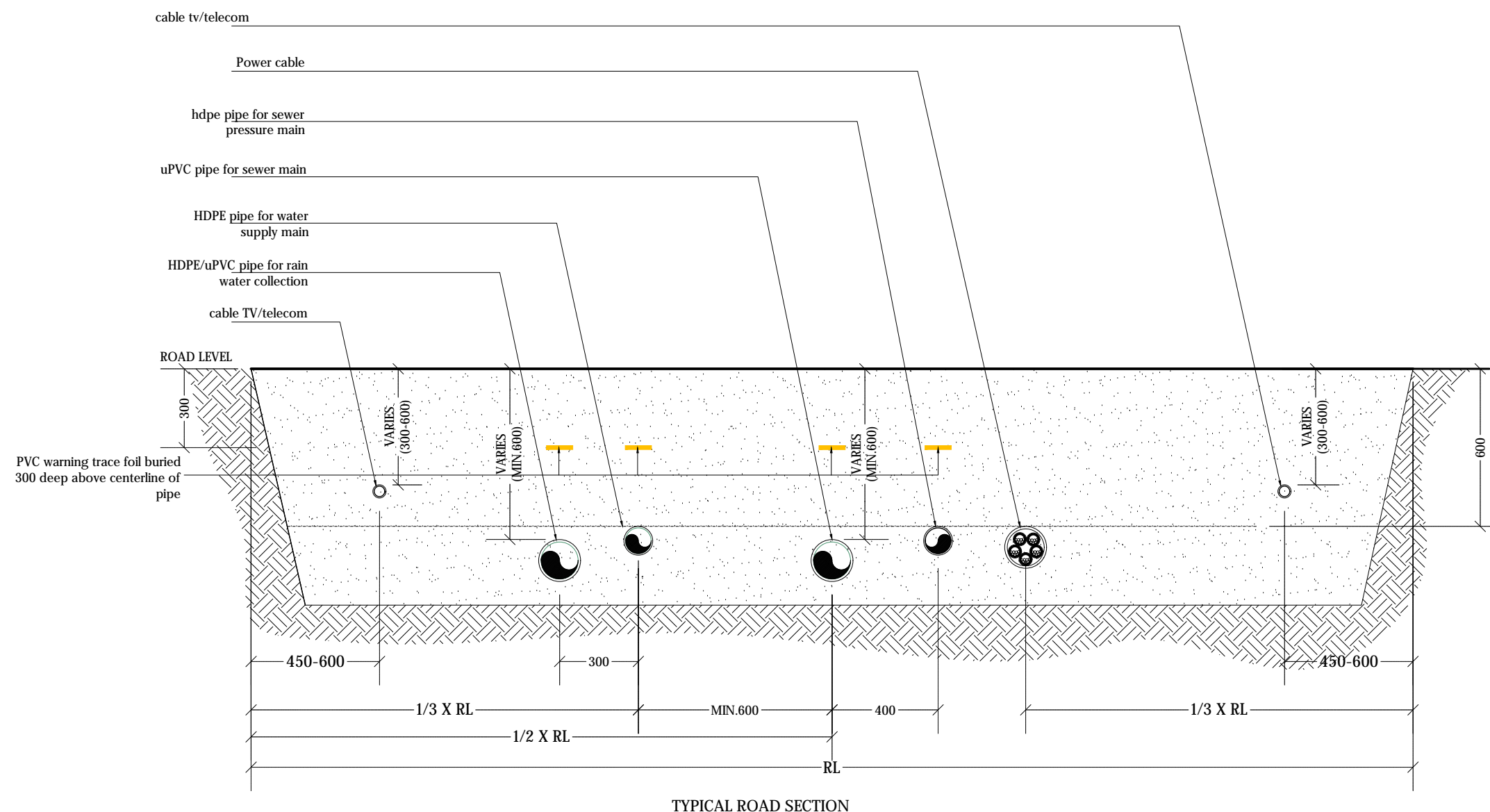
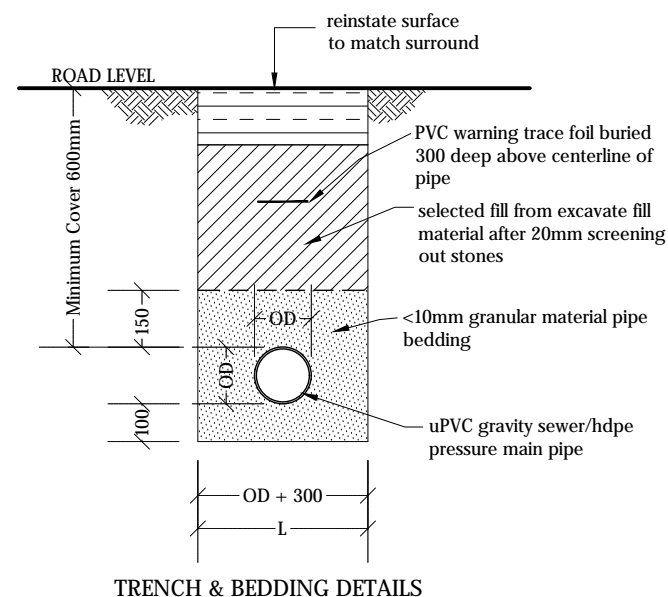
Rev: Page: W-(11)



- Light posts shall be galvanized (minimum 200 micron) and finished with epoxy paint
- All anchor bolts shall be SS316
- Cover for footings shall be 50mm
- Concrete shall be of grade C25
- All steel members and GI members to be applied with 2 coats of anti-corrosive paint with epoxy finishing paint
- All concrete cold joints shall be casted with bonding agent

[illegible]

Rev:	Page:
------	-------



Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

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

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

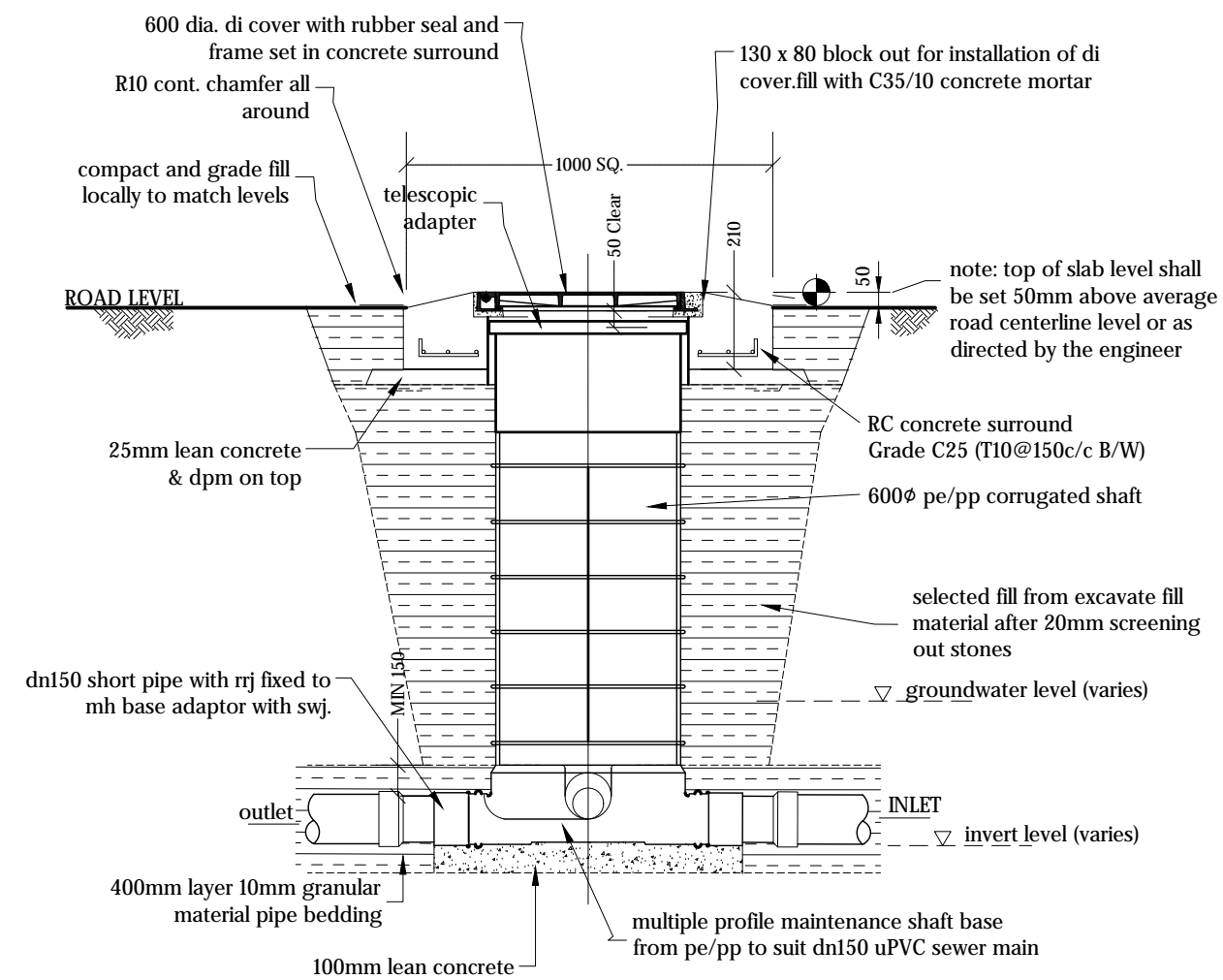
Project No: EP-WS/2019/05

Rev: Page:

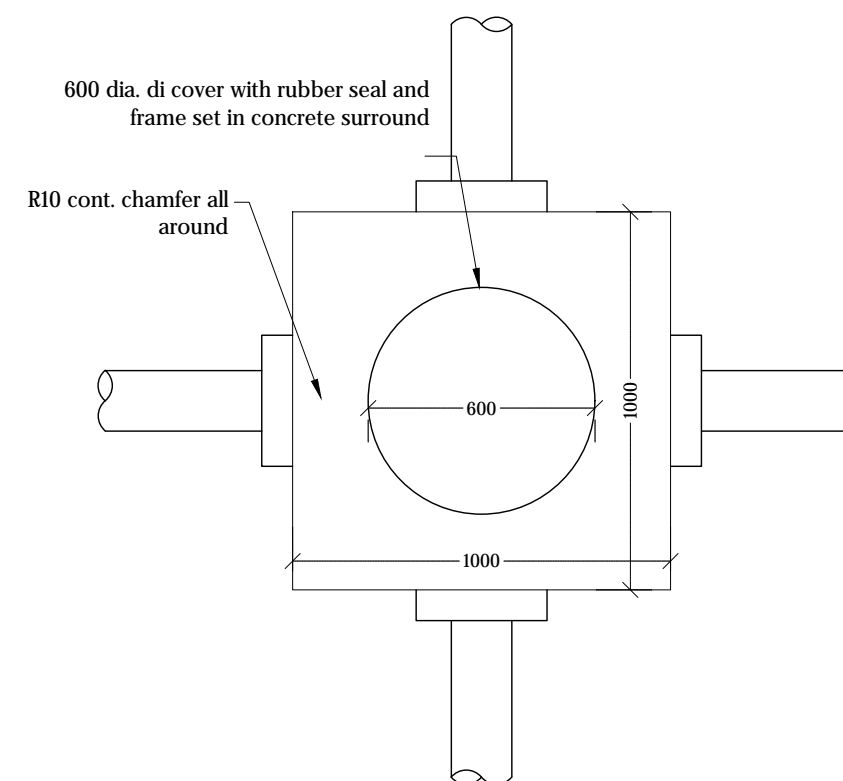
W-(13)

TRENCH AND BEDDING DETAILS

1:20



ELEVATION - MAINTENANCE SHAFT (MH)



PLAN VIEW - MAINTENANCE SHAFT (MH)

MAINTENANCE SHAFT (MH) DETAILS

1:20



Legend

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

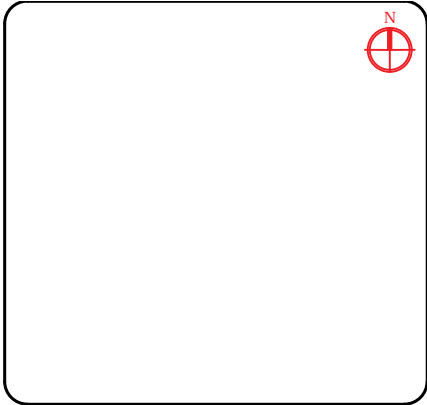
Designed: F.I.A. Approved: I.W.

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

Project No: EP-WS/2019/05

Rev: Page:

W-(14)



Legend

ELEVATION - CLEANOUT (CO)

PLAN VIEW - CLEANOUT (CO)

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



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

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

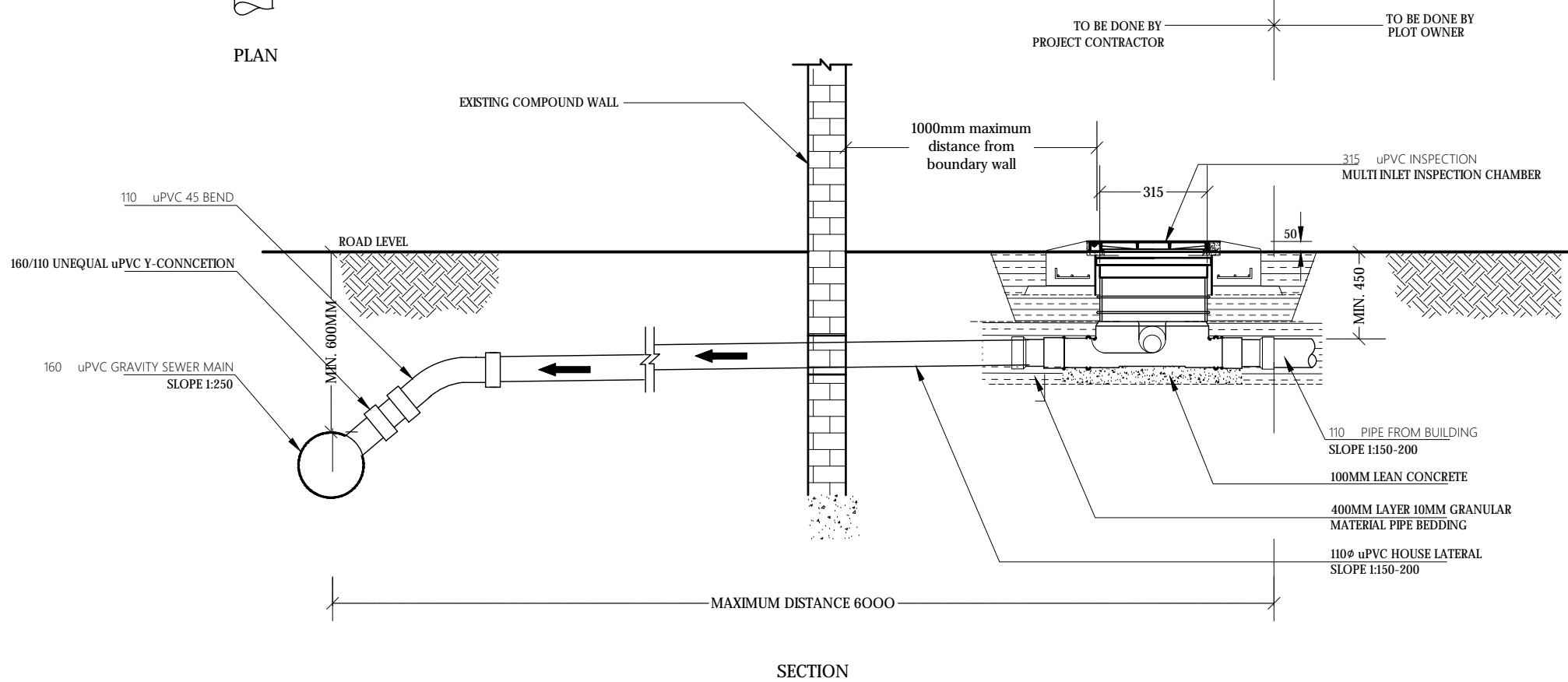
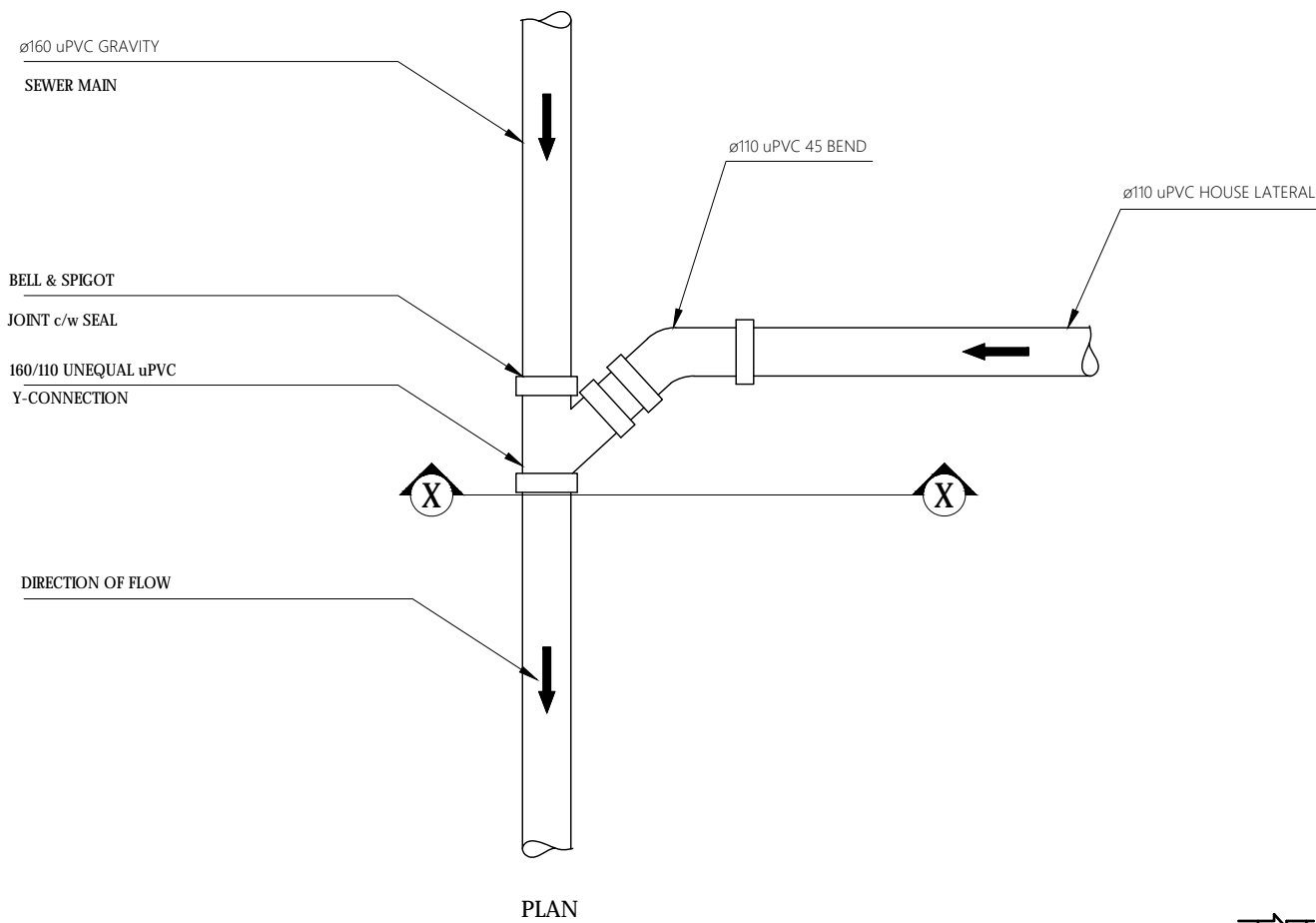
Date: Sep 2020	SCALE (A3): NTS
----------------	-----------------

Project No: EP-WS/2019/05

Rev:	Page: W-(16)
------	-----------------

CLEAN OUT DETAILS

NTS



TYPICAL HOUSE CONNECTION DETAIL

NTS



Legend

Notes:

1. Invert level at house inspection chamber and invert level of the sewer main on the road should be checked during the house connection survey and invert level should be adjusted in order to facilitate gravity flow from house inspection chamber to sewer main.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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

EPOCH
ASSOCIATES

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

INFRA
Maldives

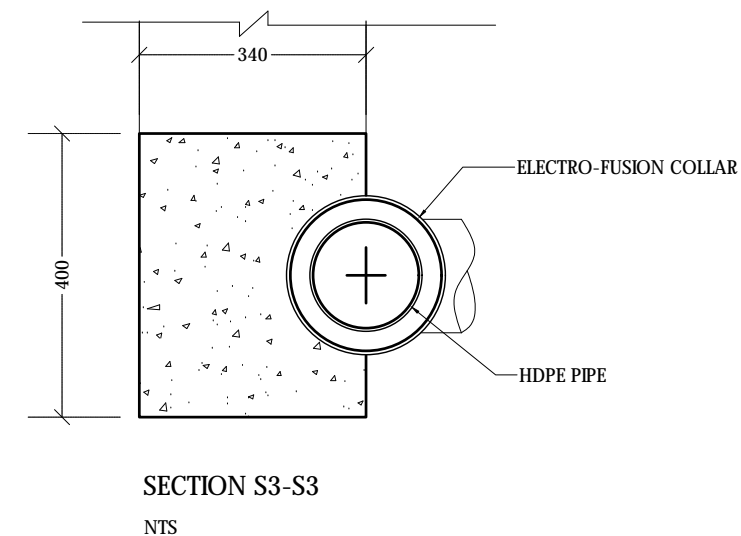
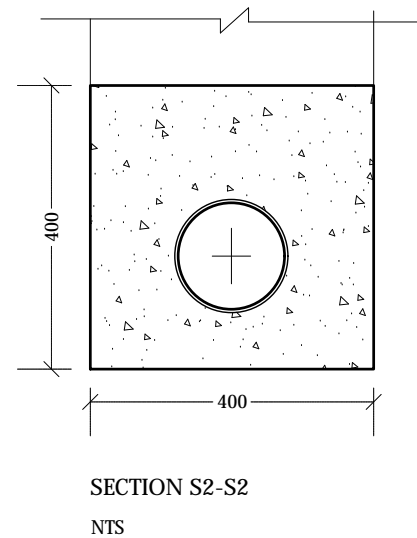
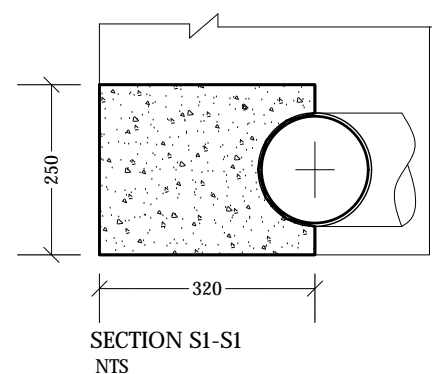
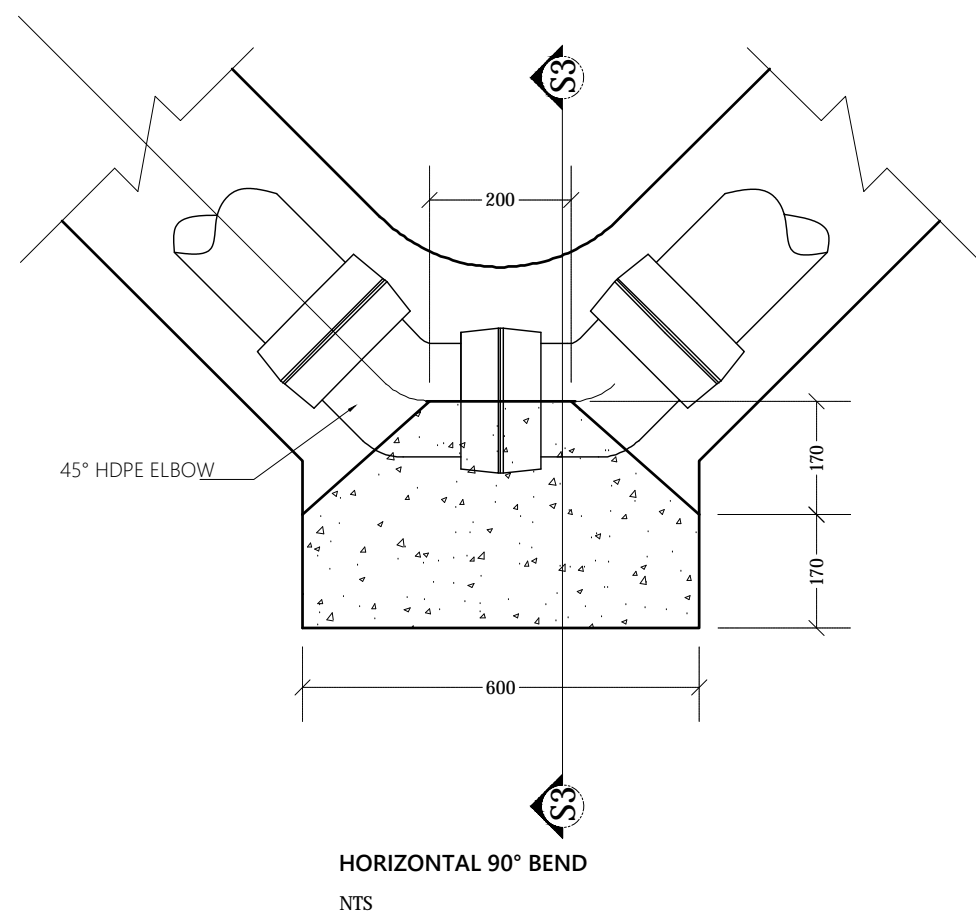
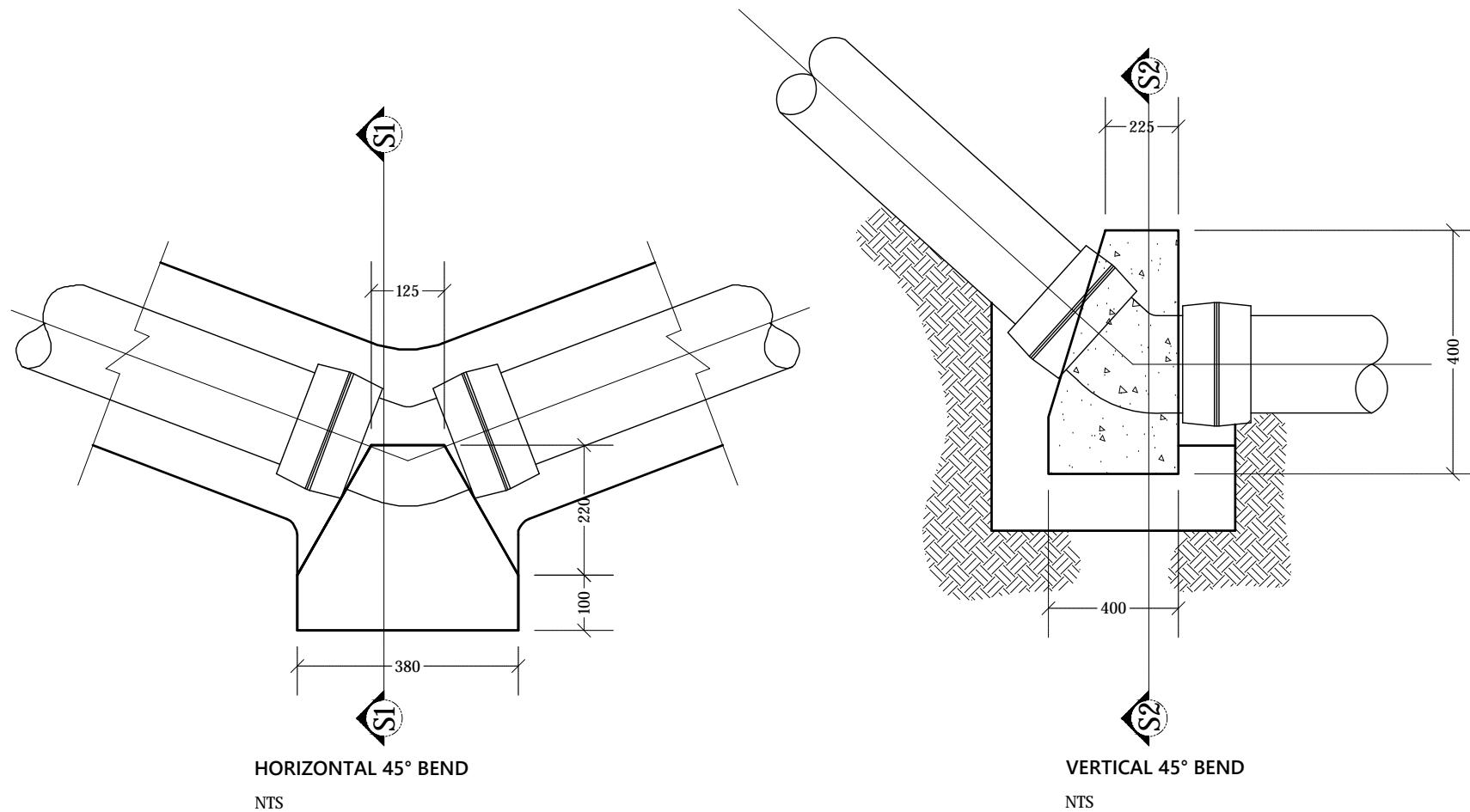
Drawn: F.I.A. Checked: M.S.S.

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

Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

Rev: Page: W-(17)



THRUST BLOCK DETAILS

Legend

Notes:

- Concrete shall be of grade C25

REV. NO.	Date	Revision Description	Drawn	Chkd	Appr

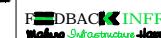
Title:
Consultancy Services for Survey,
Design and EIA works of Water
Supply and Sewerage Facilities in
6 islands, Maldives - Package 5

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



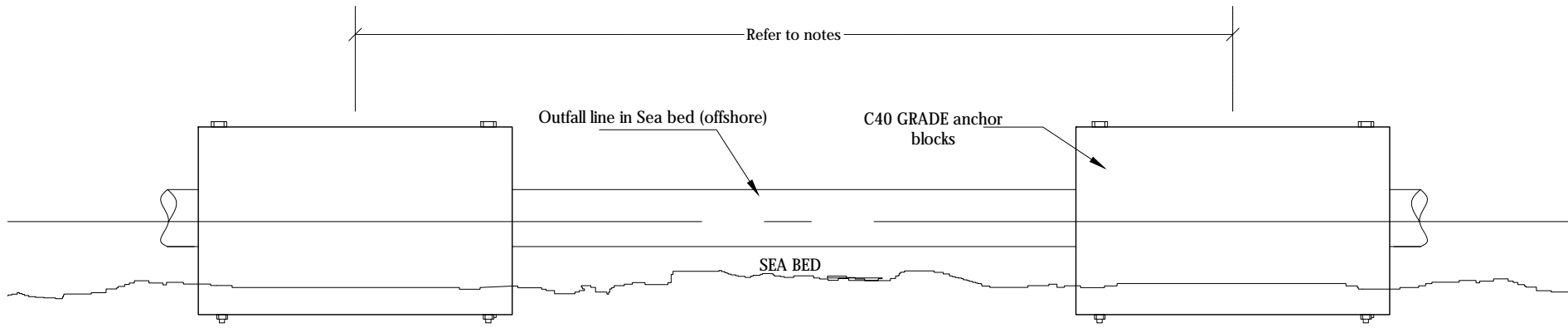
Drawn: F.J.A.	Checked: M.S.S.
---------------	-----------------

Designed: F.J.A.	Approved: J.W.
------------------	----------------

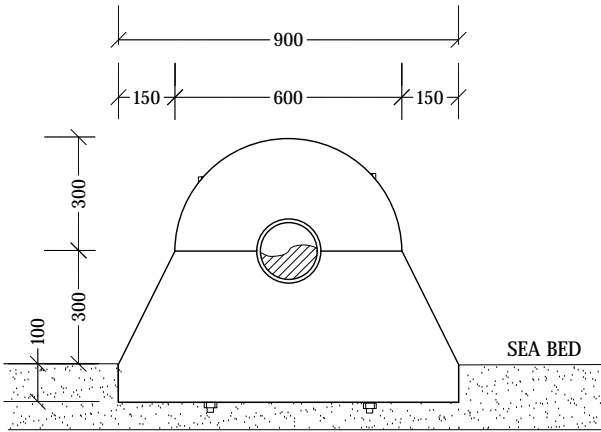
Date: Sep 2020	SCALE (A3): NTS
----------------	-----------------

Project No: EP-WS/2019/05

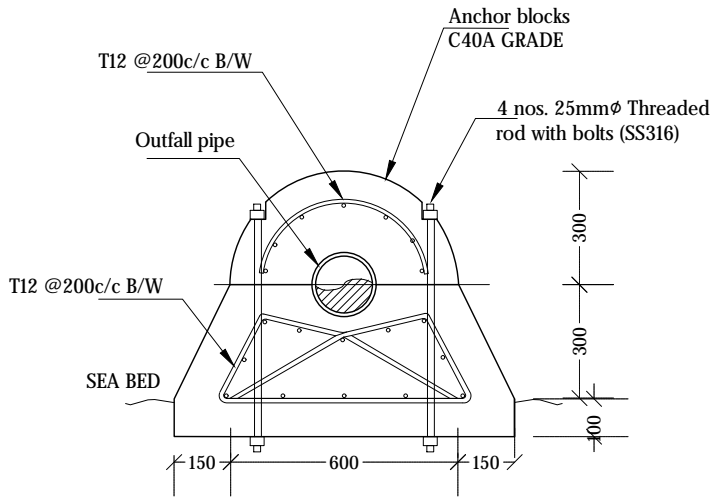
Rev:	Page:
------	-------



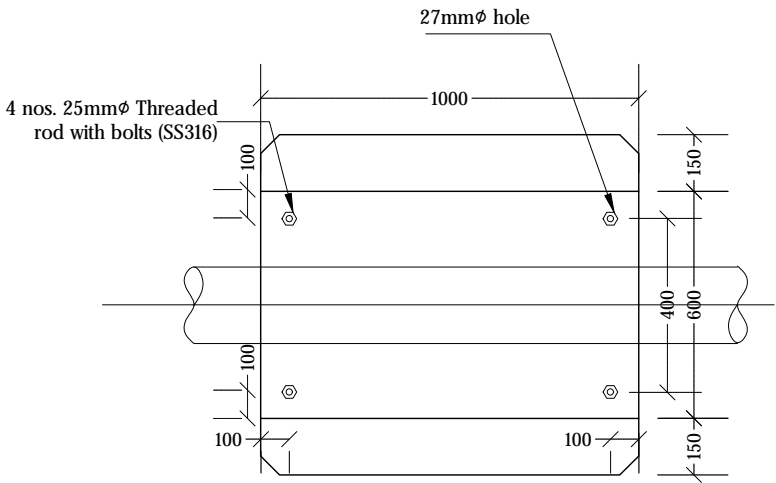
BALLAST BLOCK SIDE ELEVATION



BALLAST BLOCK FRONT ELEVATION



BALLAST BLOCK SECTION



BALLAST BLOCK PLAN

BALLAST BLOCK DETAILS

NTS



Legend

Notes:

- 1. All backing rings for stub flanges , nuts and bolts shall be grade 316 stainless steel.
- 2. All pipe work shall be bedded on 10mm thick neoprene rubber seat in semicircular recess matching the O.D. the pipe.
- 3. Fabricate specific pipe clamps to provide firm clamping action according to pipe O.D.
- 4. All structural concrete shall be of grade C40A.
- 5. All castings shall be done using sulphate resistant portland cement to BS 4027:1996.
- 6. All structural reinforcement shall be epoxy coating of non-pre-stressed reinforcement to ASTM-A775/A775M.
- 7. A cover of 75mm should be given for all reinforcements.
- 8. In shallow water (regions where the depth is less than 1m), the ballast block spacing is 3.5m. In deeper water (regions where the depth is greater than 1m), the ballast block spacing is 2.0m. All distances are from c/c of blocks.
- 9. All pipe connections shall be within blocks.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



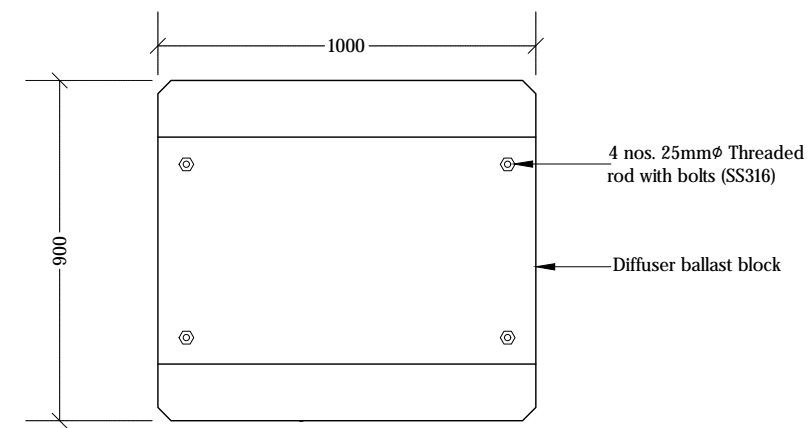
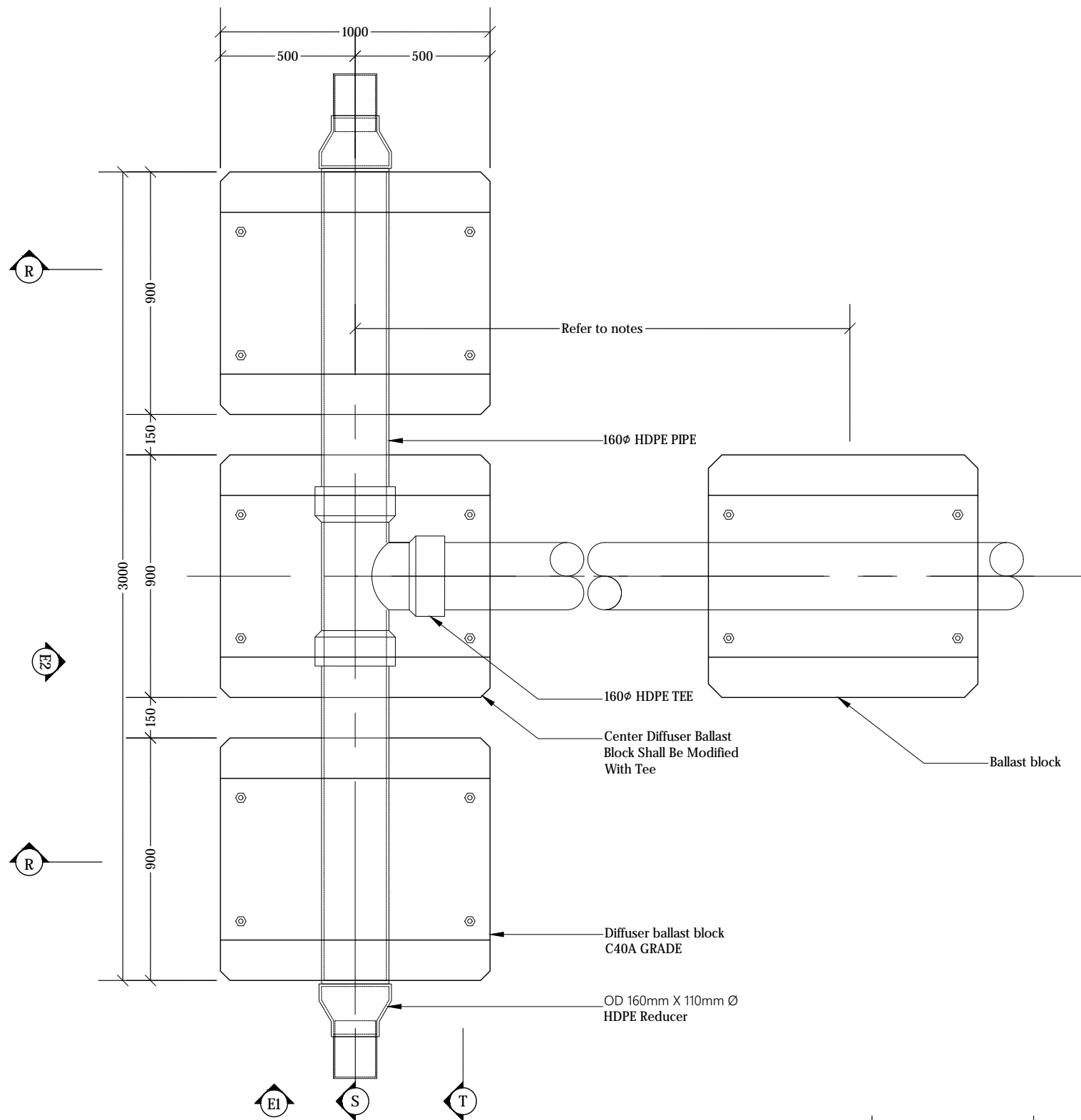
Drawn: F.I.A. Checked: M.S.S.

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

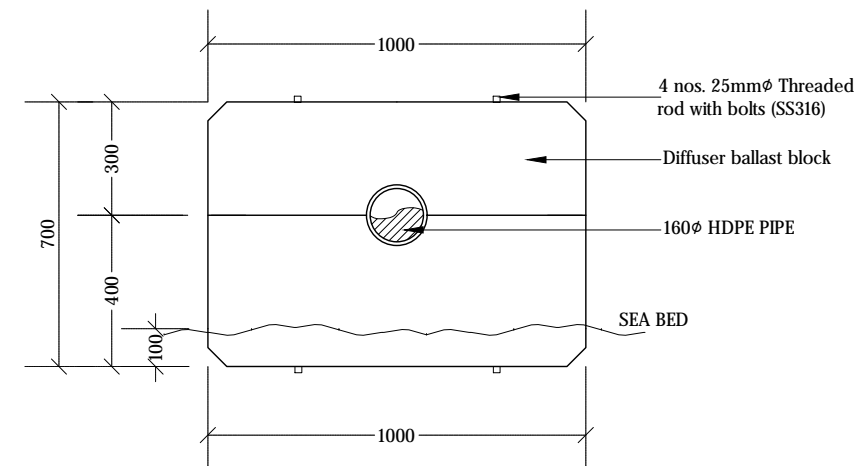
Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

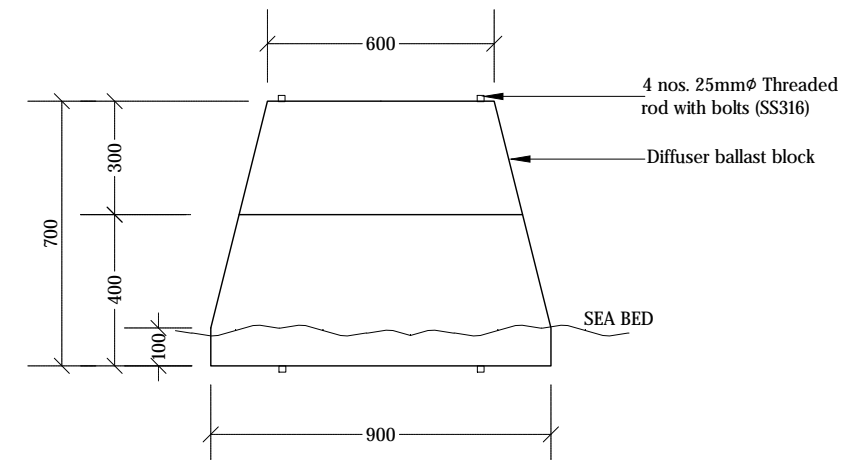
Rev: Page:
W-(19)



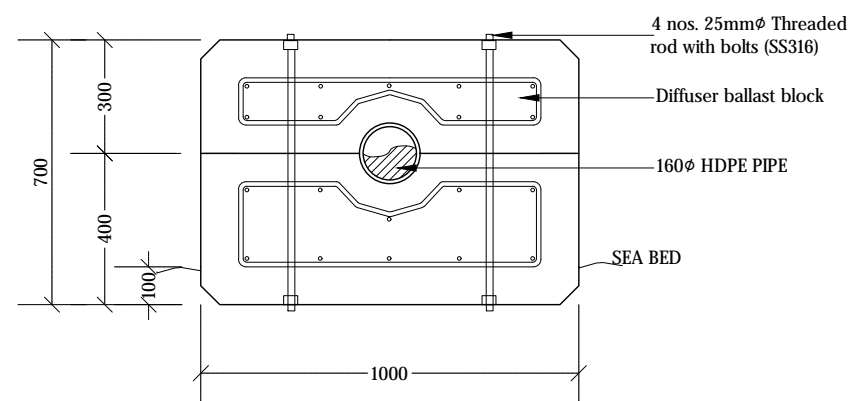
DIFFUSER BALLAST BLOCK PLAN



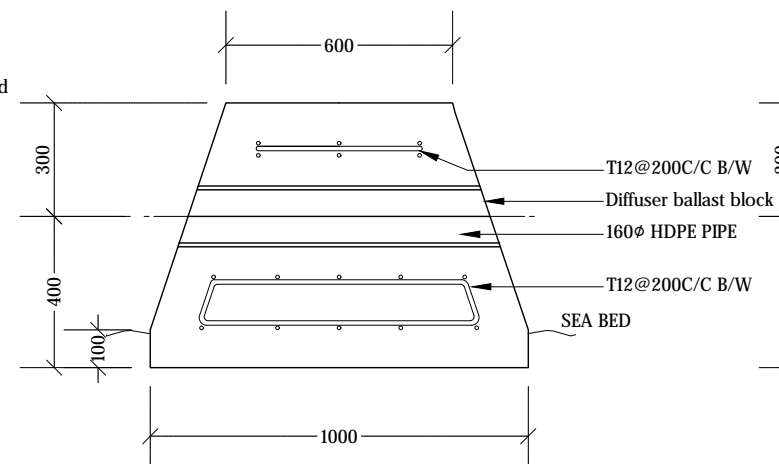
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E1



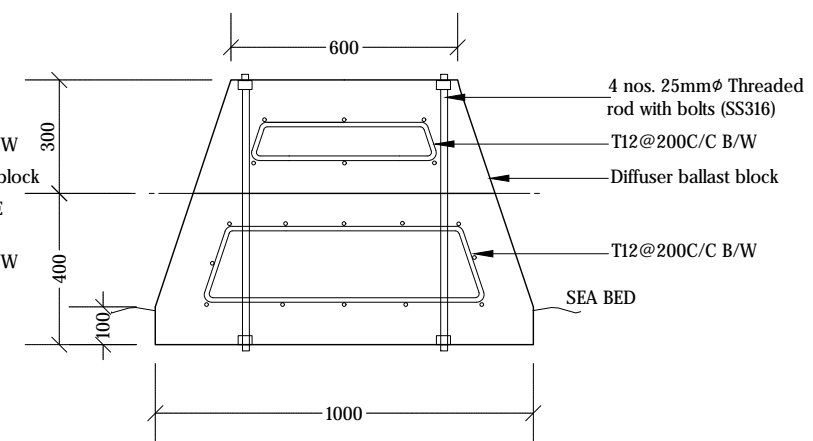
DIFFUSER BALLAST BLOCK FRONT ELEVATION - E2



DIFFUSER BALLAST BLOCK SECTION - R



DIFFUSER BALLAST BLOCK SECTION - S



DIFFUSER BALLAST BLOCK SECTION - T

DIFFUSER DETAILS
NTS

Legend

Notes:

1. All backing rings for stub flanges , nuts and bolts shall be grade 316 stainless steel.
2. All pipe work shall be bedded on 10mm thick neoprene rubber seat in semicircular recess matching the O.D. the pipe.
3. Fabricate specific pipe clamps to provide firm clamping action according to pipe O.D.
4. All structural concrete shall be of grade C40A.
5. All castings shall be done using sulphate resistant portland cement to BS 4027:1996.
6. All structural reinforcement shall be epoxy coating of non-pre-stressed reinforcement to ASTM-A775/A775M.
7. A cover of 75mm should be given for all reinforcements.
8. In shallow water (regions where the depth is less than 1m), the ballast block spacing is 3.5m. In deeper water (regions where the depth is greater than 1m), the ballast block spacing is 2.0m. All distances are from c/c of blocks.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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

EPOCH
ASSOCIATES

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

INFRA
SOLUTIONS

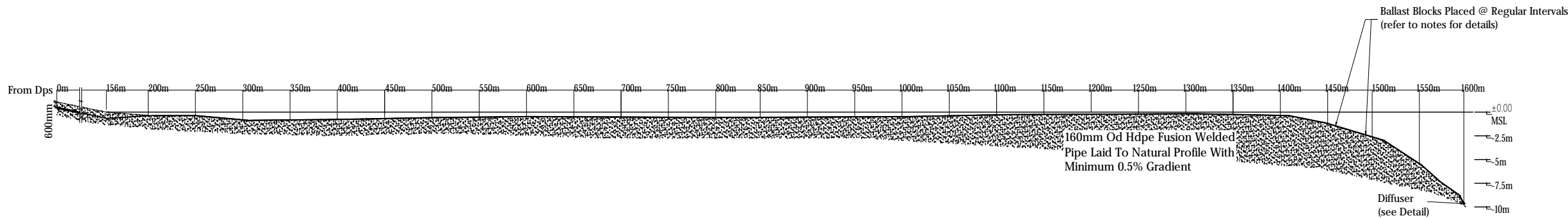
Drawn: F.I.A. Checked: M.S.S.

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

Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

Rev: Page:



STP/DPS LAYOUT
NTS



Legend

Notes:

1. Contractor should carry out a detailed bathymetric survey for the proposed area, revise and present a shop drawing for the outfall layout prior to commencement of outfall works.
2. In shallow water (regions where the depth is less than 1m), the ballast block spacing is 3.5m. In deeper water (regions where the depth is greater than 1m), the ballast block spacing is 2.0m. All distances are from c/c of blocks.

REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

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

Sub Title:
Sewerage System in M. Raiymandhoo

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



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



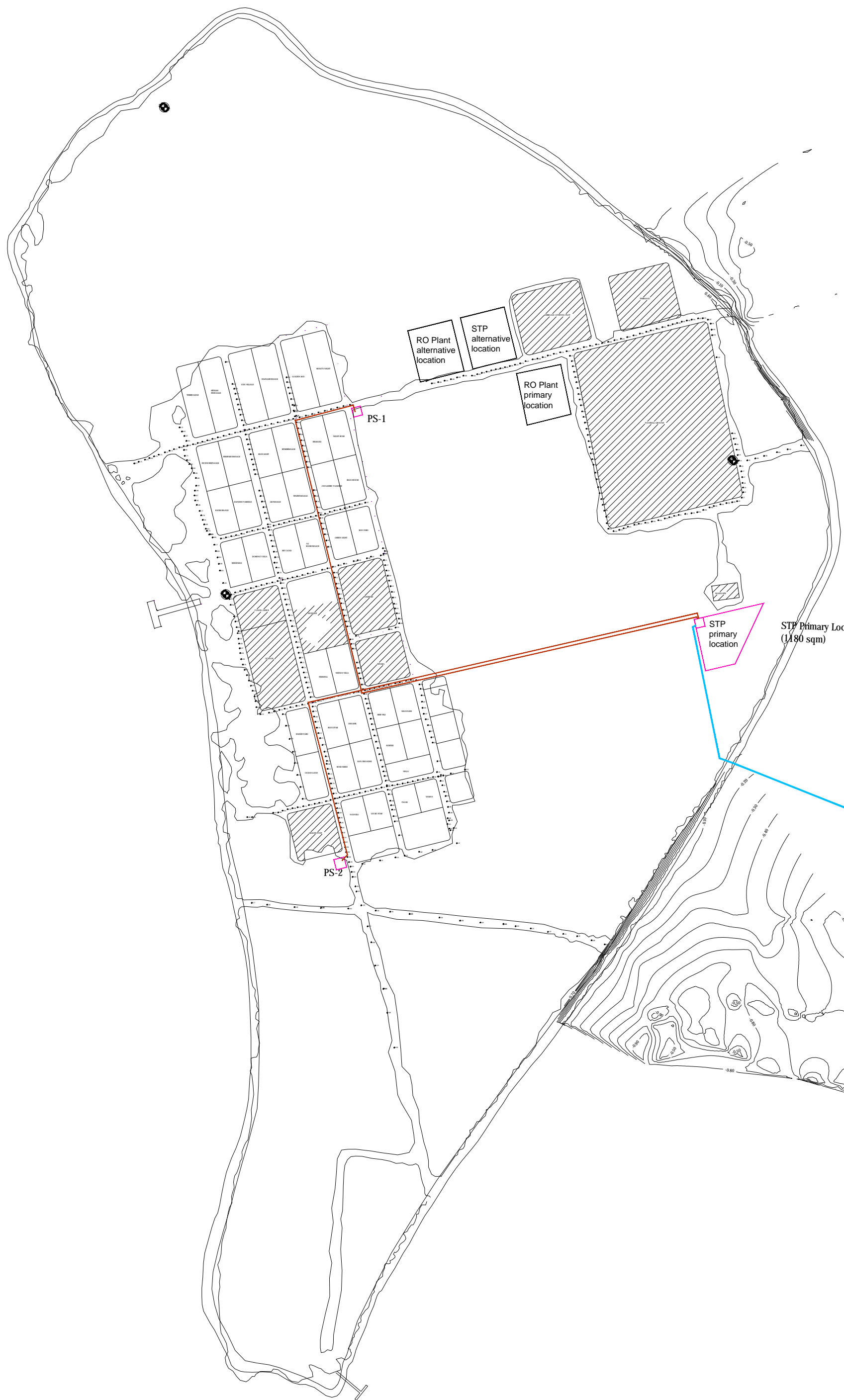
Drawn: F.I.A. Checked: M.S.S.

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

Date: Sep 2020 SCALE (A3): NTS

Project No: EP-WS/2019/05

Rev: Page: W-(21)



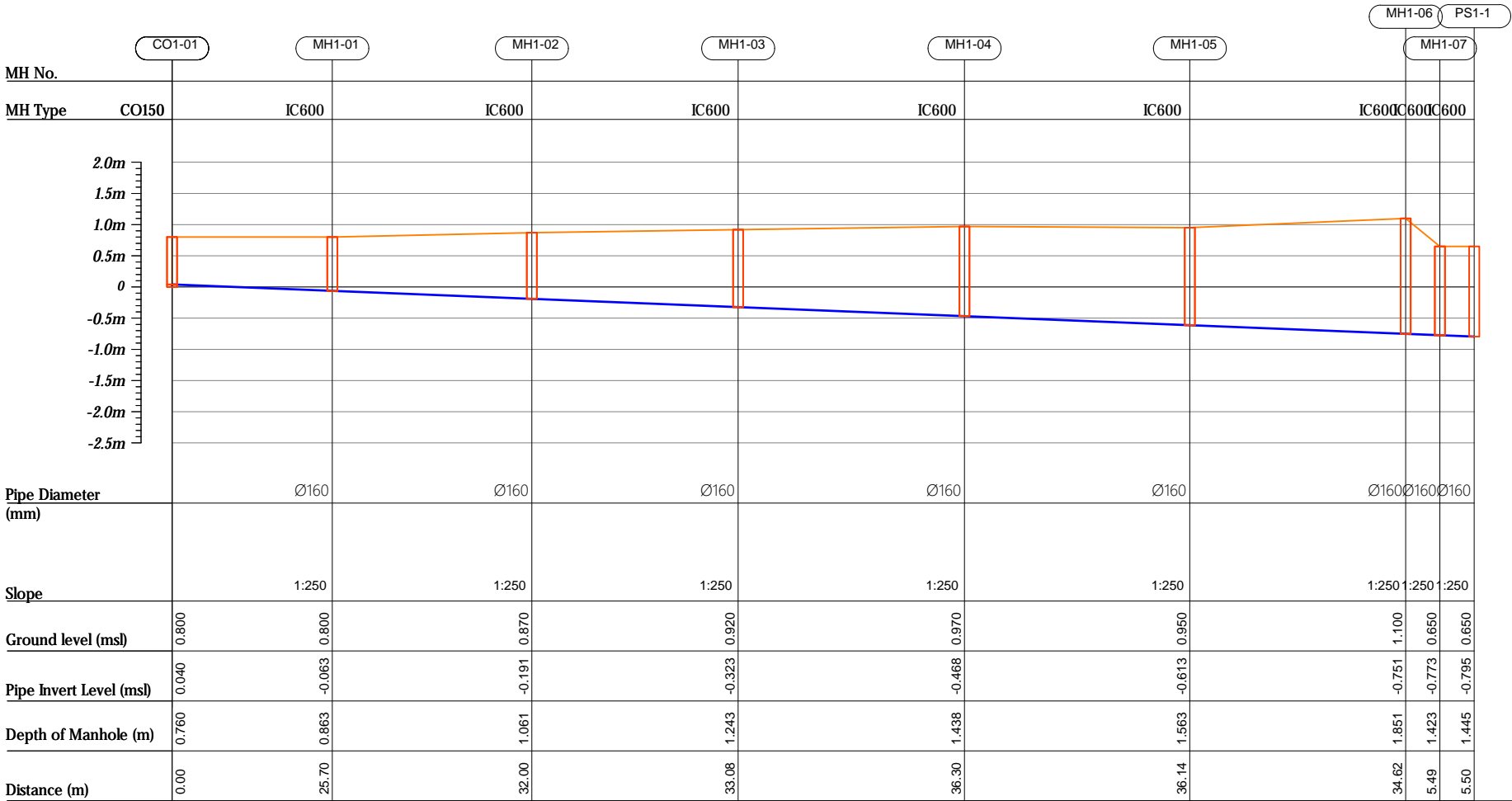
REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

Rev:	Page:
------	-------

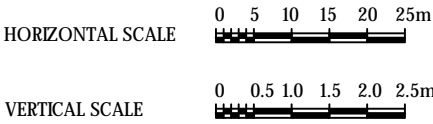
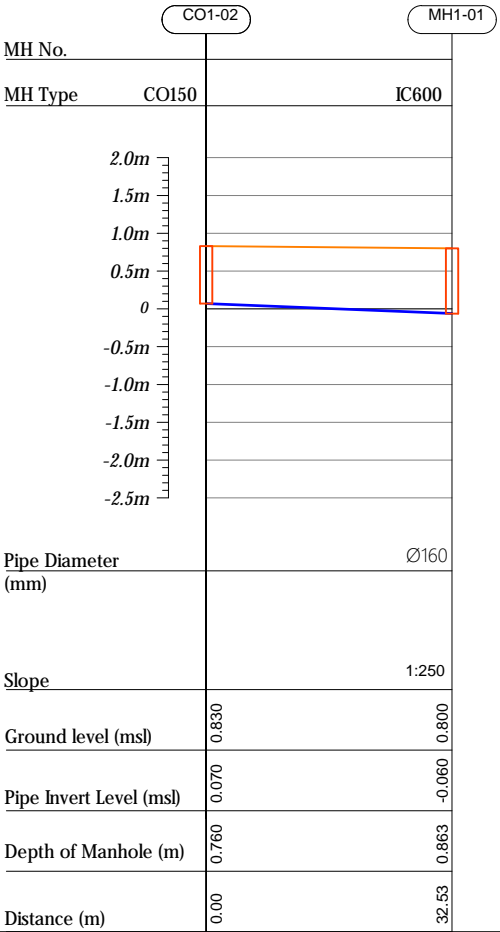
W-(22)

1:2500

Profile 01



Profile 02



CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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

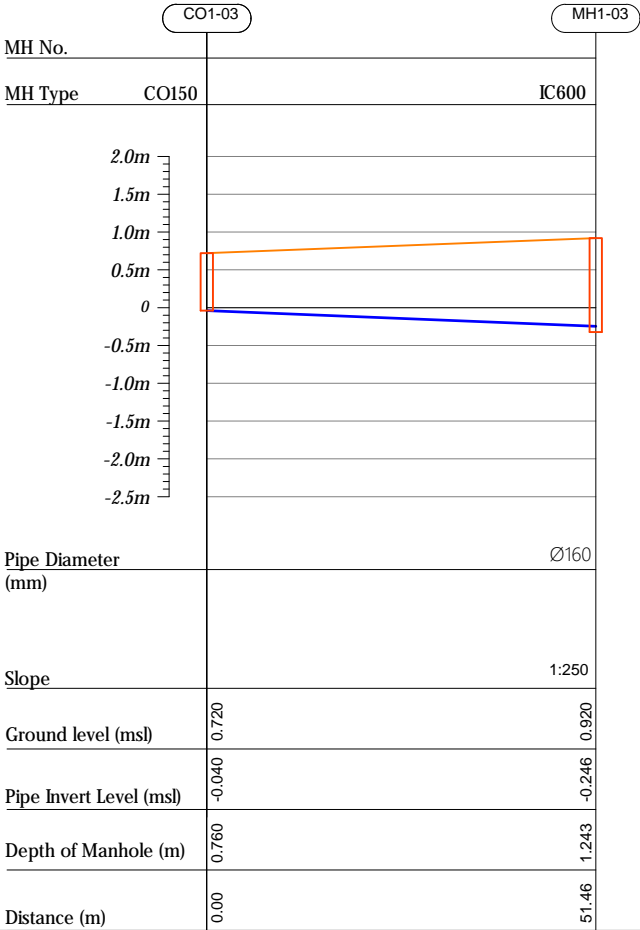
INFRA
Making Infrastructure Happen

Drawn: A.R.W	Checked: M.S.S
Designed: F.L.A	Approved: L.W
Date: Aug 2020	SCALE (A3): 1:100
Project No:	EP-WS/2019/05

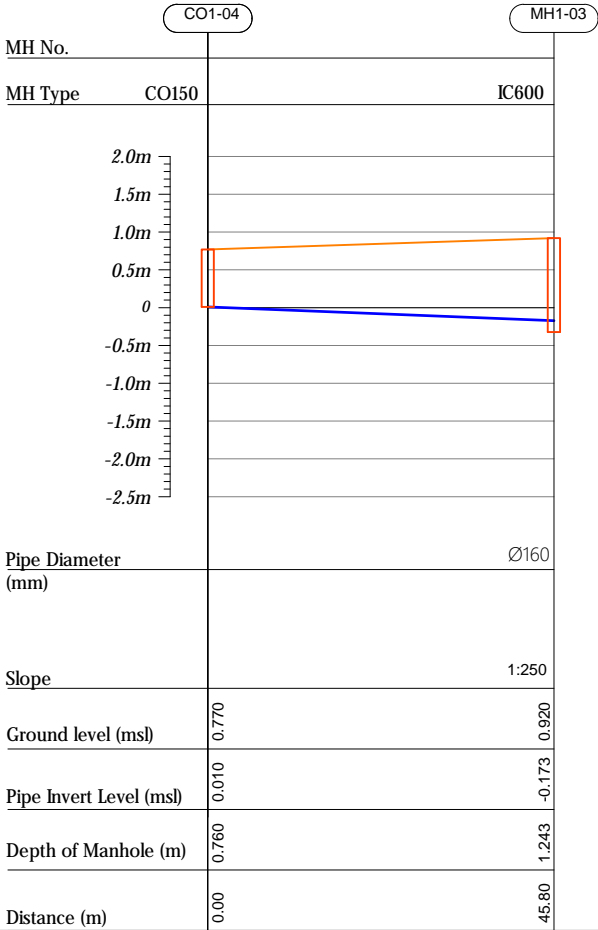
Rev: R-01

Page: PS1-01

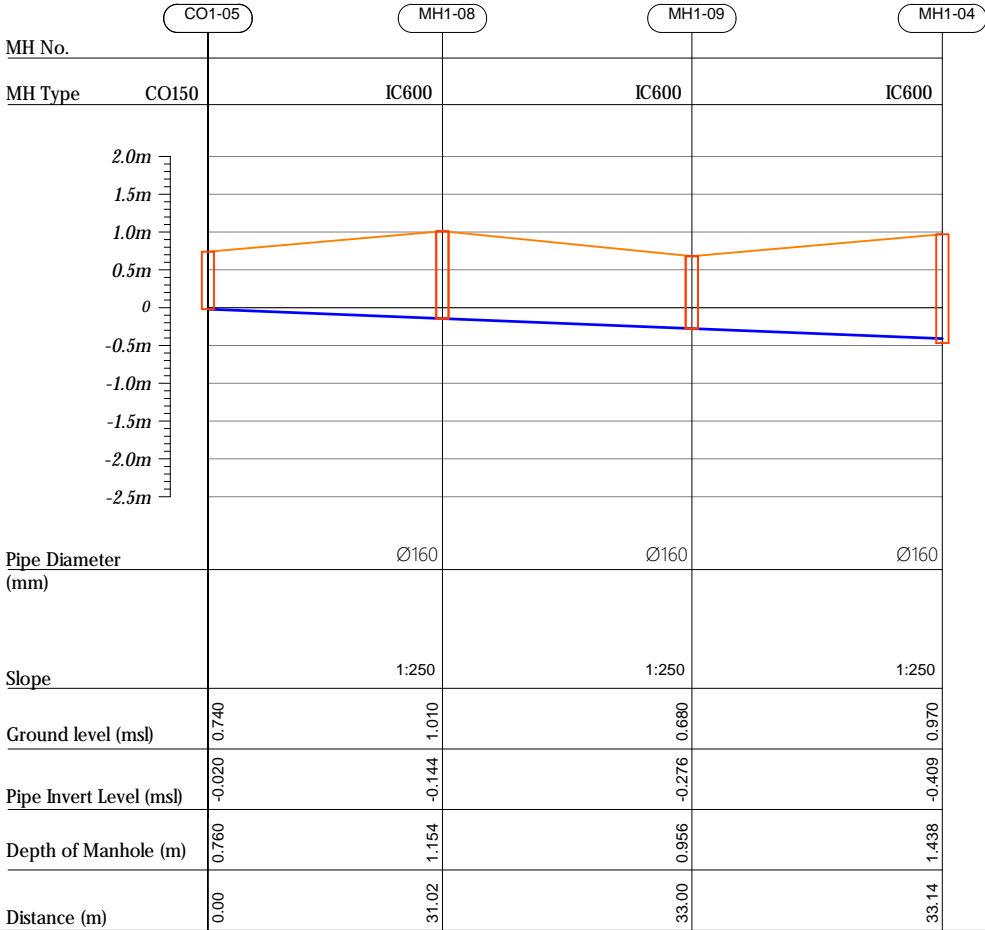
Profile 03



Profile 04

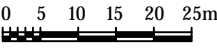


Profile 05

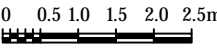


R00	JUNE 2020	STAGE -I	PD	SBC	SD
REV. NO.	Date	Revision Description	Drawn	Chkd	Appd.

HORIZONTAL SCALE



VERTICAL SCALE



- CO160 — Cleanout Ø160
- IC600 — HDPE Manhole Ø600
- PS — Pump Station

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

Sub Title:
Sewerage System in M.Raiymandhoo

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

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

Maldivu Infrastructure Develop

Drawn: A.R.W

Checked: M.S.S

Designed: F.I.A

Approved: L.W

Date: Aug 2020

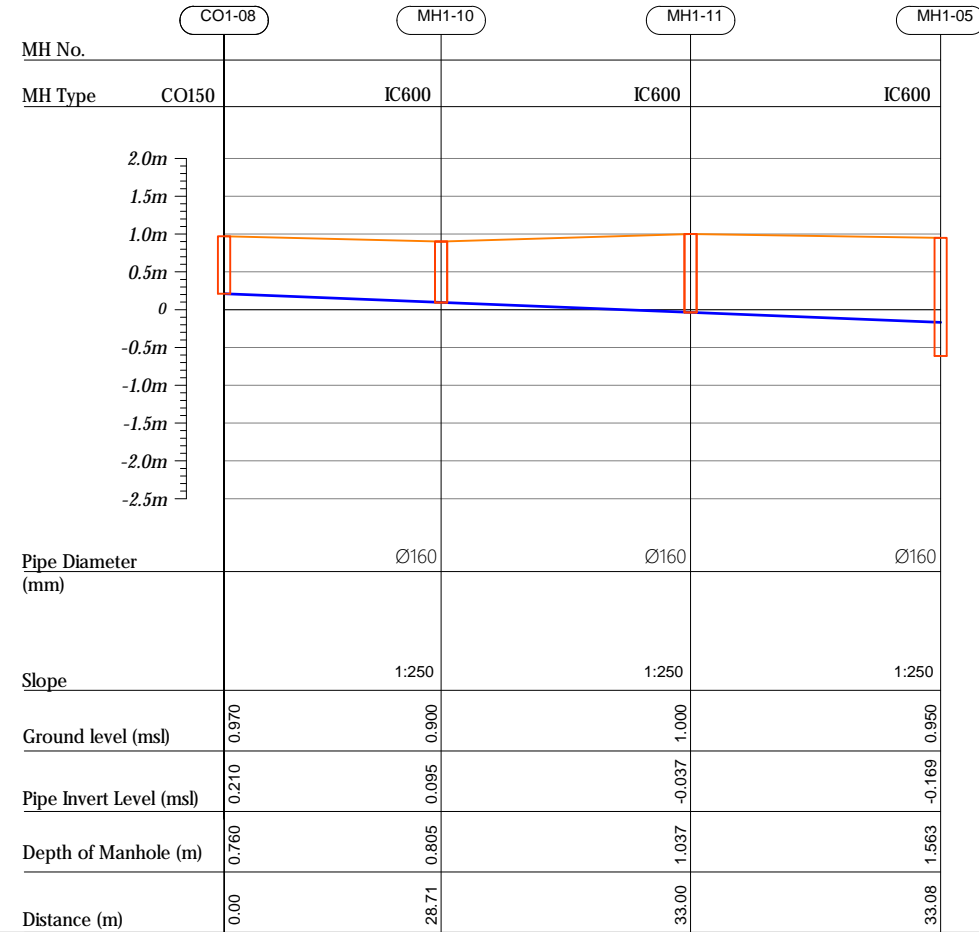
SCALE (A3): 1:100

Project No: EP-WS/2019/05

Rev: R-01

Page: PS1-02

Profile 08

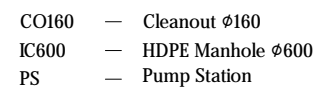


Title:
*Consultancy Services for Survey,
Design and EIA works of Water
Supply and Sewerage Facilities in
6 islands, Maldives - Package 5*

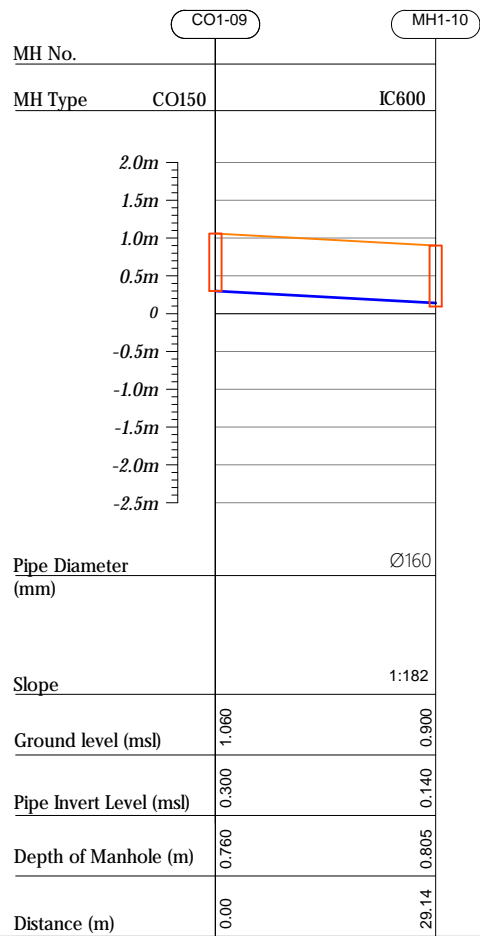
Sub Title:
Sewerage System in M.Raiymandhoo

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

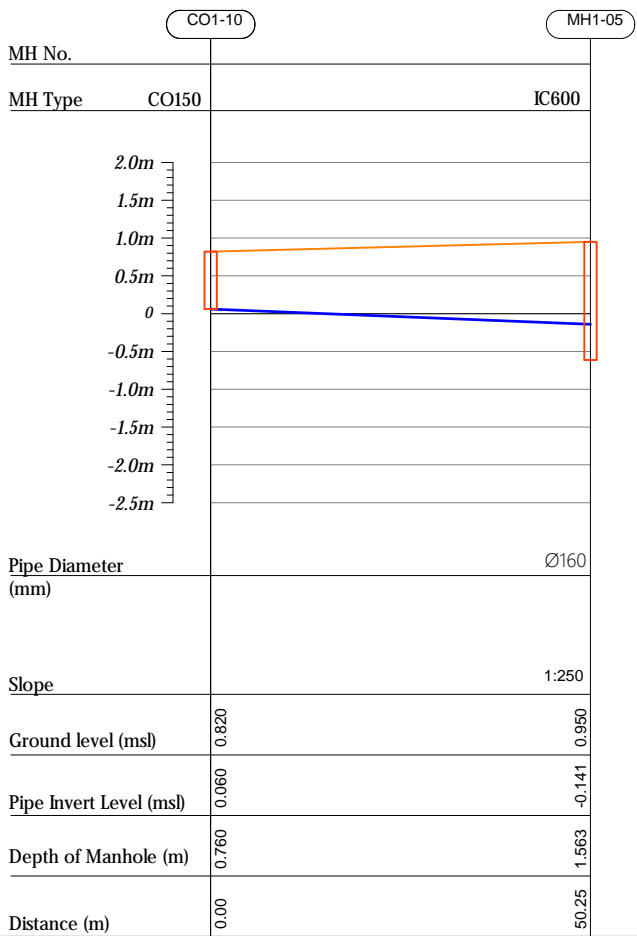
Drawn: A.R.W	Checked: M.S.S
Designed: F.L.A	Approved: L.W
Date: Aug 2020	SCALE (A3): 1:100
Project No: EP-WS/2019/05	
Rev: <i>R-01</i>	Page: <i>PS1-03</i>



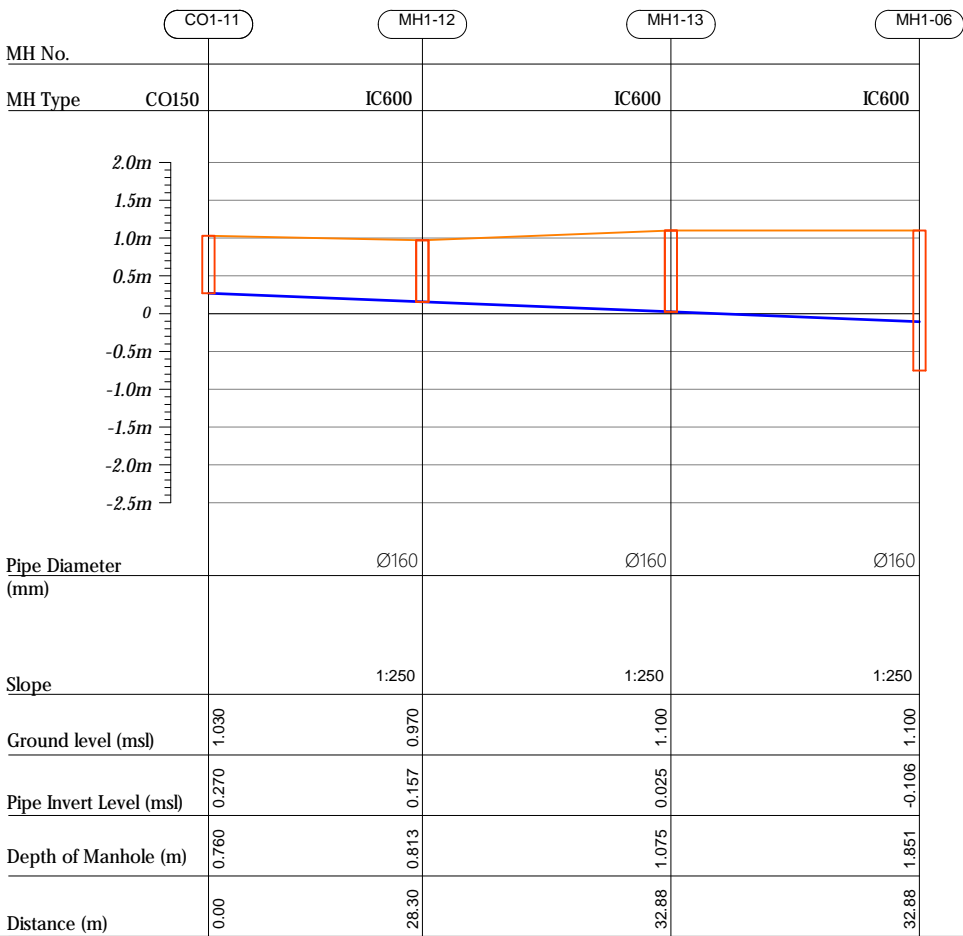
Profile 09



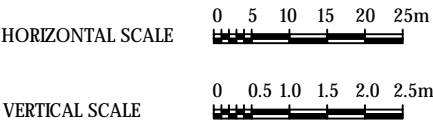
Profile 10



Profile 11



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



CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

Sub Title:
Sewerage System in M.Raiymandhoo

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


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


Making Infrastructure Happen

Drawn: A.R.W Checked: M.S.S

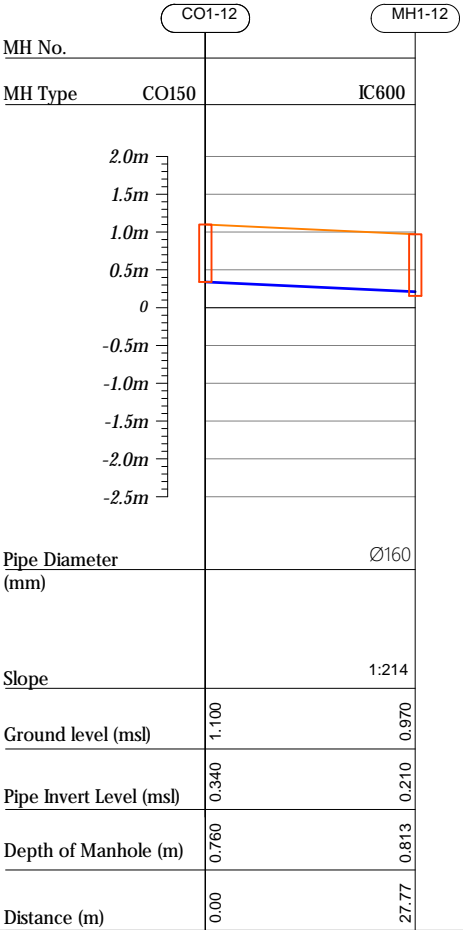
Designed: F.L.A Approved: L.W

Date: Aug 2020 SCALE (A3): 1:100

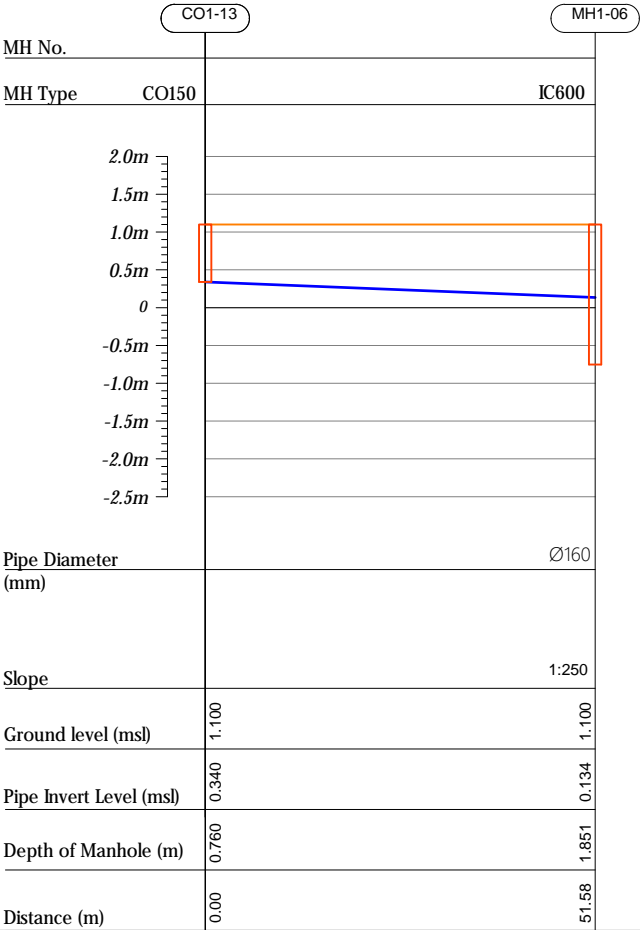
Project No: EP-WS/2019/05

Rev: R-01 Page: PS1-04

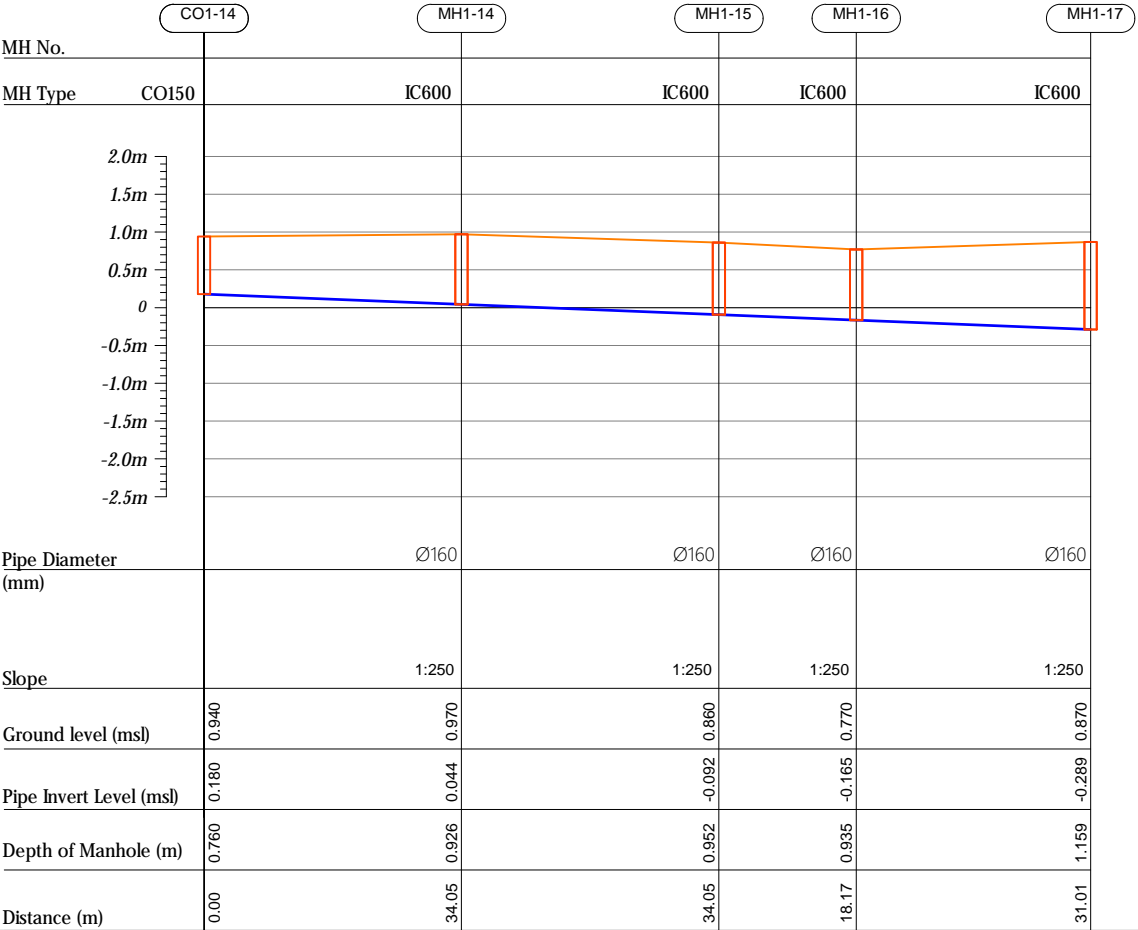
Profile 12



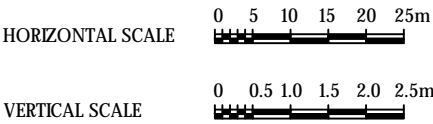
Profile 13



Profile 14



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



CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



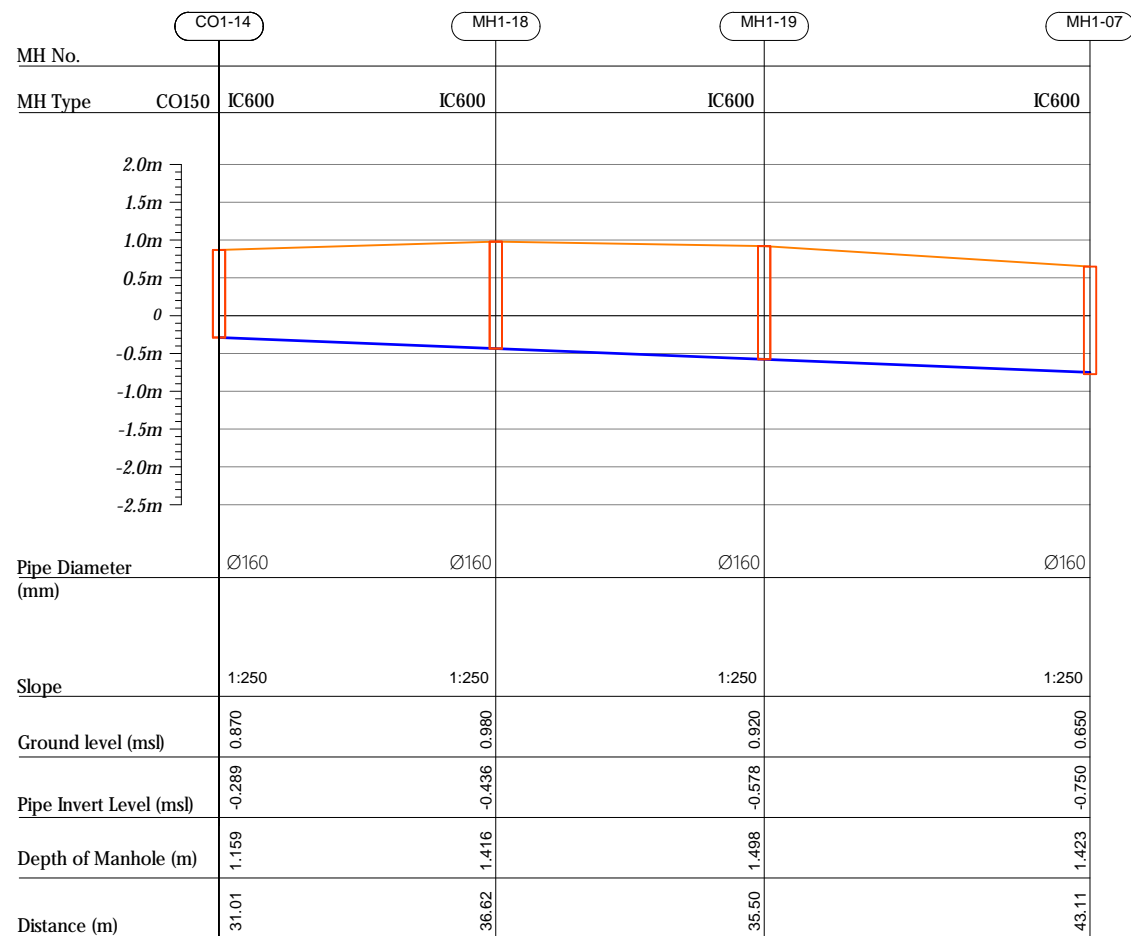
T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
Hussuvehemaa Magu, Male', Maldives



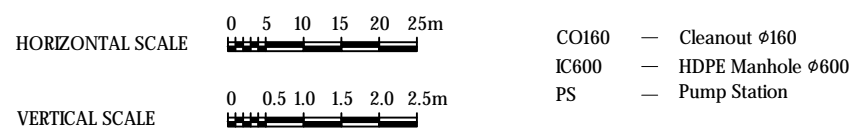
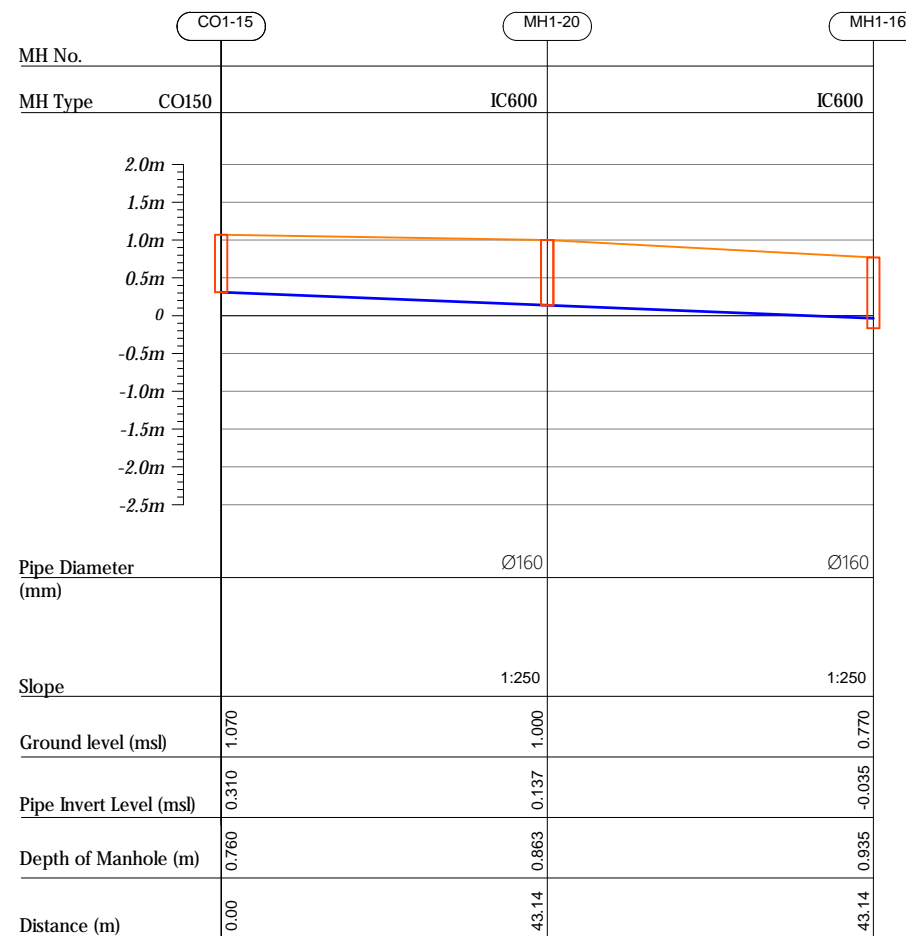
DBAC INFRA
Maldivian Infrastructure Develop

Drawn: A.R.W	Checked: M.S.S
Designed: F.L.A	Approved: L.W
Date: Aug 2020	SCALE (A3): 1:100
Project No: EP-WS/2019/05	
Rev: R-01	Page: PS1-05

Profile 14



Profile 15



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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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



Drawn: A.R.W	Checked: M.S.S
--------------	----------------

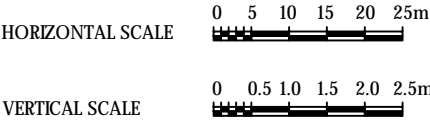
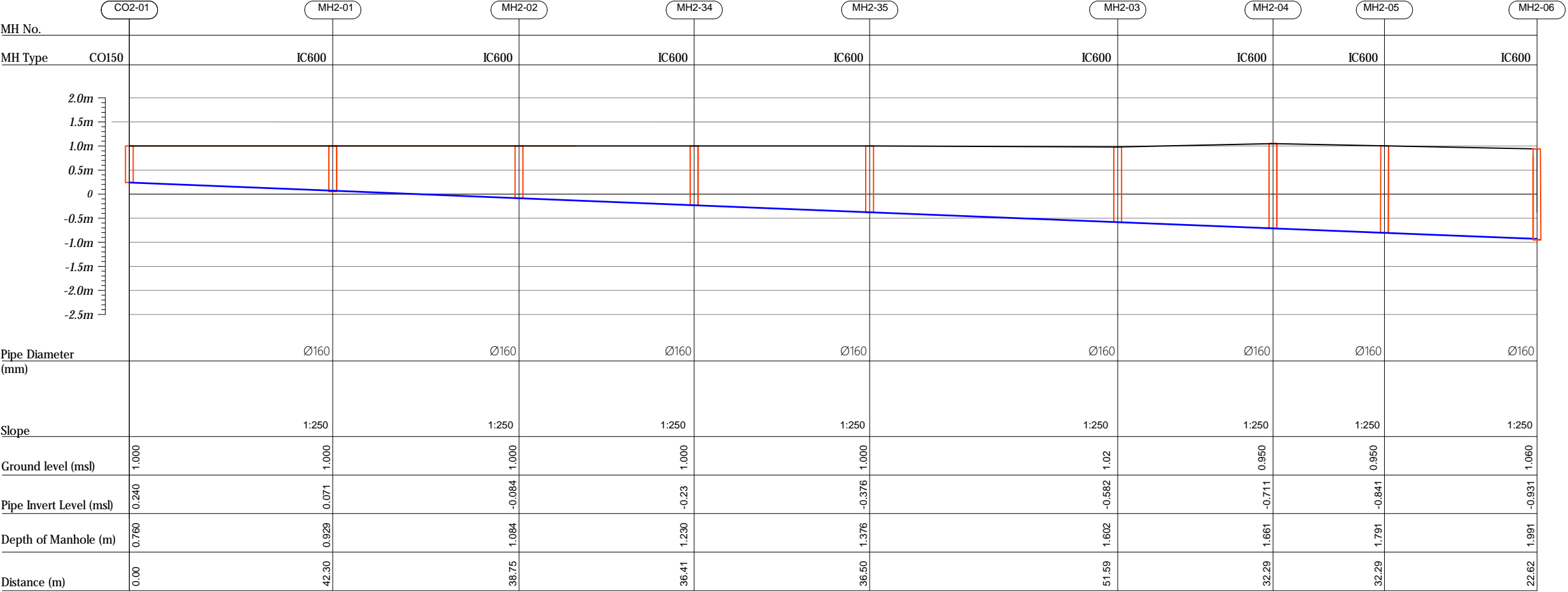
Designed: FLA	Approved: LW
---------------	--------------

Date: Aug 2020	SCALE (A3): 1:100
----------------	-------------------

Project No:	EP-WS/2019/05
-------------	---------------

Rev: <i>R-01</i>	Page: <i>PS1-0</i>
---------------------	-----------------------

Profile 01




CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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


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

Sub Title:
Sewerage System in M.Raiymandhoo

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



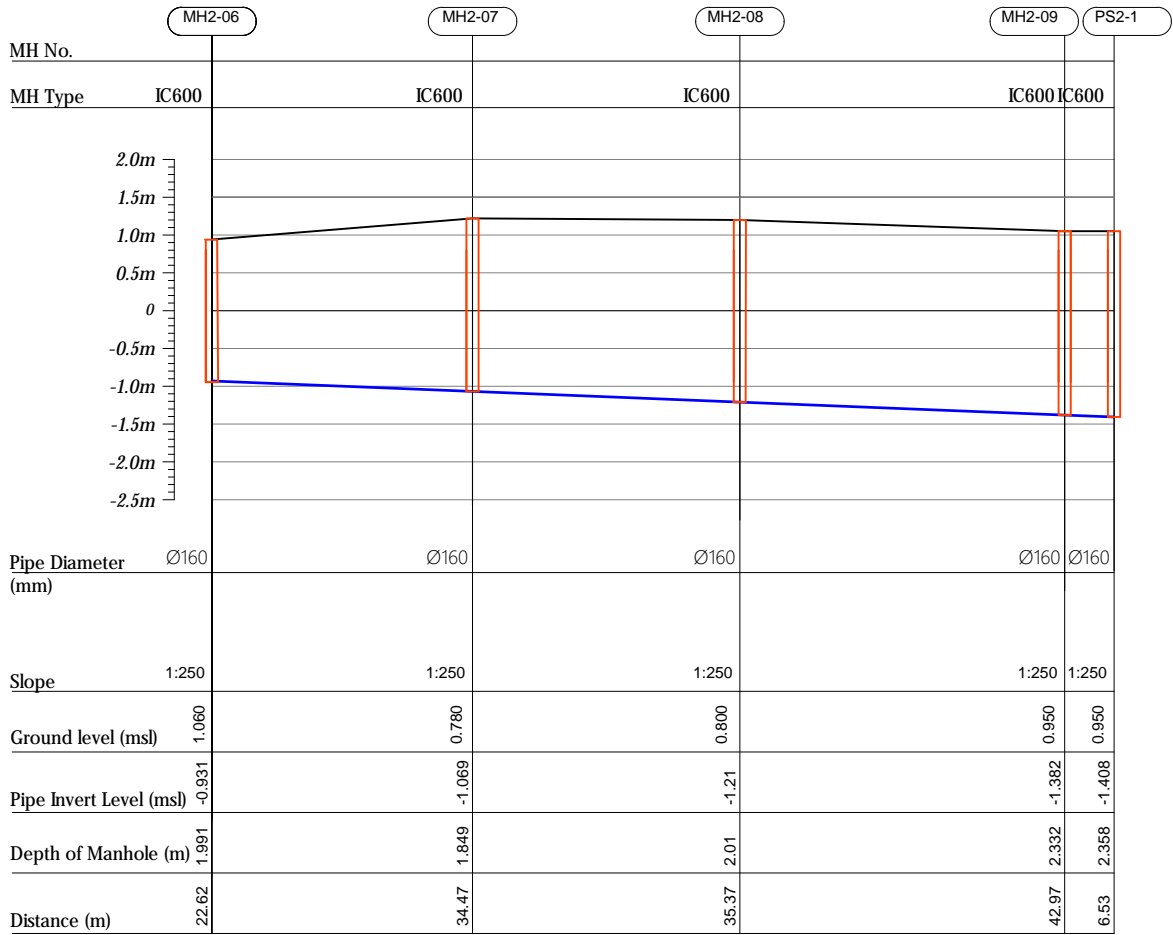
T: +960 333 3528
E: info@epoch.associates
W: www.epoch.associates
A: G. Rosary West,
Hussuvehemaa Magu, Male', Maldives



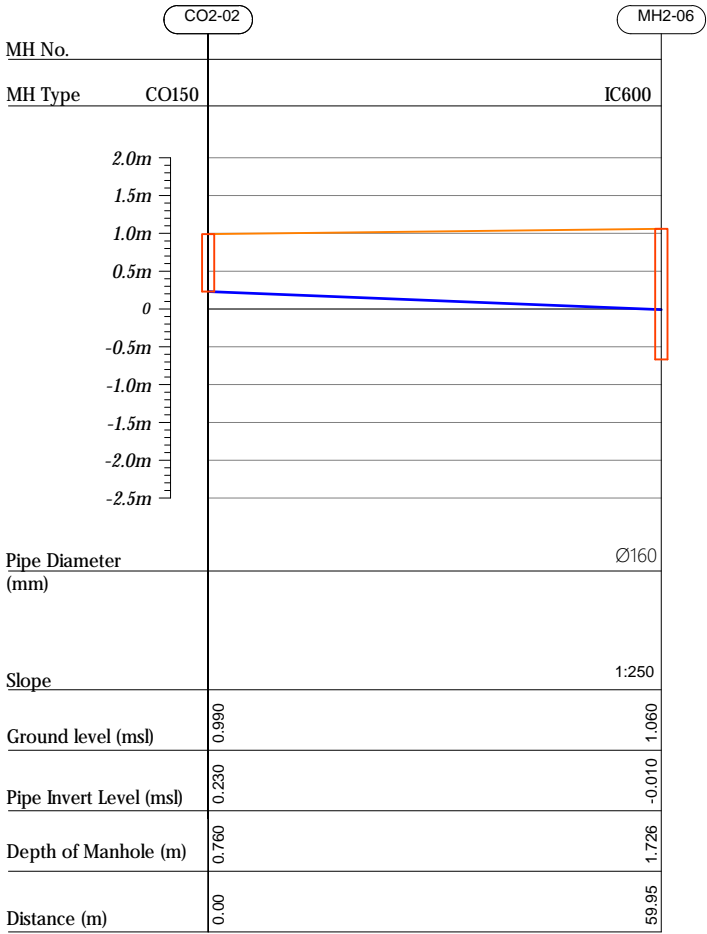
DBAC INFRA
Maldivian Infrastructure Develop

Drawn: A.R.W	Checked: M.S.S
Designed: F.L.A	Approved: LW
Date: Aug 2020	SCALE (AS): 1:100
Project No: EP-WS/2019/05	
Rev: R-01	Page: PS2-01

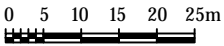
Profile 01



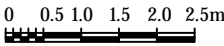
Profile 02



HORIZONTAL SCALE



VERTICAL SCALE



CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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

FIDBAC INFRA
Maldivu Infrastructure Develop

Drawn: A.R.W Checked: M.S.S

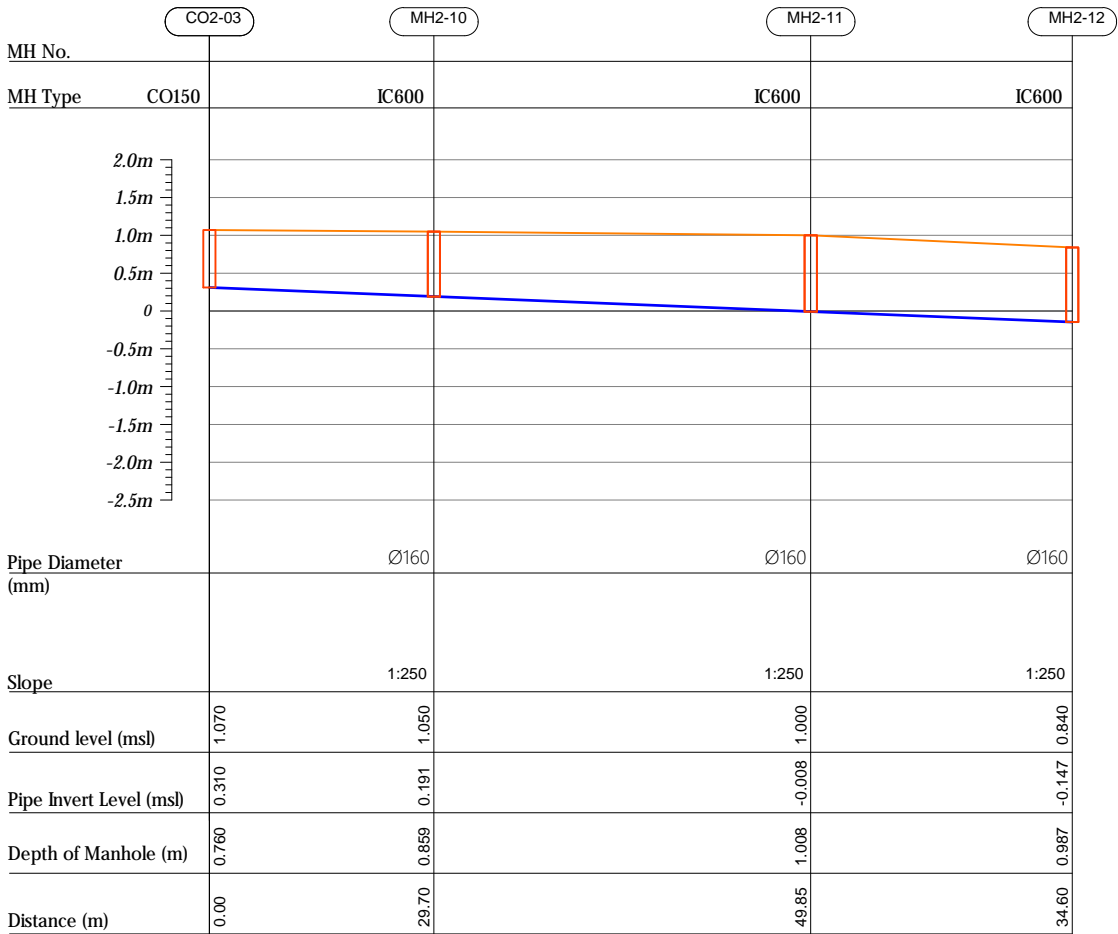
Designed: F.I.A Approved: L.W

Date: Aug 2020 SCALE (A3): 1:100

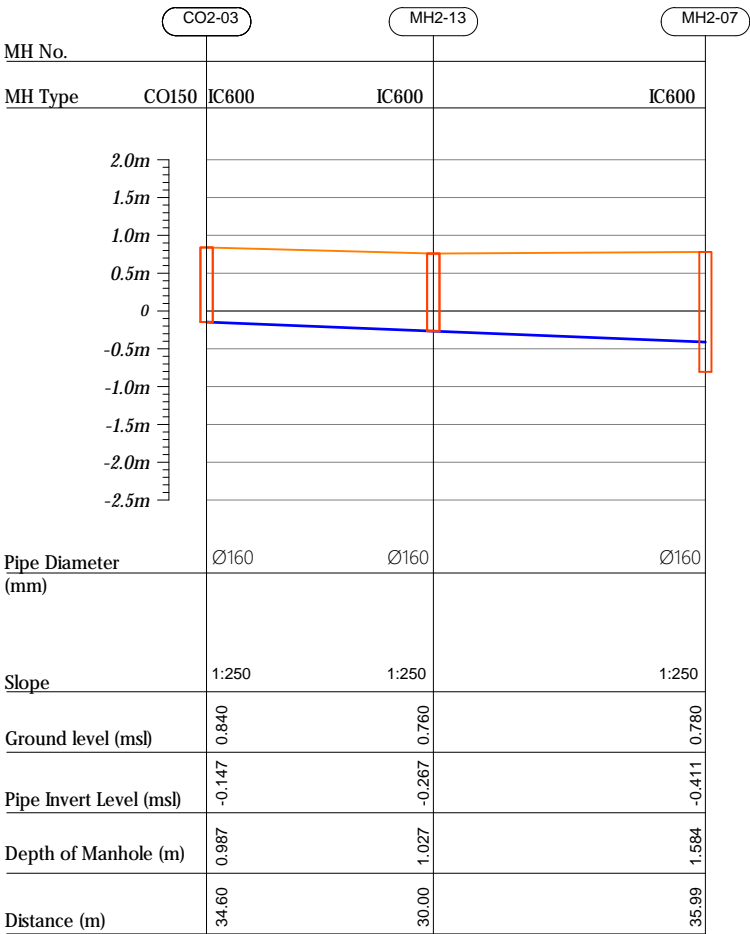
Project No: EP-WS/2019/05

Rev: R-01 Page: PS2-02

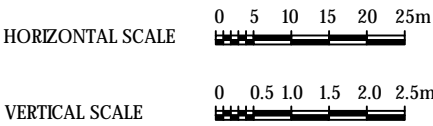
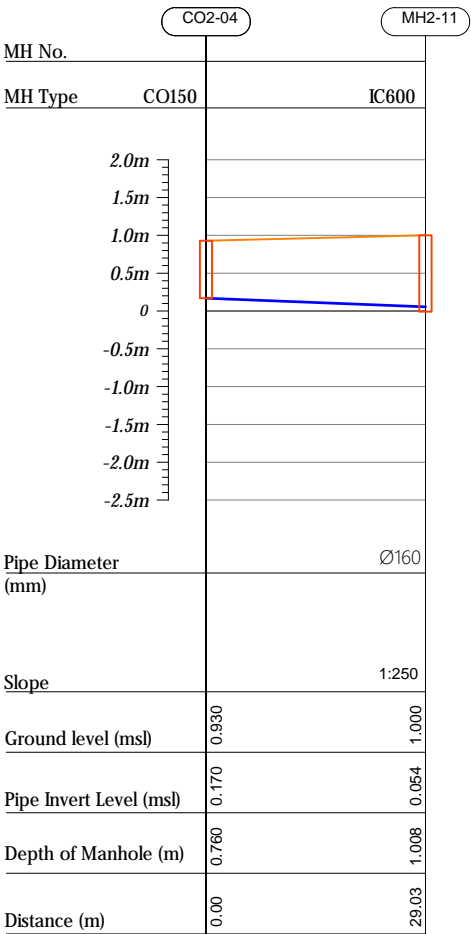
Profile 03



Profile 03



Profile 04



CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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

DBAC INFRA
Maldivuq Infrastructure Happpu

Drawn: A.R.W Checked: M.S.S

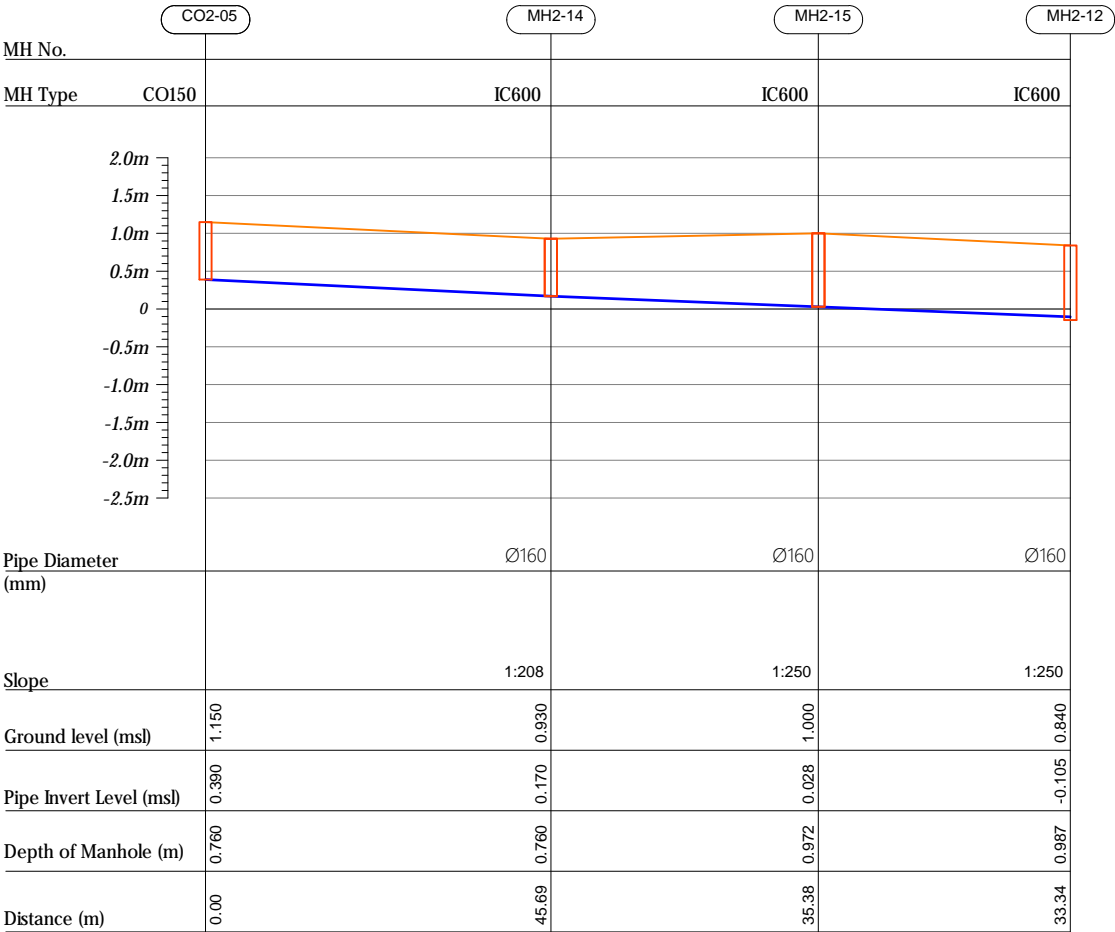
Designed: F.I.A Approved: LW

Date: Aug 2020 SCALE (A3): 1:100

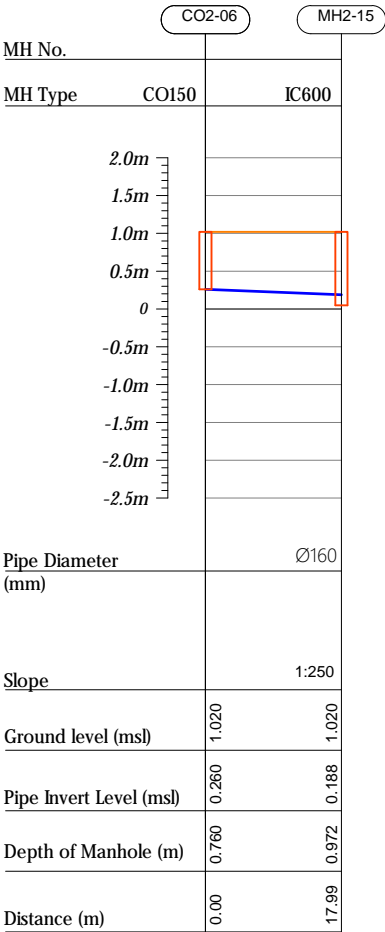
Project No: EP-WS/2019/05

Rev: R-01 Page: PS2-03

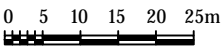
Profile 05



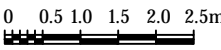
Profile 06



HORIZONTAL SCALE



VERTICAL SCALE



CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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

FIDBAC INFRA
Making Infrastructure Happen

Drawn: A.R.W. Checked: M.S.S.

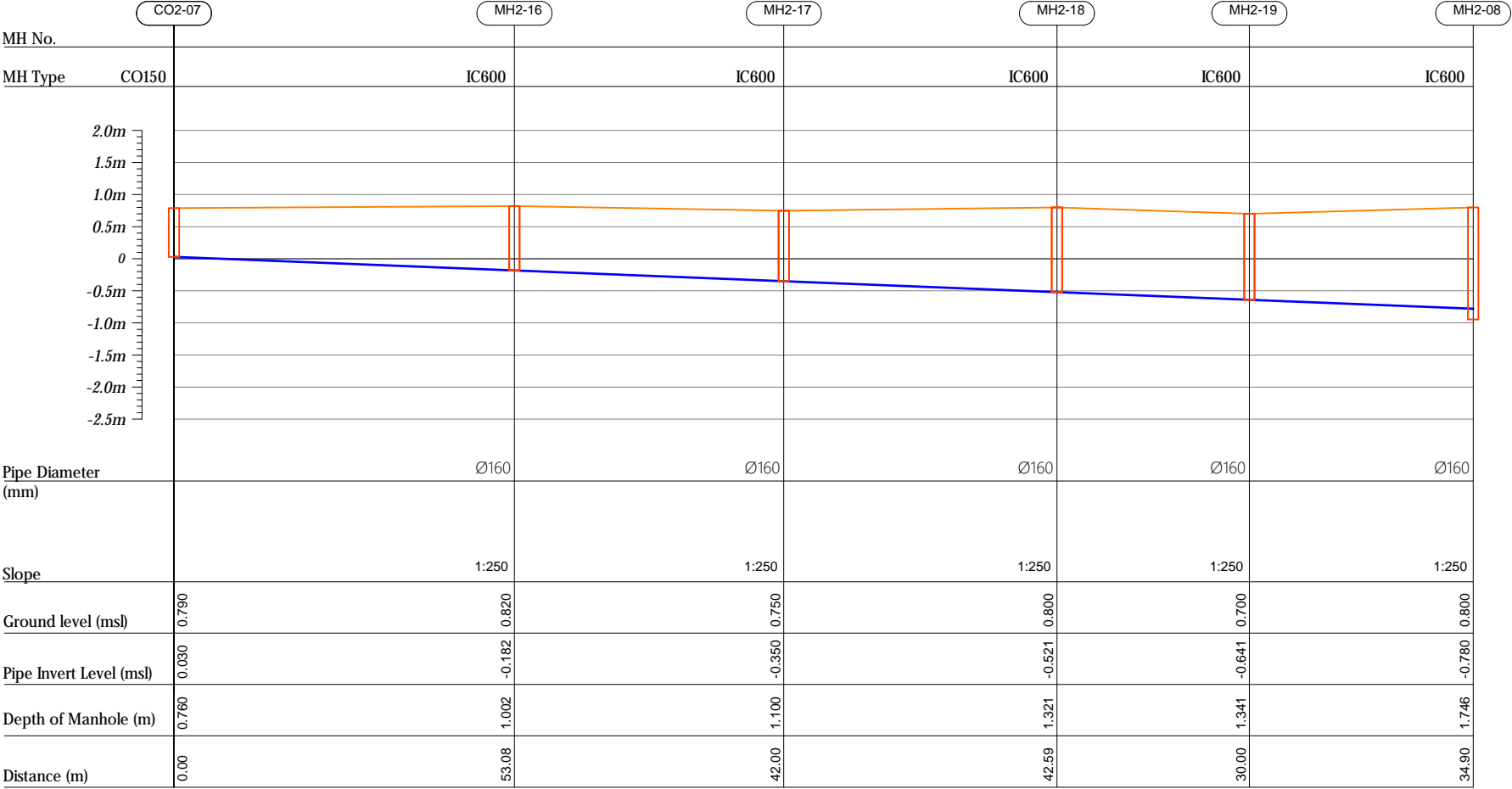
Designed: F.L.A. Approved: L.W.

Date: Aug 2020 SCALE (A3): 1:100

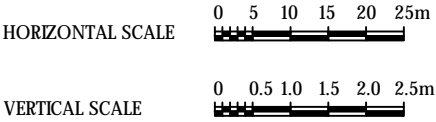
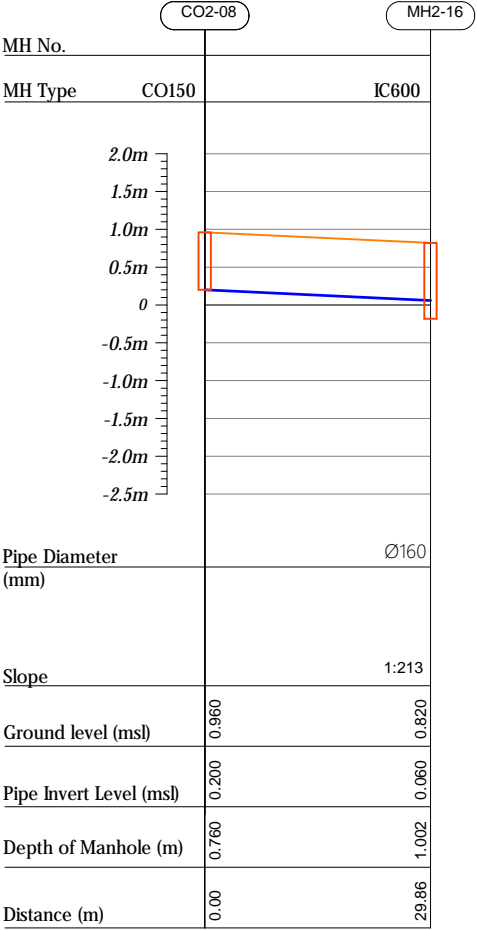
Project No: EP-WS/2019/05

Rev: R-01 Page: PS2-04

Profile 07



Profile 08




CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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


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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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



DBAC INFRA
Maldivu Infrastructure Developments

Drawn: A.R.W

Designed: F.L.A

Date: Aug 2020

Project No: EP-WS/2019/05

Checked: M.S.S

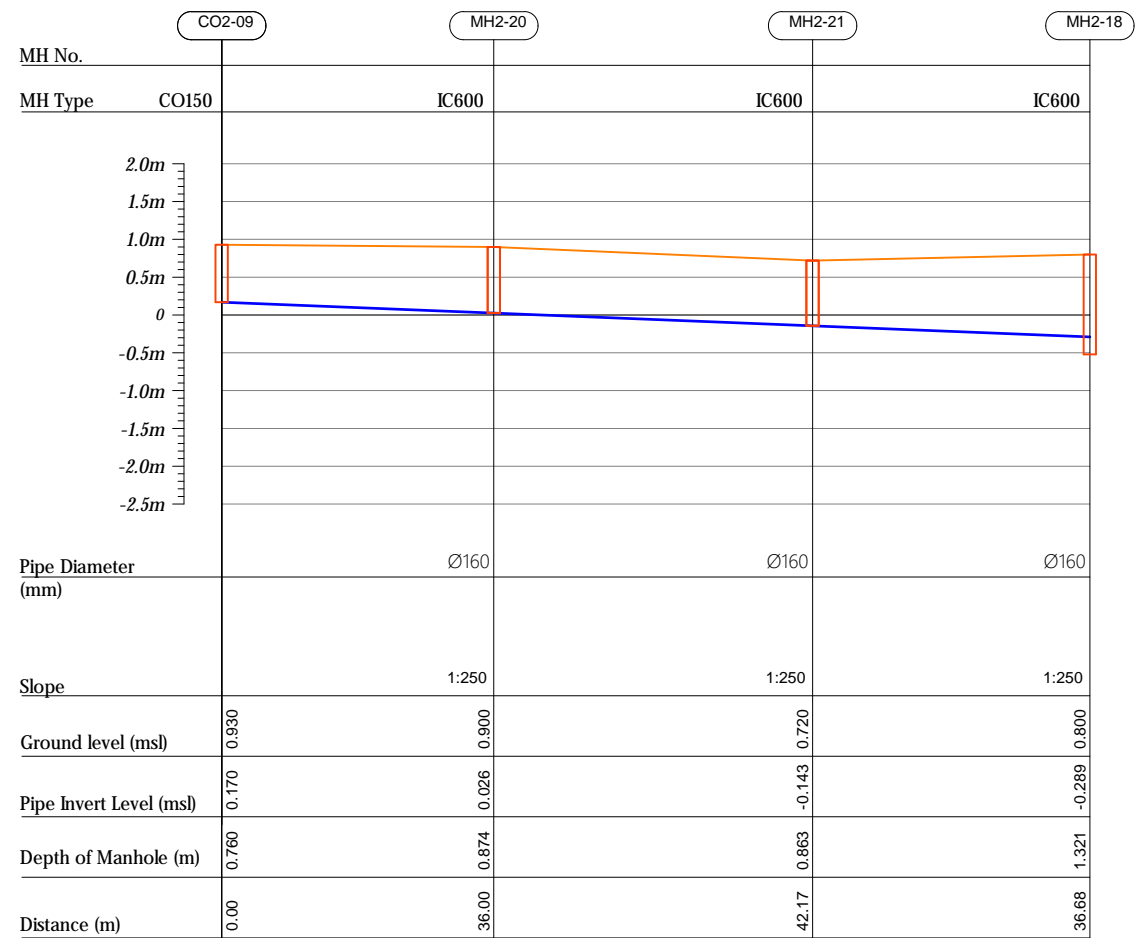
Approved: LW

SCALE (A3): 1:100

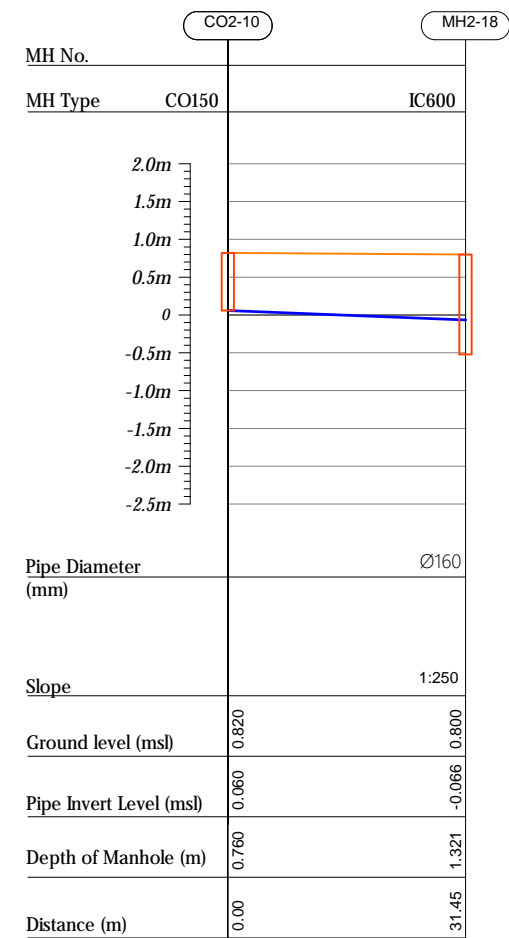
Rev: R-01

Page: PS2-05

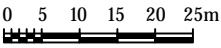
Profile 09



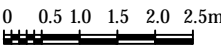
Profile 10



HORIZONTAL SCALE



VERTICAL SCALE



CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

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

Sub Title:
Sewerage System in M.Raaymandhoo

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



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

DBAC INFRA
Maldivu Infrastructure Develop

Drawn: A.R.W Checked: M.S.S

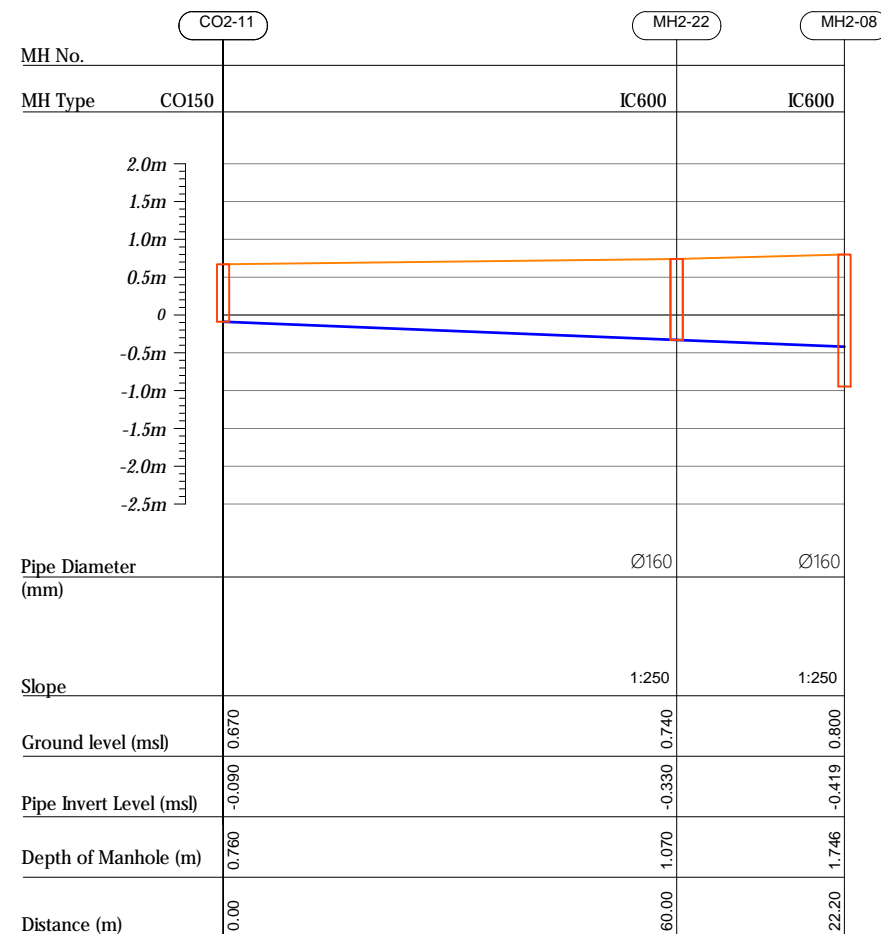
Designed: F.L.A Approved: L.W

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

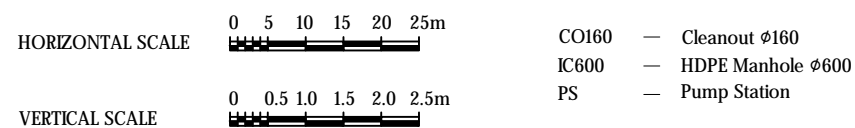
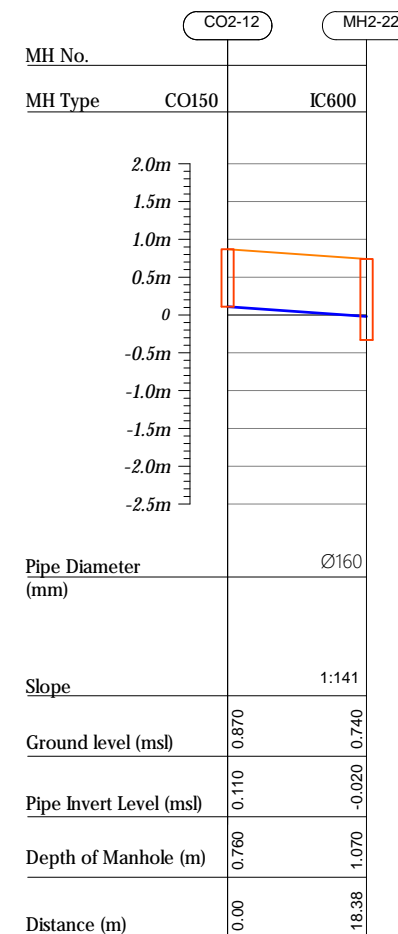
Project No: EP-WS/2019/05

Rev: R-01 Page: PS2-06

Profile 11



Profile 12



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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



Drawn: A.R.W	Checked: M.S.S
--------------	----------------

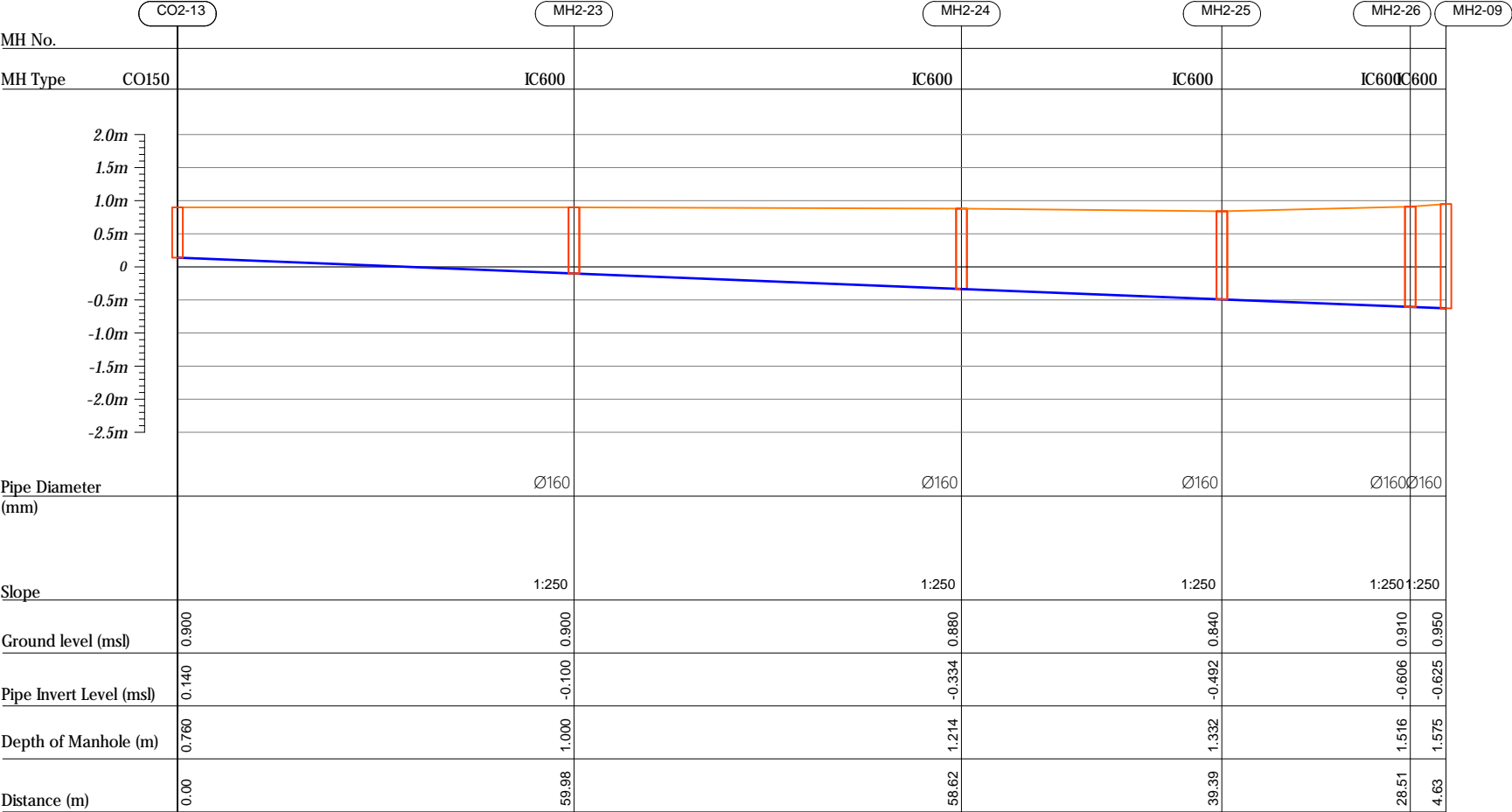
Designed: <u>EJA</u>	Approved: <u>LW</u>
----------------------	---------------------

Date: Aug 2020	SCALE (A3): 1:100
----------------	-------------------

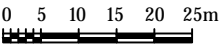
Project No: FP-WS/2019/05

Rev:	Page:
R-01	PS2-07

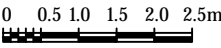
Profile 13



HORIZONTAL SCALE



VERTICAL SCALE



- CO160 — Cleanout Ø160
- IC600 — HDPE Manhole Ø600
- PS — Pump Station

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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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

DBAC INFRA
Maldivu Infrastructure Develop

Drawn: A.R.W Checked: M.S.S

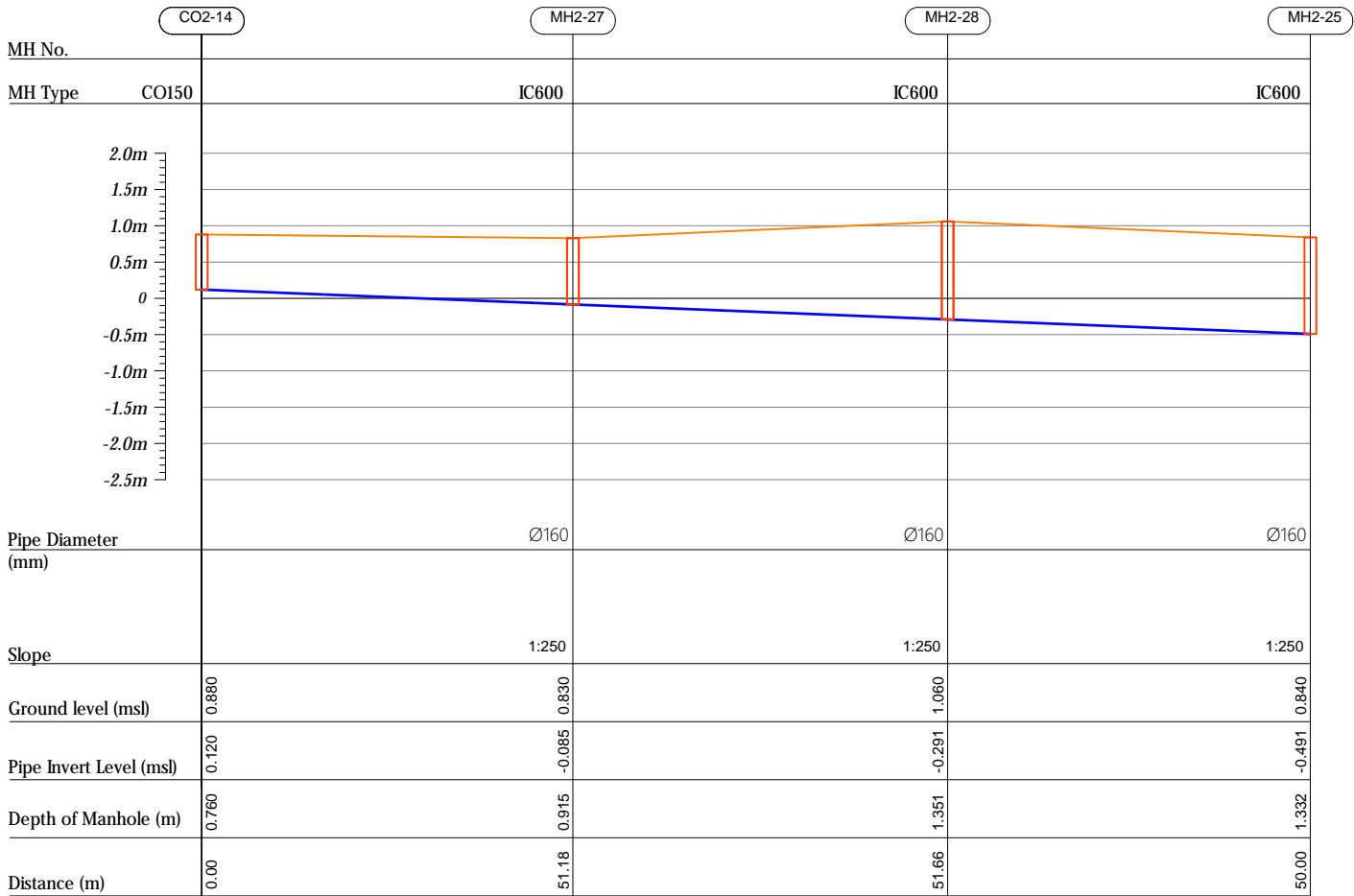
Designed: F.L.A Approved: L.W

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

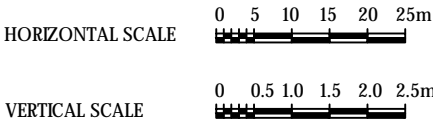
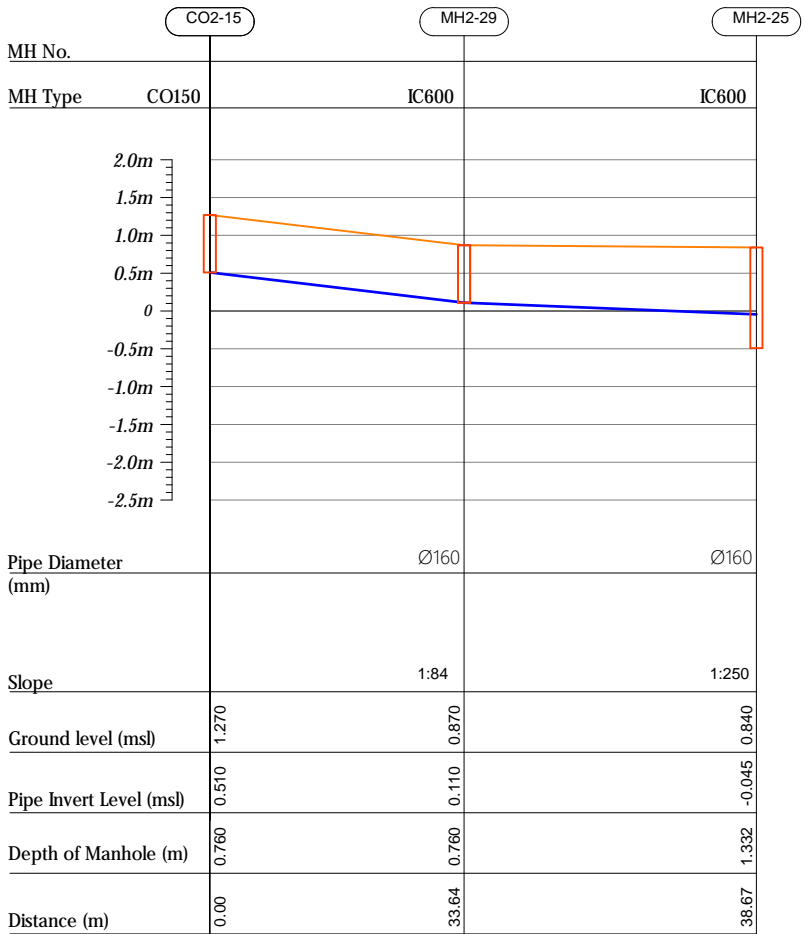
Project No: EP-WS/2019/05

Rev: R-01 Page: PS2-08

Profile 14



Profile 15



CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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

DBAC INFRA
Maldivu Infrastructure Develop

Drawn: A.R.W Checked: M.S.S

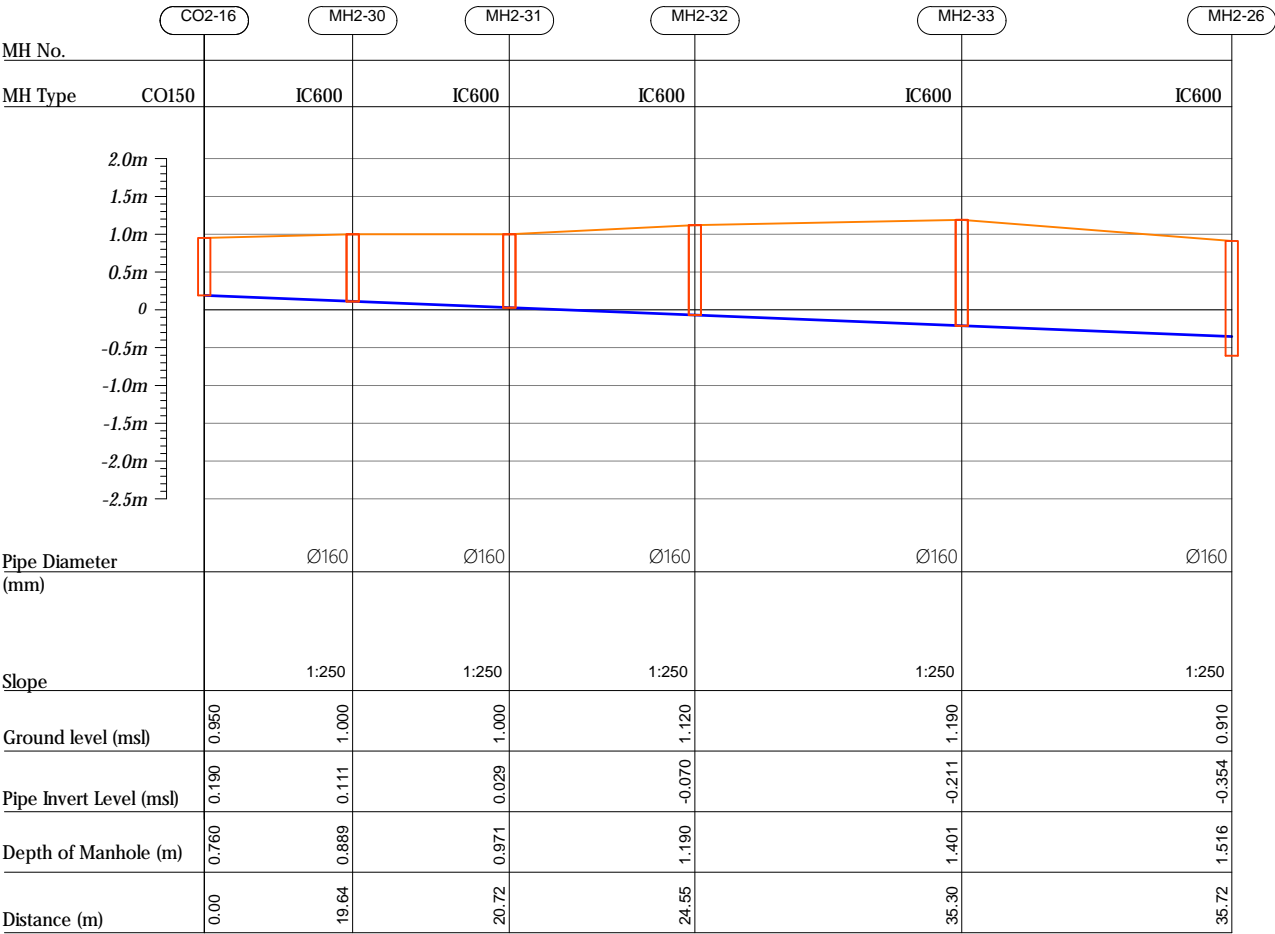
Designed: F.I.A Approved: L.W

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

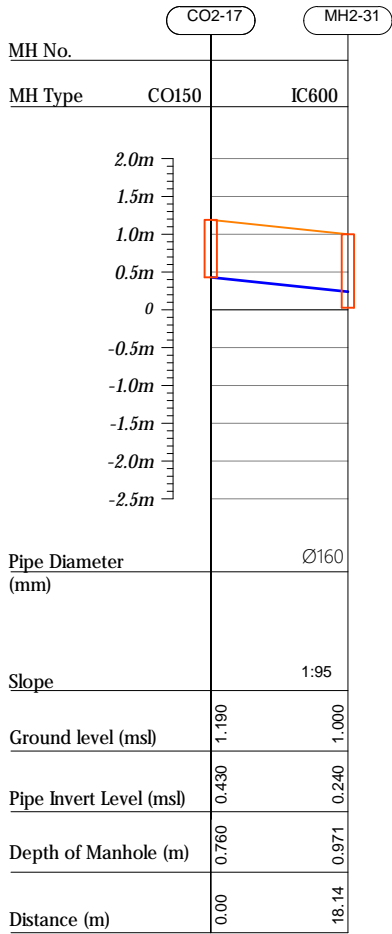
Project No: EP-WS/2019/05

Rev: R-01 Page: PS2-09

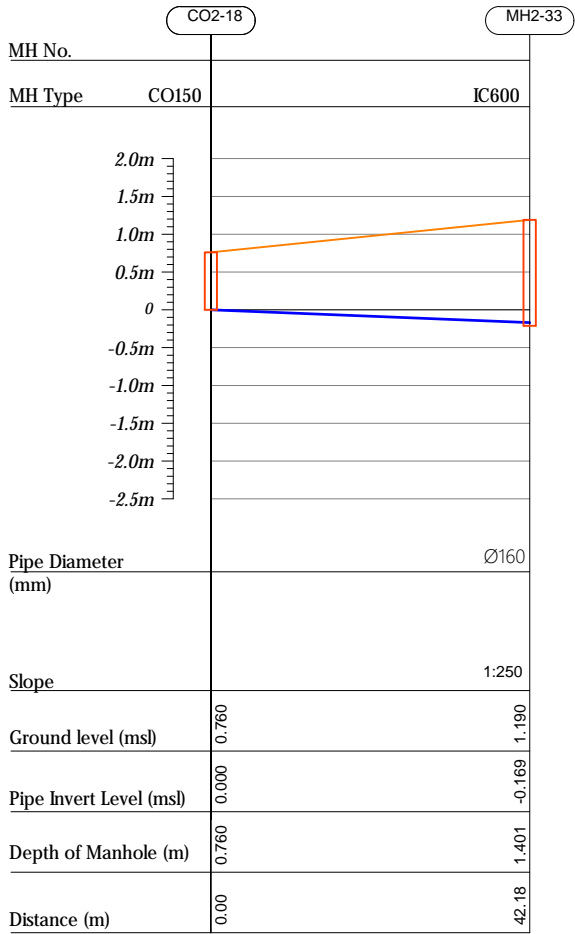
Profile 16



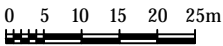
Profile 17



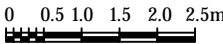
Profile 18



HORIZONTAL SCALE



VERTICAL SCALE



- CO160 — Cleanout Ø160
IC600 — HDPE Manhole Ø600
PS — Pump Station

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

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

Sub Title:
Sewerage System in M.Raiymandhoo

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



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

DBAC INFRA
Maldivian Infrastructure Develop

Drawn: A.R.W. Checked: M.S.S.

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

Date: Aug 2020 SCALE (A3): 1:100

Project No: EP-WS/2019/05

Rev: R-01 Page: PS2-10