



Development of Water Supply facilities in Ha Hoarafushi, Hdh Hanimaadhoo, Ga Villingili R Ungoofaaru,
Dh Kudahuvadho, Th Guraidhoo, Lh Naifaaru and Sh Milandhoo, Maldives

Detailed Design Drawings

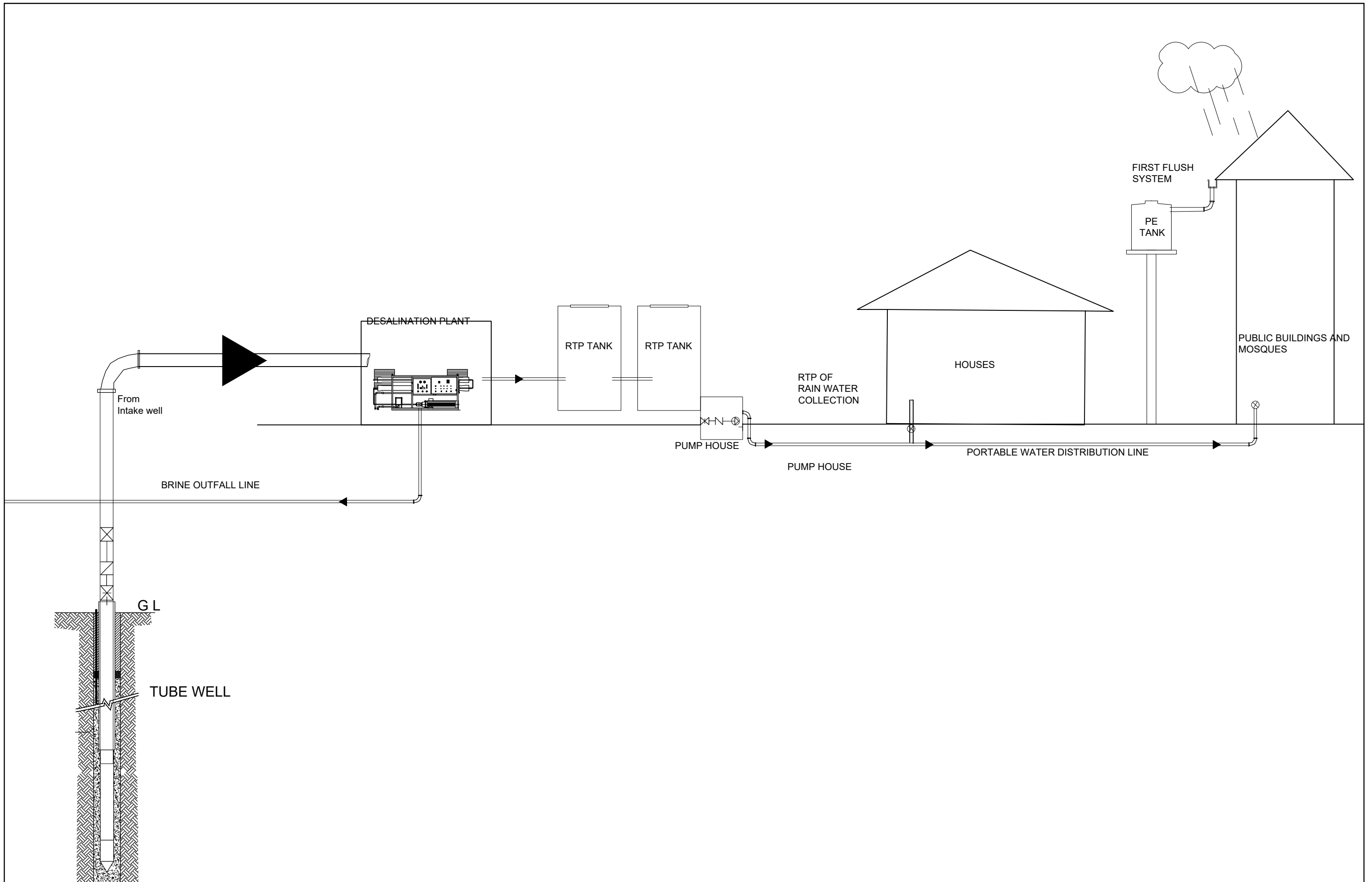
Lh Naifaru


November 2016

LIST OF DRAWINGS

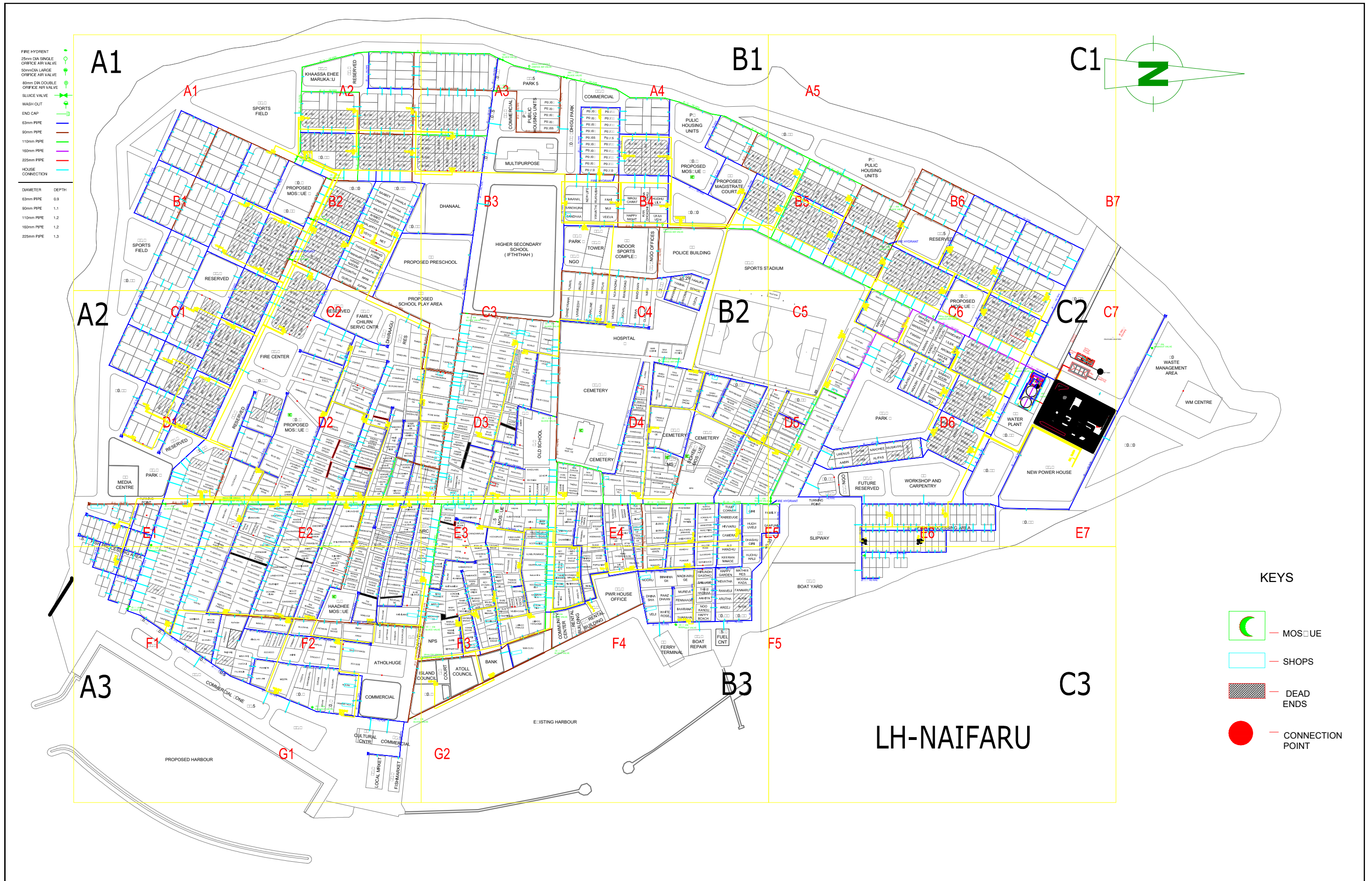
<u>Drawing Number</u>	<u>Drawing Title</u>		
NA/WS/GN/01	Schematic diagram of scheme		
Distribution Network			
NA/WS/GN/02	Key map		
NA/WS/GN/03	Distribution Network		
NA/WS/GN/04	Distribution Network		
NA/WS/GN/05	Distribution Network		
NA/WS/GN/06	Distribution Network		
NA/WS/GN/07	Distribution Network		
NA/WS/GN/08	Distribution Network		
NA/WS/GN/09	Distribution Network		
Reverse Osmosis Plant			
NA/WS/RO/01	P&ID Diagram		
NA/WS/RO/02	RO Plant		
NA/WS/RO/03	Brine Tank and Pump		
NA/WS/RO/04	RO Building Structural Plans		
NA/WS/RO/05	RO Building Structural Plans		
NA/WS/RO/06	Intake Tube Well Detail		
Storage Tank			
NA/WS/ST/01	RTP Tank and pump house plan		
NA/WS/ST/02	Plan- Pump house		
NA/WS/ST/03	Sections-Pump house (1-1 / 2-2)		
NA/WS/ST/04	Sections-Pump house (3-3)		
NA/WS/ST/05	Sections-Pump house		
NA/WS/ST/06	Typical Foundation		
NA/WS/ST/07	Reinforcement Details		
		Electrical Drawings	
		NA/WS/EL/00	Electric Load Calculation
		NA/WS/EL/01	Electrical Diagram of the Scheme
		NA/WS/EL/03	RO Plant electrical plan
		NA/WS/EL/04	Pump house electrical plan
		NA/WS/EL/06	Fire Alarms
		NA/WS/EL/07	Lightening conductor
		NA/WS/EL/08	Grounding
		NA/WS/EL/09	Cable Trench Schedule
		Standard Drawings	
		NA/WS/STD/01	Road reinstatement
		NA/WS/STD/02	First flush system
		NA/WS/STD/03	Bedding types
		NA/WS/STD/04	House connections
		NA/WS/STD/05	Thrust blocks
		NA/WS/STD/06	Sluice valve chambers
		NA/WS/STD/07	Air valve
		NA/WS/STD/08	Washout chamber
		NA/WS/STD/09	Marker post
		NA/WS/STD/10	Sign board
		NA/WS/STD/11	Fire hydrant
		NA/WS/STD/12	Fire hydrant chamber



GENERAL DRAWINGS



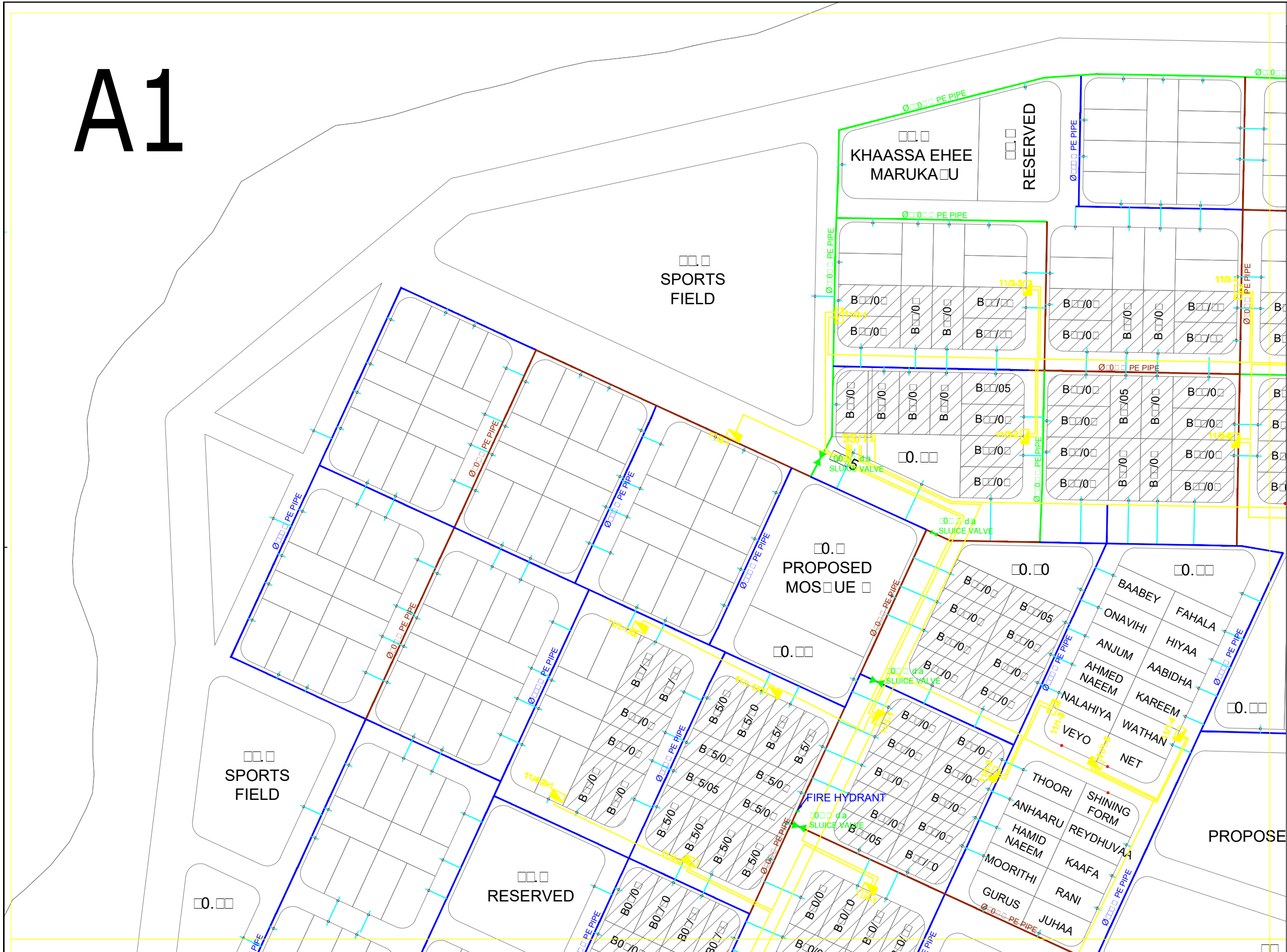
 <p>CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY</p>	<p>CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO ,Th.GURAI DHOO AND Ga.VILLINGILI , MALDIVES</p>	ENGINEER	DESIGN CHIEF	SL.NO	DRWING NO	DESCRIPTION
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<p>CONSULTANTS: GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH GRONTMIJ A/S DENMARK,DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES</p>	<p>TITLE: SCHEMATIC DIAGRAM OF THE WATER SCHEME NAIFAARU</p>		SCALE:			

DISTRIBUTION NETWORK



 <p>CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY</p>	<p>CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R.UNGOOFAARU, Lh.NAIFARU, Dh.KUDAHUVADHOO , Th.GURAI DHOO AND Ga.VILLINGILI , MALDIVES</p>	DESIGN	DRAWN	CHECKED	APPROVED	SL.NO	DRWING NO	DESCRIPTION
		ENGINEER		DESIGN CHIEF				
 <p>GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES</p>	<p>TITLE: NAIFARU DISTRIBUTION SYSTEM</p>	DATE	DRG.NO: NA/WS/DN/KEY					
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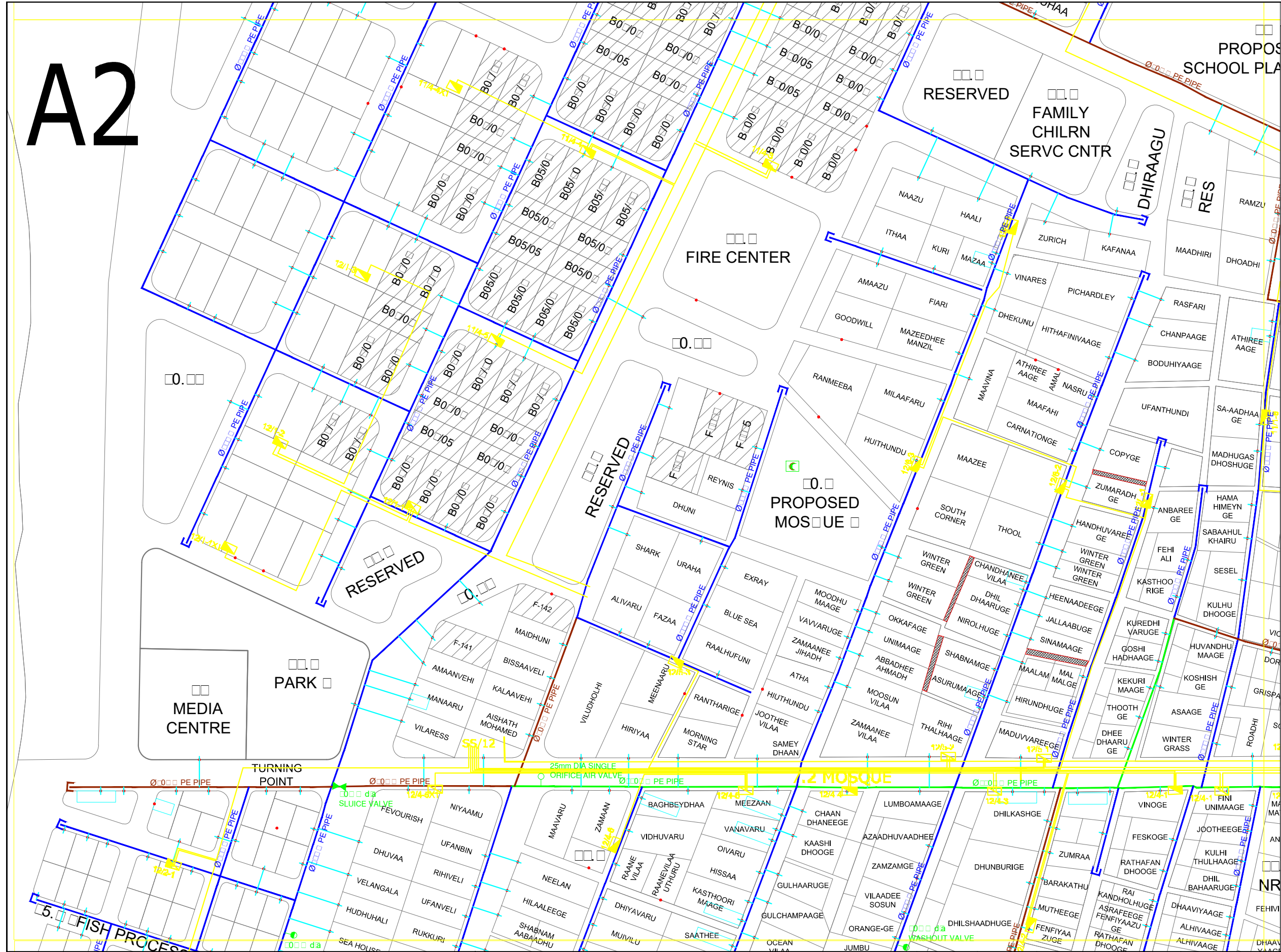
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50mm DIA LARGE ORIFICE AIR VALVE	
80mm DIA DOUBLE ORIFICE AIR VALVE	
SLUICE VALVE	
WASH OUT	
END CAP	
63mm PIPE	
90mm PIPE	
110mm PIPE	
160mm PIPE	
225mm PIPE	
HOUSE CONNECTION	

DIAMETER	DEPTH
63mm PIPE	0.9
90mm PIPE	1.1
110mm PIPE	1.2
160mm PIPE	1.2
225mm PIPE	1.3

<p>CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY</p>	<p>CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R.UNGOOFAARU, Lh.NAIFARU, Dh.KUDAHUVADHOO, Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES</p>	DESIGN	DRAWN	CHECKED	APPROVED	SL.NO	DRWING NO	DESCRIPTION
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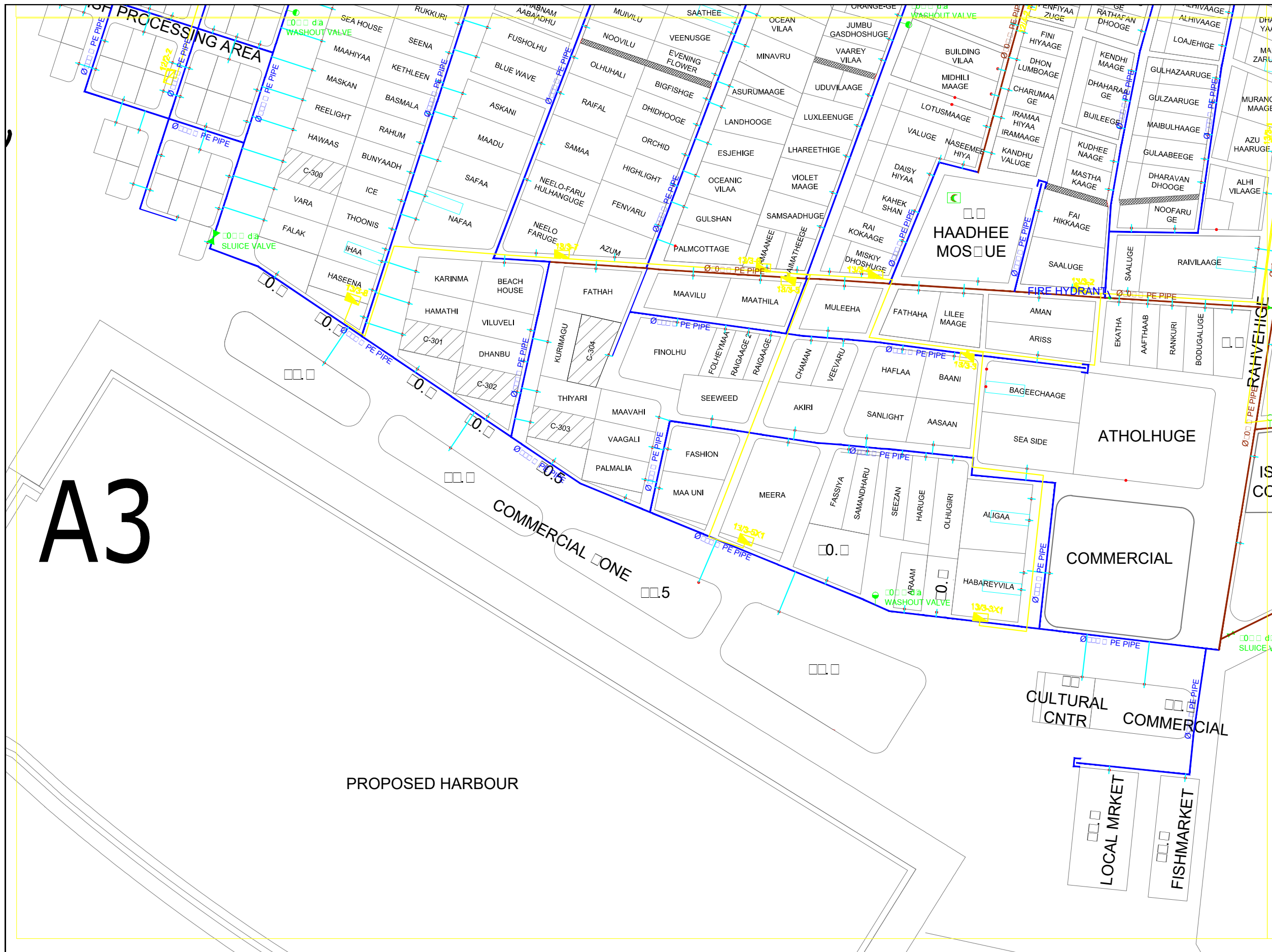
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- 25mm DIA SINGLE ORIFICE AIR VALVE
- 50mm DIA LARGE ORIFICE AIR VALVE
- 80mm DIA DOUBLE ORIFICE AIR VALVE
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63mm PIPE	0.9
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CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY	CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R.UNGOOFAARU, Lh.NAIFARU, Dh.KUDAHUVADHOO, Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES	DESIGN	DRAWN	CHECKED	APPROVED	SL.NO	DRWING NO	DESCRIPTION
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- FIRE HYDRENT
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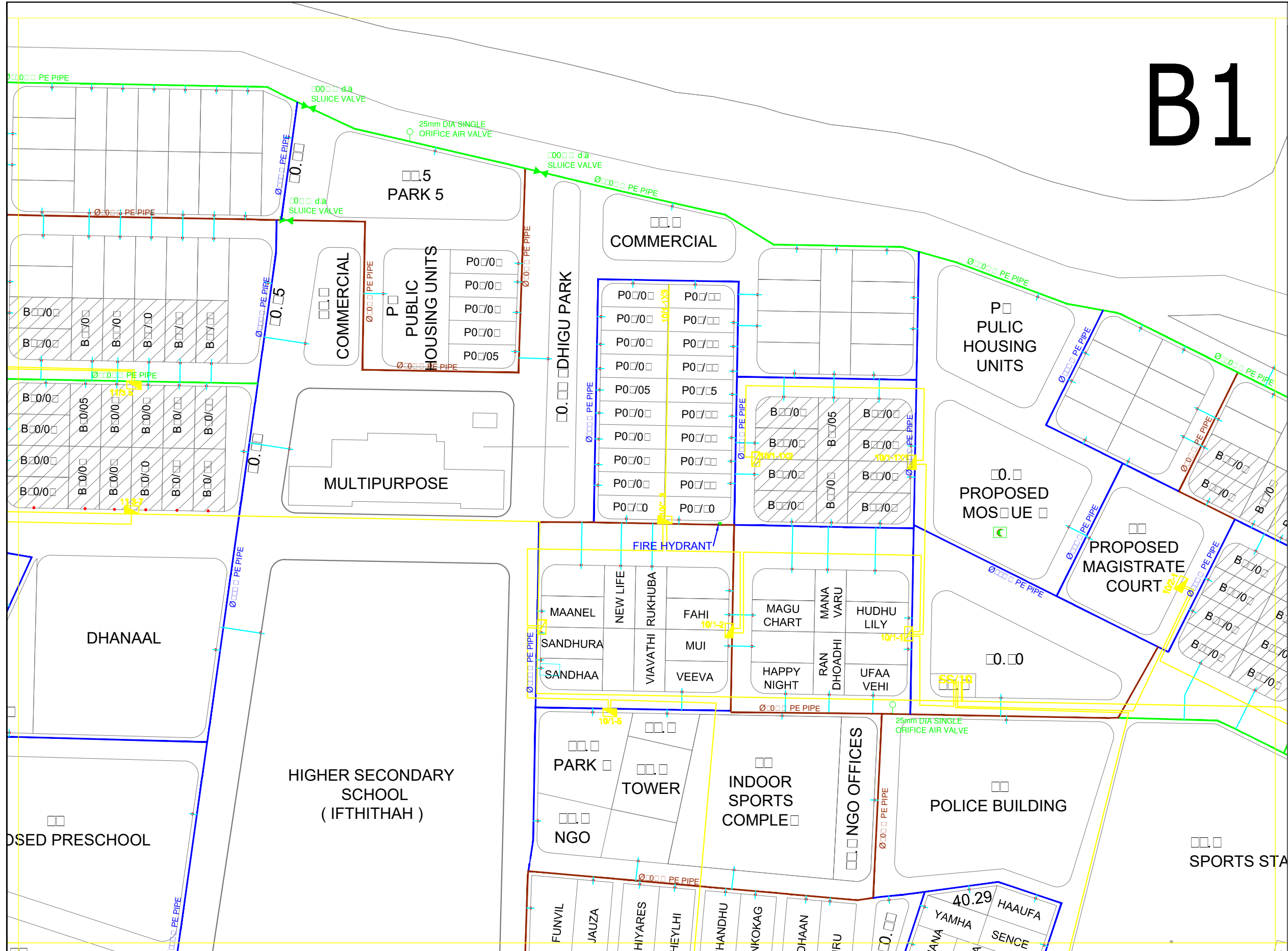
DIAMETER	DEPTH
63mm PIPE	0.9
90mm PIPE	1.1
110mm PIPE	1.2
160mm PIPE	1.2
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A3

PROPOSED HARBOUR

<p>CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY</p>	<p>CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO ,Th.GURAI DHOO AND Ga.VILLINGILI , MALDIVES</p>	DESIGN	DRAWN	CHECKED	APPROVED	SL.NO	DRWING NO	DESCRIPTION
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B1



FIRE HYDRANT	
25mm DIA SINGLE ORIFICE AIR VALVE	
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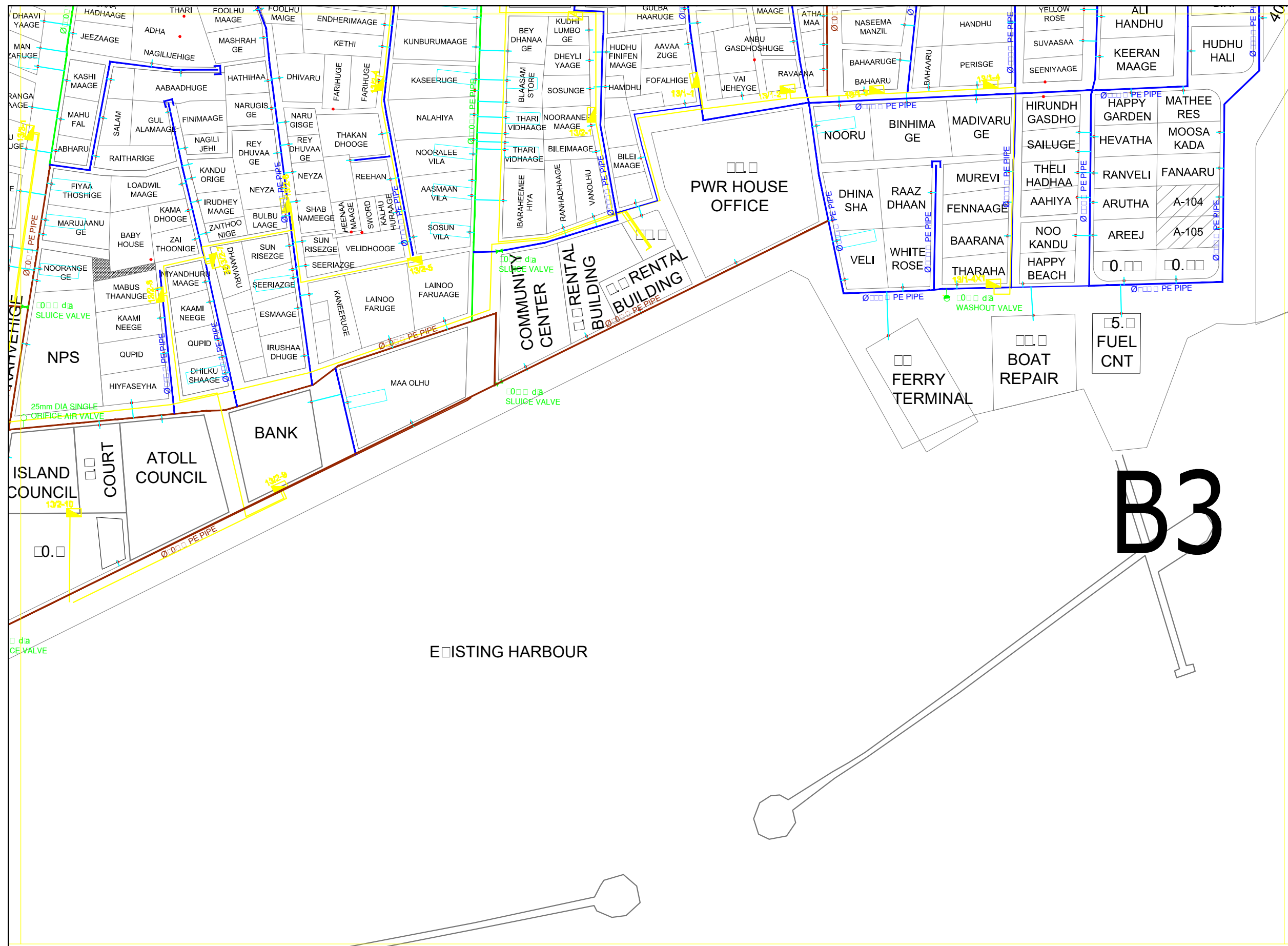
B2



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 GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES					DATE	DRG.NO: NA/WS/DN/05					
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GRID NO: B3

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CLIENT:
MINISTRY OF ENVIRONMENT
AND ENERGY

CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI,
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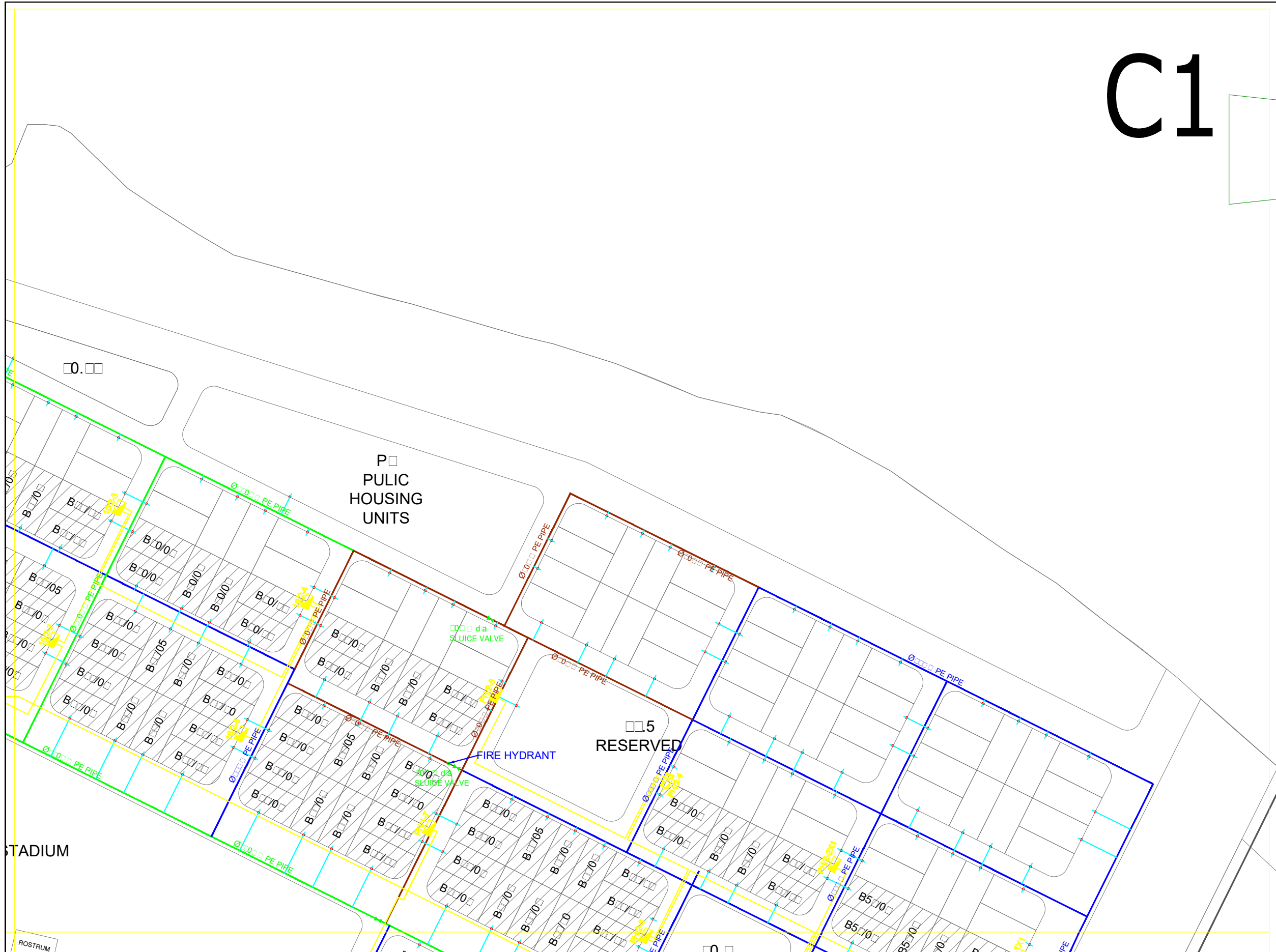


GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT
COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS
(Pvt) Ltd, MALDIVES

TITLE:
NAIFARU DISTRIBUTION SYSTEM

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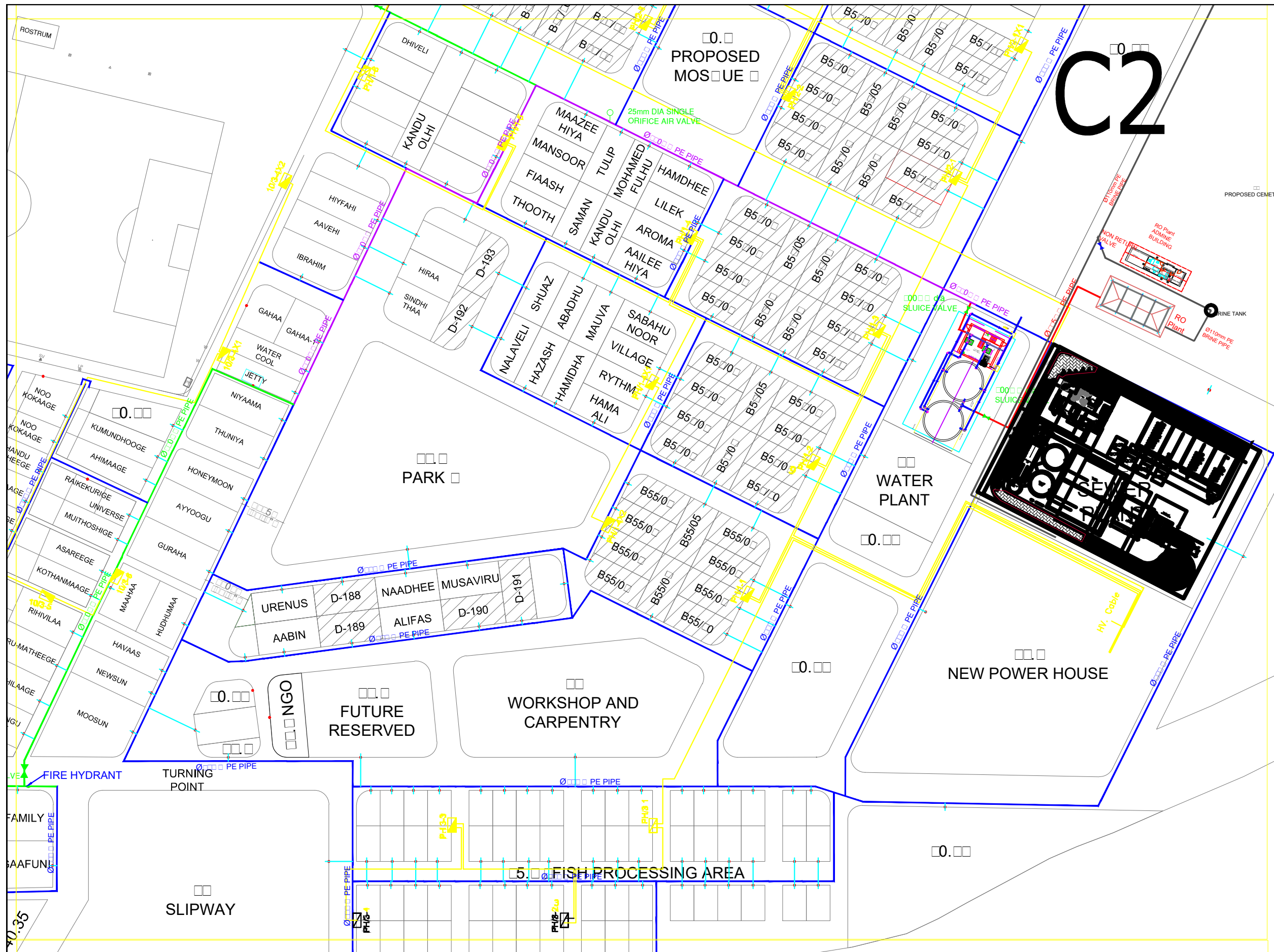


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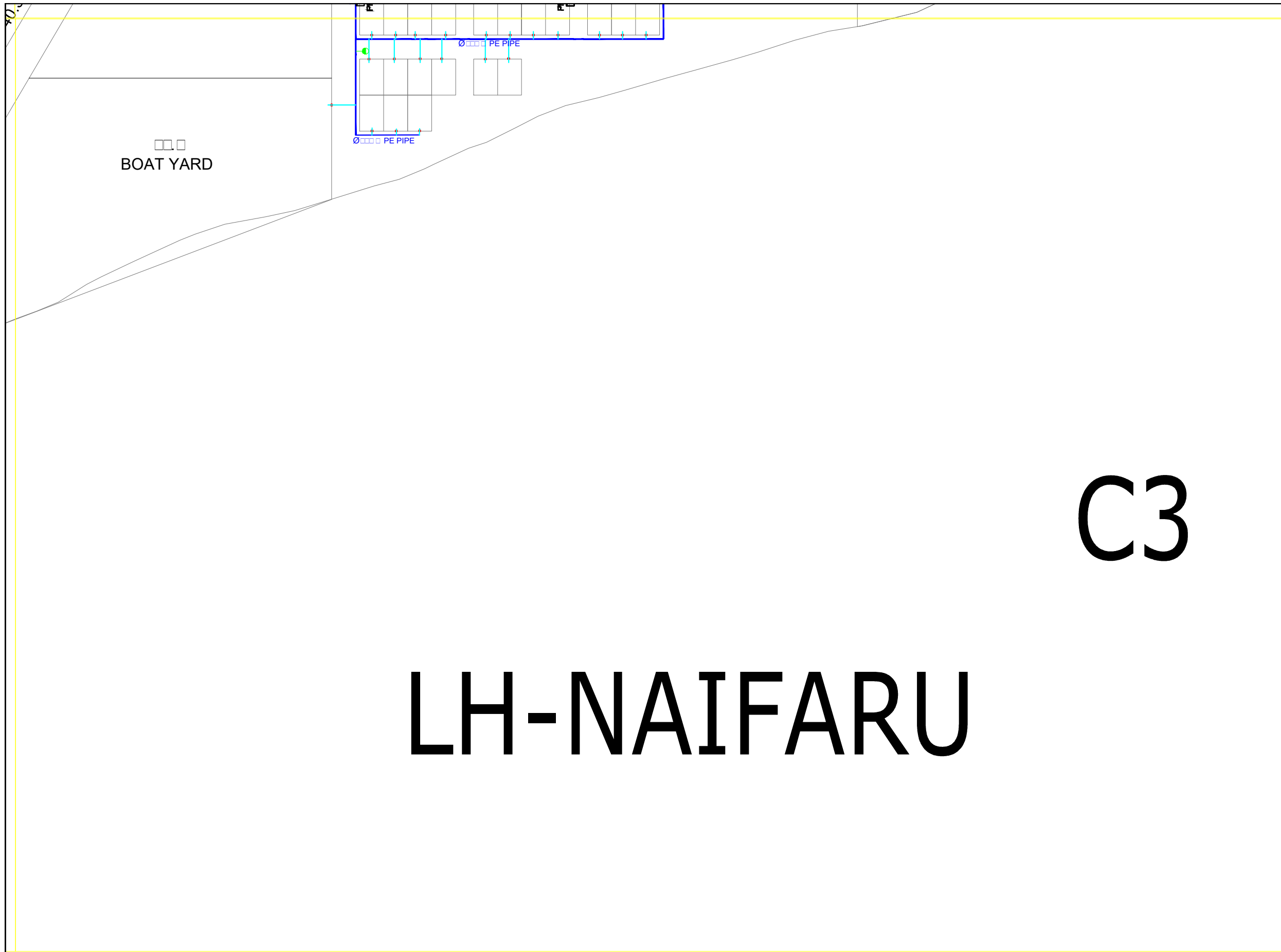
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			SCALE: 1 : 500					



GRID NO:C3

- FIRE HYDRENT
- 25mm DIA SINGLE ORIFICE AIR VALVE
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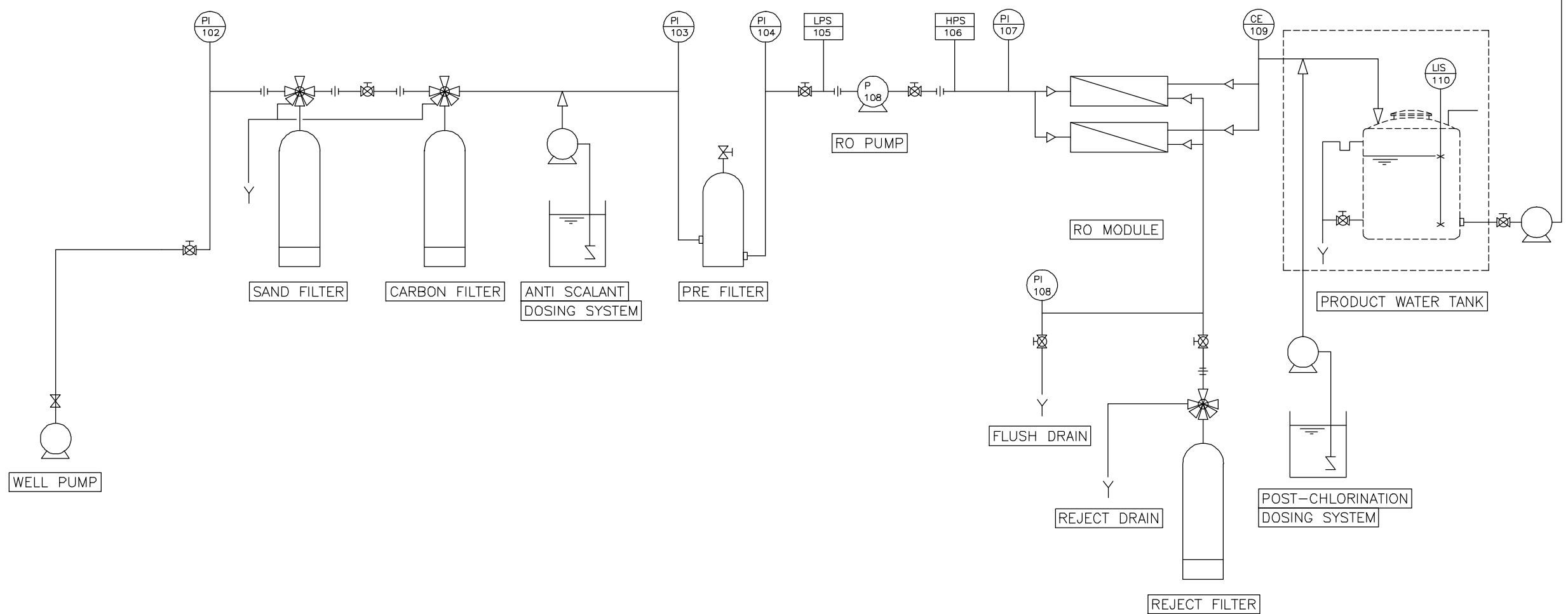
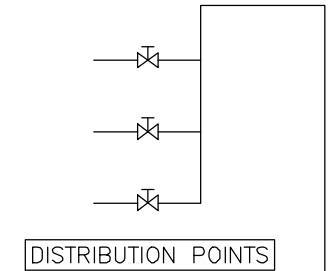
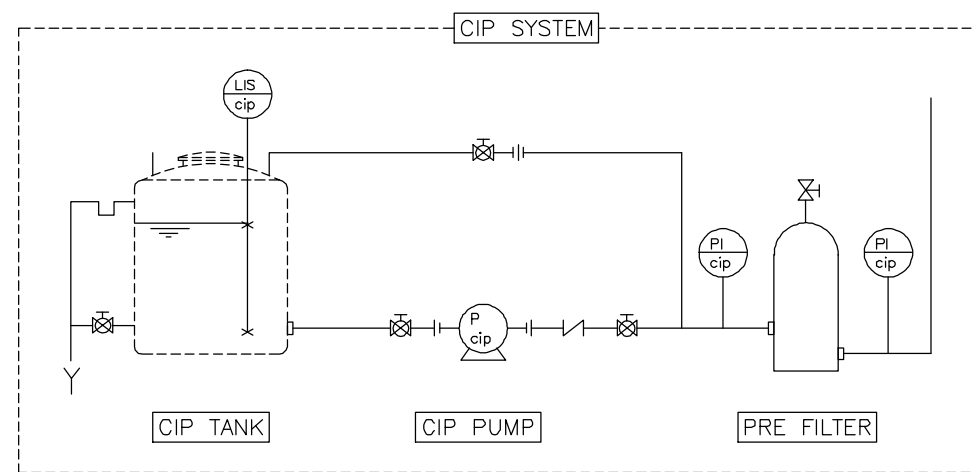
C3

LH-NAIFARU

DIAMETER	DEPTH
63mm PIPE	0.9
90mm PIPE	1.1
110mm PIPE	1.2
160mm PIPE	1.2
225mm PIPE	1.3

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REVERSE OSMOSIS PLANT



CLIENT:
MINISTRY OF ENVIRONMENT AND ENERGY

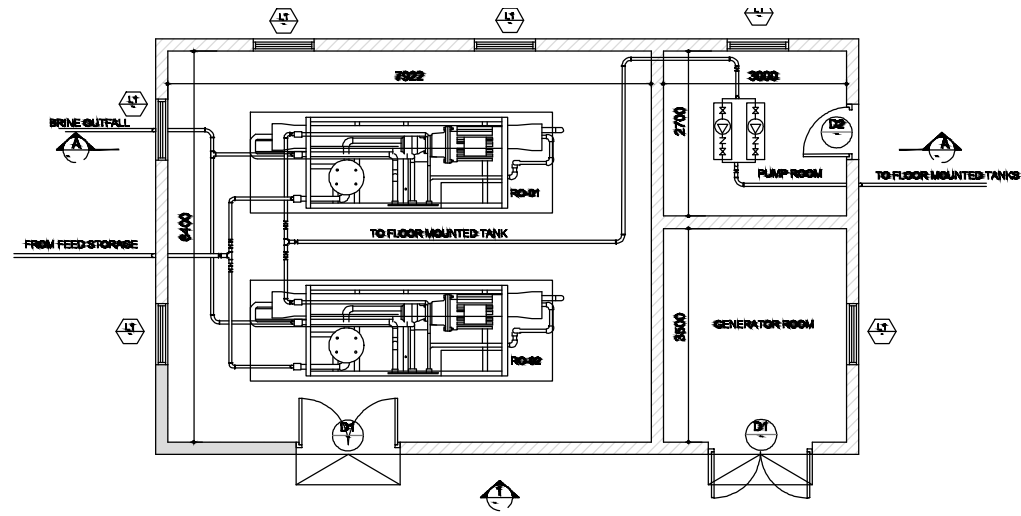
CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO, Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES

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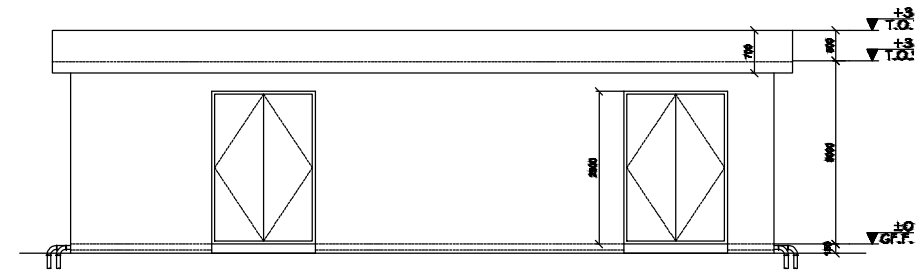
GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES

PID DIAGRAM

DATE	DRG.NO:	SCALE:
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RO PLANT BUILDING
SCALE 1:100



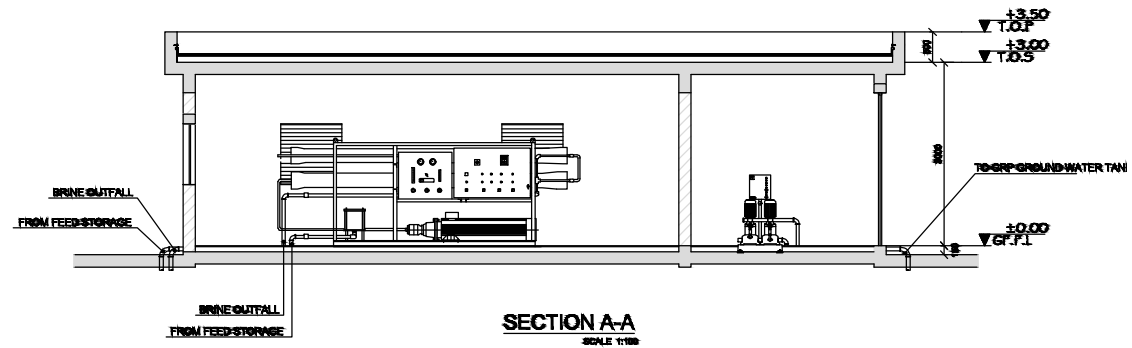
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SCALE 1:100

RO PLANT SCHEDULE FOR XXXXXXXX ISLAND

NO.	PUMP CAPACITY	MOTOR	POWER SUPPLY	REMARKS
01	2500 LPH	25 KW (380V 3PH 3W)	400-1150000	TWO NOS OF RO PLANT WORKING ACCORDING TO FLIGHT SENSOR

DOOR & LOUVER SCHEDULE

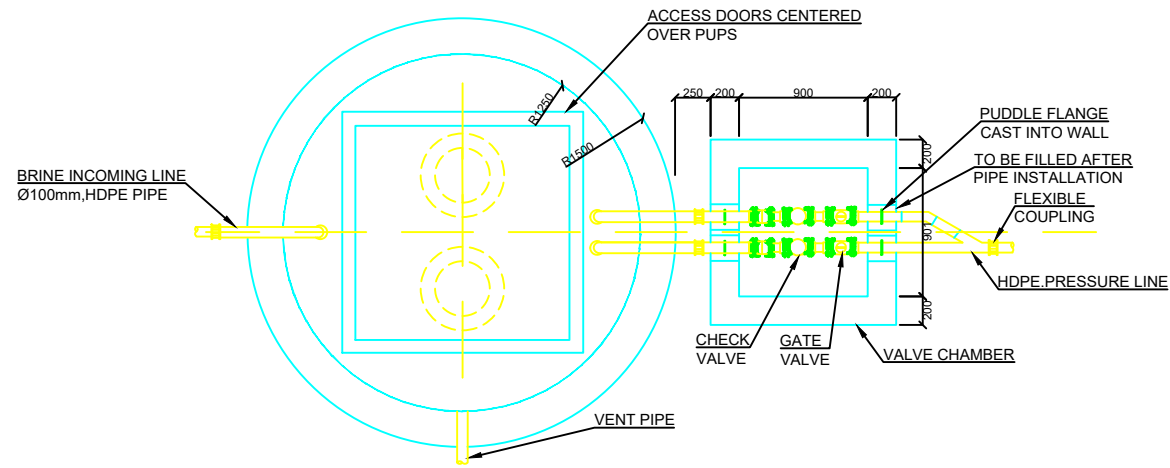
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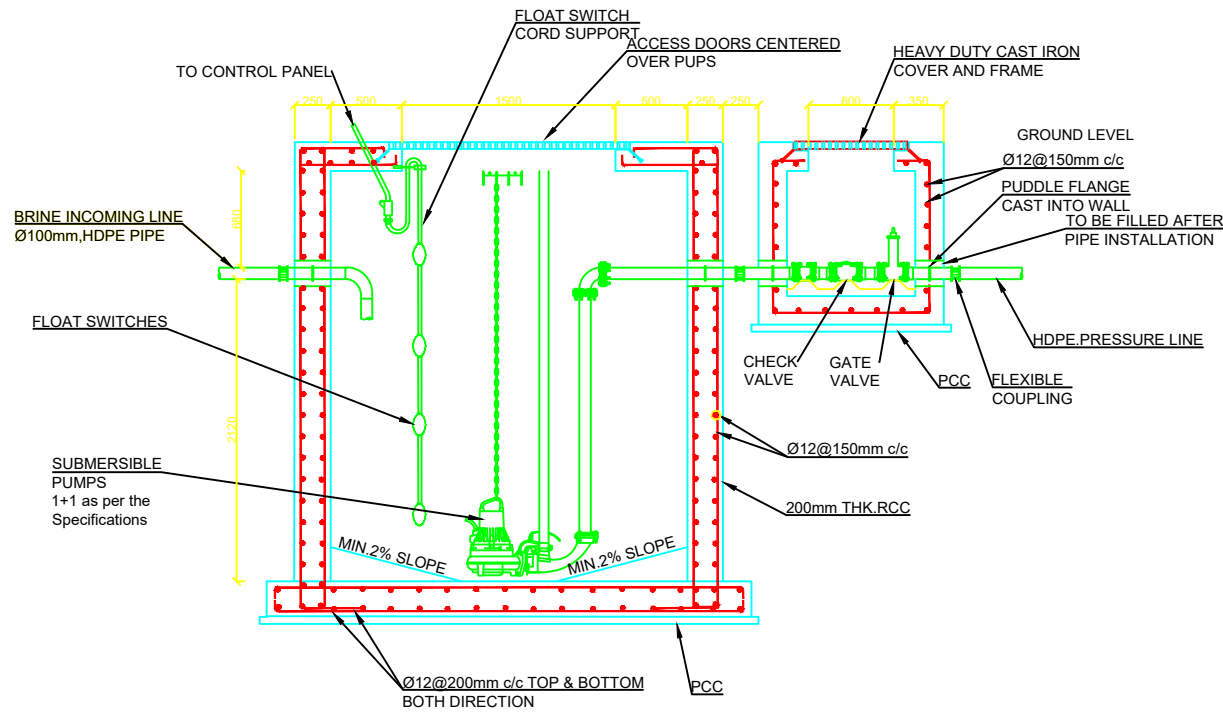
SECTION A-A
SCALE 1:100




	CLIENT:	MINISTRY OF ENVIRONMENT AND ENERGY	CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R.UNGOOFAARU, Lh.NAIFARU, Dh.KUDAHUVADHOO, Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES	DESIGN ENGINEER	DRAWN	CHECKED DESIGN CHIEF	APPROVED	SL.NO	DRWING NO	DESCRIPTION
		GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES	REVERSE OSMOSIS UNIT STRUCTURAL PLANS	DATE	DRG.NO: NA/WS/RO/□	SCALE: 1 : 500				

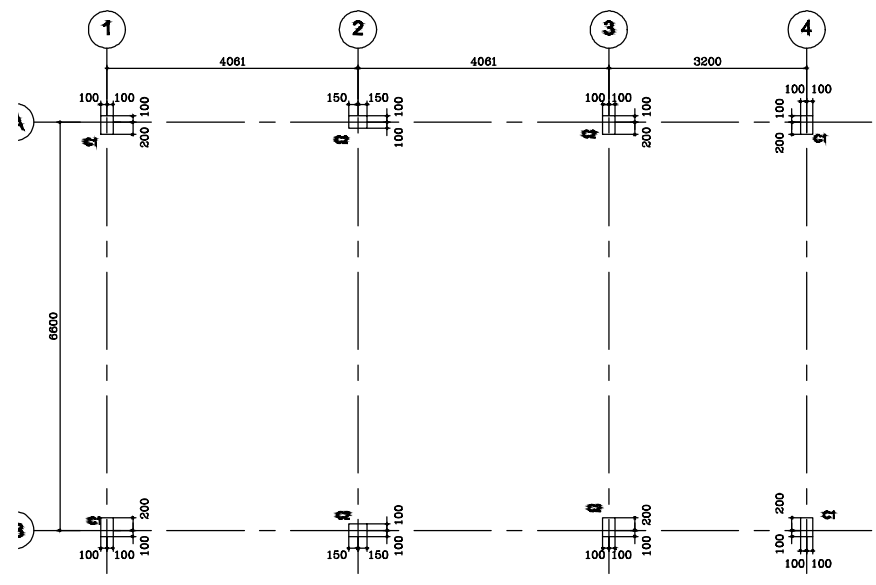


BRINE PUMP DETAILS - PLAN

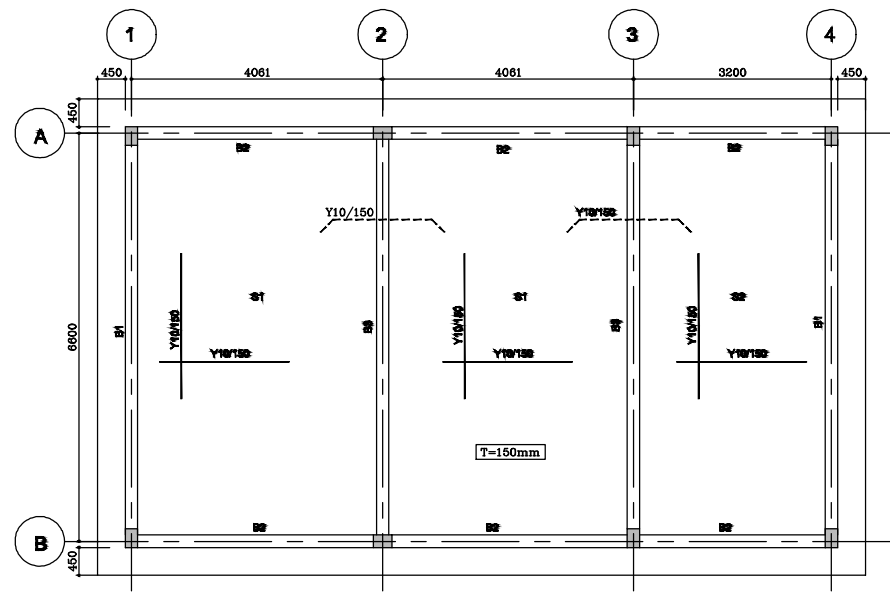


BRINE PUMP DETAILS - SECTION

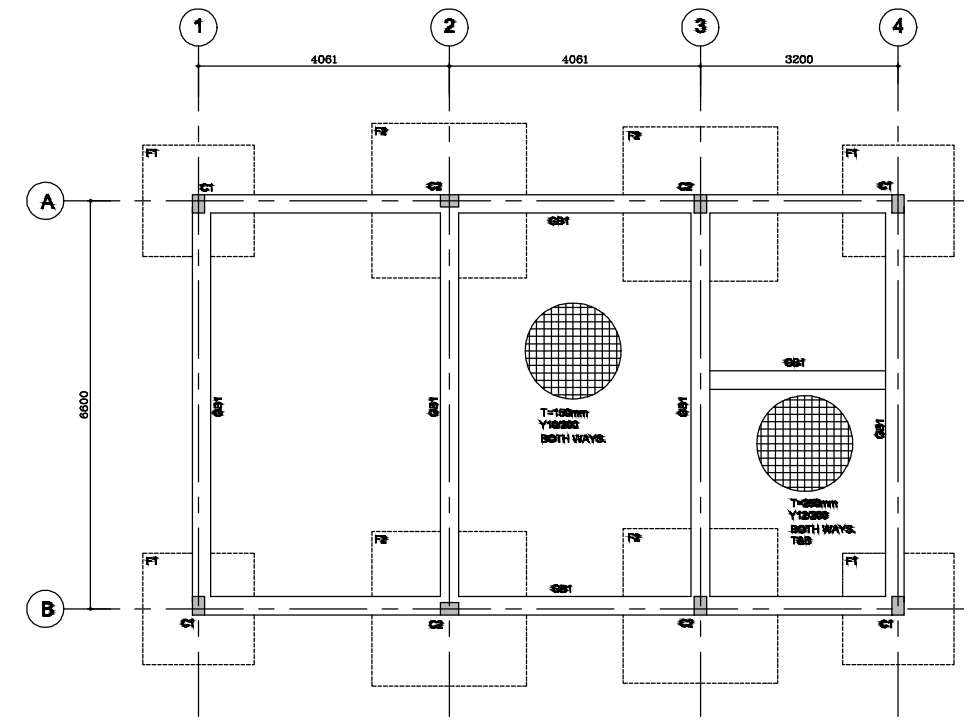
	CLIENT:	MINISTRY OF ENVIRONMENT AND ENERGY CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R.UNGOOFAARU, Lh.NAIFARU, Dh.KUDAHUVADHOO, Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES	DESIGN	DRAWN	CHECKED	APPROVED	SL.NO	DRWING NO	DESCRIPTION
			ENGINEER		DESIGN CHIEF				
	GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES	BRINE PUMP DETAILS	DATE	DRG.NO: NAIFARU/RO/03 SCALE: 1 : 500					



COLUMN & AXIS LAYOUT
SCALE 1:100



ROOF SLAB LAYOUT
SCALE 1:100



FOOTING & GRADE BEAM LAYOUT
SCALE 1:100



CLIENT:
MINISTRY OF ENVIRONMENT AND ENERGY

CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R.UNGOOFAARU, Lh.NAIFARU, Dh.KUDAHUVADHOO, Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES

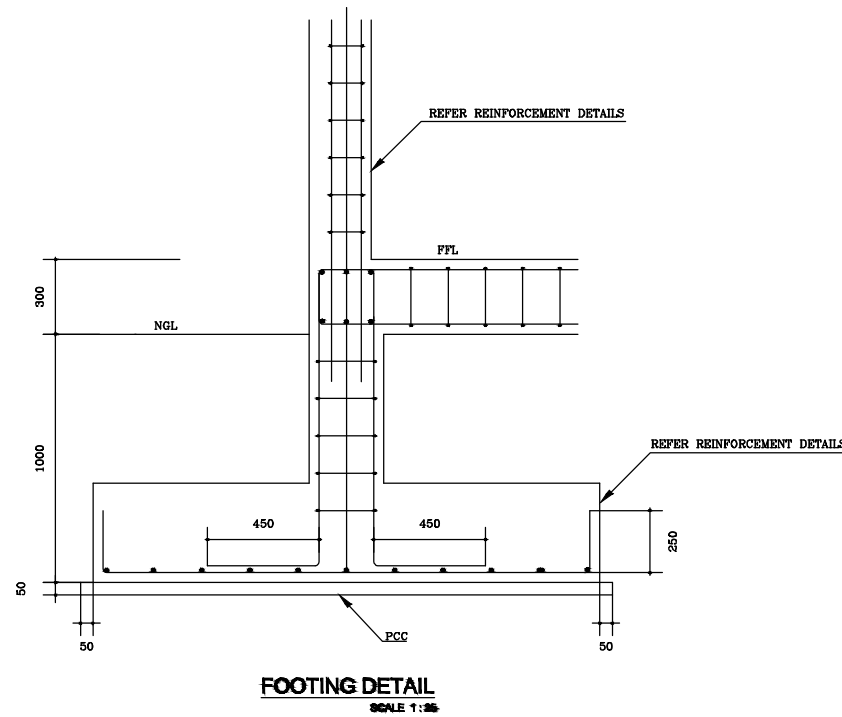
DESIGN ENGINEER	DRAWN	CHECKED	APPROVED
		DESIGN CHIEF	

SL.NO	DRWING NO	DESCRIPTION

GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES

REVERSE OSMOSIS UNIT STRUCTURAL PLANS

DATE
DRG.NO: NA/WS/RO/0□
SCALE: 1 : 500





COLUMNS REINFORCEMENT DETAILS							
TYPE	FOUND		GROUND FLOOR		STIRRUPS		
	SIZE	REINT.	SIZE	REINT.			
C1	200	300	ØY16	200	200	4Y16	Y8/200
C2	200	300	ØY16	200	300	ØY16	Y8/200

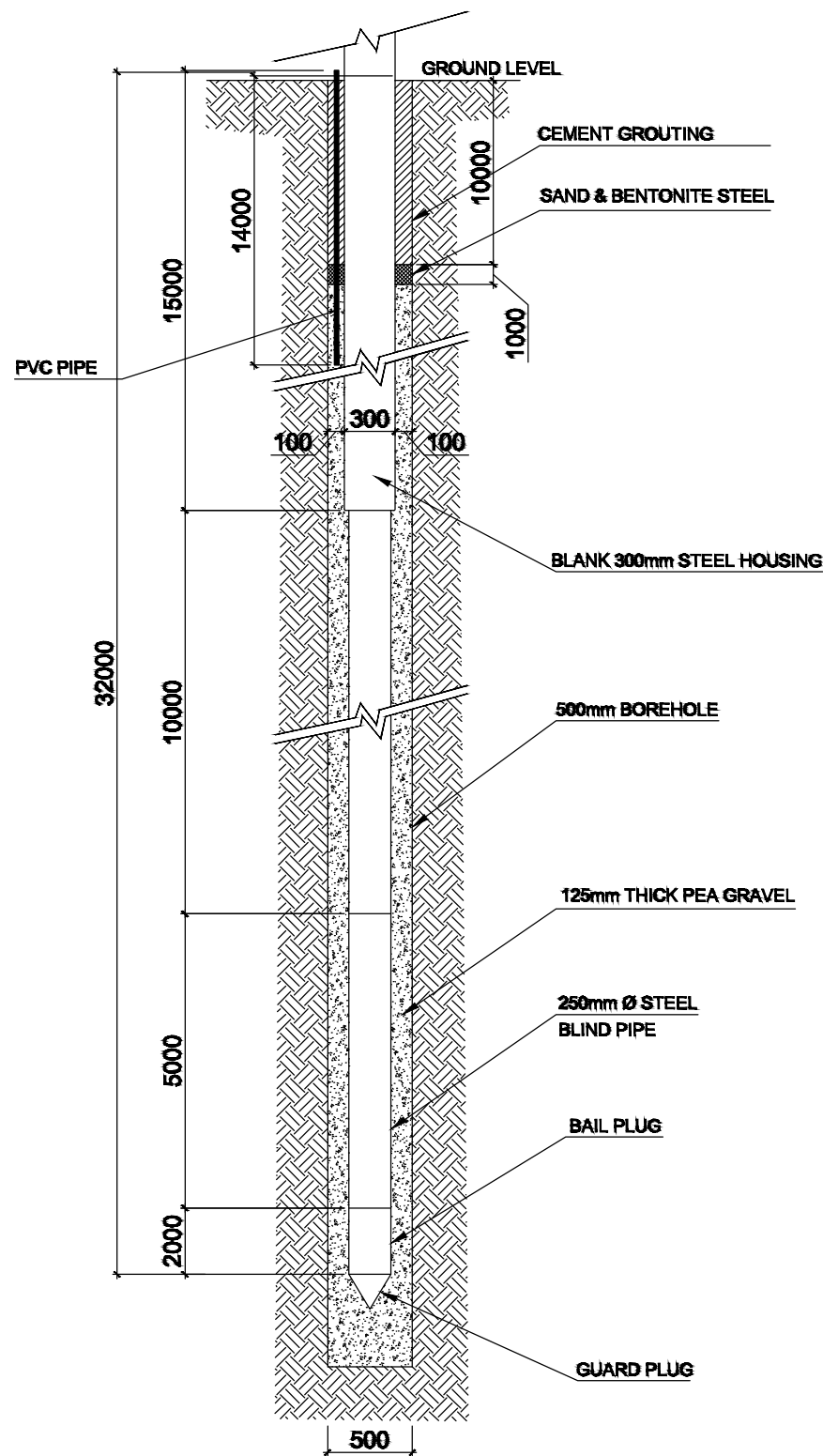
FOOTING REINFORCEMENT DETAILS							
MARK	DIMENSION			REINFORCEMENT		BOXED	REMARKS
	L	W	H	WIDTH	LENGTH		
F1	1800	1800	300	ØY16/m	ØY16/m		
F2	2500	2500	400	ØY16/m	ØY16/m		

GRADE BEAM REINFORCEMENT DETAILS							
MARK	SIZE		BOTTOM	TOP	STIRRUPS	SIDE BARS	REMARKS
	b	h	BARS	BARS			
GB1	300	300	3Y16	3Y16	Y8/200		


BEAM REINFORCEMENT DETAILS							
MARK	SIZE		BOTTOM	TOP	STIRRUPS	SIDE BARS	REMARKS
	b	h	BARS	BARS			
B1	200	500	3Y16 + 2Y16	2Y16	Y8/150		
B2	200	400	3Y16	3Y16	Y8/150		
B3	200	400	ØY16	3Y16	Y8/150		

SLABS REINFORCEMENT DETAILS				
MARK	THICK	REINFORCEMENT		REMARKS
		WIDTH	LENGTH	
S1	150	Y10/150	Y10/150	
S2	150	Y10/150	Y10/150	

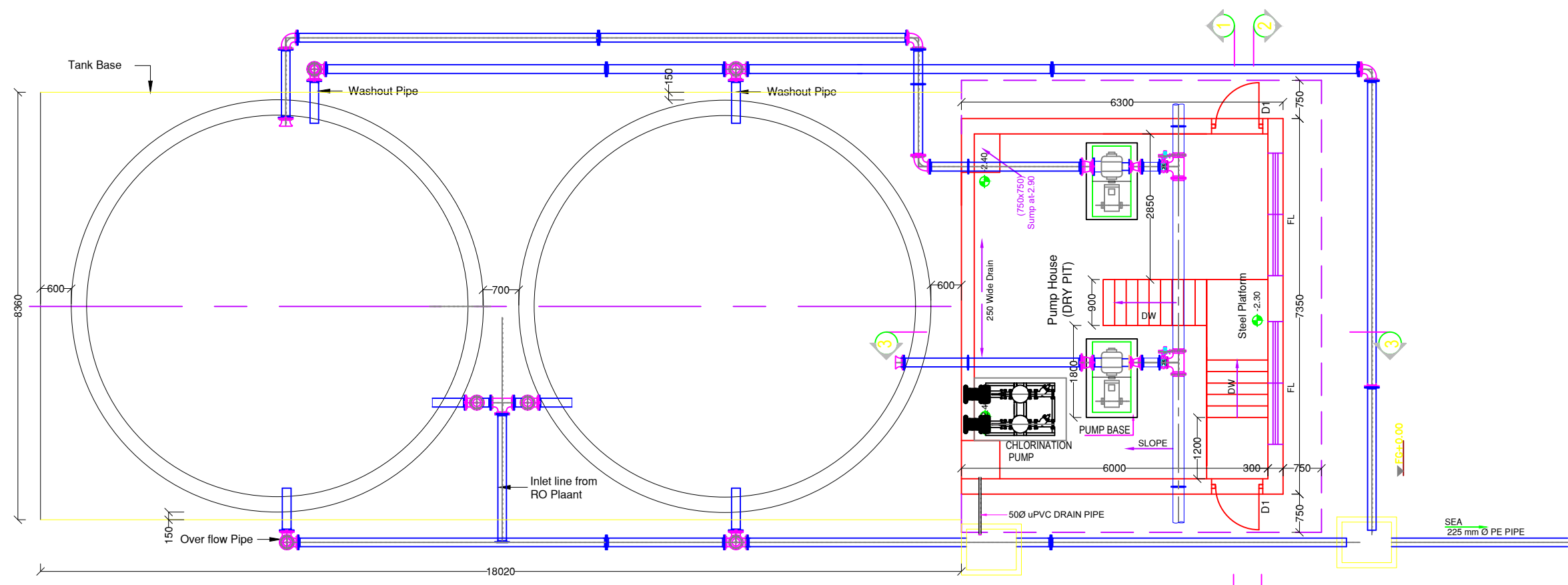
	CLIENT:	MINISTRY OF ENVIRONMENT AND ENERGY	CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R.UNGOOFAARU, Lh.NAIFARU, Dh.KUDAHUVADHOO, Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES	DESIGN ENGINEER	DRAWN	CHECKED DESIGN CHIEF	APPROVED	SL.NO	DRWING NO	DESCRIPTION
		GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES		REVERSE OSMOSIS UNIT STRUCTURAL PLANS	DATE	DRG.NO: NA/WS/RO/0□ SCALE: 1 : 500				



TUBE WELL DETAIL


	CLIENT:	MINISTRY OF ENVIRONMENT AND ENERGY	CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO, Th.GURAIIDHOO AND Ga.VILLINGILI, MALDIVES		DESIGN ENGINEER	DRAWN	CHECKED DESIGN CHIEF	APPROVED	SL.NO	DRIVING NO	DESCRIPTION
		GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES	TUBE WELL DETAIL	DATE	DRG.NO: NA/WS/RO/05 SCALE: 1 : 500						

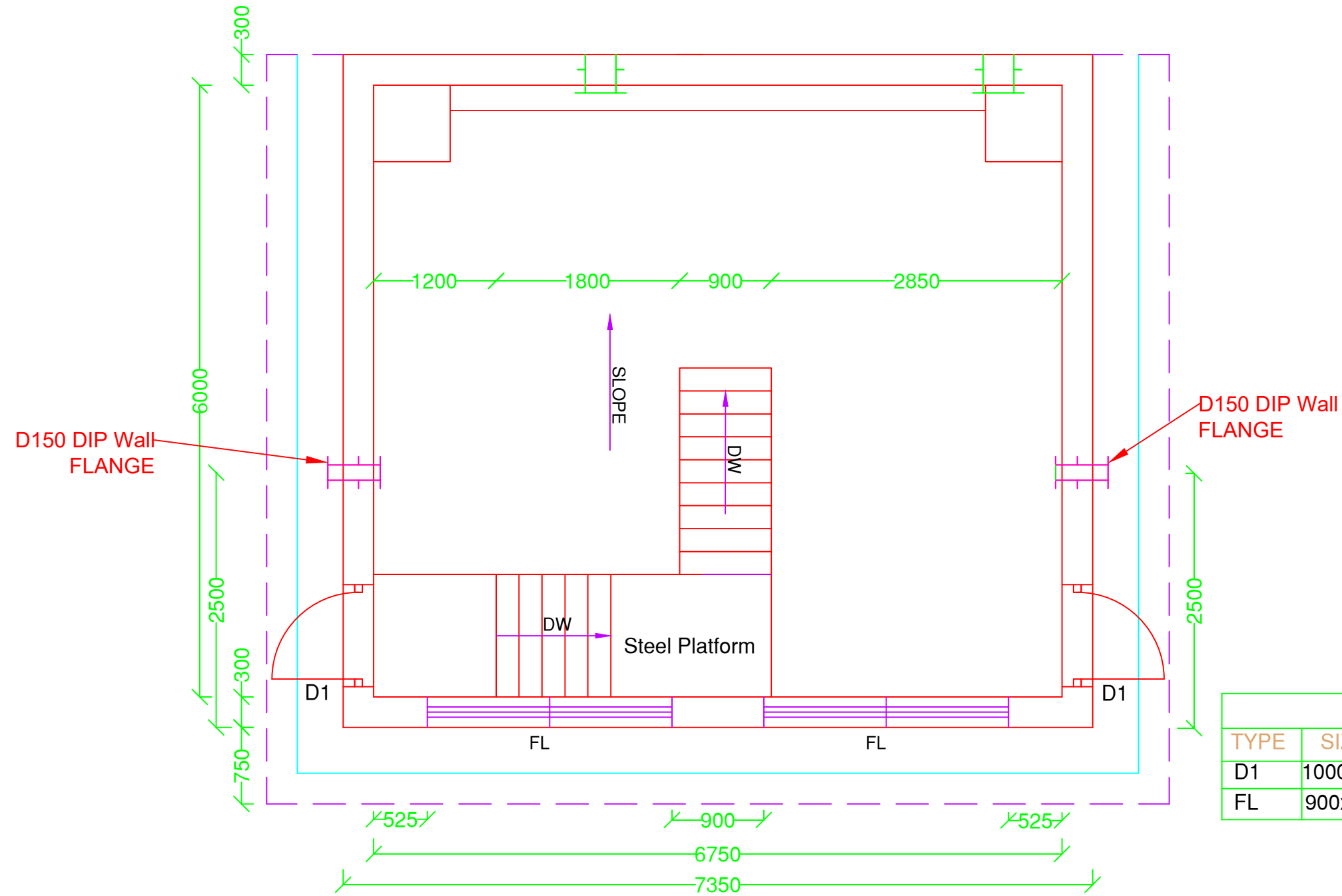
STORAGE TANK




SCHEDULE OF OPENINGS			
TYPE	SIZE	NOS	DESCRIPTION
D1	1000x2000	02	Al.Door
FL	900x2400	02	Al.Fan Light

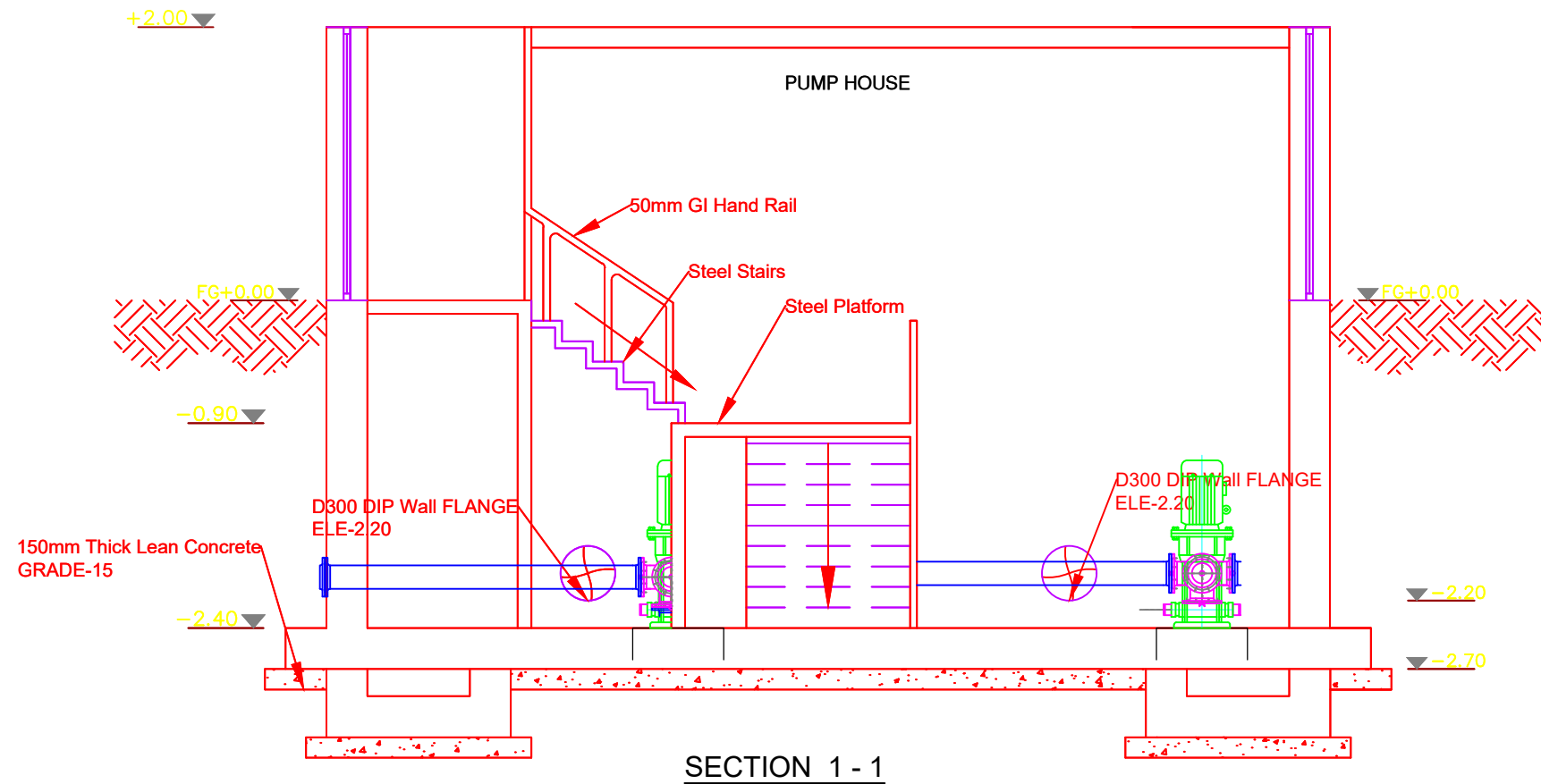
NOTE
 1) Concrete Mix Shall be of Grade-35
 2) Pump drawings are indicative.

	CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY	CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO ,Th.GURAI DHOO AND Ga.VILLINGILI , MALDIVES	ENGINEER DATE	DESIGN CHIEF	SL.NO	DRWING NO	DESCRIPTION
	CONSULTANTS: GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH GRONTMIJ A/S DENMARK,DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES	TITLE: NAIFAARU 1300m ³ RTP TANK & PUMP HOUSE PLAN	DRG.NO: NA/WS/ST/01 SCALE: 1 : 100				

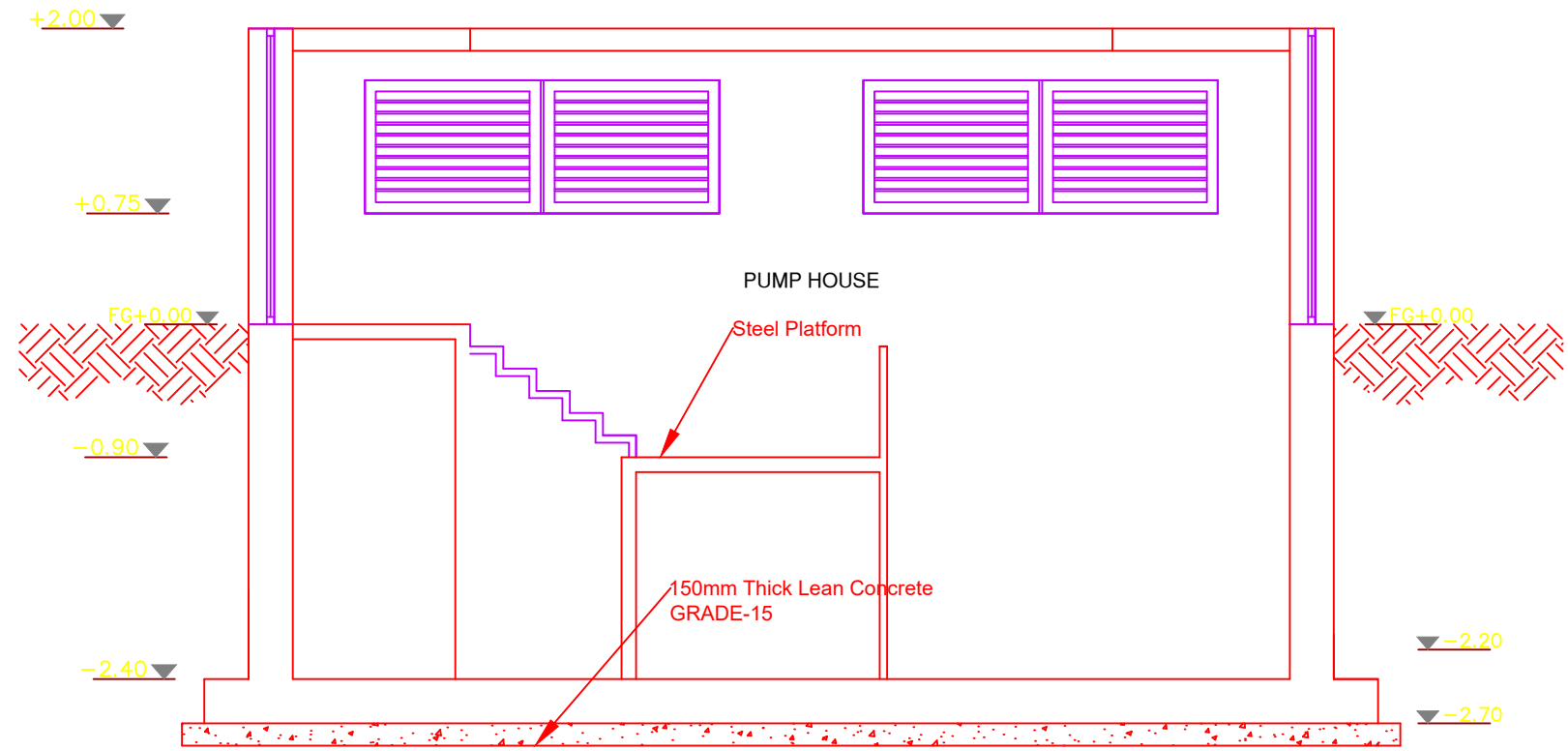


PLAN - PUMP HOUSE


	CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY	CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO,Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES	ENGINEER DATE	DESIGN CHIEF	SL.NO	DRWING NO	DESCRIPTION
	CONSULTANTS: GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH GRONTMIJ A/S DENMARK,DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES	TITLE: NAIFAARU 1300m³ GROUND RESERVOIR & PUMP HOUSE PLAN	DRG.NO: NAWWS/ST/02 SCALE: 1 : 50				



SECTION 1 - 1



SECTION 2 - 2

	CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY	CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh.KUDAHUVADHOO ,Th.GURAIHOO AND Ga.VILLINGILI , MALDIVES	ENGINEER	DESIGN CHIEF	SL.NO	DRWING NO	DESCRIPTION
	CONSULTANTS: GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH GRONTMIJ A/S DENMARK,DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES	TITLE: NAIFAARU 1300m³ RTP TANKS & PUMP HOUSE SECTION 1 - 1 & 2 - 2	DATE	DRG.NO: NAWS/ST/03 SCALE: 1 : 50			