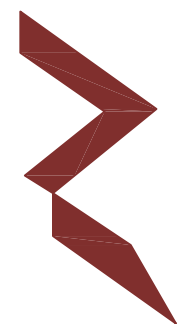


WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL SYSTEM IN LH.NAIFARU, MALDIVES

DETAILED DRAWINGS



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3rd floor, H. Azum, Ameenemagu, Male'

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OF SEWERAGE FACILITIES IN LH.NAIFARU,
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CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY
PROJECT NUMBER: -
DATE: SEPTEMBER 2016

Rev no Date
-- -----
-- -----
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NOTE

1. ALL LEVELS SHOWN ARE IN METERS.

2. ALL LEVELS SHOWN ARE FROM MEAN SEA LEVEL

3. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.

4. ALL GRAVITY SEWER PIPES SHALL BE UPVC TO BS EN1401-1:2009.

5. ALL GRAVITY SEWER MAINS SHALL BE 160MM DIA UPVC OF WALL THICKNESS & STIFFNESS RATED TO SN4 & SDR41.

6. ALL GRAVITY HOUSE LATERALS SHALL BE 110MM DIA UPVC OF WALL THICKNESS & STIFFNESS RATED TO SN4 & SDR41.

7.ALL GRAVITY SEWER MAINS SHALL HAVE MINIMUM 0.4% SLOPE.

8. ALL GRAVITY SEWER PIPES SHALL BE JOINTED USING RUBBER RING PUSH FIT JOINTING METHOD & RUBBER RINGS COMPLY WITH BS 2494 (TYP2).

9. CONNECTION FROM THE HOUSEHOLD TO THE INSPECTION CHAMBER IS NOT INCLUDED. PROVISION SHALL BE GIVEN IN IC FOR MULTIPLE CONNECTIONS.

10. ALL SEWER PIPES SHALL BE BURIED UNDER EARTH COVER OF MINIMUM 0.6 METERS.

11. CATCHMENT OVER FLOW LINKS ARE TO BE CONNECTED BETWEEN AS PER ENGINEERS' APPROVAL

LEGEND

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

- 19044m

600mm Ø PE/PP Maintenance Shaft

- 275 nos

160mmØ uPVC Clean Out

- 255 nos

110 mm Ø HDPE Pumping Main (PE100, PN16, SDR11)

- 830 m

160 mm Ø HDPE Pumping Main (PE100, PN16, SDR11)

- 780 m

250 mm Ø HDPE Sea Outfall Pipe (PE100, PN16, SDR11)

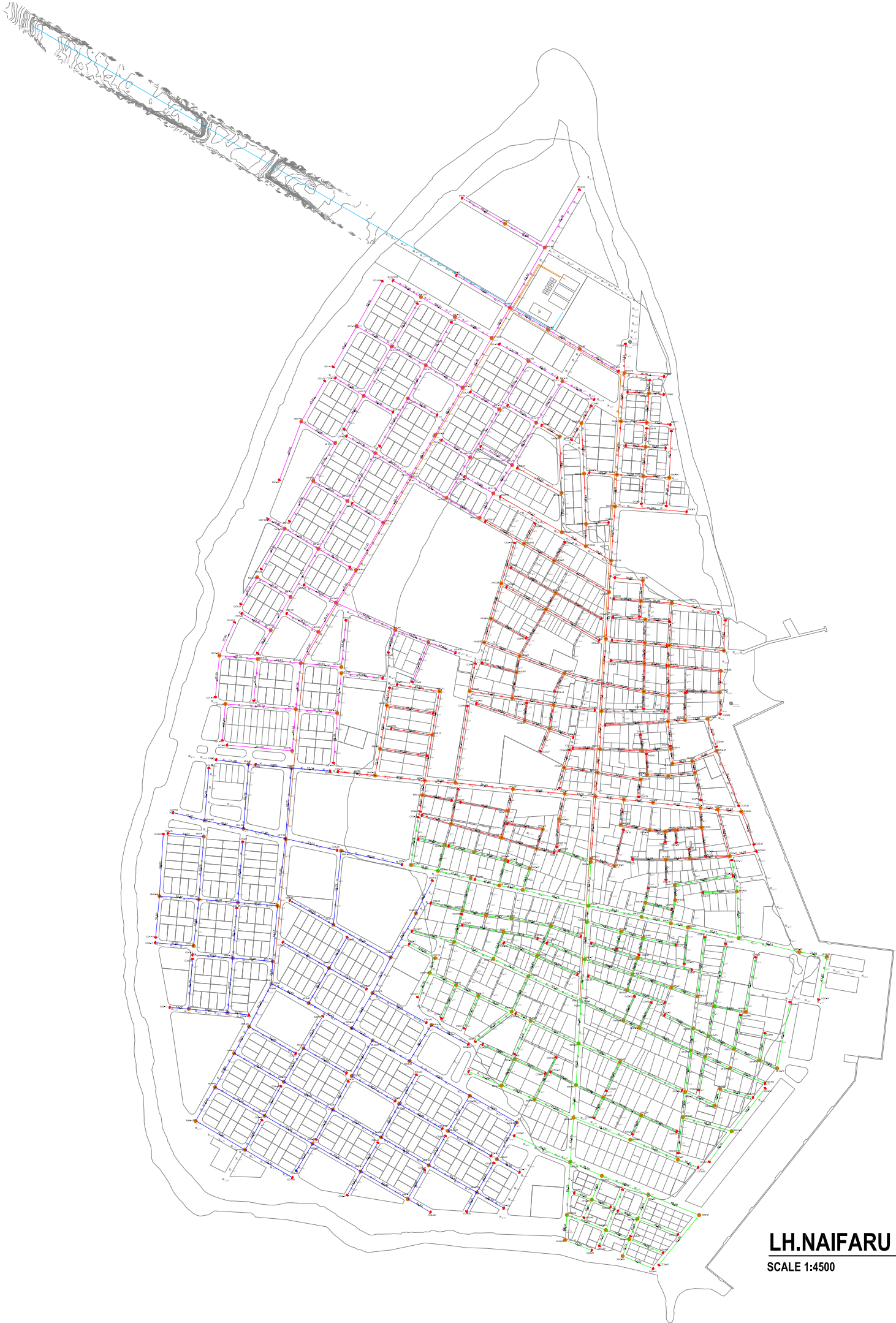
- 605 m

PRIMARY BENCH MARKS

PSM 0001; 318961.408E, 601598.151N, 1.033Z

PSM 0002; 319023.219E, 602658.971N, 1.109Z

PSM 0003; 318569.443E, 602060.551N, 1.197Z



LH.NAIFARU NETWORK LAYOUT

SCALE 1:4500



CONSULTANCY SERVICES FOR SURVEY ,DESIGN & SUPERVISION
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CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY

PROJECT NUMBER : -

DATE : -SEPTEMBER 2016

ENGINEER : - Mohamed Saif Saeed

CHECKED BY : - Ihsan Waheed

DRAWN BY : -Mohamed Saif Saeed



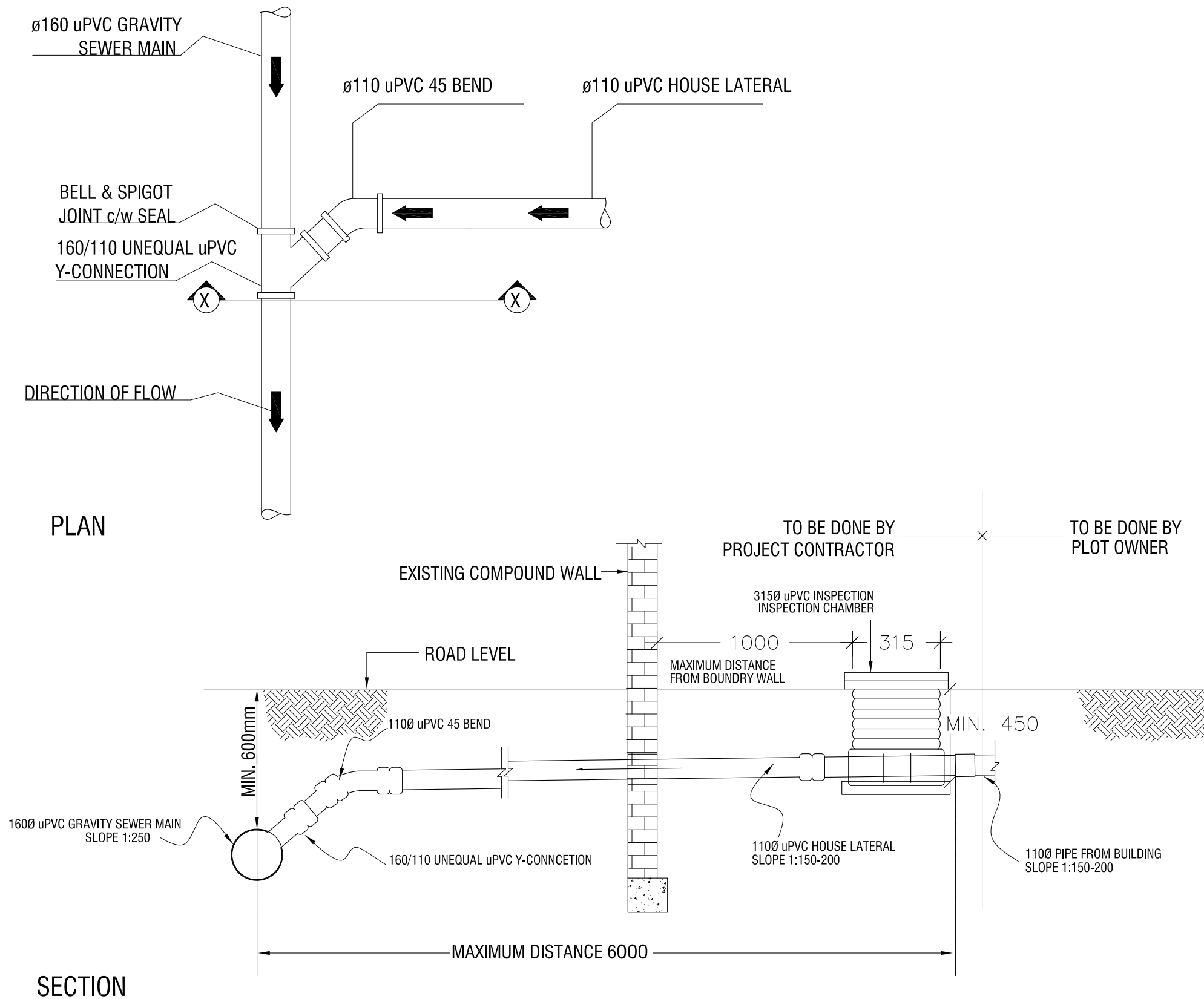
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Title: LH.Naifaru
Site Plan

Page: NA - 01

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TYPICAL HOUSE CONNECTION DETAIL
N.T.S

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DATE: SEPTEMBER 2016
ENGINEER: - Mohamed Saif Saeed
CHECKED BY: - Insan Wahneed
DRAWN BY: - Mohamed Saif Saeed

Rev no	Date
1	

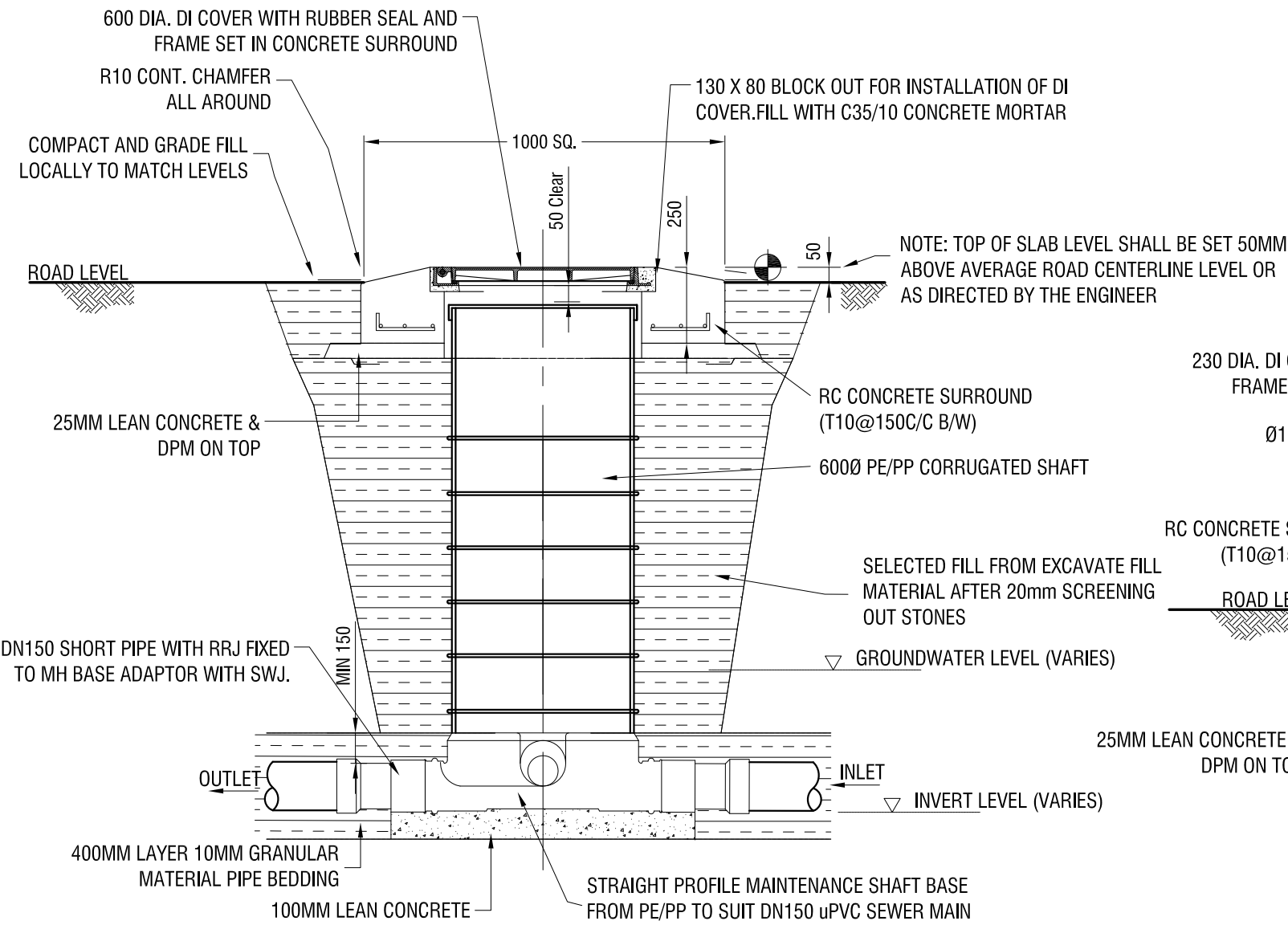


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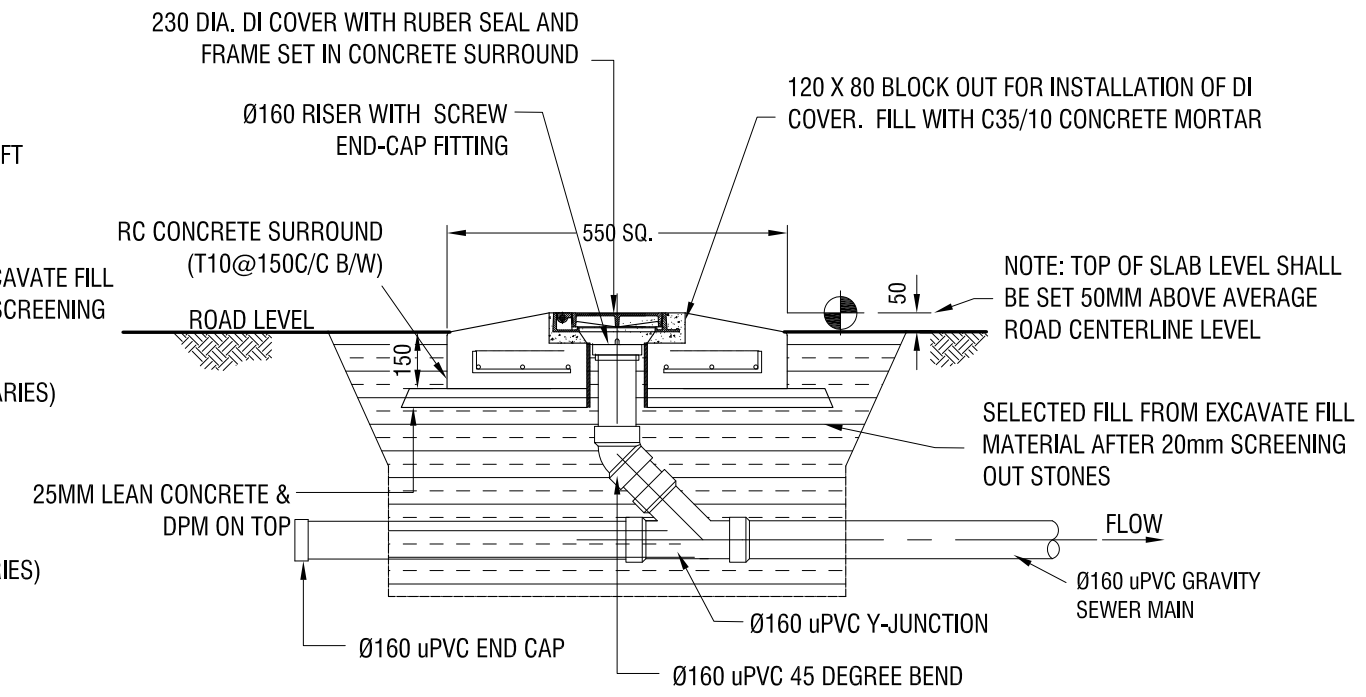
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Title: House connection detail
Page: NA - 02

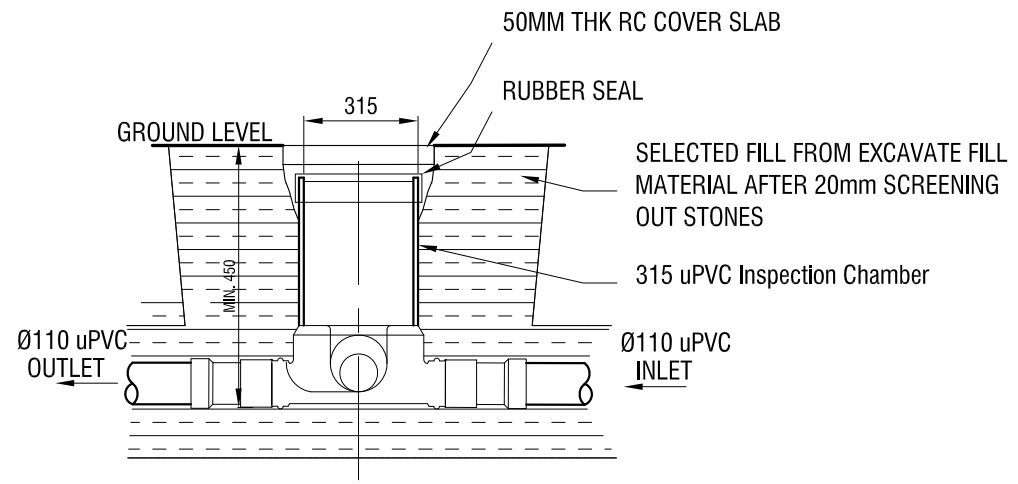
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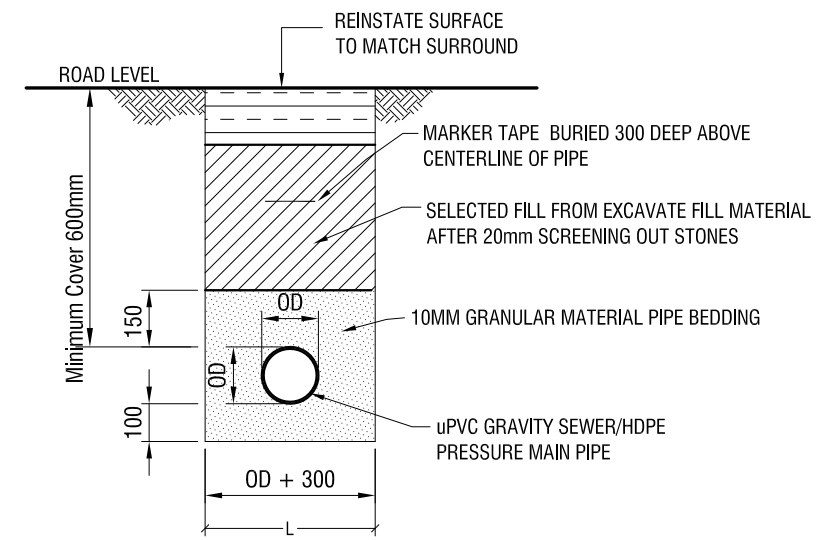
ELEVATION - MAINTENANCE SHAFT (MH)
Scale 1:20



ELEVATION - CLEANOUT (CO)
Scale 1:20



HOUSE ISPECTION CHAMBER (IC)
Scale 1:20



TRENCH & BEDDING DETAILS
Scale 1:20

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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Rev no	Date
1	

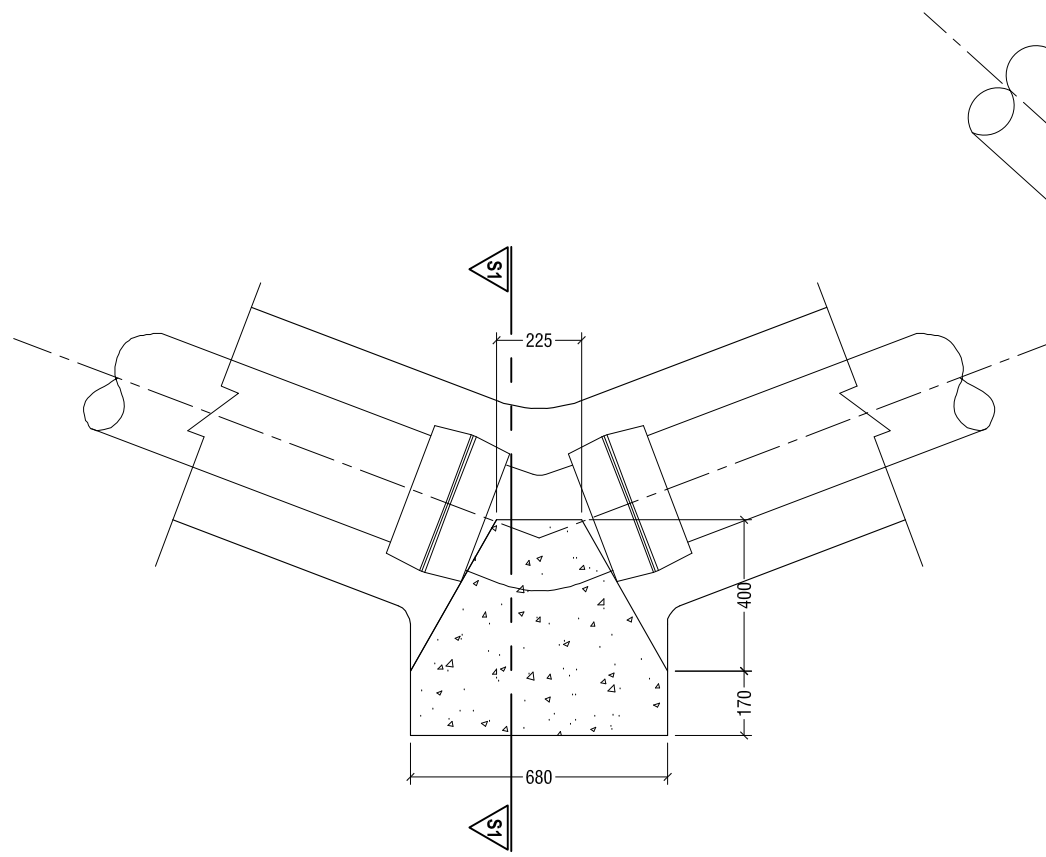


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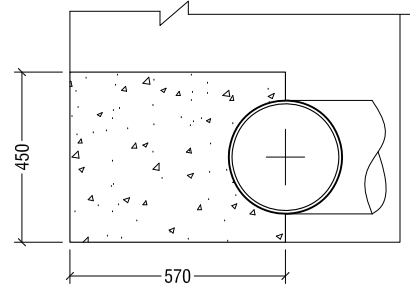
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Title: Maintenance shaft, cleanout, house inspection chamber, trench and bedding details
Page: NA - 03

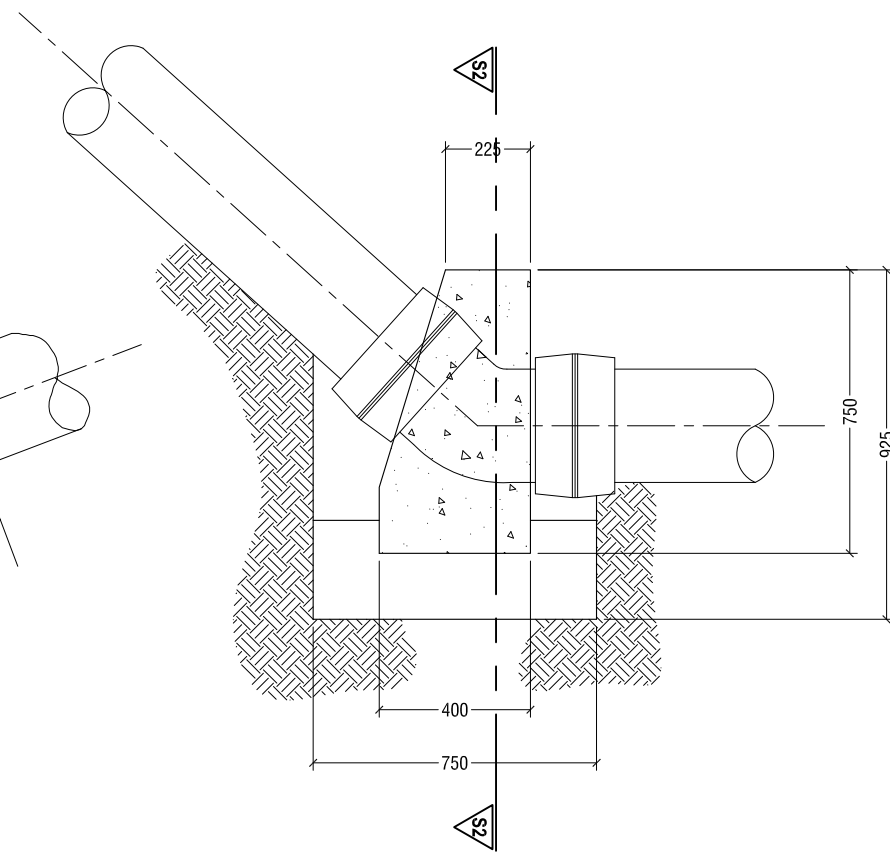
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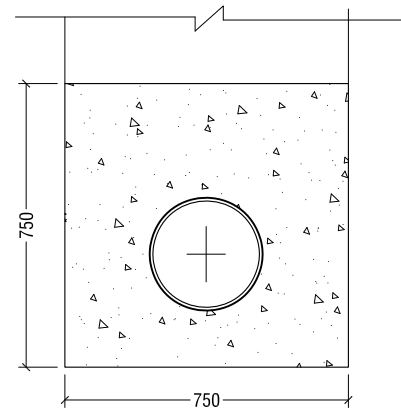
HORIZONTAL 45° BEND
NTS



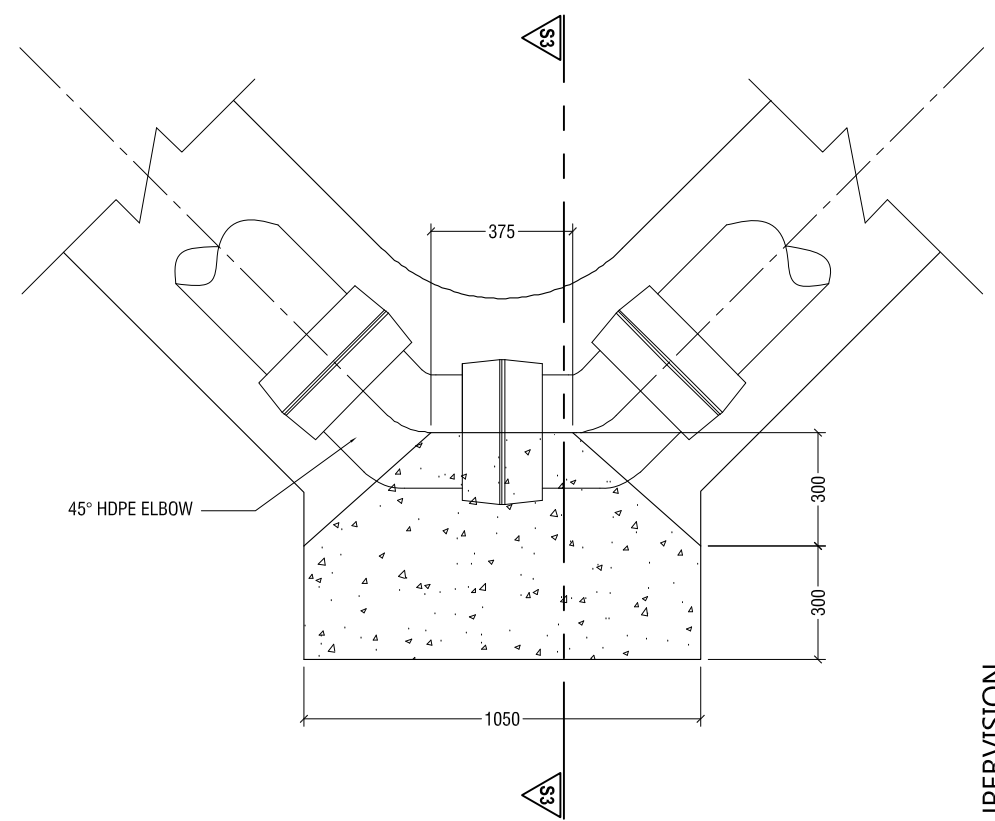
SECTION S1-S1
NTS



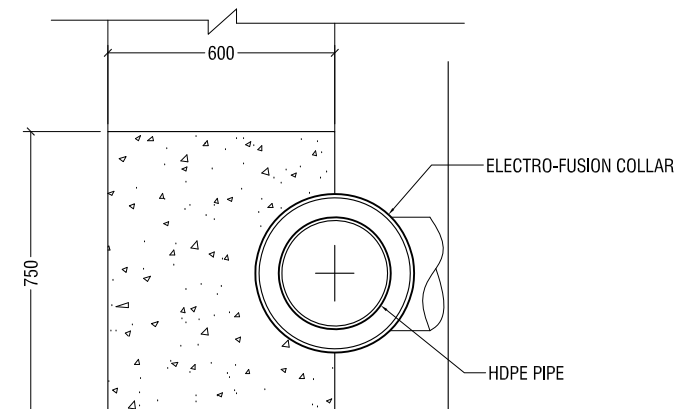
VERTICAL 45° BEND
NTS



SECTION S2-S2
NTS

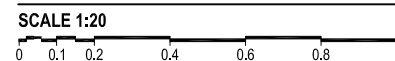


HORIZONTAL 90° BEND
NTS



SECTION S3-S3
NTS

THRUST BLOCK DETAIL - FORCE MAINS ONLY



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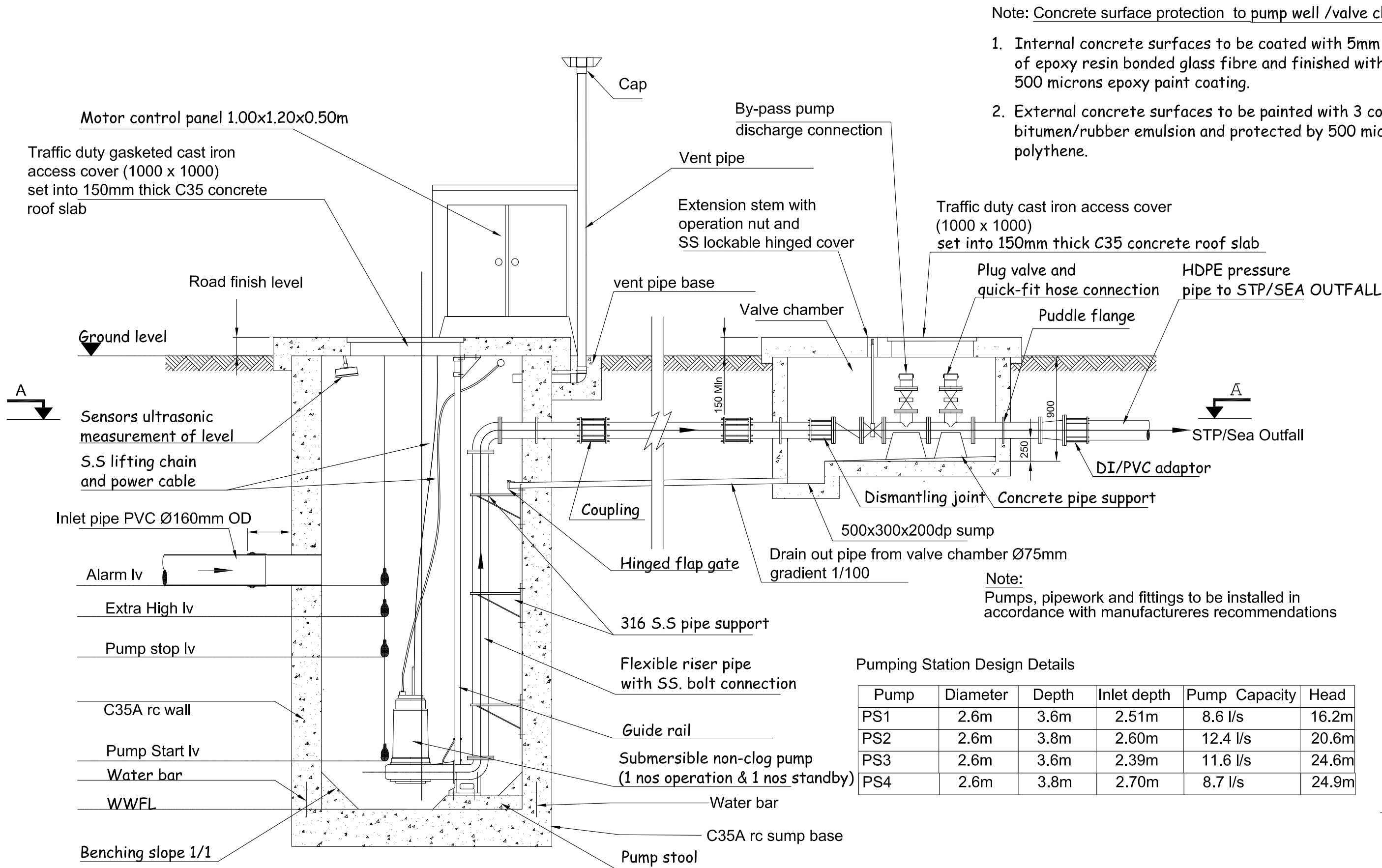
Title: Thrust block detail

Page: NA - 04

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CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY
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DATE: SEPTEMBER 2016
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DRAWN BY: - Mohamed Saif Saeed

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Pumping Station Design Details

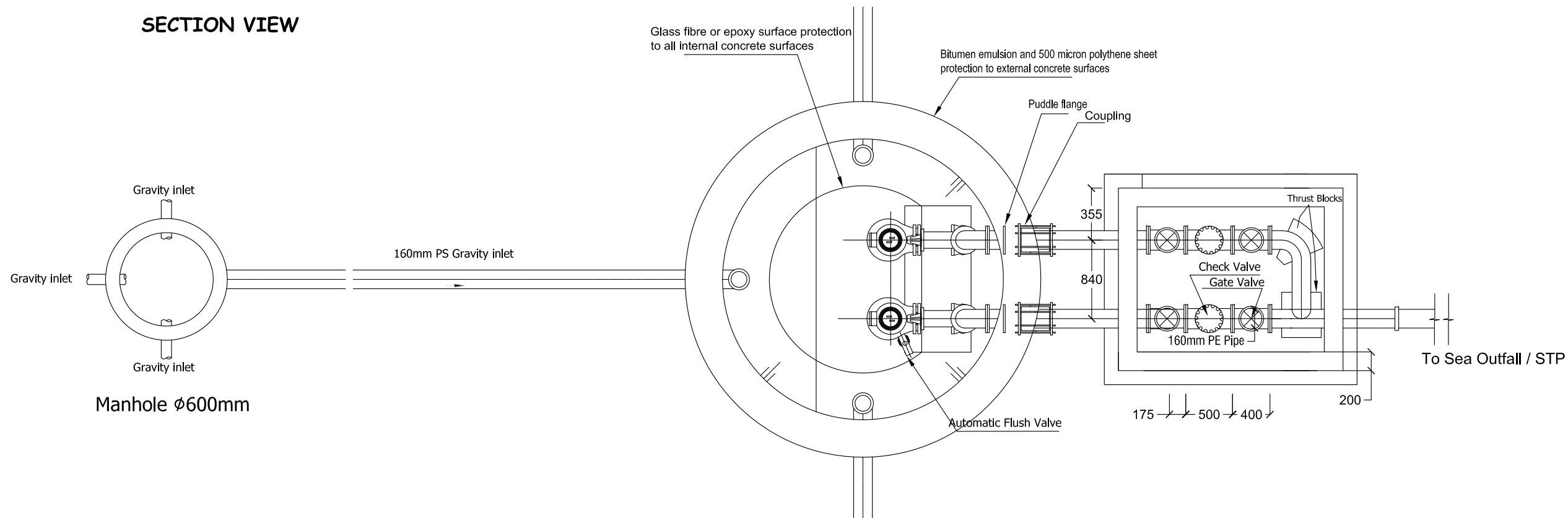
Pump	Diameter	Depth	Inlet depth	Pump Capacity	Head
PS1	2.6m	3.6m	2.51m	8.6 l/s	16.2m
PS2	2.6m	3.8m	2.60m	12.4 l/s	20.6m
PS3	2.6m	3.6m	2.39m	11.6 l/s	24.6m
PS4	2.6m	3.8m	2.70m	8.7 l/s	24.9m

TYPICAL PUMPING STATION DETAIL - LONGITUDINAL SECTION

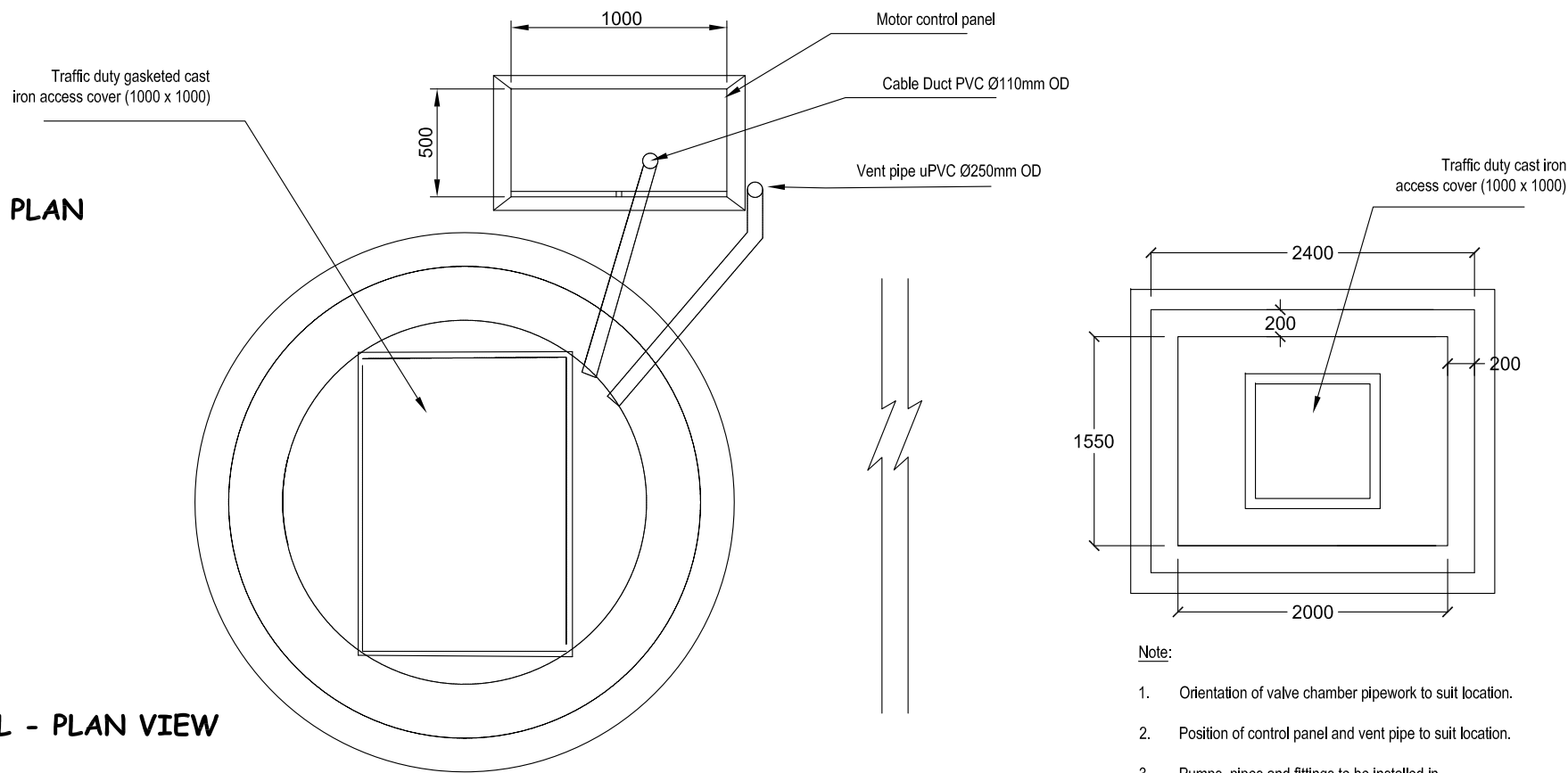
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SECTION VIEW



GROUND LEVEL PLAN



Note:

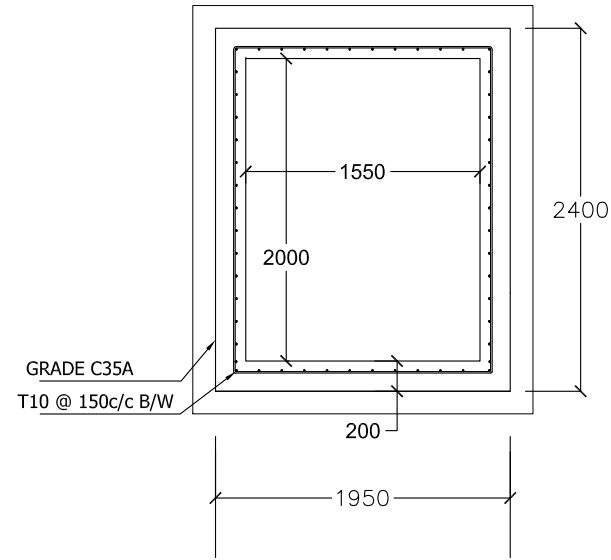
1. Orientation of valve chamber pipework to suit location.
2. Position of control panel and vent pipe to suit location.
3. Pumps, pipes and fittings to be installed in accordance with manufacturers recommendations.

TYPICAL PUMPING STATION DETAIL - PLAN VIEW

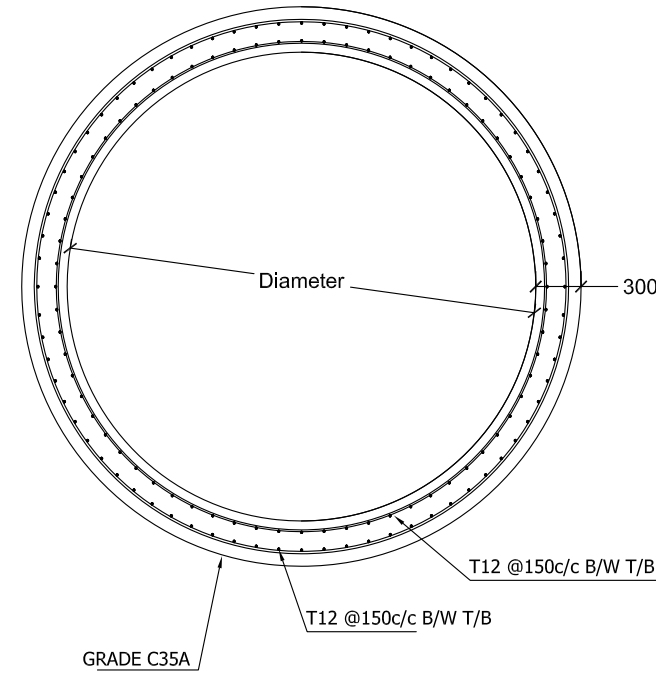
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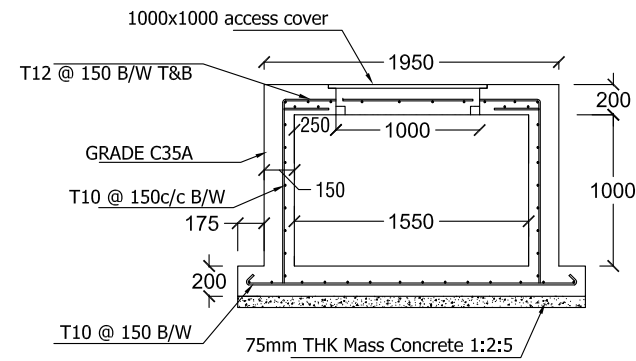


PLAN



Note:

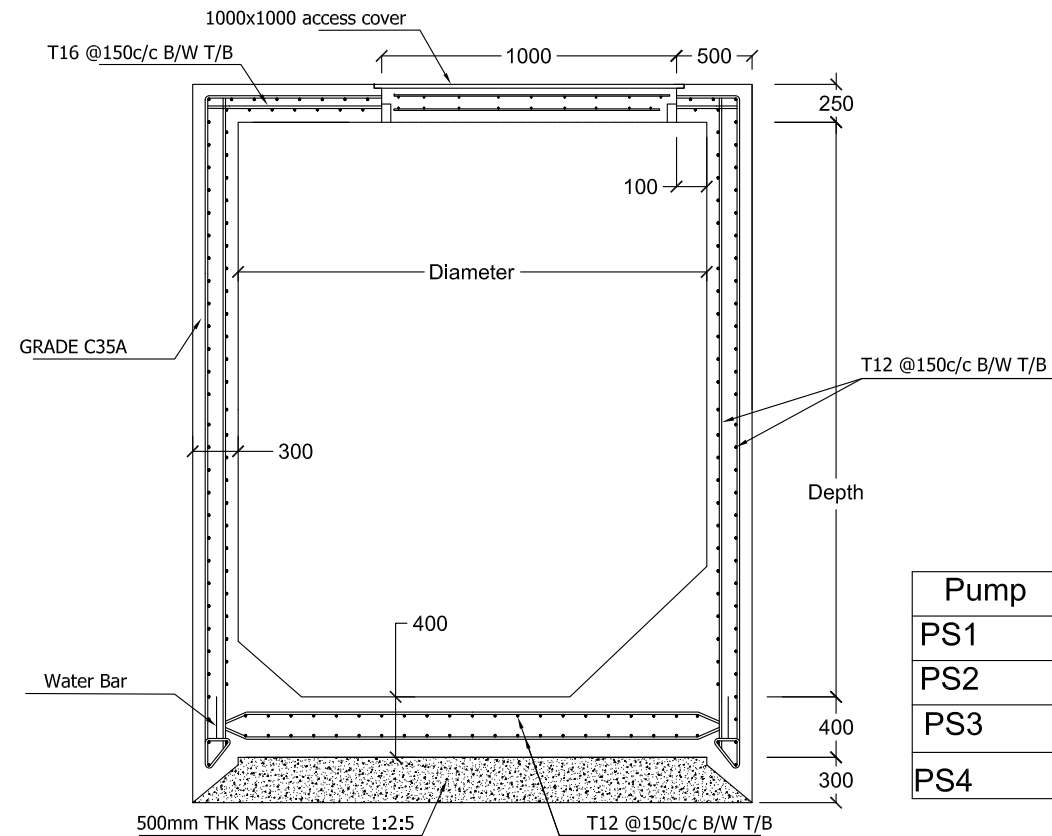
1. All structural concrete shall be of grade C35A.
2. All castings shall be done using Sulpahte Resistant Portland Cement to BS 4027:1996.
3. All structural reinforcement shall be epoxy coating of non-pre-stressed reinforcement to ASTM-A775/A775M.



SECTION

VALVE CHAMBER DETAIL

PUMPING STATION STRUCTURAL DETAILS
Scale: N.T.S



PUMP STATION DETAIL

Pump	Diameter	Depth	Inlet depth
PS1	2.6m	3.6m	2.51m, 1.87m, 2.23m, 1.92m
PS2	2.6m	3.8m	2.60m, 1.78m, 1.77m, 2.04m
PS3	2.6m	3.6m	2.38m, 2.39m, 2.12m, 2.15m
PS4	2.6m	3.8m	2.45m, 2.69m, 2.70m ,

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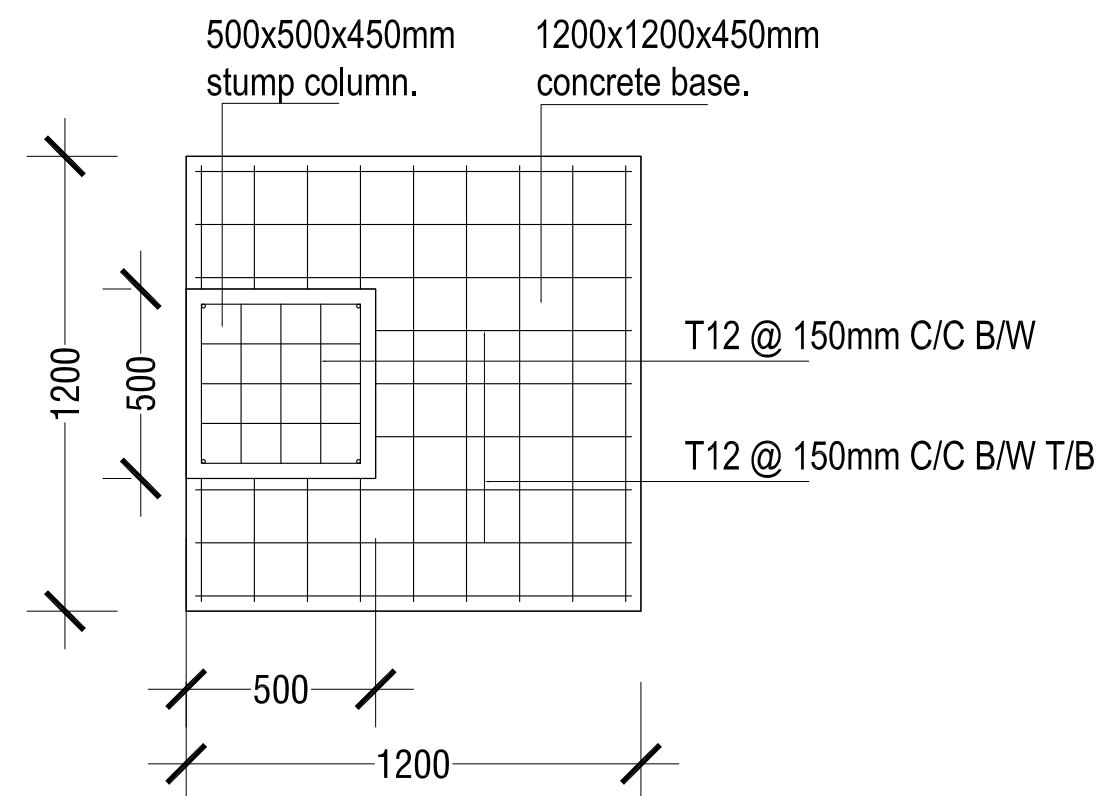
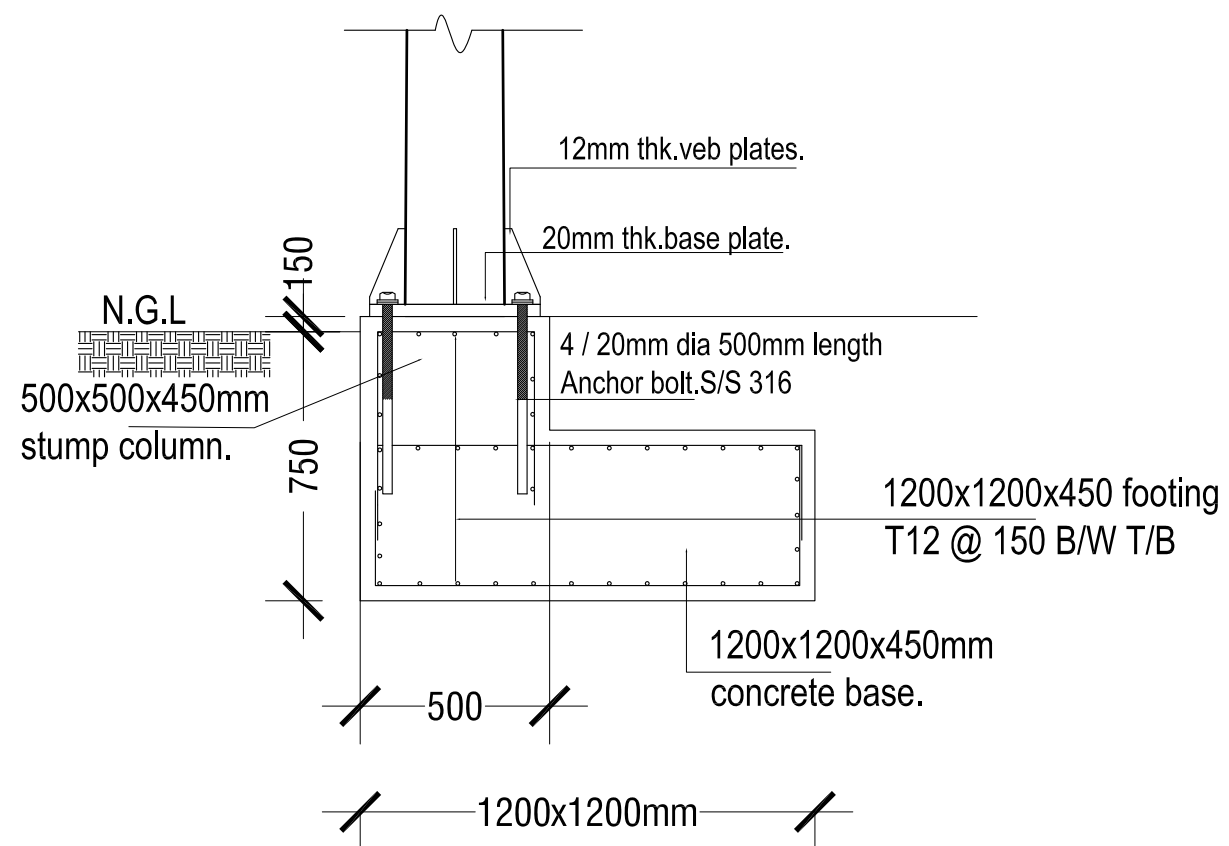
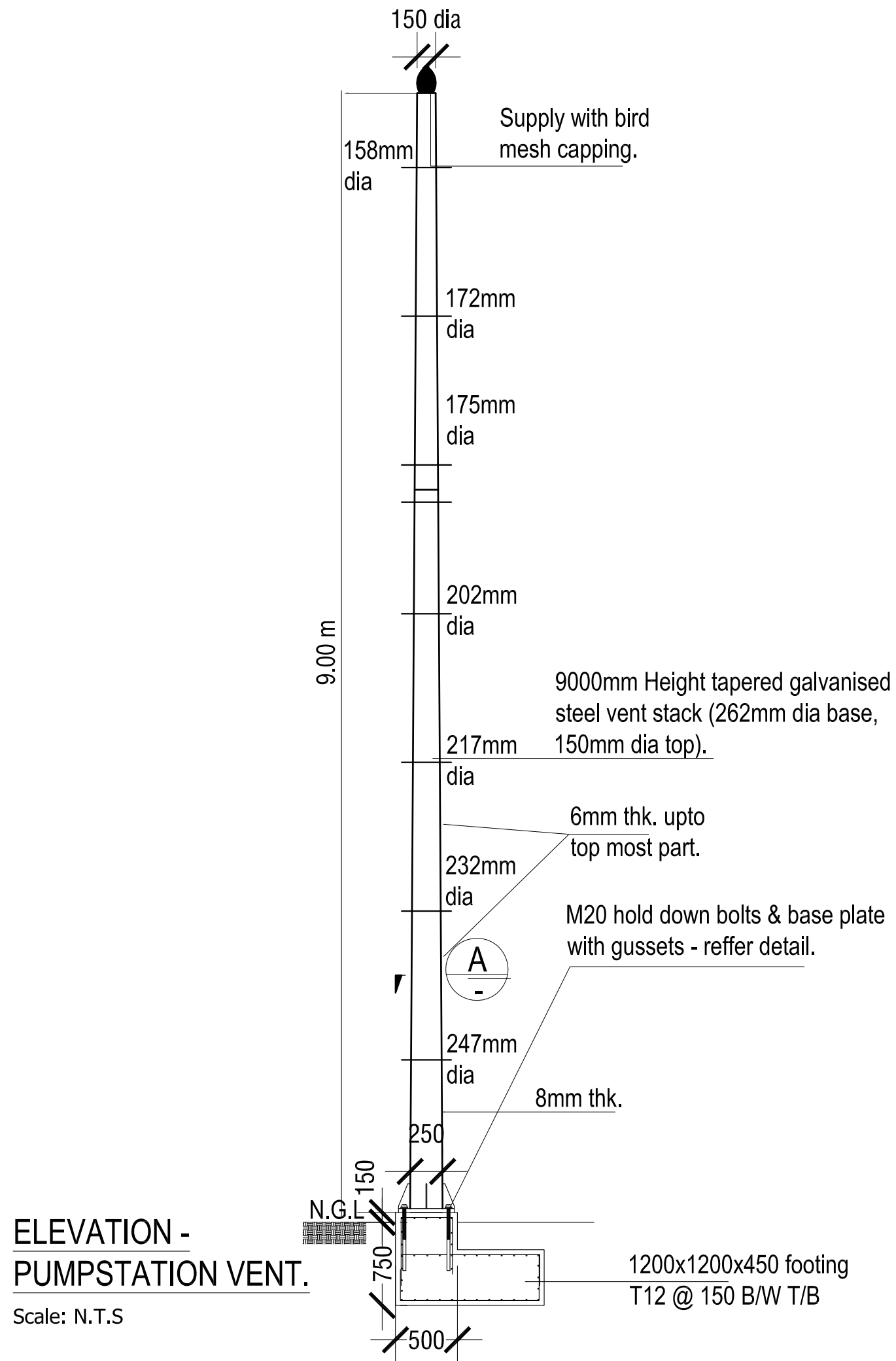
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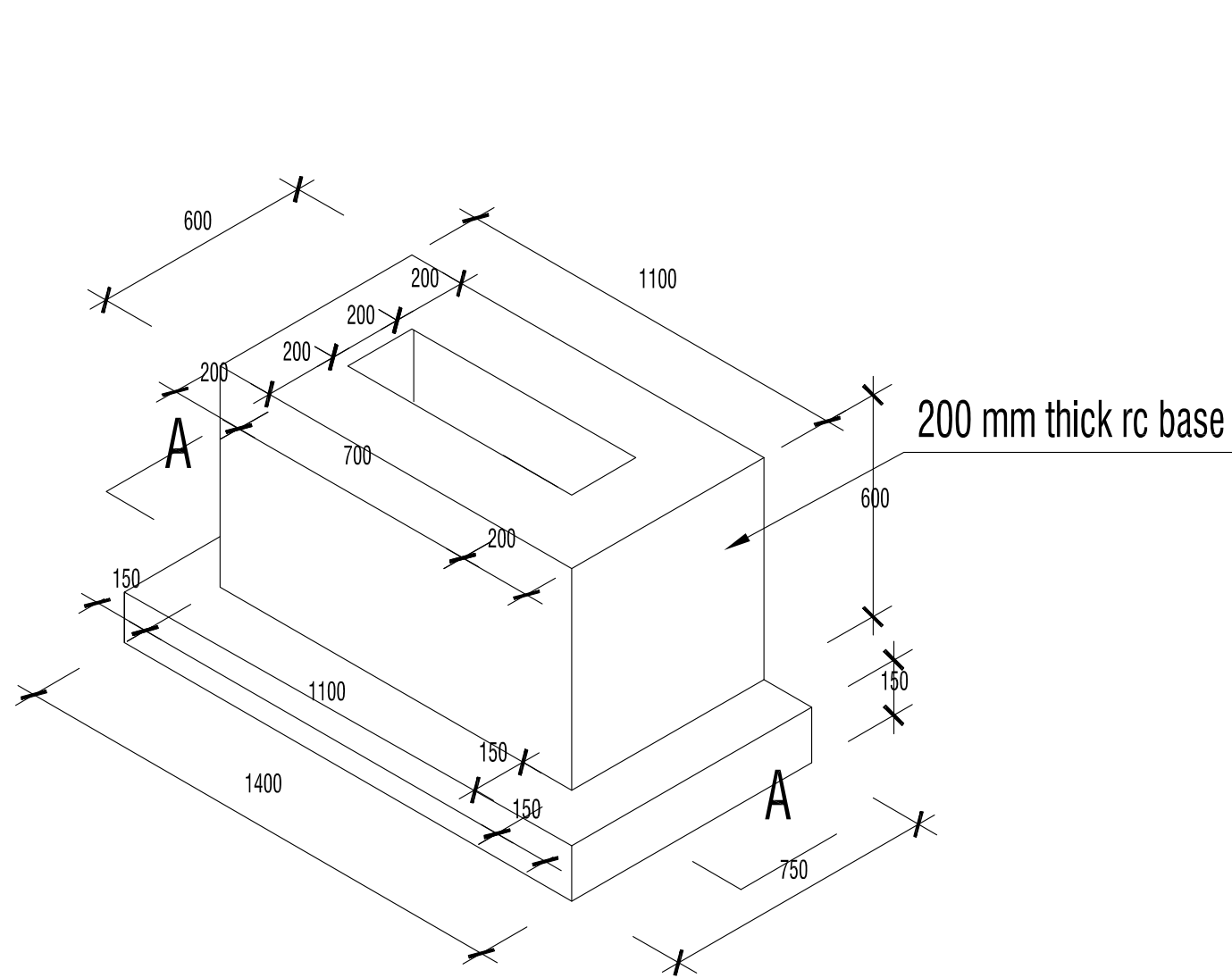
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Title: PUMP STATION
DETAIL

Page: NA - 07

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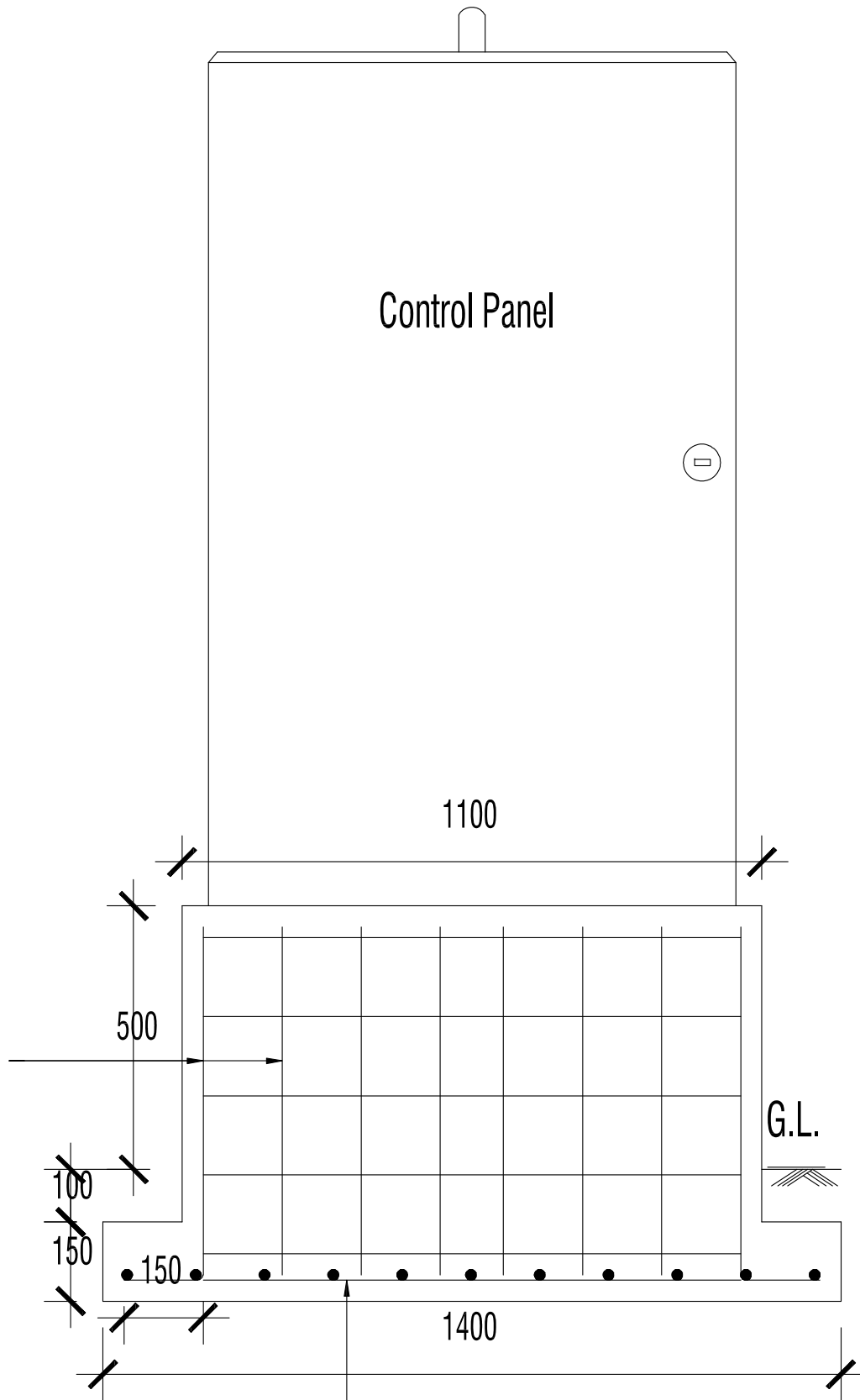




ISOMETRIC VIEW

Scale: N.T.S

T10 -150 B/W



T10 -150 B/W

SECTION A - A

Scale: N.T.S

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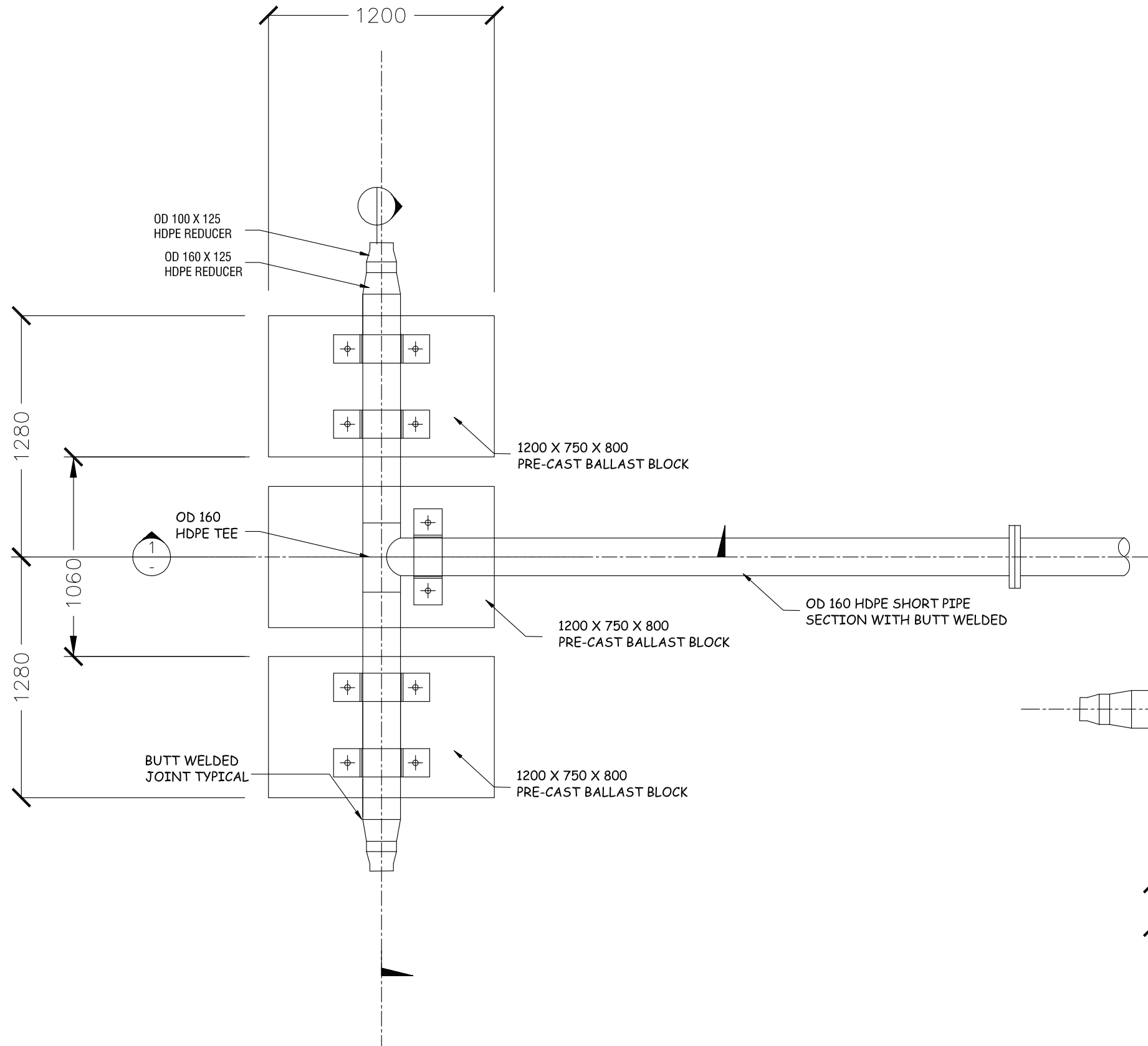


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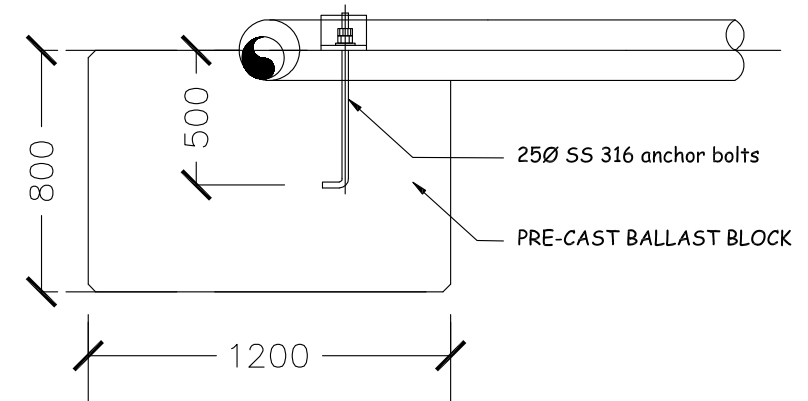
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Title: Control Panel Base
Section A-A
Page: NA - 09

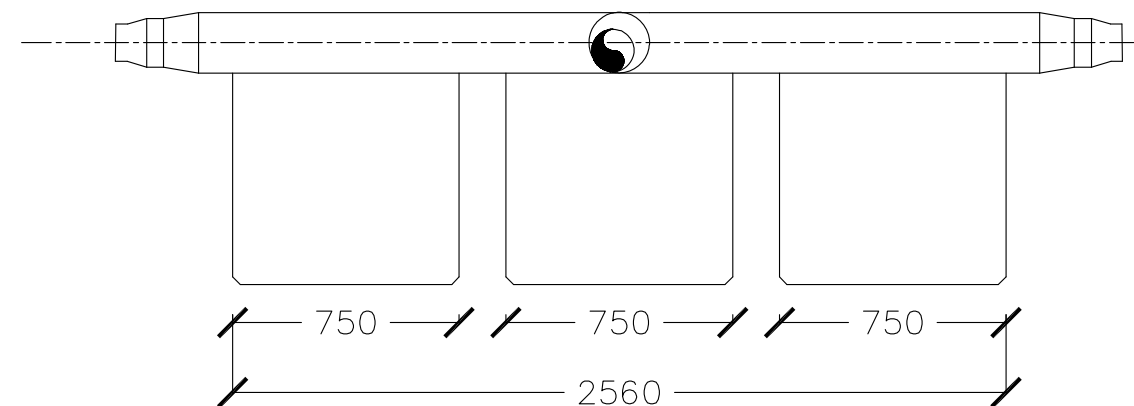
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PLAN – T-HEAD DIFFUSER
Scale: N.T.S



SECTION – T-HEAD DIFFUSER
Scale: N.T.S



SECTION – T-HEAD DIFFUSER

- NOTES:
1. ALL BACKING RINGS FOR STUB FLANGES, NUTS AND BOLTS SHALL BE GRADE 316 STAINLESS STEEL.
 2. ALL PIPEWORK SHALL BE BEDDED ON 10MM THICK NEOPRENE RUBBER SEAT IN SEMICIRCULAR RECESS MATCHING THE O.D OF THE PIPE.
 3. FABRICATE SPECIFIC PIPE CLAMPS TO PROVIDE FIRM CLAMPING ACTION ACCORDING TO PIPE O.D .

CONSULTANCY SERVICES FOR SURVEY , DESIGN & SUPERVISION
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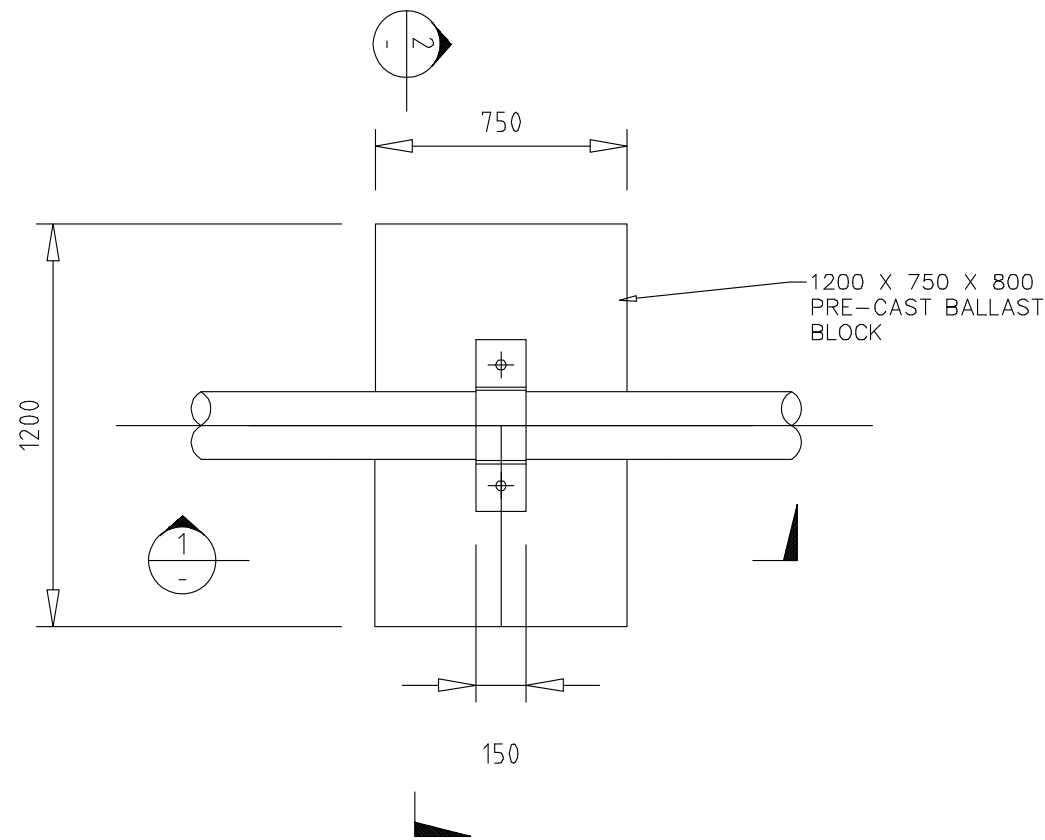
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Title: T-Head Diffuser
Plan & Section

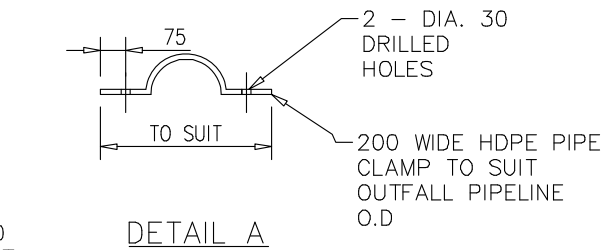
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PLAN PRE-CAST BALLAST BLOCK

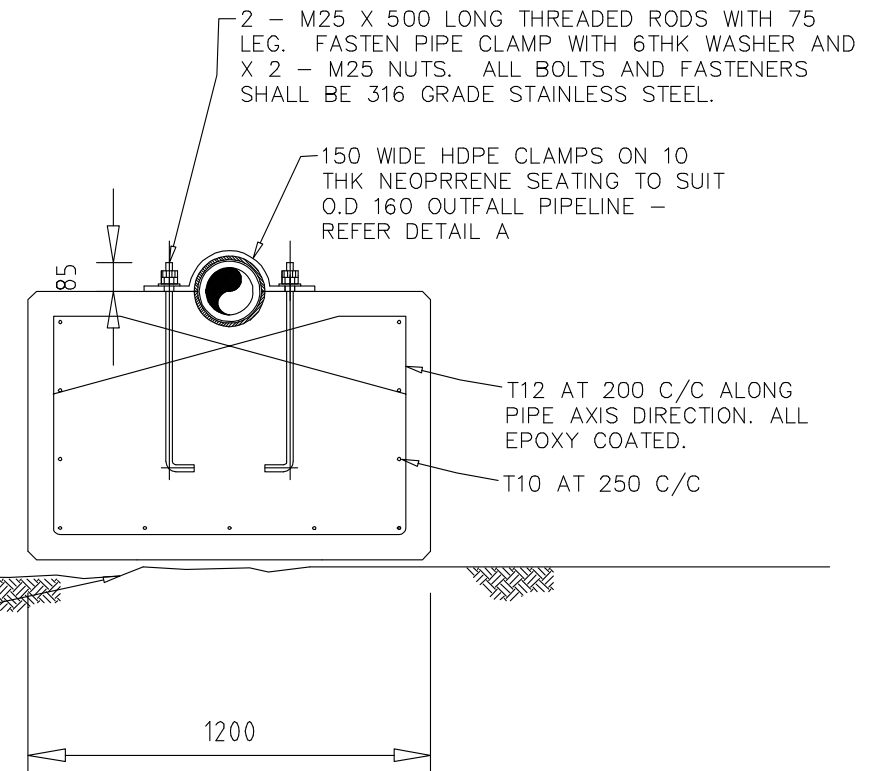
Scale: N.T.S



DETAIL A

PRE-CAST BALLAST BLOCK

PREPARE SEABED PRIOR TO PLACEMENT OF BALLAST BLOCKS MAX. +/- 25MM AMPLITUDE

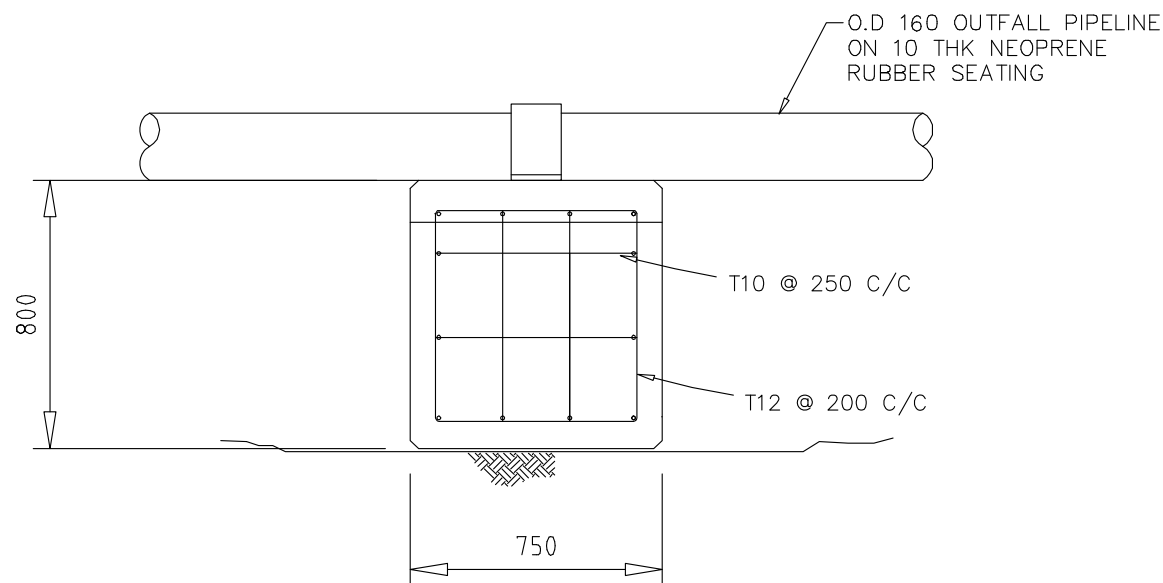


SECTION - PRE-CAST BALLAST BLOCK ASSEMBLY

Scale: N.T.S

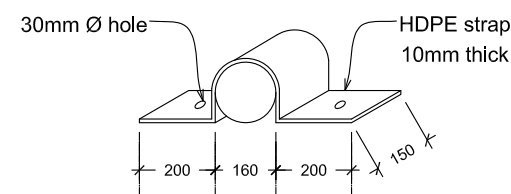
NOTES:

1. MIN 75MM COVER TO ALL REINFORCEMENT BARS.
2. ALL REINFORCEMENT SHALL BE EPOXY COATED PRIOR TO PLACEMENT OF CONCRETE.
3. PRE-CAST BALLAST BLOCKS SHALL BE FABRICATED WITH N40 / 20 CONCRETE.

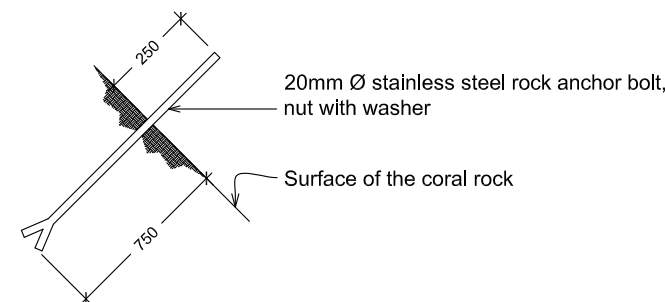


ELEVATION

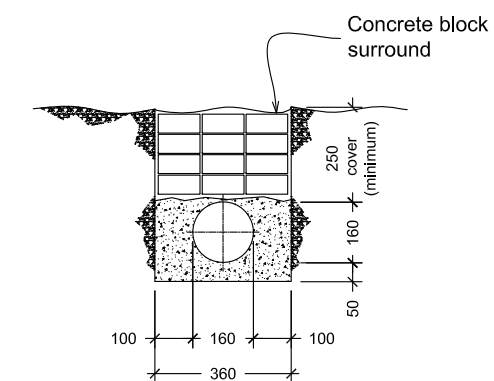
Scale: N.T.S



Straps at every one metre
DETAIL OF FIXING PIPE ON REEF FACE



ANCHOR BOLT DETAIL FOR FIXING OUTFALL PIPE ON STEEP REEF SLOPES

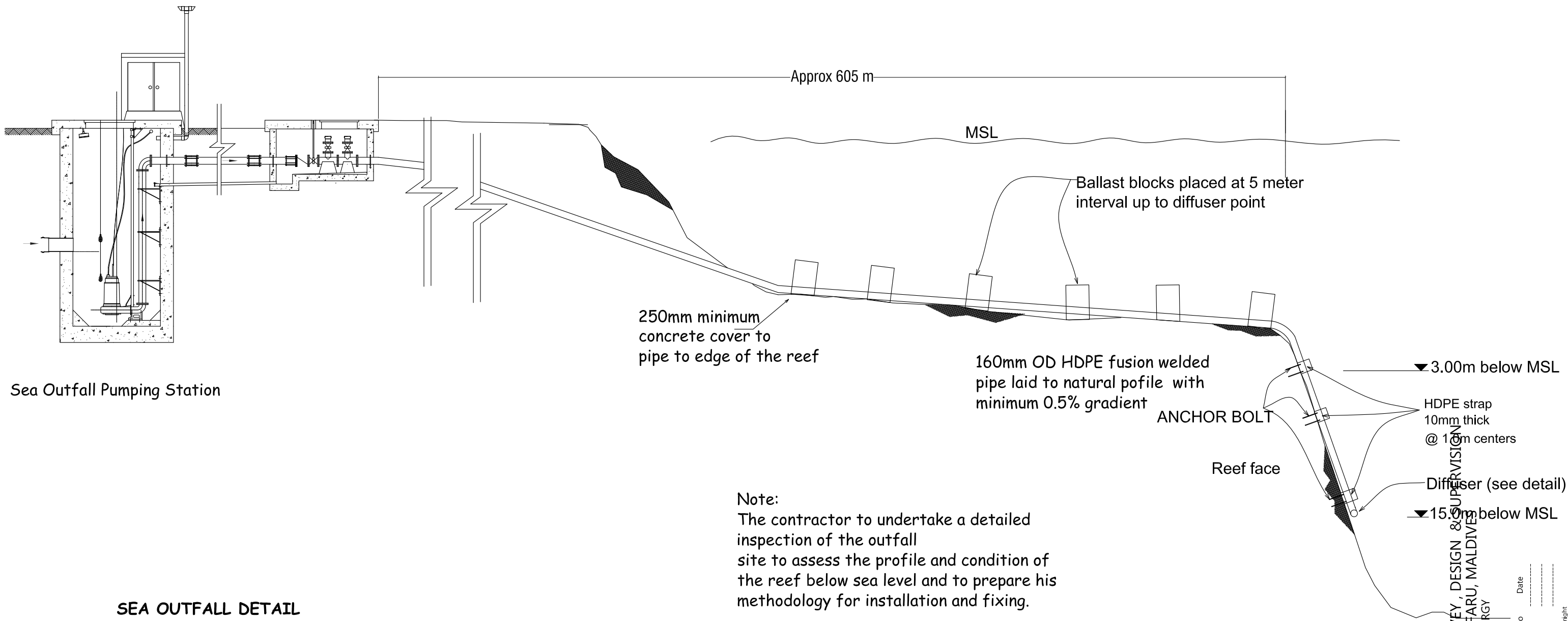


BURIED SECTION DETAIL

SEA OUTFALL FIXING DETAIL

Scale: N.T.S





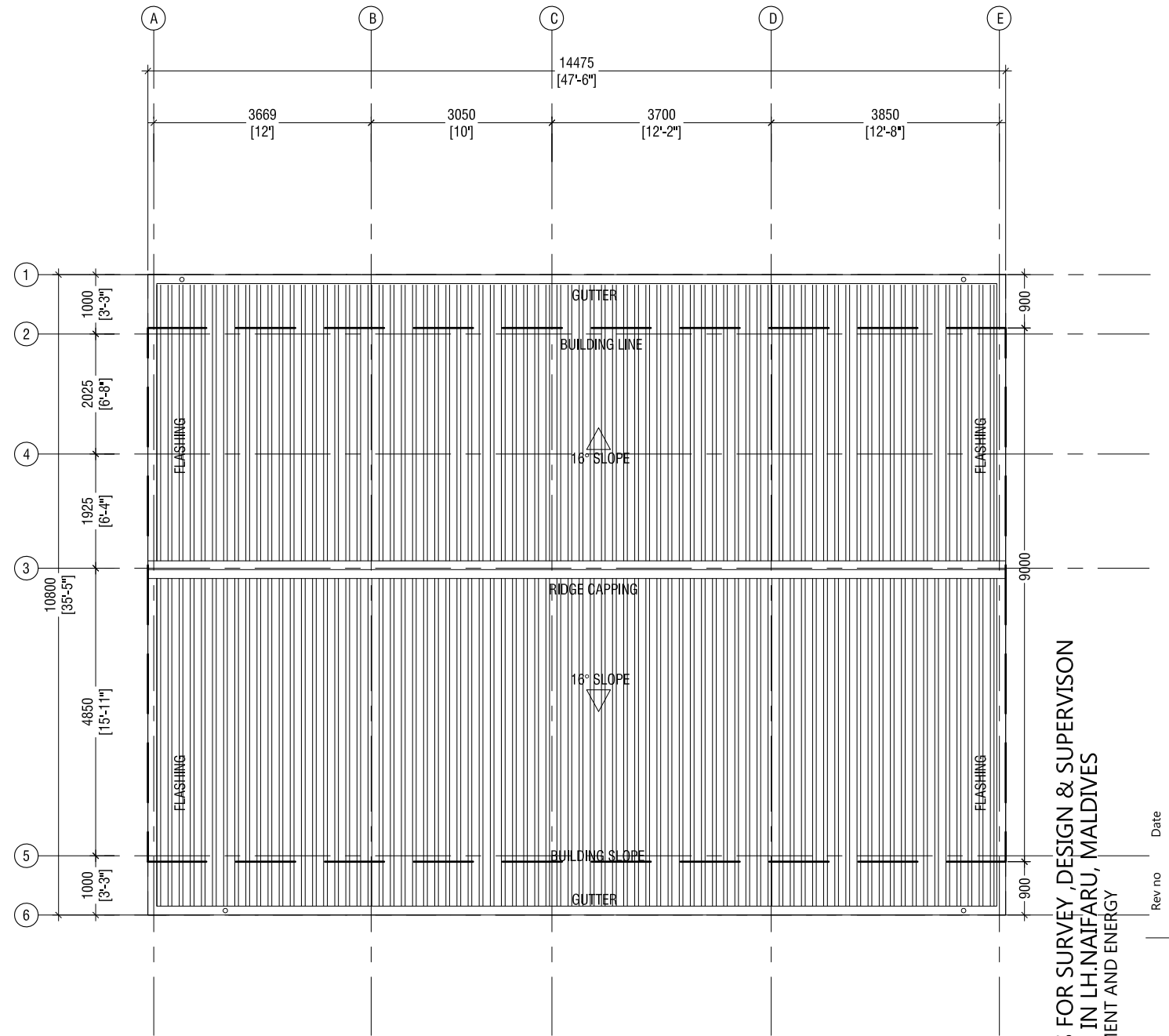
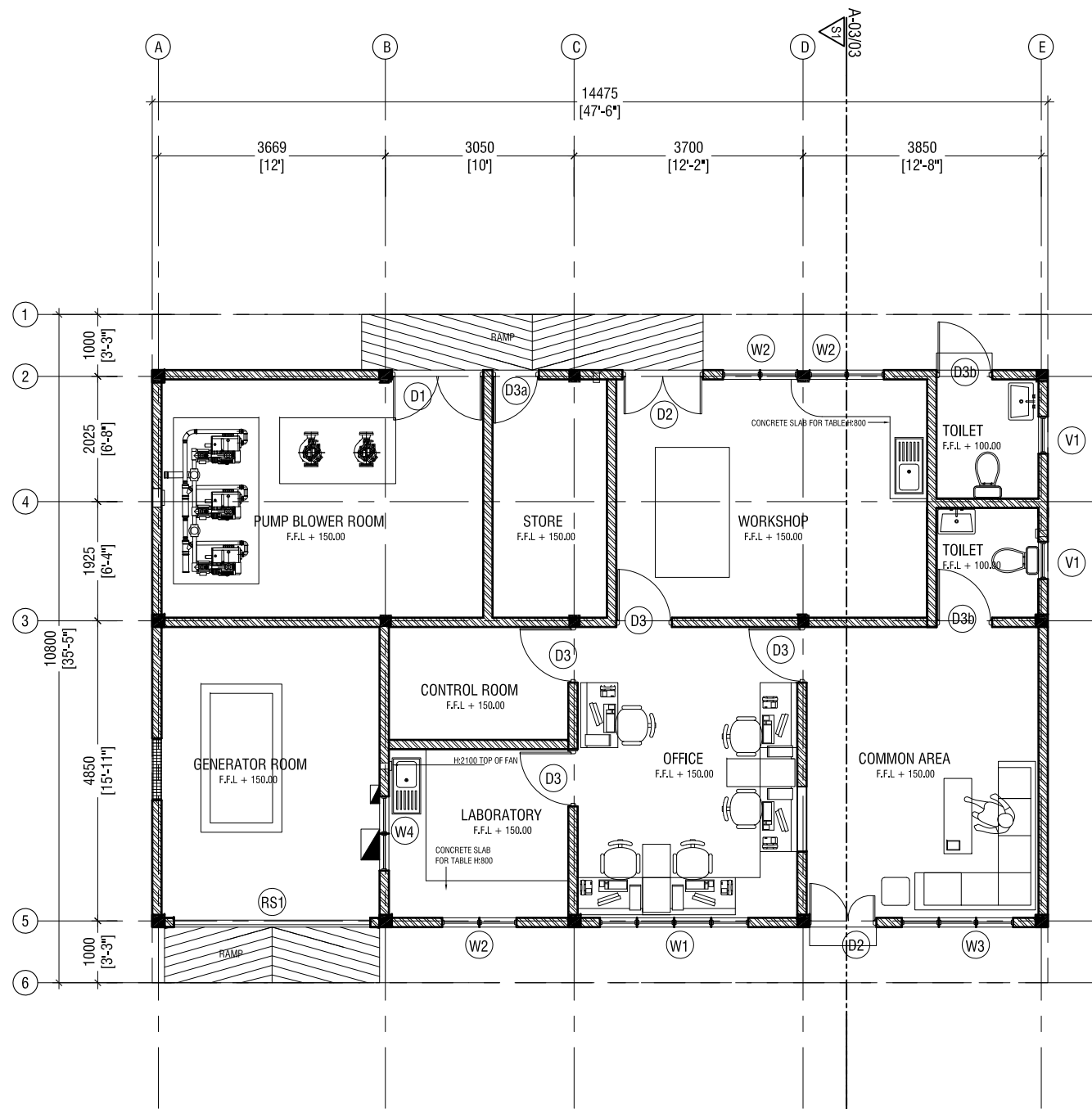
Sea Outfall Pumping Station

SEA OUTFALL DETAIL

Scale: N.T.S

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DRAWN BY: - Mohamed Saif Saeed

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1	2016-09-01
2	2016-09-01
3	2016-09-01



GROUND FLOOR PLAN

SCALE 1:100



ROOF PLAN

SCALE 1:100



CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
OF SEWERAGE FACILITIES IN LH.NAIFARU, MALDIVES
CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY

PROJECT NUMBER: -
DATE: SEPTEMBER 2016
ENGINEER: - Insan Waneed
CHECKED BY: - Insan Waneed
DRAWN BY: - Mariyam Irasha Shareef

Rev no Date

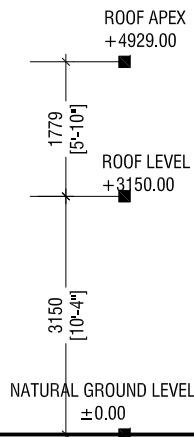
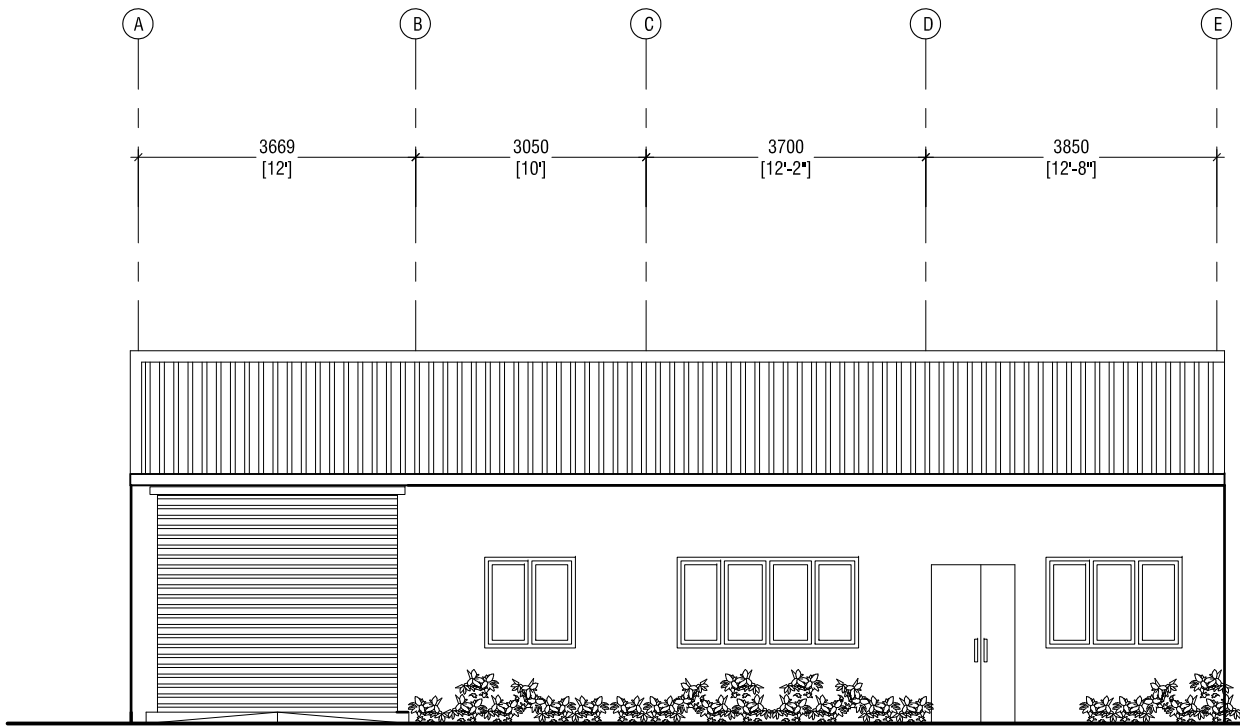
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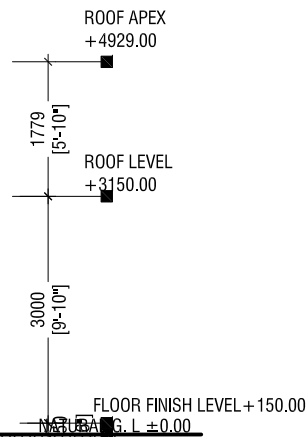
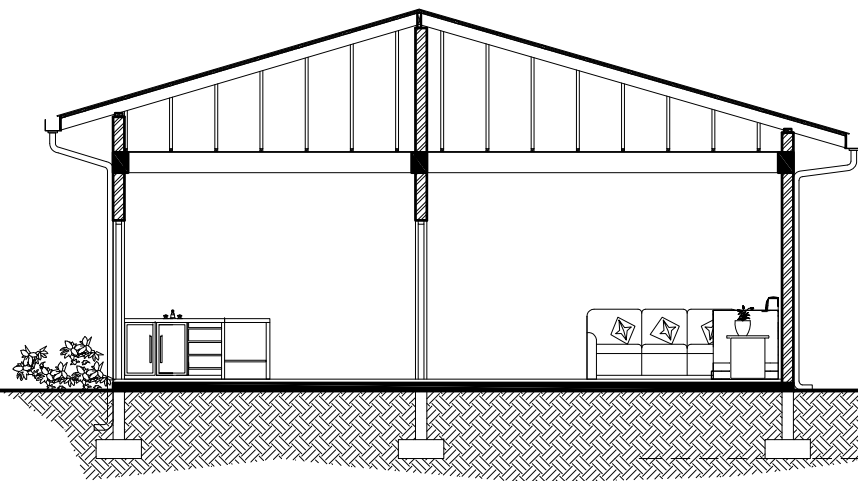
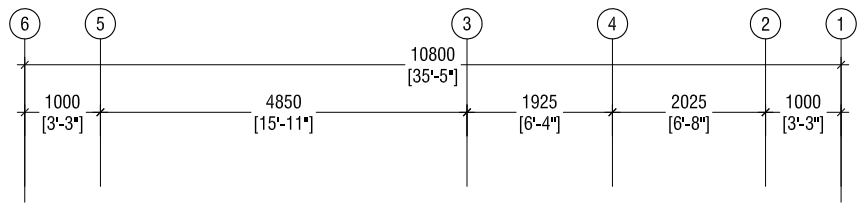
Title: ADMIN BUILDING GROUND
FLOOR PLAN & ROOF PLAN

Page: NA - 13

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ELEVATION E1
SCALE 1:100

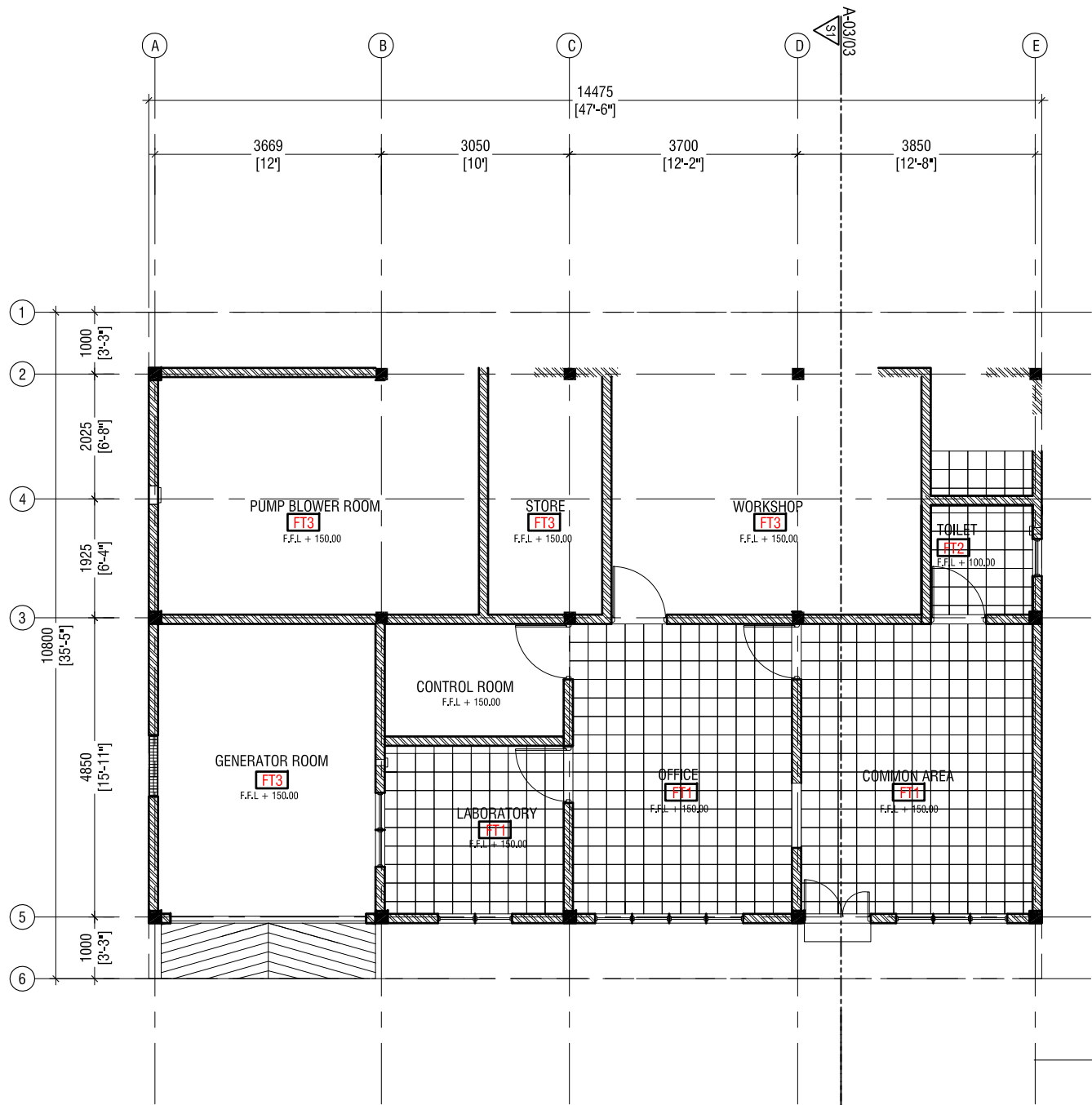


SECTION S1 - S1
SCALE 1:100



CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
OF SEWERAGE FACILITIES IN LH.NAIFARU, MALDIVES
CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY
PROJECT NUMBER: -
DATE: SEPTEMBER 2016
ENGINEER: :- Ihsan Wáneed
CHECKED BY: :- Ihsan Wáneed
DRAWN BY: :- Mariyam Irasha Shareef

Rev no	Date



GROUND FLOOR FINISHES PLAN

SCALE 1:100

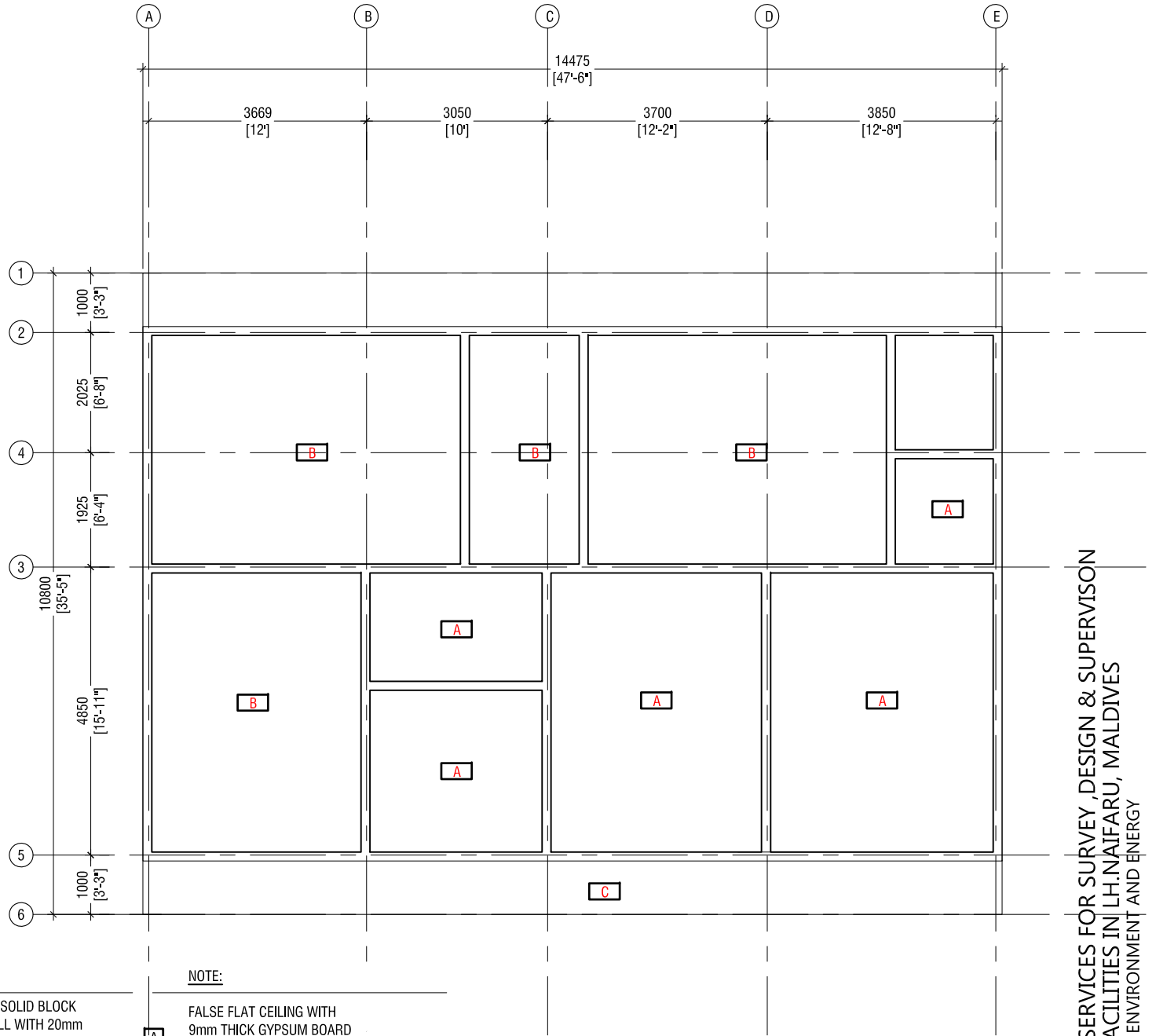


NOTE:
150mm THICK SOLID BLOCK
MASONRY WALL WITH 20mm
PLASTERING ON EXTERIOR
16mm PLASTERING ON INTERIOR
WITH WHITE EMULSION PAINT ON
BOTH SIDES

FT1 — **TILE FINISH**
300x300 CERAMIC TILES

FT2 — **TILE FINISH**
300x300 CERAMIC NON SLIP TILES

FT3 — **CONCRETE FINISH**
EPOXY FLOOR PAINT



NOTE:
FALSE FLAT CEILING WITH
9mm THICK GYPSUM BOARD
UNDER 50X38mm TIMBER FRAMING
WITH EMULSION PAINT FINISH

B — ALL EXPOSED WOODEN ROOF
MEMBERS COVERED WITH PVC NET

C — 06mm CEMENT BOARD EAVE CEILING WITH
EXTERIOR PAINT

REFLECTED CEILING PLAN

SCALE 1:100



CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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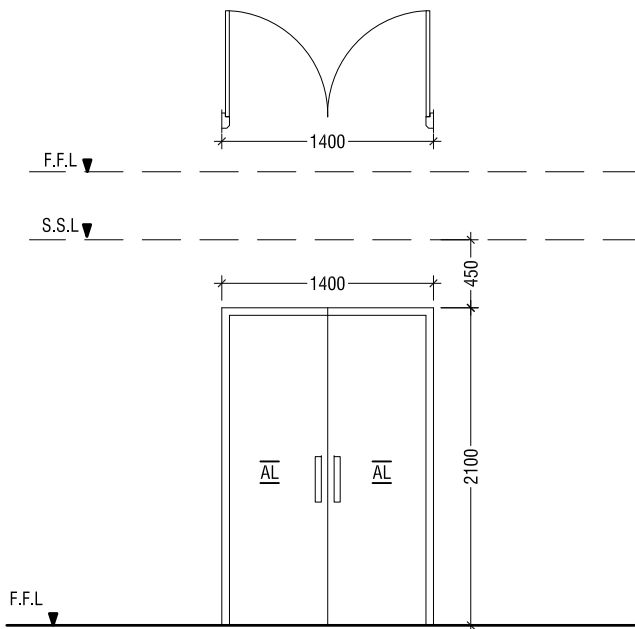
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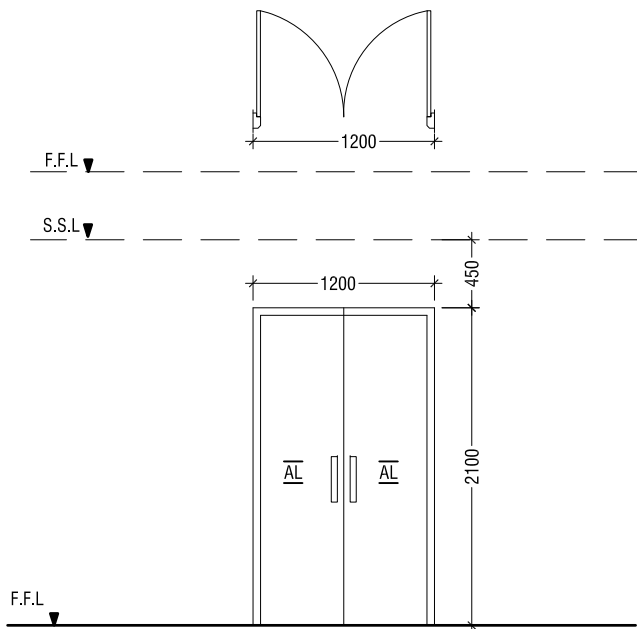
ADMIN BUILDING FINISHES
Title: AND CEILING

Page: NA - 15

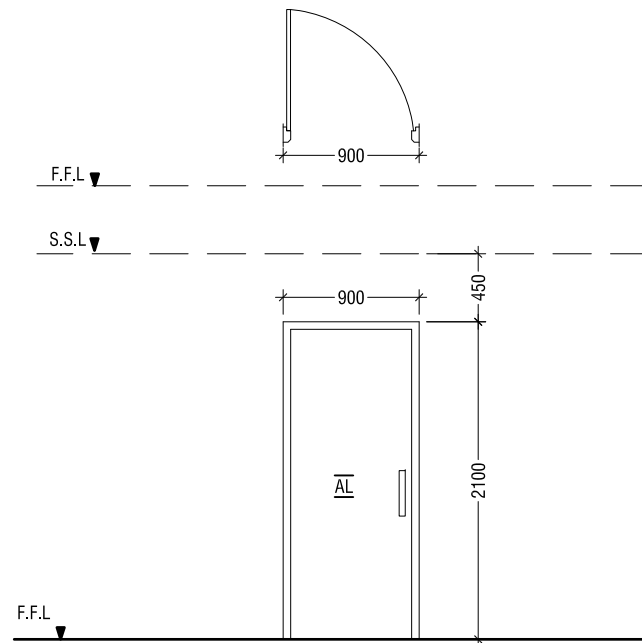
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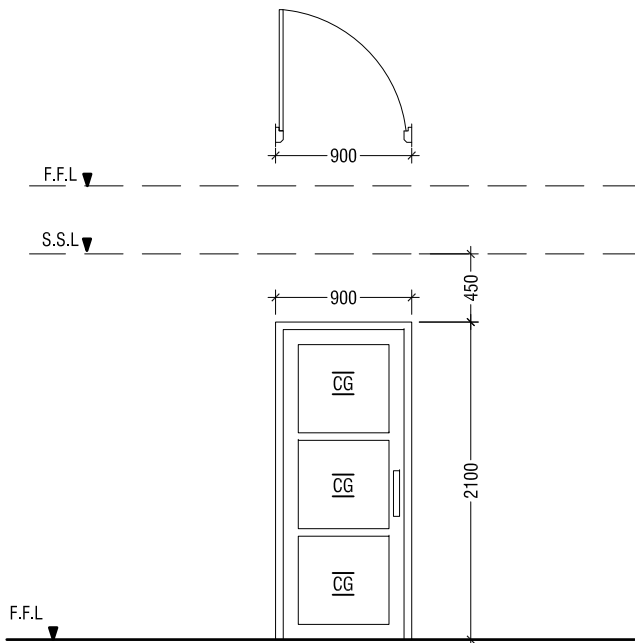
D1	SWING TYPE DOOR
REMARKS	AL FRAMED DOORS WITH AL PANELS
LOCATION	PUMP BLOWER ROOM
QUANTITY	01 NOS
OPEN AREA	2.6 SQM.



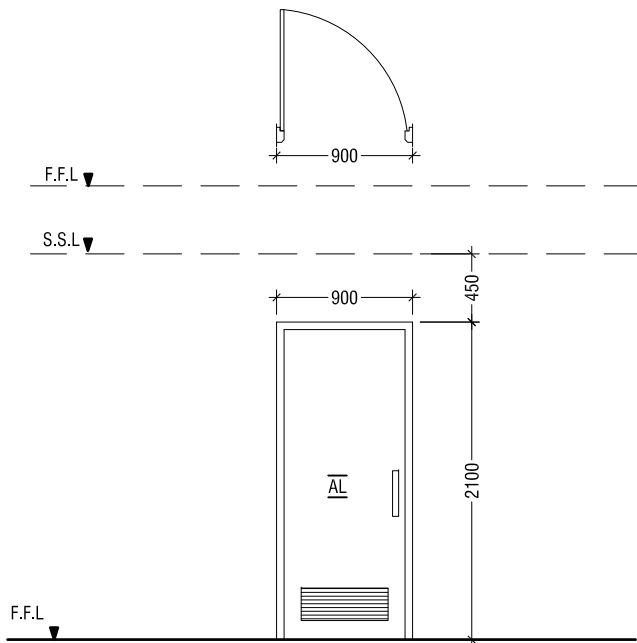
D2	SWING TYPE DOOR
REMARKS	AL FRAMED DOORS WITH AL PANELS
LOCATION	WORKSHOP & COMMON AREA ENTRANCE
QUANTITY	02 NOS
OPEN AREA	2.2 SQM.



D3	SWING TYPE DOOR
REMARKS	AL FRAMED DOORS WITH AL PANELS
LOCATION	PUMP BLOWER ROOM
QUANTITY	01 NOS
OPEN AREA	1.72 SQM.



D3a	SWING TYPE DOOR
REMARKS	AL FRAMED DOORS WITH AL PANELS
LOCATION	PUMP BLOWER ROOM
QUANTITY	01 NOS
OPEN AREA	1.64 SQM.



D3b	SWING TYPE DOOR
REMARKS	AL FRAMED DOORS WITH AL PANELS AND LOUVERS
LOCATION	TOILETS
QUANTITY	02 NOS
OPEN AREA	1.64 SQM.

DOORS & WINDOWS SCHEDULE 01

SCALE 1:50



LEGEND:-
ST - SOLID TIMBER
AL - ALUMINIUM LOUVERS
FR-G - FROSTED GLASS
RG - REFLECTIVE GLASS
FRG - FIXED REFLECTIVE GLASS

NOTE:-
-ALL DOORS & WINDOWS TO BE CHECKED ON SITE BEFORE FABRICATION.
-ALL DOOR & WINDOWS VIEWED FROM EXTERIOR, FOR DOOR SWING, REFER TO FLOOR PLANS.
-THE DOORS / WINDOWS WHICH DOES NOT TOUCH THE BEAM PLEASE PUT A LINTEL BEAM (LB) ABOVE THE DOOR / WINDOW.

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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ENGINEER: :- Ihsan Waleed
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DRAWN BY: :- Mariyam Irasha Shareef

Rev no

Date

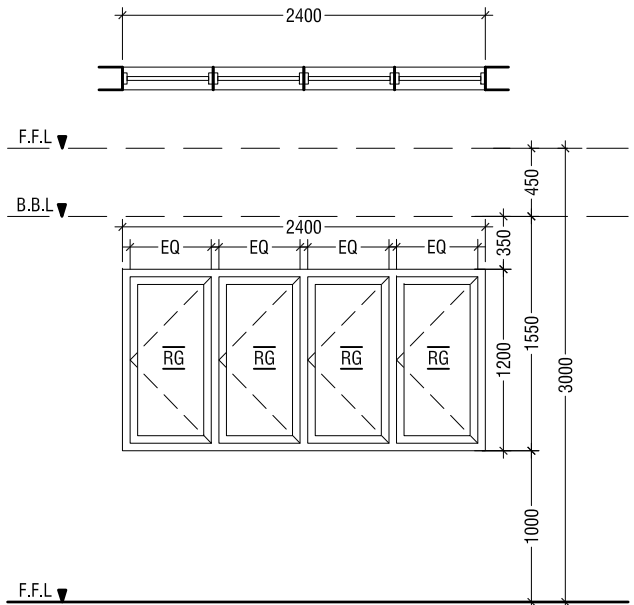
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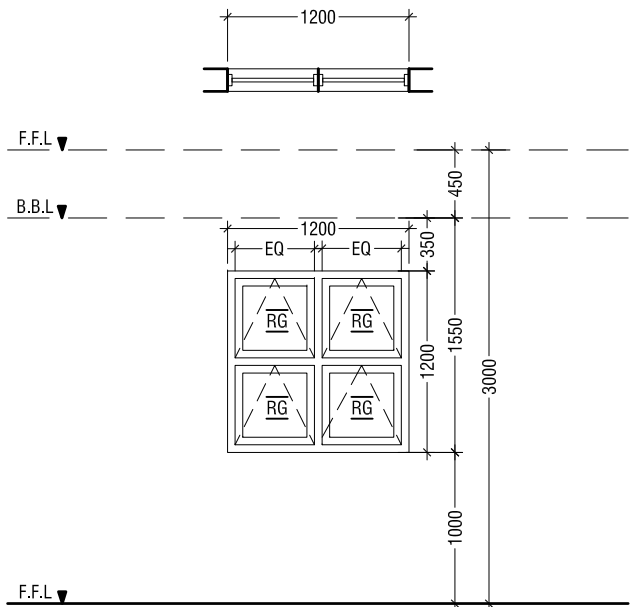
Title: DOOR & WINDOW
SCHEDULE 01

Page: NA - 16

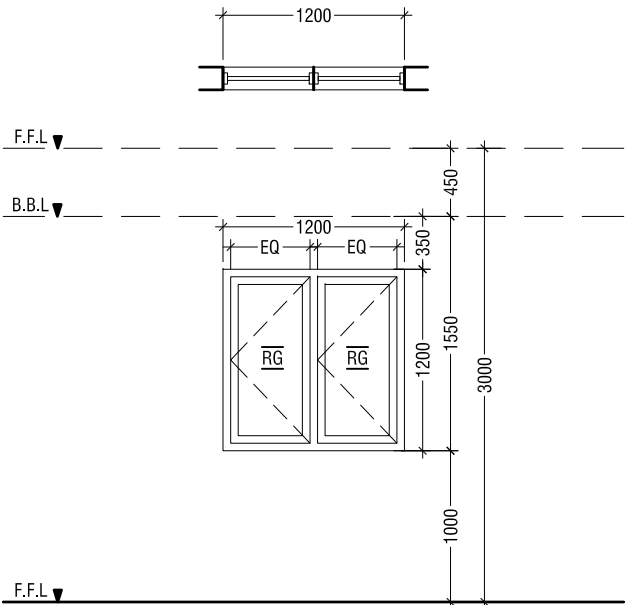
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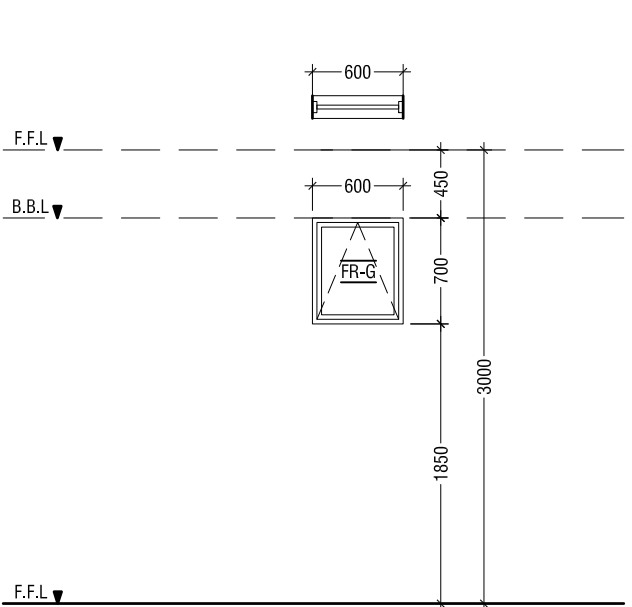
W1	SWING TYPE WINDOW
REMARKS	WHITE POWDER COATED ALUMINIUM DOOR WITH REFLECTIVE DOUBLE GLAZED GLASS PANELS
LOCATION	GROUND & THIRD FLOOR SITTING ROOM
QUANTITY	03 NOS
OPEN AREA	2.82 SQM.



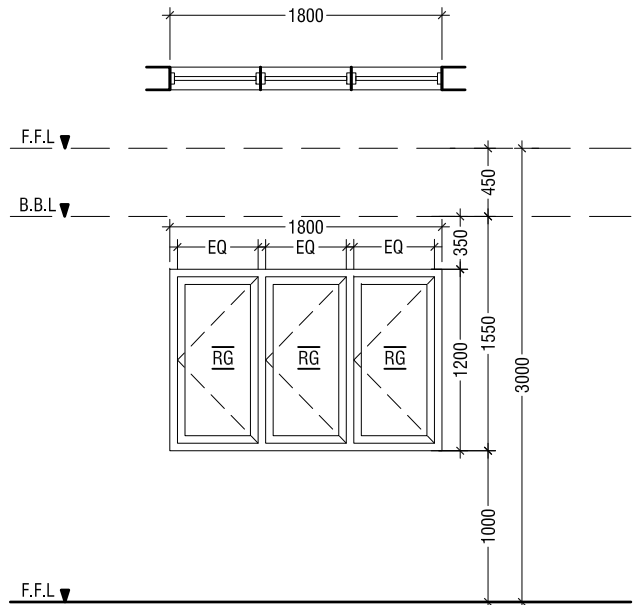
W2	CASEMENT TYPE WINDOW
REMARKS	WHITE POWDER COATED ALUMINIUM DOOR WITH REFLECTIVE DOUBLE GLAZED GLASS PANELS
LOCATION	GROUND & THIRD FLOOR SITTING ROOM
QUANTITY	03 NOS
OPEN AREA	2.82 SQM.



W2	SWING TYPE WINDOW
REMARKS	WHITE POWDER COATED ALUMINIUM DOOR WITH REFLECTIVE DOUBLE GLAZED GLASS PANELS
LOCATION	GROUND & THIRD FLOOR SITTING ROOM
QUANTITY	03 NOS
OPEN AREA	2.82 SQM.



V1	SWING TYPE WINDOW
REMARKS	WHITE POWDER COATED ALUMINIUM DOOR WITH REFLECTIVE DOUBLE GLAZED GLASS PANELS
LOCATION	GROUND & THIRD FLOOR SITTING ROOM
QUANTITY	03 NOS
OPEN AREA	2.82 SQM.



W3	SWING TYPE WINDOW
REMARKS	WHITE POWDER COATED ALUMINIUM DOOR WITH REFLECTIVE DOUBLE GLAZED GLASS PANELS
LOCATION	GROUND & THIRD FLOOR SITTING ROOM
QUANTITY	03 NOS
OPEN AREA	2.82 SQM.

DOORS & WINDOWS SCHEDULE 02



LEGEND:-
AL - ALUMINIUM LOUVERS
FR-G - FROSTED GLASS
RG - REFLECTIVE GLASS
FRG - FIXED REFLECTIVE GLASS

NOTE:-
-ALL DOORS & WINDOWS TO BE CHECKED ON SITE BEFORE FABRICATION.
-ALL DOOR & WINDOWS VIEWED FROM EXTERIOR, FOR DOOR SWING, REFER TO FLOOR PLANS.
-THE DOORS / WINDOWS WHICH DOES NOT TOUCH THE BEAM PLEASE PUT A LINTEL BEAM (LB) ABOVE THE DOOR / WINDOW.

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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CHECKED BY:- Insan Waleed

DRAWN BY:- Mariyam Irasha Shareef

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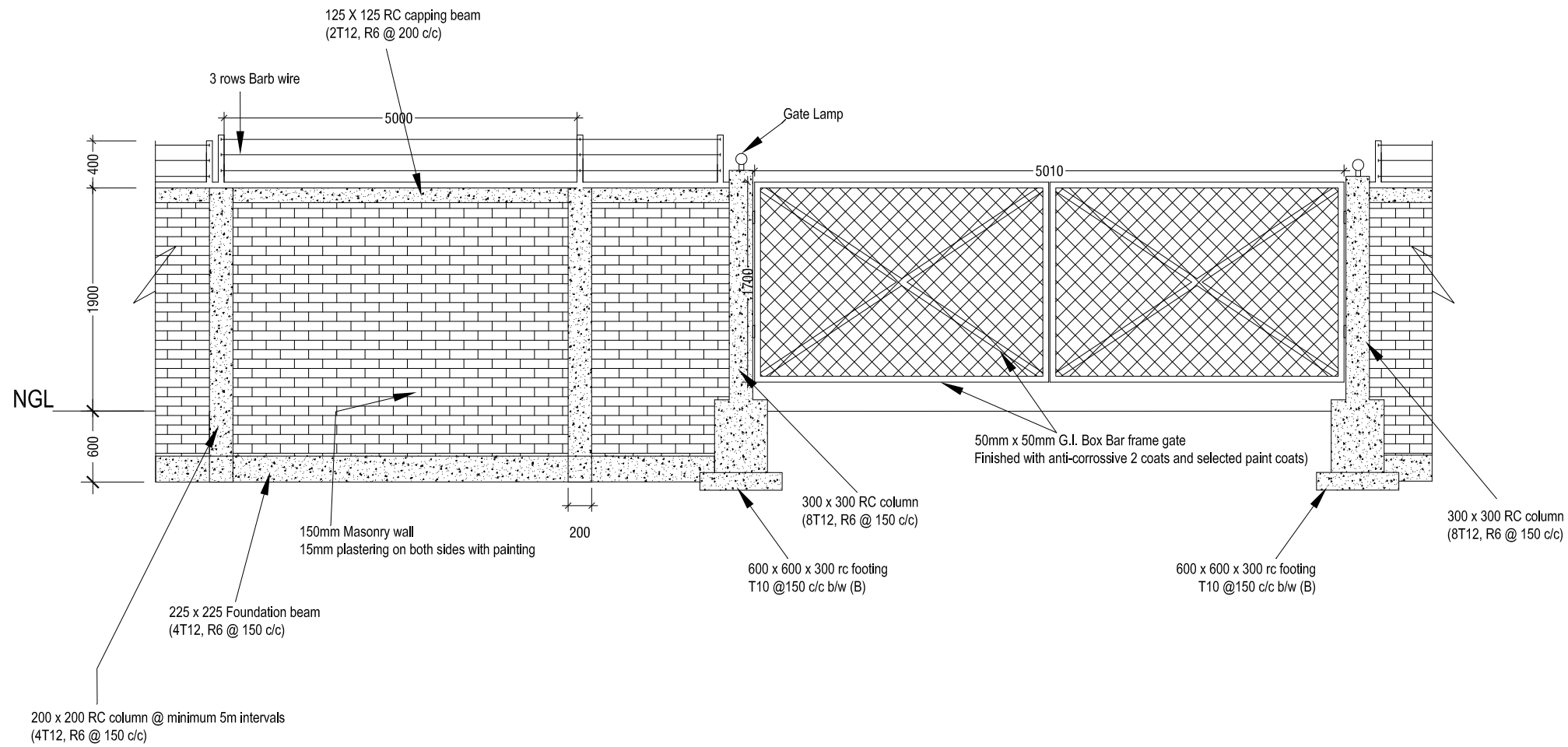
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Title: DOOR & WINDOW
SCHEDULE 02

Page: NA - 17

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BOUNDARY WALL & GATE DETAIL

SCALE 1:50

0 0.25 0.5 1 1.5 2 2.5

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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DATE: SEPTEMBER 2016

ENGINEER:- Ihsan Wáheed

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DRAWN BY:- Mariyam Irasha Shareef

Rev no

Date



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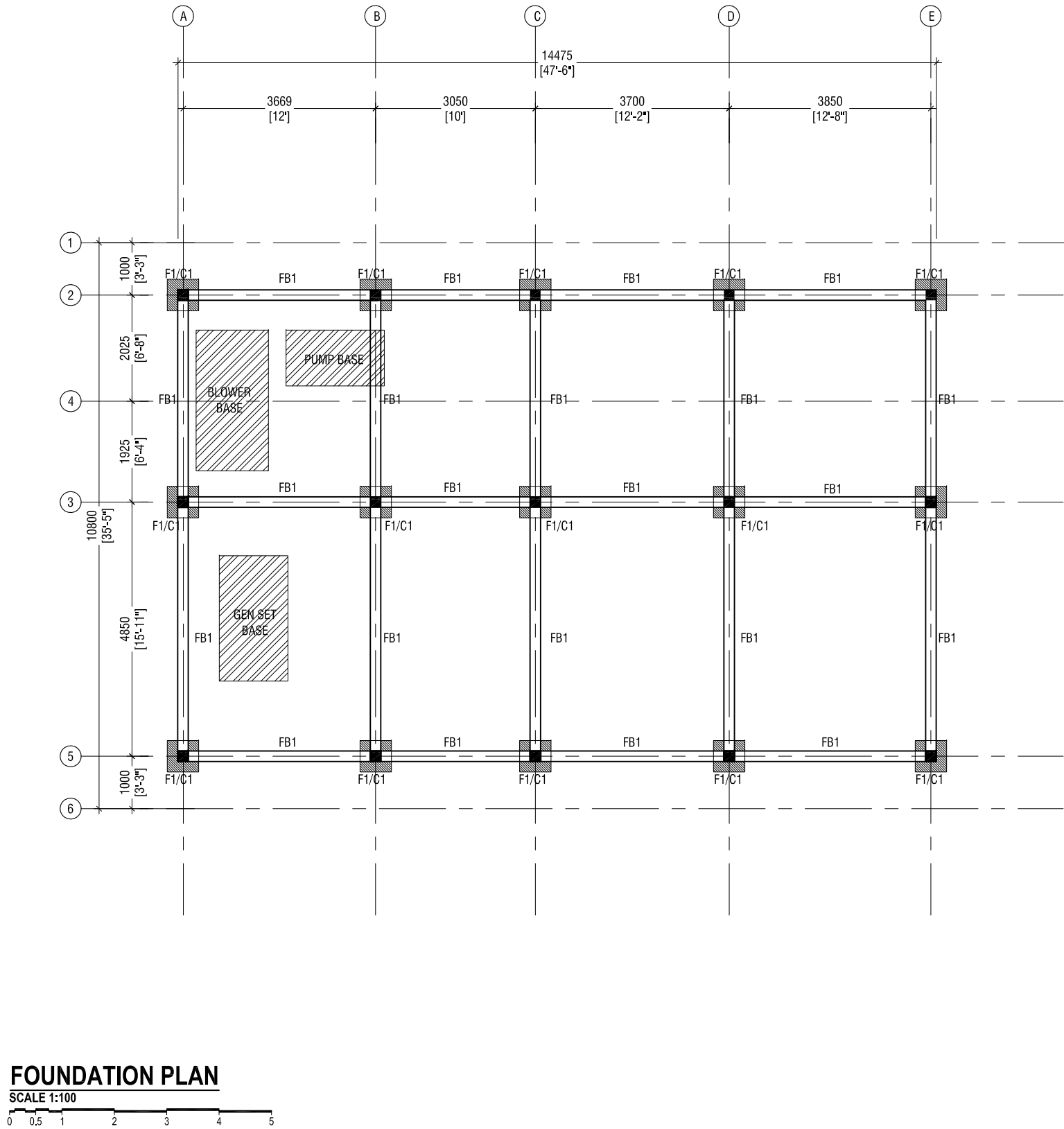
ADMIN BUILDING

Title: BOUNDARY WALL &

GATE DETAIL

Page: NA - 18

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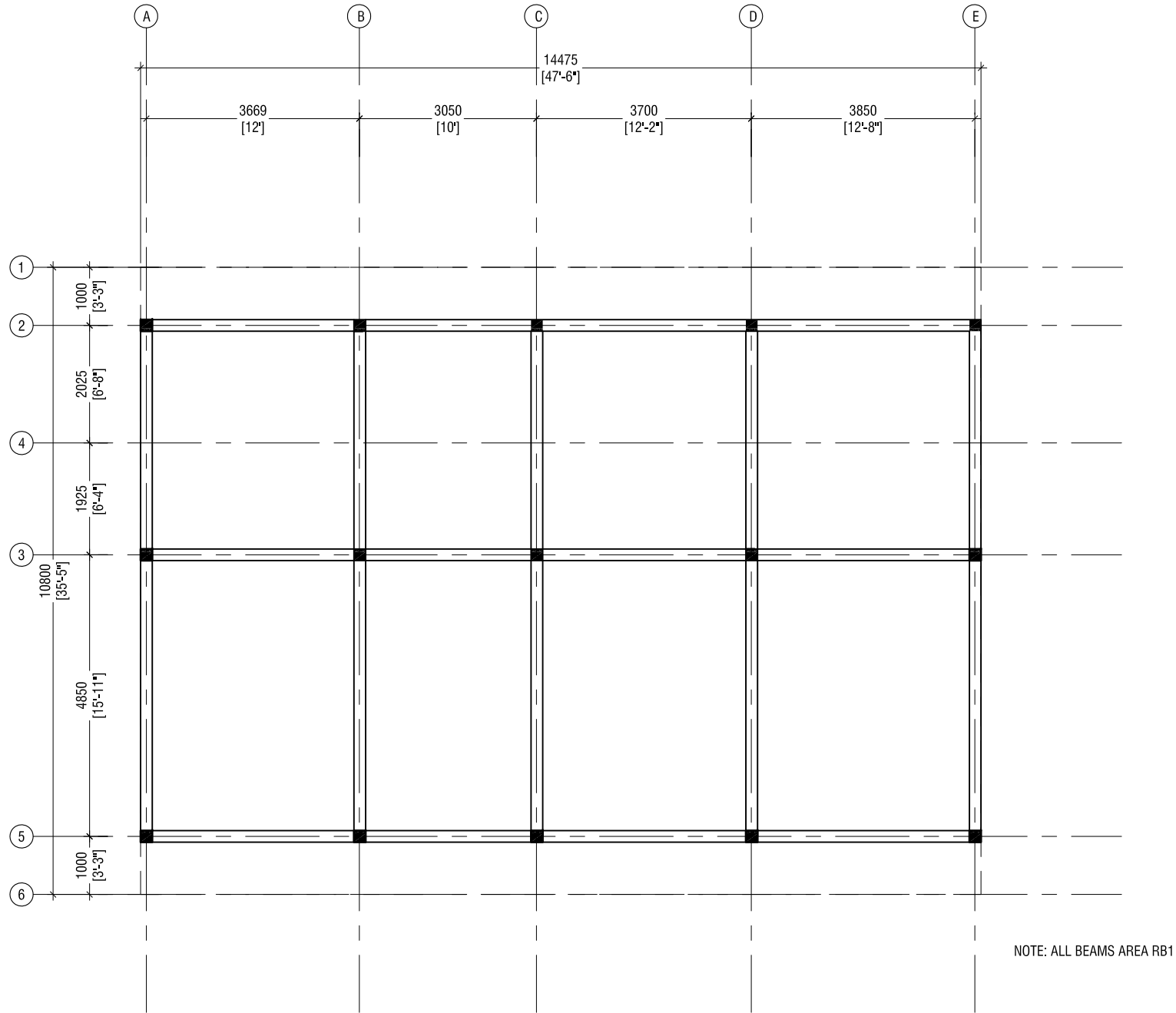


FOUNDATION PLAN
SCALE 1:100

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
OF SEWERAGE FACILITIES IN LH.NAIFARU, MALDIVES
CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY

PROJECT NUMBER:-	Rev no	Date
DATE: SEPTEMBER 2016	1	11/09/2016
ENGINEER:- Ihsan Waneed	2	11/09/2016
CHECKED BY:- Ihsan Waneed	3	11/09/2016
DRAWN BY:- Mariyam Irasha Shareef	4	11/09/2016

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ROOF BEAM PLAN

SCALE 1:100



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Title: ADMIN BUILDING ROOF
BEAM

Page: NA - 20

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
OF SEWERAGE FACILITIES IN LH.NAIFARU, MALDIVES

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PROJECT NUMBER:-

DATE: SEPTEMBER 2016

ENGINEER:- Ihsan Waaheed

CHECKED BY:- Ihsan Waaheed

DRAWN BY:- Mariyam Irasha Shareef

Rev no

Date

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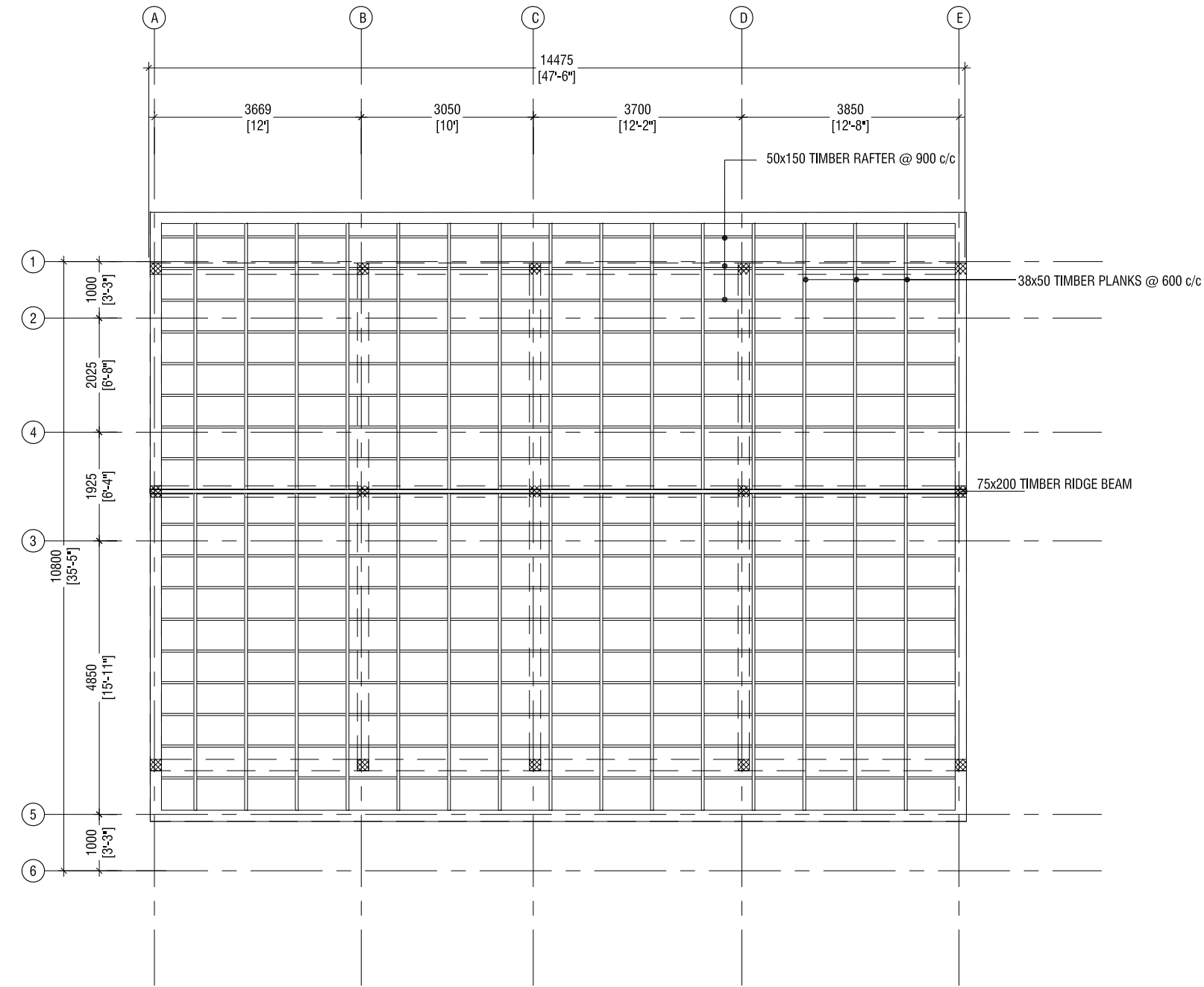
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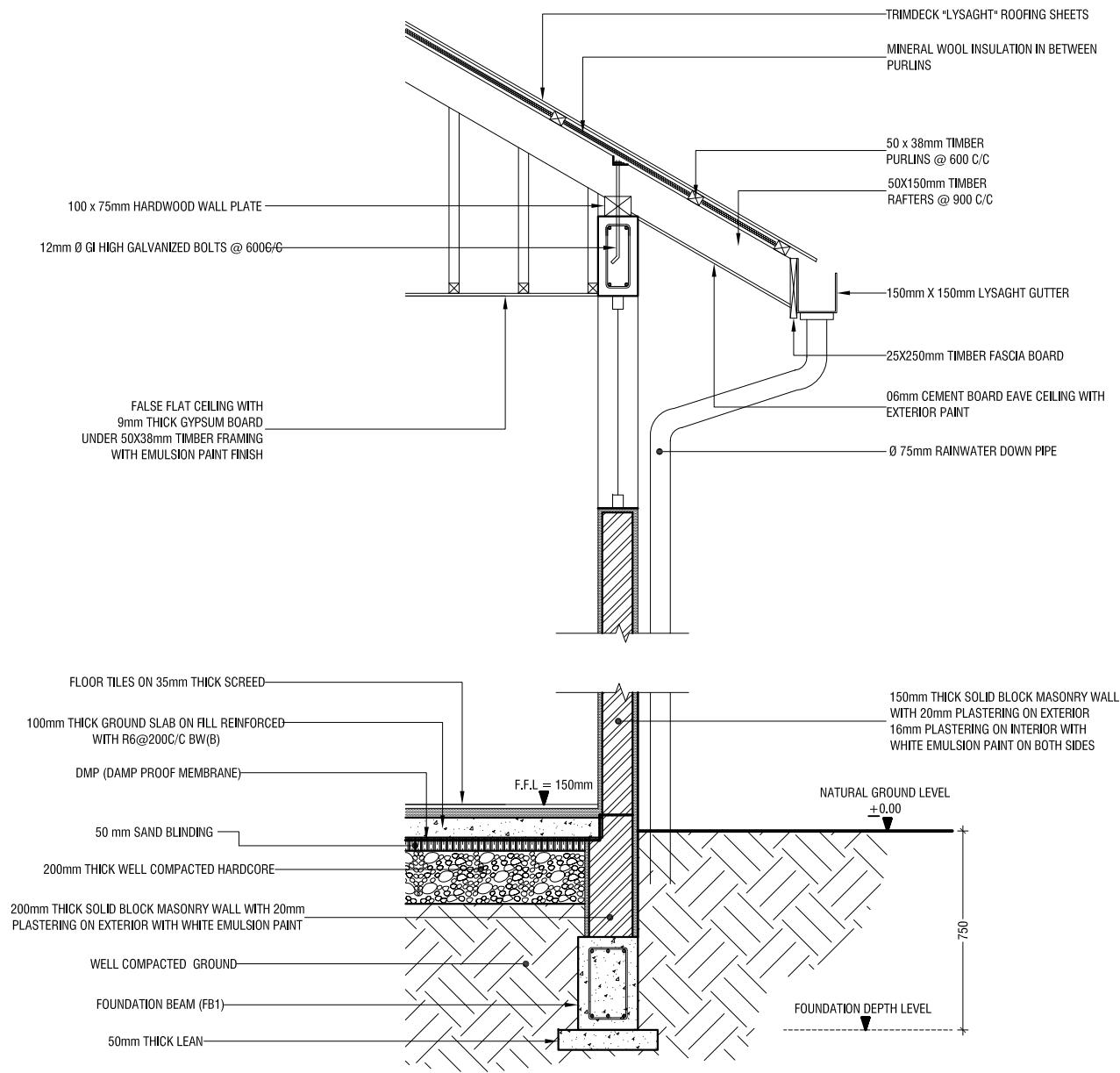
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ROOF FRAMING PLAN
SCALE 1:100

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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PROJECT NUMBER :-	Rev no	Date
DATE: SEPTEMBER 2016	--	-----
ENGINEER :- Ihsan Waleed	--	-----
CHECKED BY :- Ihsan Waleed	--	-----
DRAWN BY :- Mariyam Irasha Shareef	--	-----



TYPICAL SECTION

SCALE 1:20



CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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PROJECT NUMBER :-
DATE: SEPTEMBER 2016
ENGINEER :- Insan Waneed
CHECKED BY :- Insan Waneed
DRAWN BY :- Mariyam Irasha Shareef

Rev no	Date
1	2016-09-01
2	2016-09-01
3	2016-09-01
4	2016-09-01
5	2016-09-01
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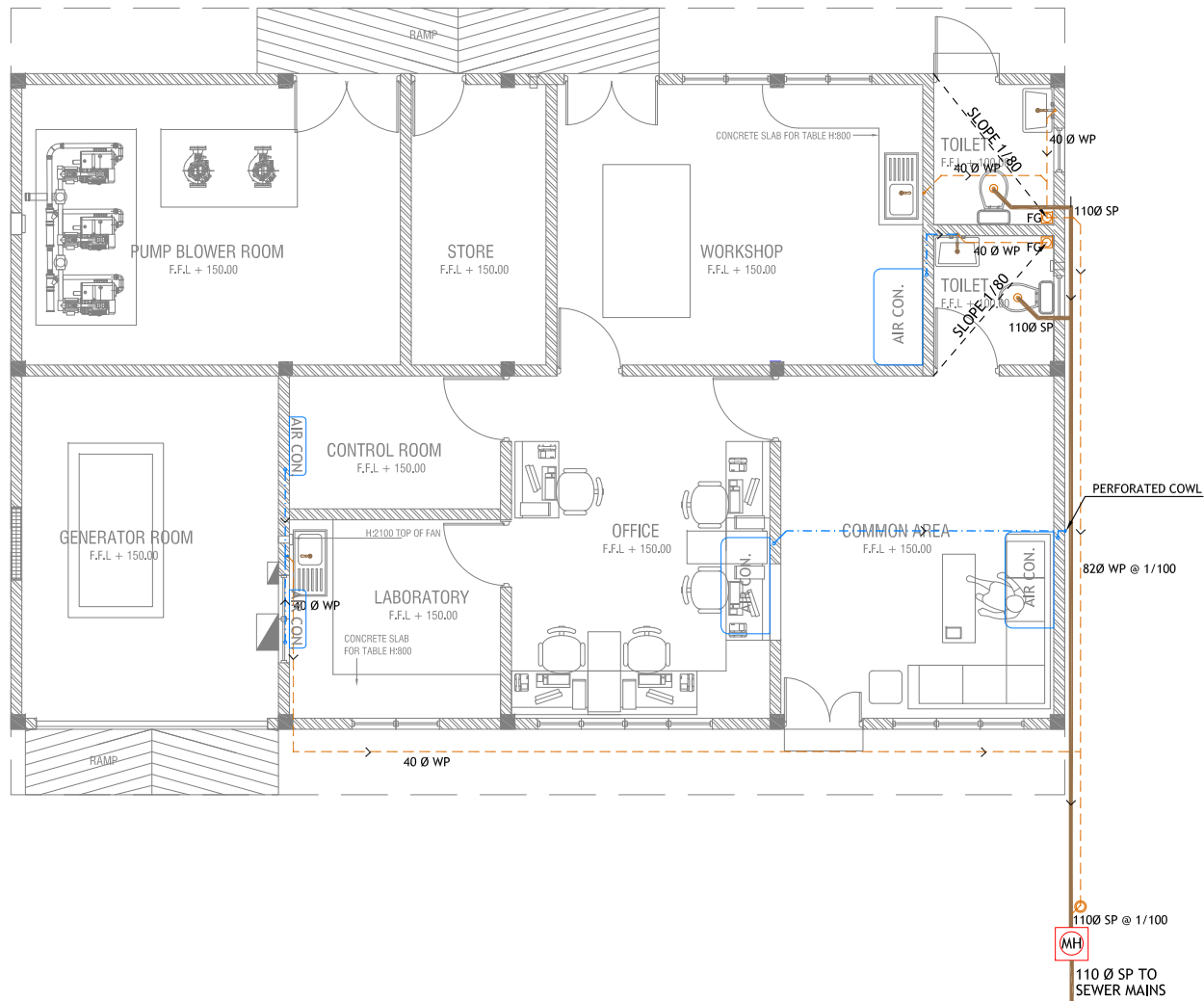
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Title: ADMIN BUILDING
TYPICAL SECTION

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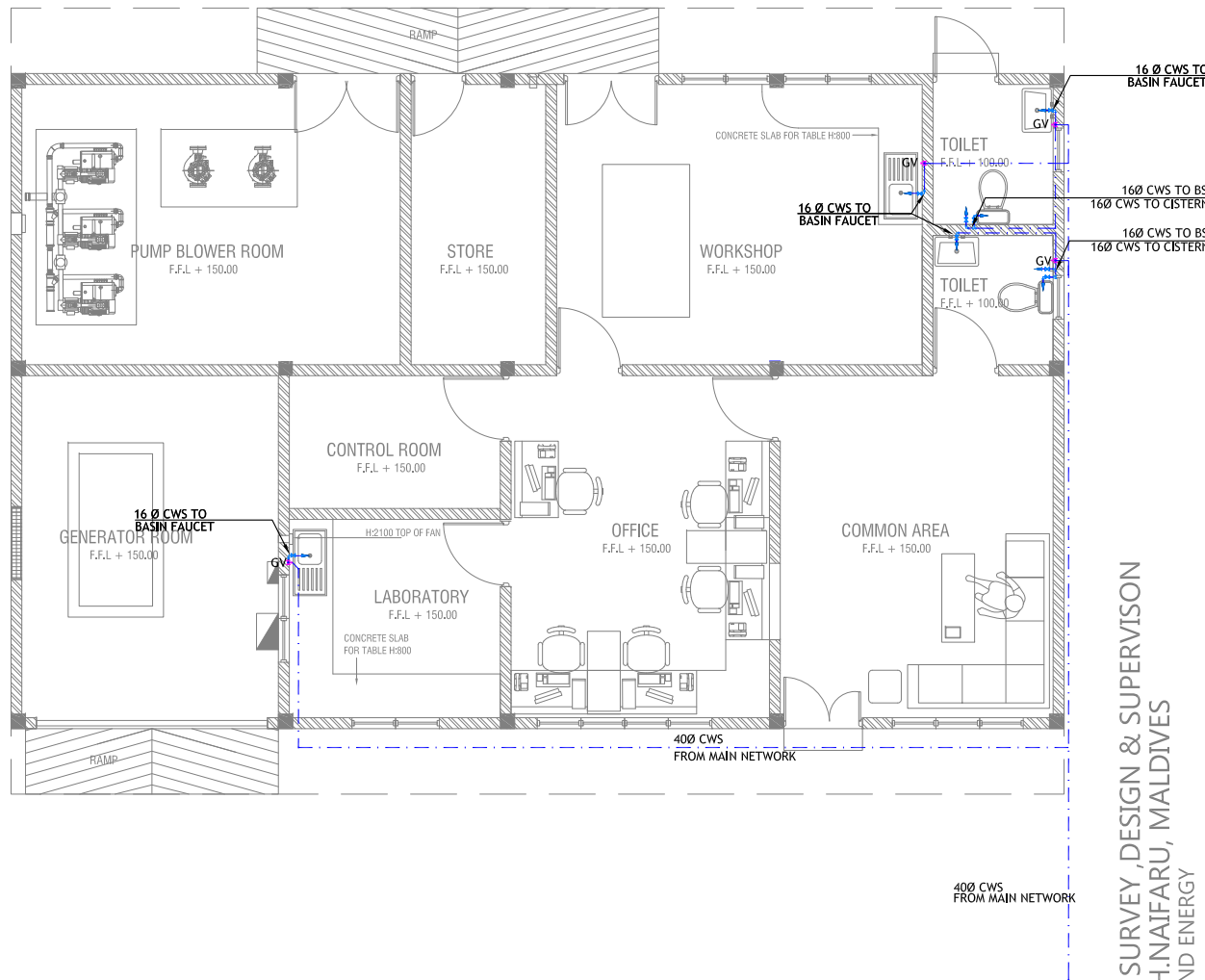
DRAINAGE LAYOUT PLAN
SCALE 1:100



LEGEND

- FG Floor Gully
- MH Chamber Manhole
- SP Soil pipe
- WP Waste pipe
- RWP Rain Water Pipe
- MHVP Manhole Vent Pipe
- GT Grease Trap
- CD Condensate Drain

ALL RAIN WATER OUTLETS TO HAVE PERFORATED COWLS ABOVE PAVING



PLUMBING LAYOUT PLAN
SCALE 1:100



LEGEND

- CWS Cold Water Supply
- HWS Hot Water Supply
- RWS Rain Water Supply
- GV Gate Valve
- WT Wall Tap
- TA To Above
- TB To Below

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY
PROJECT NUMBER: -
DATE: SEPTEMBER 2016
ENGINEER: - Mohamed Saif Saeed
CHECKED BY: - Insan Wahneed
DRAWN BY: - Mariyam Irasha Shaleef

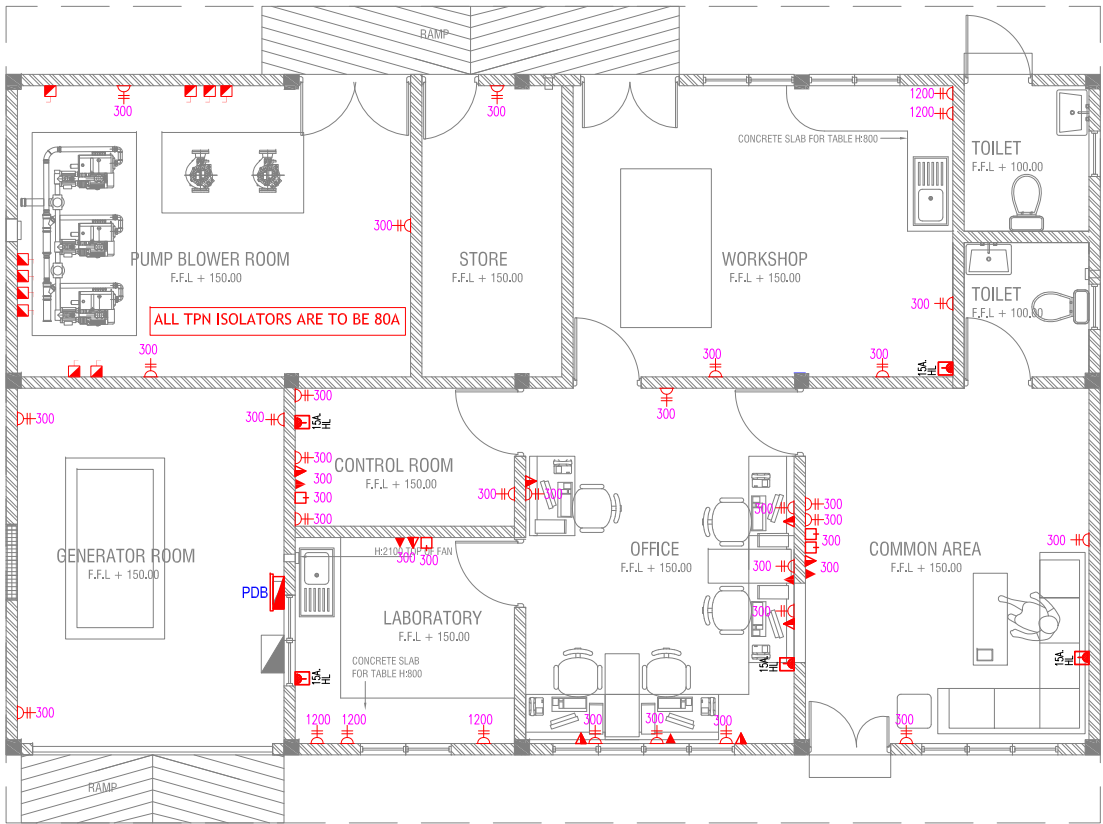


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Title: ADMIN BUILDING SERVICES
GROUND FLOOR DRAINAGE
AND PLUMBING LAYOUT
Page: NA - 24

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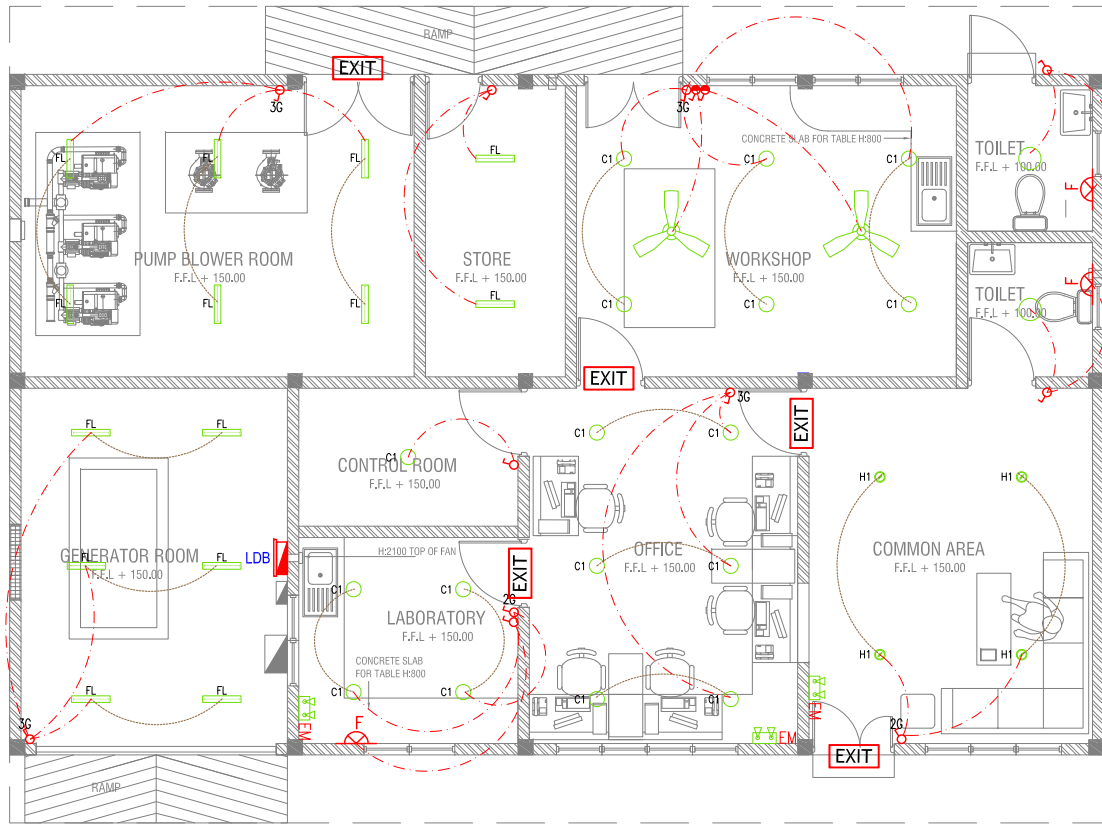
LEGEND

- 15A SWITCHED SOCKET OUTLET @ H.L.
- SPN ISOLATOR
- BEAM PLAN @ CEILING LEVEL
- 13A POWER POINT
- COMPUTER NETWORK OUTLET (RJ 45 CONNECTORS)
- TELEPHONE OUTLET (RJ11, CONNECTOR)
- 13A TWIN SOCKET OUTLET
- TV POINT
- DISTRIBUTION BOX
- 20A SWITCHED NEON INDICATOR FOR EWH.
- TPN ISOLATOR

ALL ELECTRICAL COMPONENTS CONNECTED TO DB

POWER LAYOUT PLAN

SCALE 1:100



LEGEND

- C1 CEILING DOWN LIGHT (18W)
- H1 RECESSED DOWN LIGHT (13W)
- CEILING LIGHT
- OWL OUTDOOR WALL LIGHT (CONNECTED TO MAIN DB)
- FL 2 FT TUBE LIGHT
- G LIGHT SWITCH @ 1200 MM
- 2W 2 WAY SWITCH @ 1200 MM
- CEILING FAN SWITCH @ 1200 MM
- CEILING FAN
- EM EMERGENCY LGT.
- EXIT EXIT LIGHT
- F FLEX. POWER OUTLET WITHOUT COVER PLATE

ALL ELECTRICAL COMPONENTS CONNECTED TO LDB

LIGHTING LAYOUT PLAN

SCALE 1:100



CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
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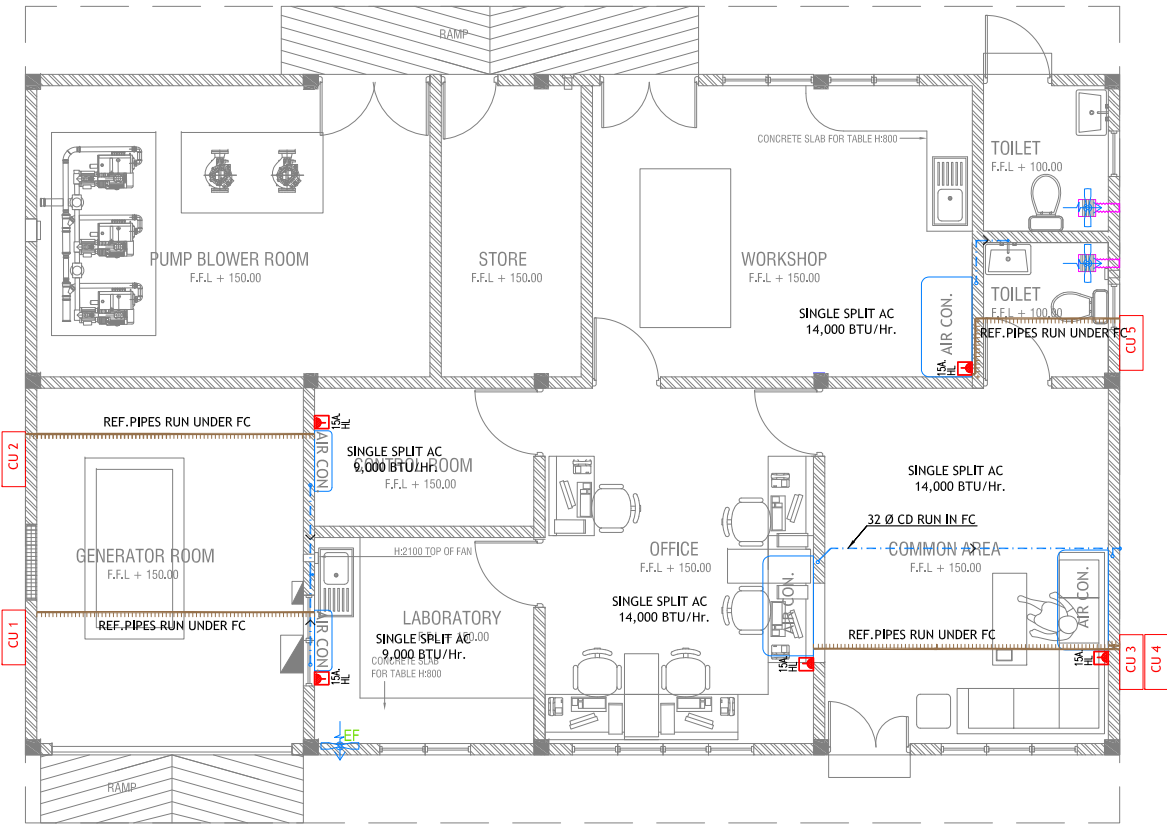
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Title: ADMIN BUILDING SERVICES
GROUND FLOOR POWER
AND LIGHTING LAYOUT
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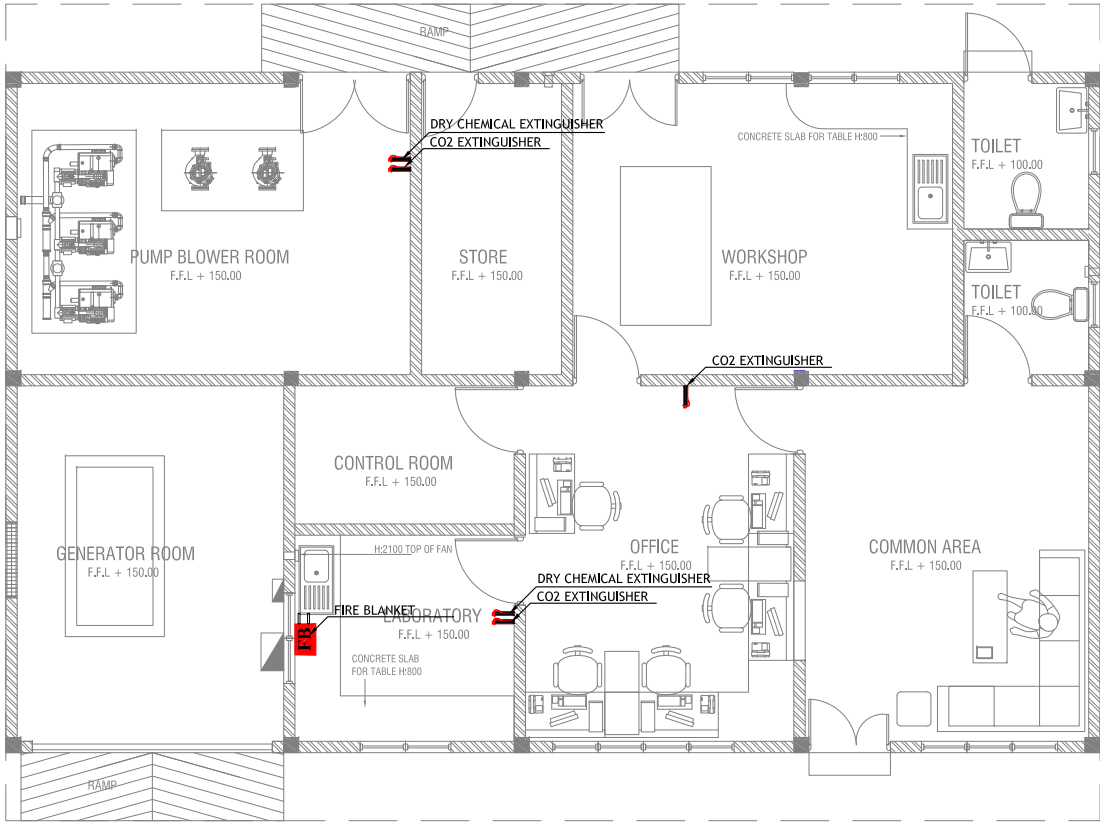
ACV LAYOUT PLAN

SCALE 1:100



LEGEND

- EF EXHAUST FAN (WALL/WINDOW MOUNT)
- EXHAUST FAN (CEILING MOUNT)



FIRE LAYOUT PLAN

SCALE 1:100



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3	2016-09-20
4	2016-09-20
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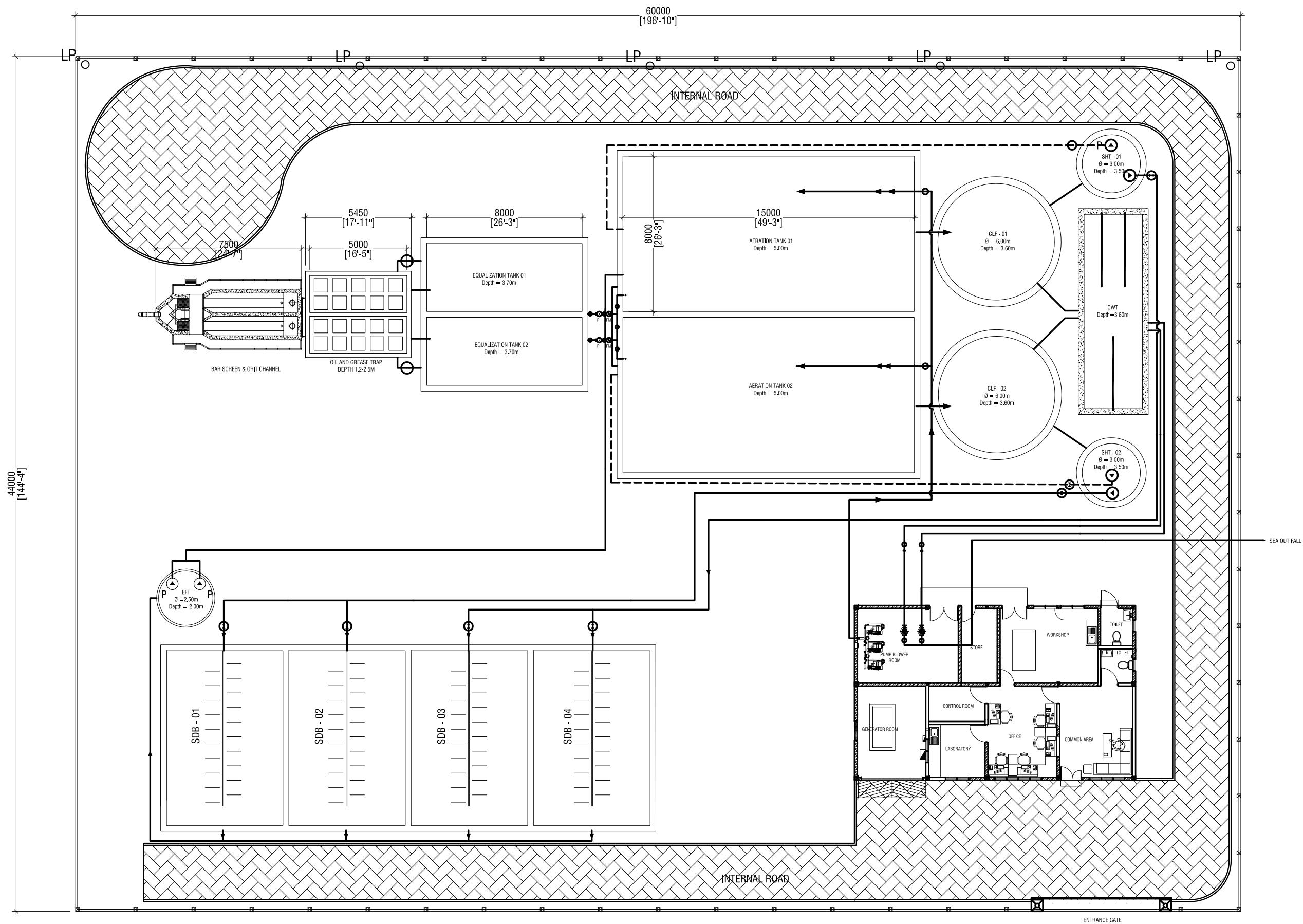
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Title: ADMIN BUILDING SERVICES
GROUND FLOOR FIRE AND
ACV LAYOUT

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GENERAL STP LAYOUT - NAIFARU
SCALE 1:200

CONSULTANCY SERVICES FOR SURVEY, DESIGN & SUPERVISION
OF SEWERAGE FACILITIES IN LH.NAIFARU, MALDIVES
CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY

PROJECT NUMBER -	Rev no	Date
DATE: SEPTEMBER 2016	--	---
ENGINEER: - Mohamed Saif	--	---
CHECKED BY: - Ihsan Waheed	--	---
DRAWN BY: - Mohamed Saif	--	---



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