
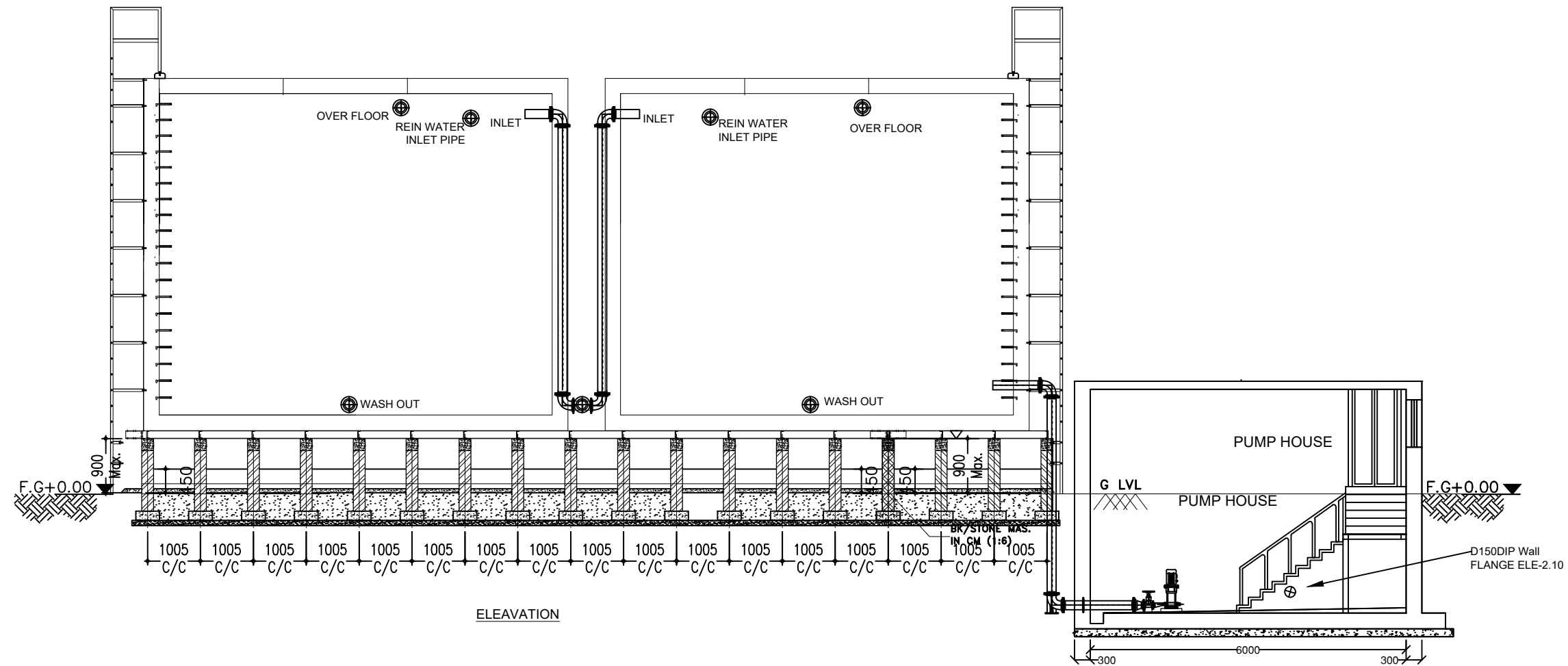



| | | | | | | | |
|---|---|---|--------------------------------------|---------------------|--------------|------------------|--------------------|
|  | CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY | CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO ,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 TANKS & PUMP HOUSE SECTION 3 - 3 | DRG.NO: NA/WS/ST/05 SCALE: 1 : 50 | | | | |

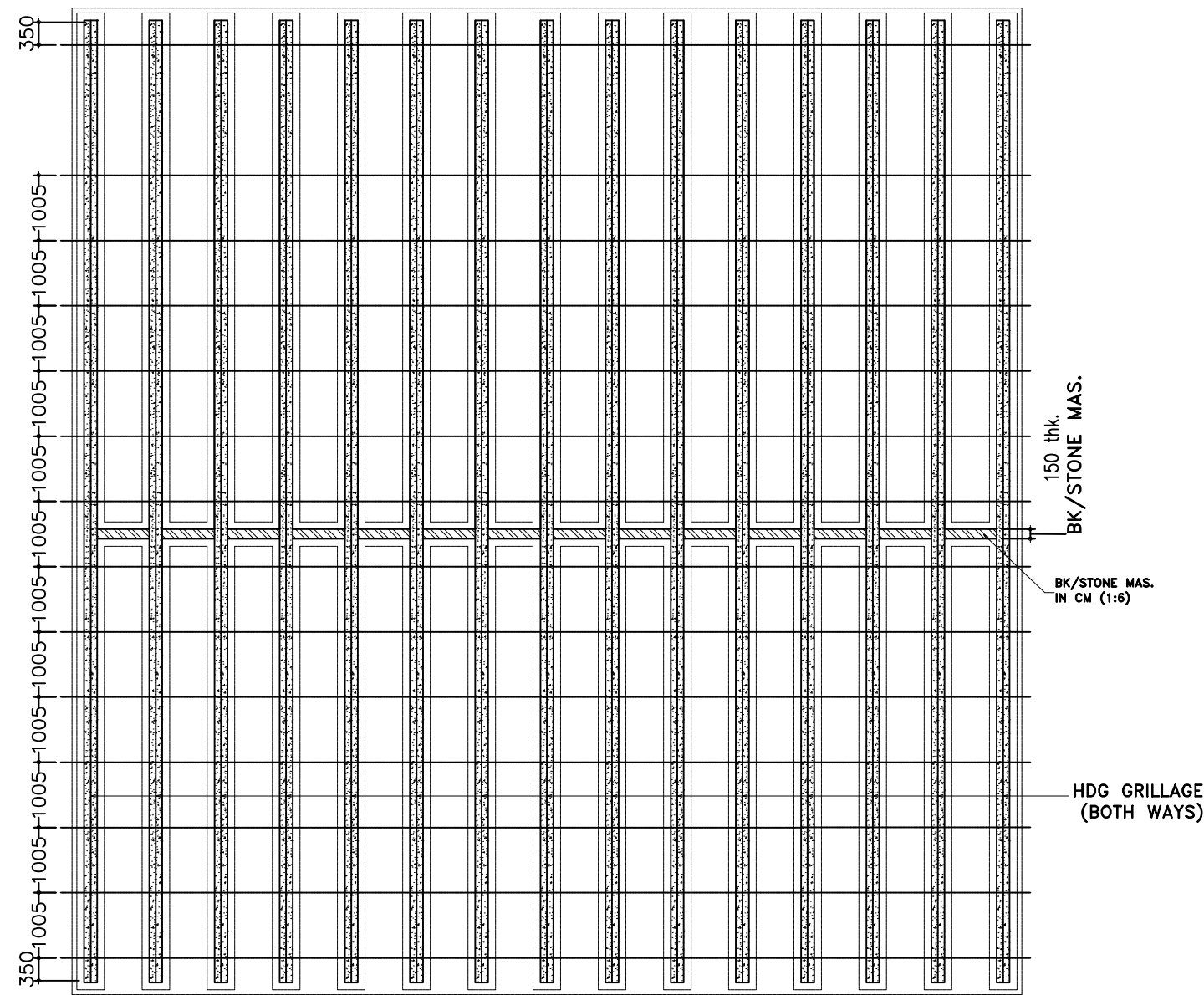


SECTION OF RTP TANK PUMP HOUSE AND TANK FOUNDATION

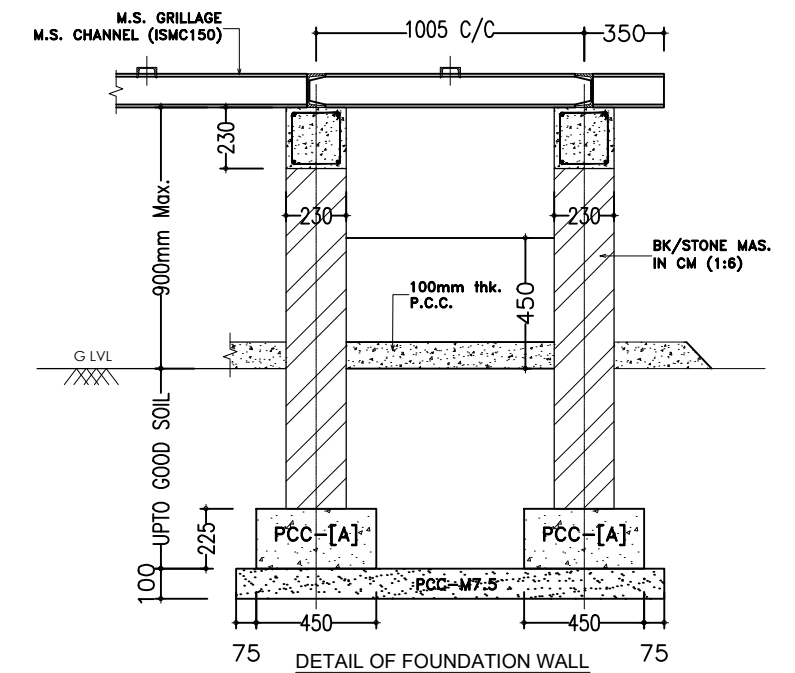
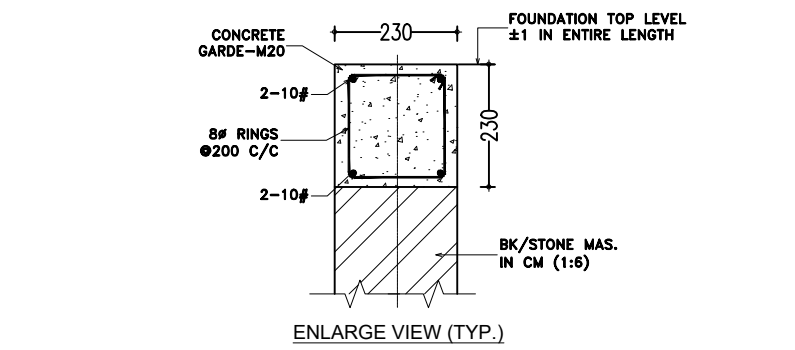
NOTES:

1. RTP Tank Assembling and moving as per the Manufacture's Specifications.
2. Drawings are indicating

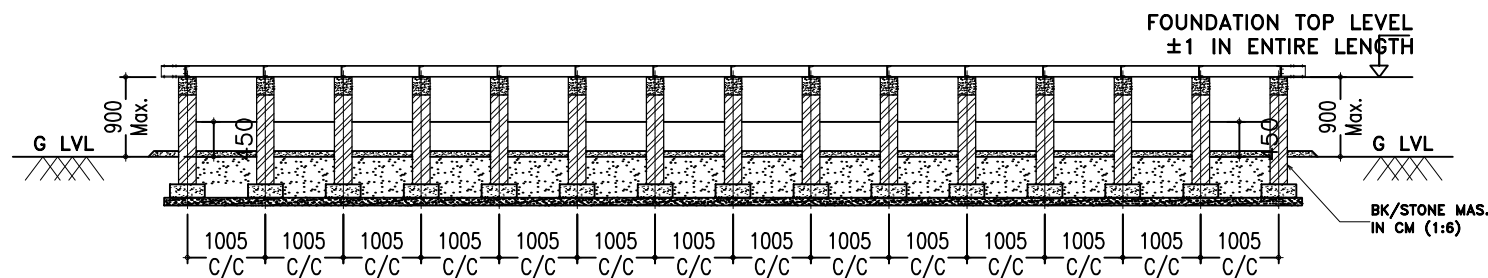
| | | | | | | | | | |
|---|--|--|--|------------------|----------------|-------------|-------|-----------|-------------|
|  | CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY | CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh.KUDAHUVADHOO ,Th.GURAI DHOO AND Ga.VILLINGILI , MALDIVES | DESIGN | DRAWN | CHECKED | APPROVED | SL.NO | DRWING NO | DESCRIPTION |
| | 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 SECTIONS | ENGINEER DATE | DESIGN CHIEF | NA/WS/ST/06 | | | |
| | | | | DRG.NO: | SCALE: 1 : 100 | | | | |



PLAN



[A]: P.C.C M15 for General Soils
P.C.C M20 for seashores/coasts & chemical/industrial area



ELEVATION



CLIENT:
MINISTRY OF ENVIRONMENT
AND ENERGY

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

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

TITLE:
TYPICAL BASE DETAILS OF RTP TANK

DESIGN

DRAWN

CHECKED

APPROVED

ENGINEER

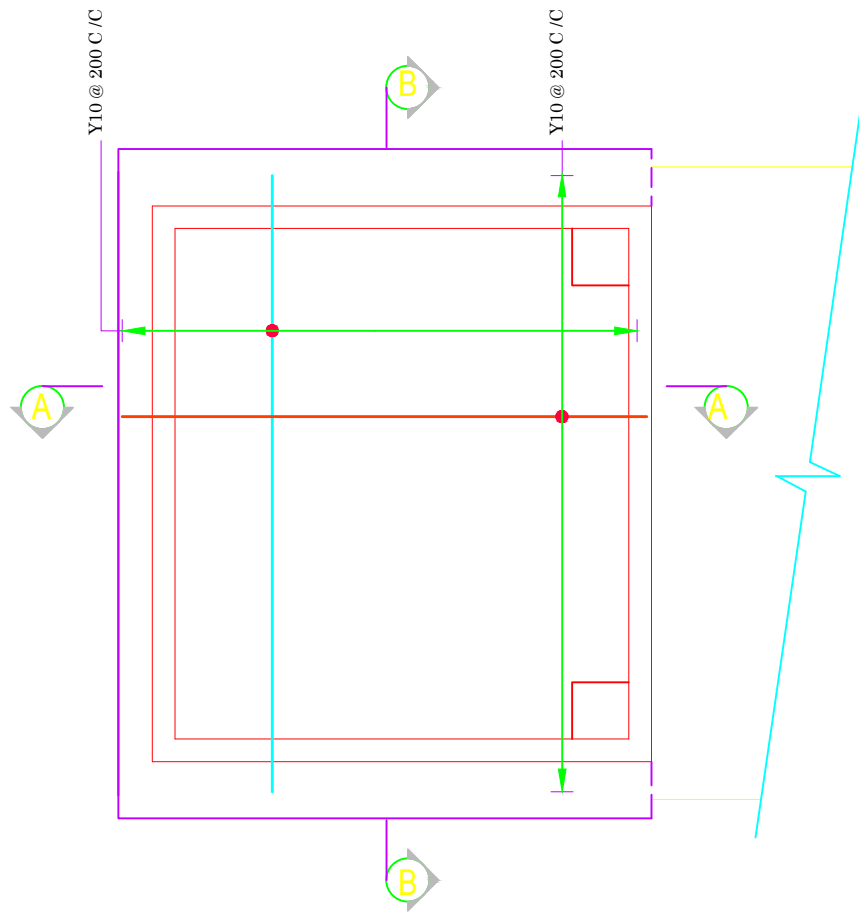
DESIGN CHIEF

DATE

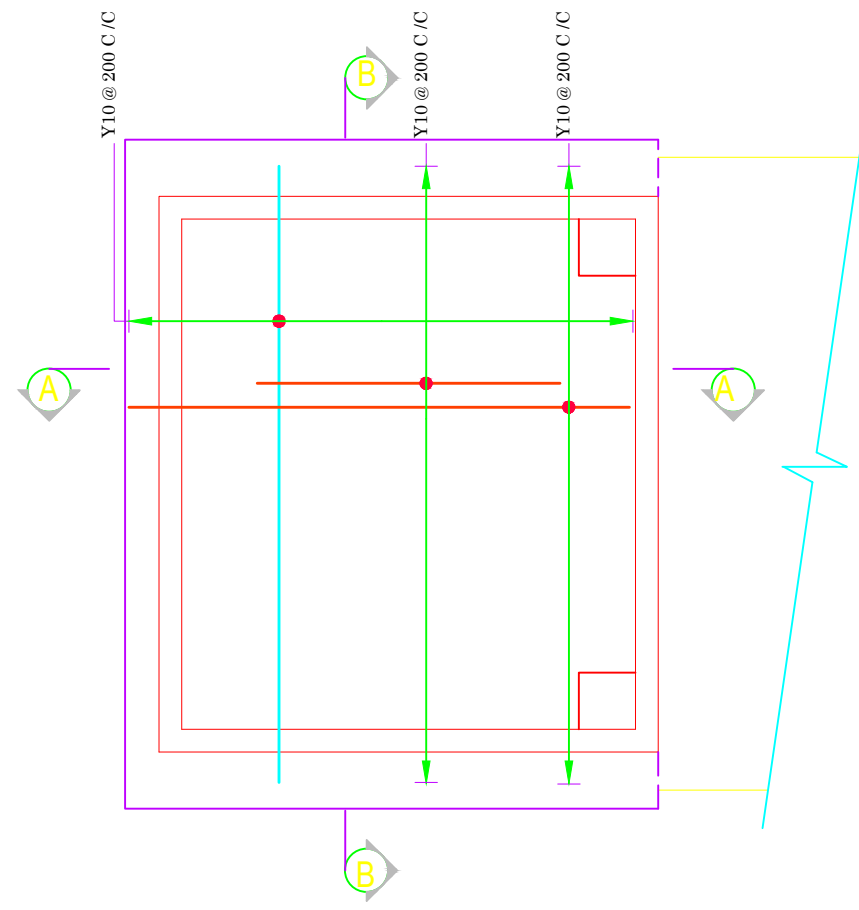
DRG.NO: NAWS/ST/0□

SCALE: 1 : 100

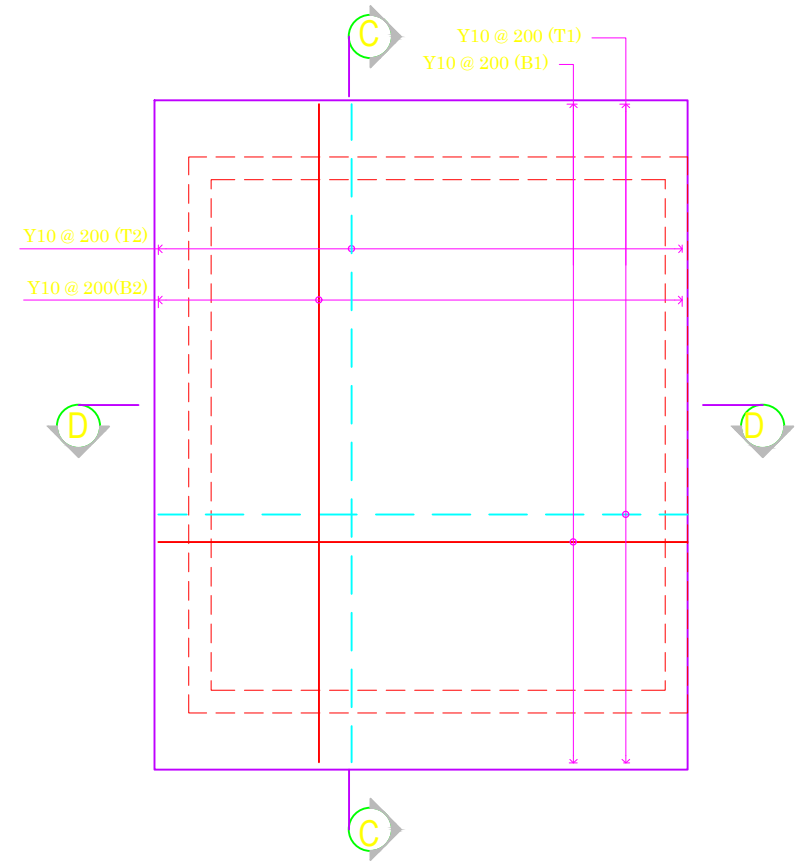
| SL.NO | DRWING NO | DESCRIPTION |
|-------|-----------|-------------|
| | | |
| | | |
| | | |



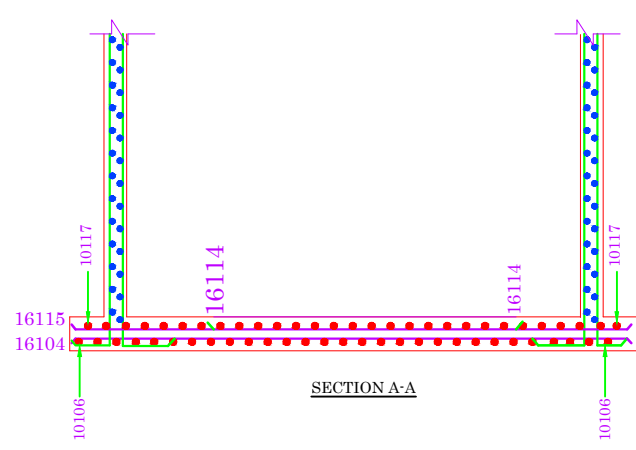
**DETAILS OF REINFORCEMENT-FLOOR SLAB
(BOTTOM MAT)**



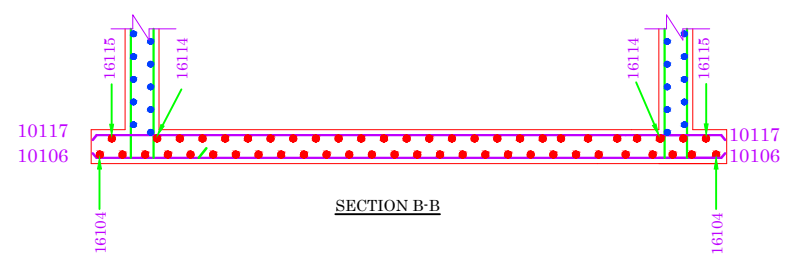
**DETAILS OF REINFORCEMENT-FLOOR SLAB
(TOP MAT)**



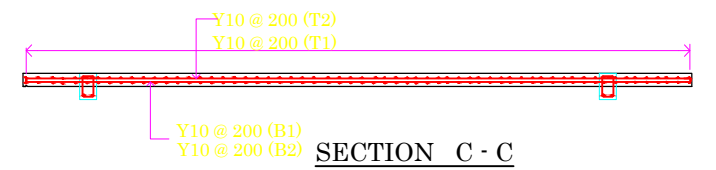
DETAILS OF REINFORCEMENT- ROOF SLAB



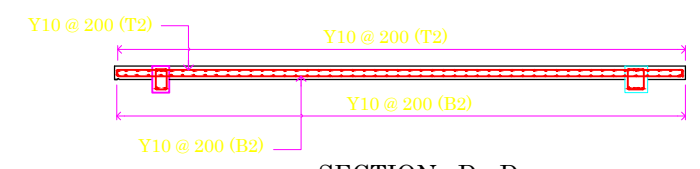
SECTION A-A




SECTION B-B



SECTION C - C



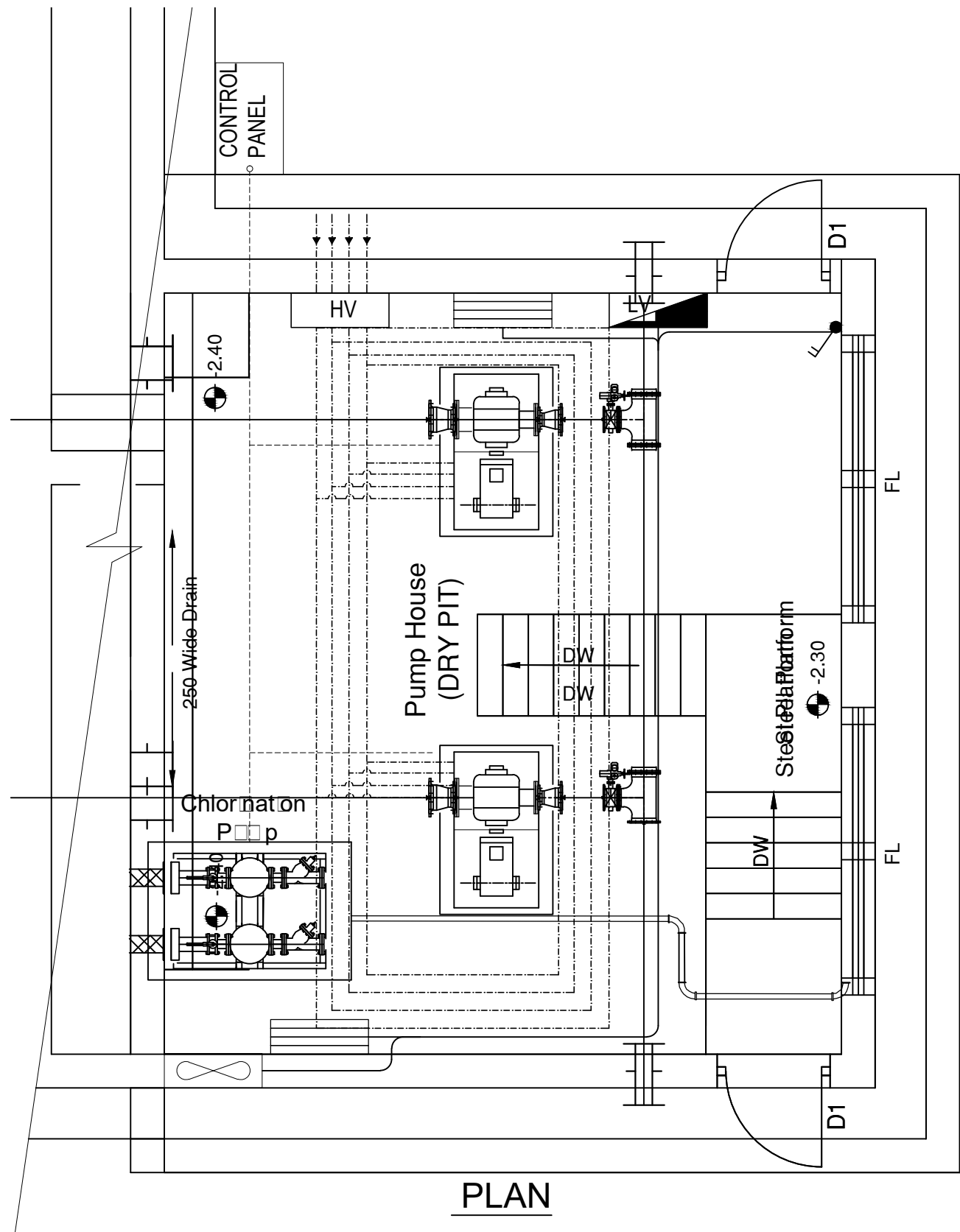
SECTION D - D

| | | | | | | |
|--|---|--------------------------|---------------------|--------------------|-----------|-------------|
|  <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> | <p>ENGINEER DATE</p> | <p>DESIGN CHIEF</p> | SL.NO | DRWING NO | DESCRIPTION |
| | | | | | | |
| <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: NAIFARU PUMP HOUSE REINFORCEMENT DETAIL</p> | | | DRG.NO: NAWS/ST/01 | | |
| | | | | SCALE: 1 : 100 | | |

ELECTRICAL DRAWINGS



Electric Load Calculation
Lh. Naifaru Island Water Supply Scheme

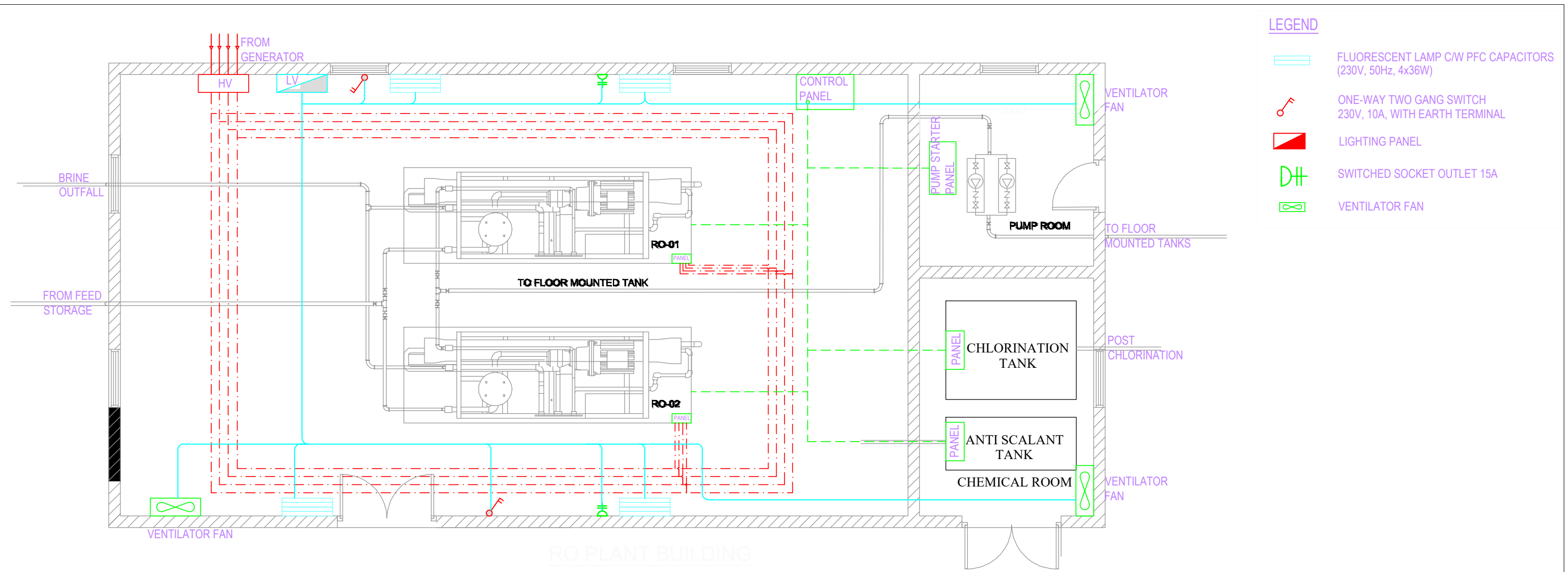
| Appliance/ Machine | qty | Rated unit power Watt | Installed Power Watt | Mean Load Factor | Peak Diversity Factor | Design Active Load W | Design Apparent Load VA | Design Current Amps | 3 current Amps /ph | Energy usage kWh/mnth |
|---|-----|-----------------------|----------------------|------------------|-----------------------|----------------------|-------------------------|---------------------|--------------------|-----------------------|
| PLANT SITE AND BUILDINGS | | | | | | | | | | |
| Ceiling Fan | 0 | 85 | 0 | 0.5 | 0.85 | 0 | 0 | 0.000 | | 0.00 |
| Pendent / Down Light | 2 | 18 | 36 | 0.45 | 0.4 | 6.48 | 8 | 0.035 | | 11.66 |
| Outdoor weather-proof lamp | 4 | 18 | 72 | 0.45 | 1 | 32.4 | 41 | 0.176 | | 23.33 |
| Florescent Tube Light Ceiling Mounted | 0 | 144 | 0 | 0.25 | 0.25 | 0 | 0 | 0.000 | | 0.00 |
| Florescent Tube Light Wall Mounted | 6 | 144 | 864 | 0.15 | 0.25 | 32.4 | 41 | 0.176 | | 93.31 |
| Flood Light Wall Mounted | 2 | 100 | 200 | 0.45 | 1 | 90 | 113 | 0.489 | | 64.80 |
| Outdoor weather-proof lamp pole mounted | 4 | 20 | 80 | 0.45 | 1 | 36 | 45 | 0.196 | | 25.92 |
| Ventilator Fans | 4 | 90 | 360 | 0.45 | 0.85 | 137.70 | 172 | 0.748 | | 116.64 |
| Switch socket Outlet 13A | 9 | 1000 | 9000 | 0.15 | 0.25 | 337.5 | 422 | 1.834 | | 972.00 |
| Switch socket Outlet 15A | 3 | 1500 | 4500 | 0.5 | 0.85 | 1912.5 | 2391 | 10.394 | | 1620.00 |
| Total | | | 15112 | | | 2,585 | 3,231 | 14.05 | 4.68 | 2,927.66 |
| MACHINERY | | | | | | | | | | |
| RO Plant | 2 | 65000 | 130000 | 0.35 | 0.85 | 38675 | 48344 | 120.859 | 120.859 | 27846.00 |
| Intake Pumps | 2 | 7000 | 14000 | 0.35 | 0.85 | 4165 | 5206 | 13.016 | 13.016 | 2998.80 |
| Feed/ Backwash Pumps | 2 | 6500 | 13000 | 0.35 | 0.8 | 3640 | 4550 | 11.375 | 11.375 | 2620.80 |
| High Lift Distribution Pumps | 2 | 6090 | 12180 | 0.2 | 0.2 | 487.2 | 609 | 1.523 | 1.523 | 350.78 |
| Pre- Chlorination Pump | 2 | 360 | 720 | 0.2 | 0.2 | 28.8 | 36 | 0.090 | 0.090 | 20.74 |
| Post- Chlorination Pump | 2 | 360 | 720 | 0.2 | 0.2 | 28.8 | 36 | 0.090 | 0.090 | 20.74 |
| Antiscalent Pump | 2 | 500 | 1000 | 0.2 | 0.2 | 40 | 50 | 0.125 | 0.125 | 28.80 |
| Brine Disposal Pump | 2 | 6500 | 5000 | 0.35 | 1 | 1750 | 2188 | 5.469 | 5.469 | 1260.00 |
| Rainwater Booster pump | | | | | | | | | | |
| Rainwater pump to storage tank | | | | | | | | | | |
| Total | | | 176,620.00 | | | 48,815 | 61,019 | 152.55 | 152.55 | 35,146.66 |
| Grant Total | | | 191,732.00 | | | 51,400 | 64,250 | 166.60 | 157.23 | 38,074.32 |





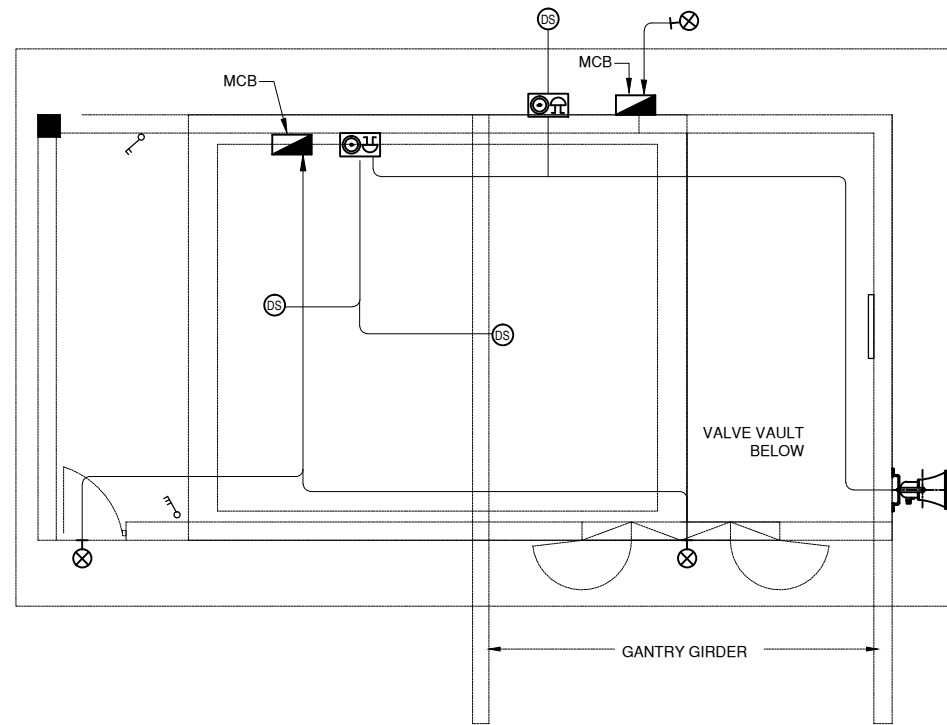
LEGEND

- FLUORESCENT LAMP C/W PFC CAPACITORS (230V, 50Hz, 4x36W)
- ONE-WAY TWO GANG SWITCH 230V, 10A, WITH EARTH TERMINAL
- LIGHTING PANEL
- SWITCHED SOCKET OUTLET 15A







| | | | | | | | |
|---|---|---|---|--------------|---------------------------------------|-----------|-------------|
|  | CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY | CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R. UNGOOF AARU, Lh.NAIFARU, Dh.KUDAHUVADHOO, Th.GURAI DHOO AND Ga.VILLINGILI, MALDIVES | ENGINEER | 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 | | TITLE: NAIFAARU 1300m ³ GROUND RESERVOIR & PUMP HOUSE ELECTRICAL PLAN | DATE | DRG.NO: NA/WS/EL/01 SCALE: 1 : 100 | | |

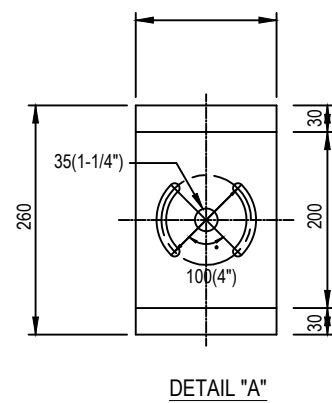
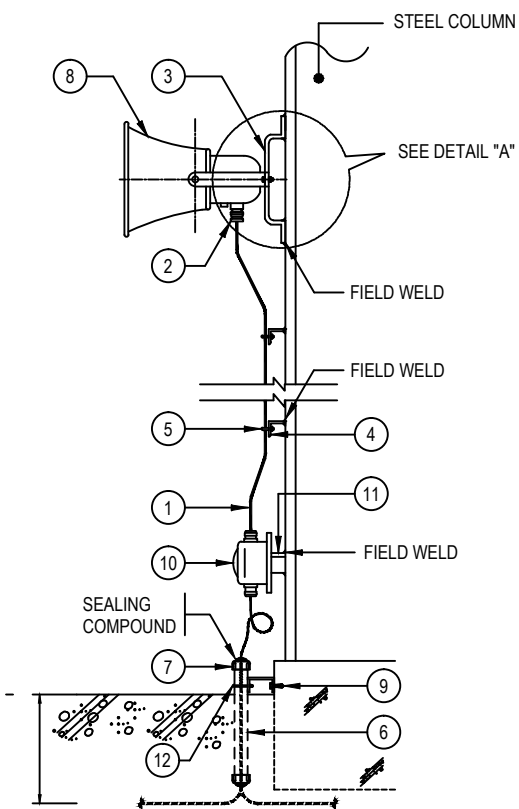


| | | | | | | | | | |
|---|---|---|---------------------------------------|-------|---------------------------------------|-----------------------|-------|-----------|-------------|
|  | CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY | CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh.KUDAHUVADHOO ,Th.GURAIHOO 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 ELECTRICAL PLANS | DATE | DRG.NO: NA/WS/EL/03 SCALE: 1 : 100 | | | | |





LEGEND

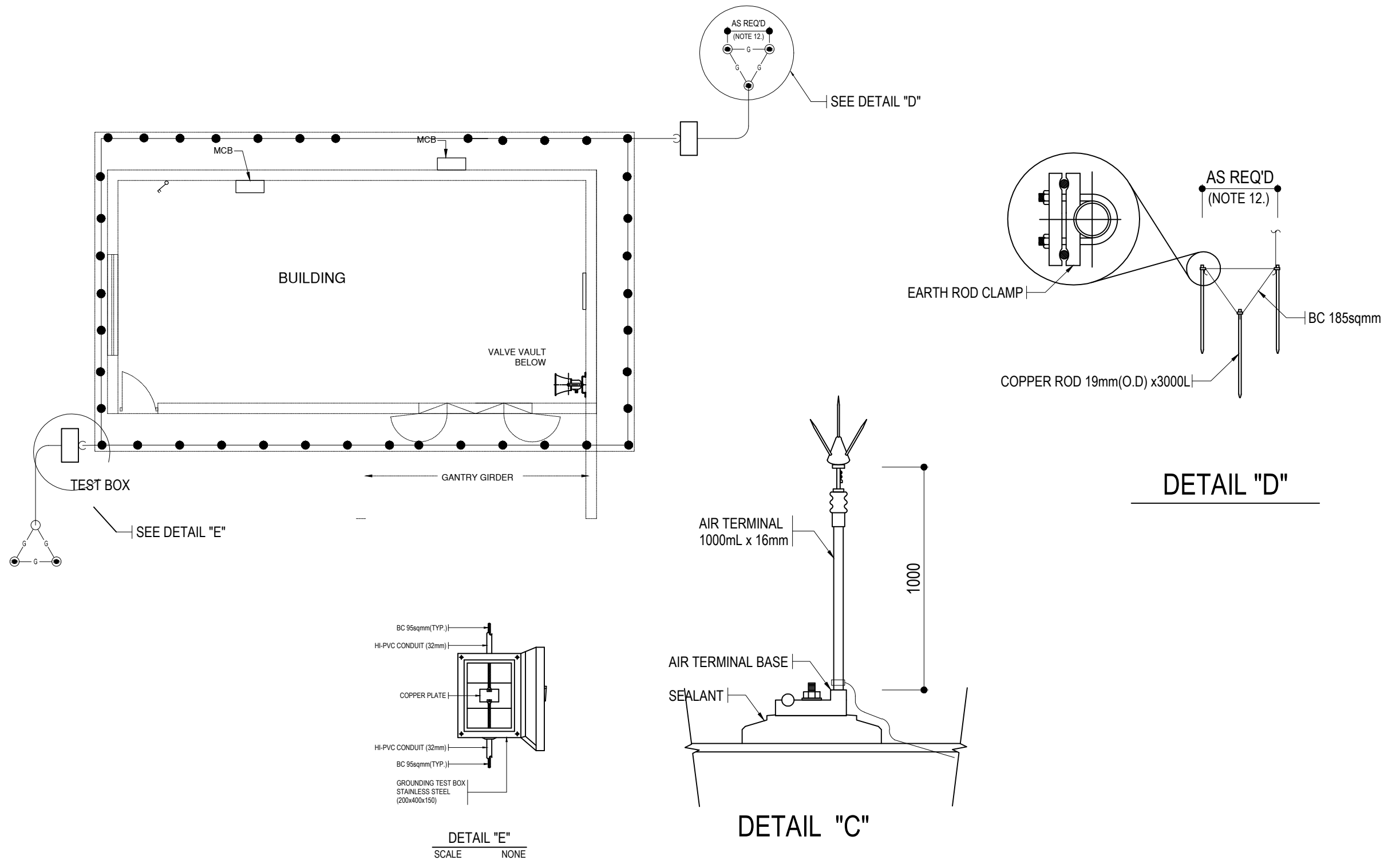
-  PHOTO-ELECTRIC SMOKE DETECTOR
-  EXIT LIGHT (SMALL SIZE, WALL MOUNTED YTYPE)
-  BELL (NOT ASSOCIATED WITH FIRE ALARMS)
-  FIRE ALARM CALL POINTS
-  LIGHTING PANEL
-  FIRE ALARM MANUAL STATION (BELL & CALL POINT)





| MATERIAL LIST | | | | |
|---------------|--------------------|------|------|--------|
| NO. | DESCRIPTION | UNIT | Q'TY | REMARK |
| 1 | LOCKNUT & BUSHING | EA | | |
| 2 | OUTLET BOX & COVER | EA | | |
| 3 | FLEXIBLE CONNECTOR | EA | | |
| 4 | GUN STUD ANCHOR | EA | | |
| 5 | CONDUIT | M | | |
| 6 | " " ANGLE | M | | |
| 7 | FLEXIBLE CONDUIT | M | | |
| 8 | FLEXIBLE CONNECTOR | EA | | |
| 9 | CEILING | EA | | |
| 10 | FIRE DETECTOR | EA | | |
| 11 | FIRE DETECTOR | | | |
| 12 | FIRE DETECTOR | | | |

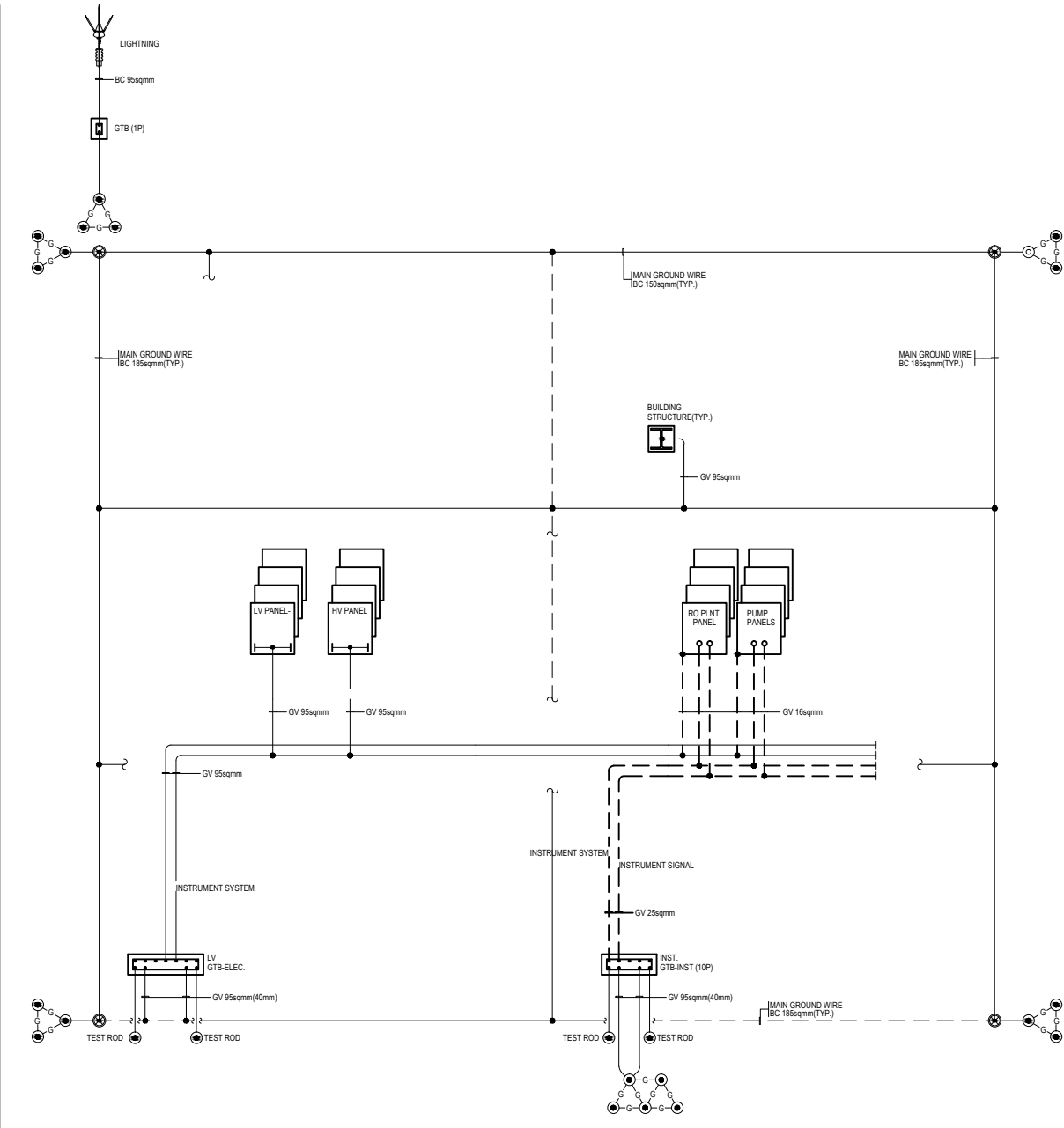
NOTE:
 ALL DIMENSION ARE IN MILLIMETERS AND ALL ELEVATIONS ARE METERS ABOVE MSL.
 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER GENERAL DRAWINGS

| | | | | | | | | | |
|---|---|---|------------------------|-------|---------------------------------------|-----------------------|-------|-----------|-------------|
|  | 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 | | FIRE ALARMS NAIFARU | DATE | DRG.NO: NA/WS/EL/0□ SCALE: 1 : 500 | | | | |



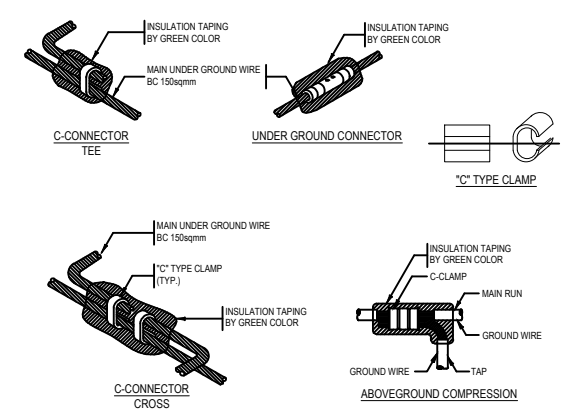
NOTE:
 □ ALL DIMENSION ARE IN MILLIMETERS AND ALL ELEVATIONS ARE METERS ABOVE MSL.
 □ THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER GENERAL DRAWINGS

| | | | | | | | | | |
|---|---|--|--------------------------------|-------|---------------------------------------|-----------------------|-------|-----------|-------------|
|  | 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 | | LIGHTNING CONDUCTOR NAIFARU | DATE | DRG.NO: NA/WS/EL/0□ SCALE: 1 : 100 | | | | |



- NOTES**
1. MAIN GROUNDING LOOP : BC 150sqmm
 2. TAP TO ELECTRICAL EQUIPMENT IN SUNSTATIONS AS SWITCHGEAR : LV : GV 95sqmm
 3. TAP TO MOTOR
- LOW VOLTAGE MOTOR
UP TO 11kW : 10sqmm(25mm)
UP TO 22kW : 16sqmm(25mm)
UP TO 40kW : 35sqmm(25mm)
UP TO 70kW : 70sqmm(32mm)
UP TO 120kW : 95sqmm(32mm)
 4. TAP TO TRANSFORMER NEUTRAL : GV 95sqmm(32mm)
 5. TAP TO POWER & LIGHTING PANEL : GV 25sqmm(25mm)
 6. TAP TO LOCAL CONTROL PANEL : GV 25sqmm(25mm)
 7. TAP TO WELDING RECEPTACLE PANEL : GV 25sqmm(25mm)
 8. TAP TO PUSH-BUTTON STATION : GV 6sqmm(25mm)
 9. TAP TO BUILDING STRUCTURE : GV 95sqmm(32mm)
 10. TAP TO PROCESS EQUIPMENT FOR STATIC GROUNDING : GV 25sqmm(25mm)
 11. TAP TO CABLE TRAY BONDING
BRANCH EARTHING WIRE BE TAPPED FROM MAIN EARTHING WIRE WITH THE INTERVAL OF 20M MAX. BY GV 35sqmm SO AS TO UNIFY TO POWER STATION.
 12. CONSTRUCTION COMPANY SHALL ENSURE COMPLIANCE WITH LOCAL REGULATION, (EVEN THOUGH THE DRAWINGS WERE ACCEPTED.)

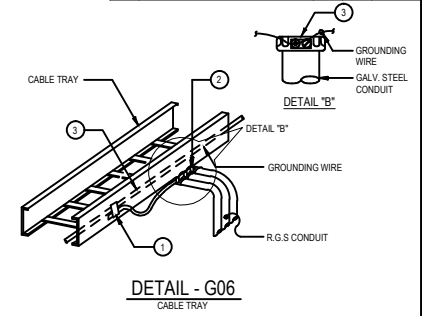
GROUNDING & LIGHTNING FOR BLOCK DIAGRAM



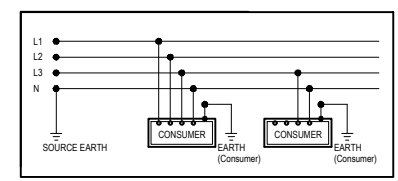
DETAIL - G01
CADWELD GROUNDING CONNECTION

MATERIAL LIST

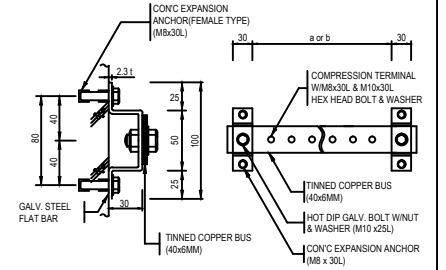
| ITEM NO. | DESCRIPTION | UNIT | QTY | REMARK |
|----------|-----------------------------|------|-----|--------|
| 1 | COMPRESSION SLEEVE (C-TYPE) | EA | 1 | |
| 2 | GROUNDING BUSHING | EA | 1 | |
| 3 | GROUNDING WIRE | M | - | |



DETAIL - G06
CABLE TRAY



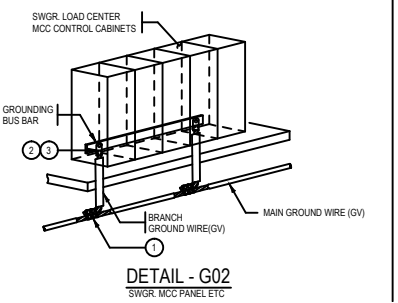
"TT NETWORK SYSTEM GROUNDING"



DETAIL - G10
FASTENING TERMINAL

MATERIAL LIST

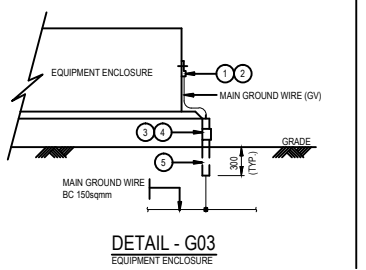
| ITEM NO. | DESCRIPTION | UNIT | QTY | REMARK |
|----------|--|------|-----|--------|
| 1 | COMPRESSION SLEEVE (C-TYPE) | EA | 1 | |
| 2 | COMPRESSION TERMINAL LUG | EA | 1 | |
| 3 | BOLT & NUT W/FLAT & SPRING WASHER(M12) | EA | 1 | |



DETAIL - G02
SWGR MCC PANEL ETC

MATERIAL LIST

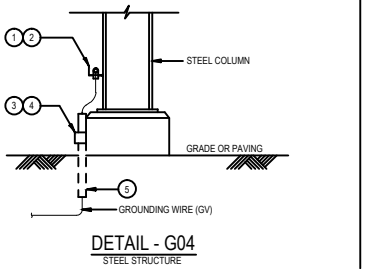
| ITEM NO. | DESCRIPTION | UNIT | QTY | REMARK |
|----------|---|------|-----|--------|
| 1 | COMPRESSION TERMINAL LUG | EA | 1 | |
| 2 | HEX HEAD BOLT & NUT W/FLAT & SPRING WASHER(M12) | EA | 1 | |
| 3 | 1 HOLE CLAMP FOR 22 | EA | 1 | |
| 4 | EXPANSION BOLT M6x50L | EA | 1 | |
| 5 | PVC CONDUIT 22 | M | 0.6 | |



DETAIL - G03
EQUIPMENT ENCLOSURE

MATERIAL LIST

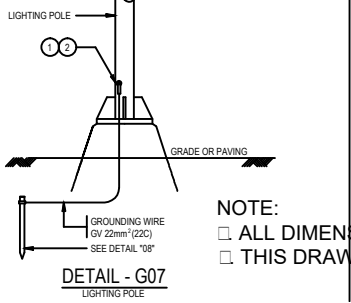
| ITEM NO. | DESCRIPTION | UNIT | QTY | REMARK |
|----------|--------------------------|------|-----|--------|
| 1 | GROUNDING PIECE | EA | 1 | |
| 2 | COMPRESSION TERMINAL LUG | EA | 1 | |
| 3 | 1 HOLE CLAMP FOR 22 | EA | 1 | |
| 4 | EXPANSION BOLT M6x50L | EA | 1 | |
| 5 | PVC CONDUIT 22 | M | 0.6 | |



DETAIL - G04
STEEL STRUCTURE

MATERIAL LIST

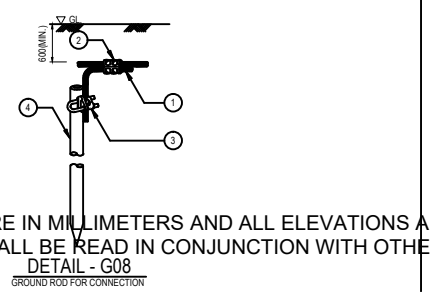
| ITEM NO. | DESCRIPTION | UNIT | QTY | REMARK |
|----------|---|------|-----|--------|
| 1 | COMPRESSION TERMINAL LUG | EA | 1 | |
| 2 | HEX HEAD BOLT & NUT W/FLAT & SPRING WASHER(M10) | EA | 1 | |



DETAIL - G07
LIGHTING POLE

MATERIAL LIST

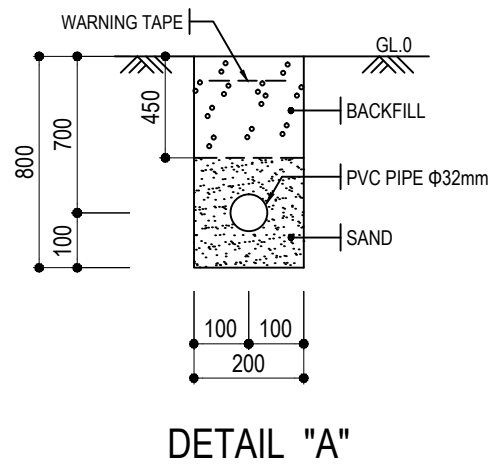
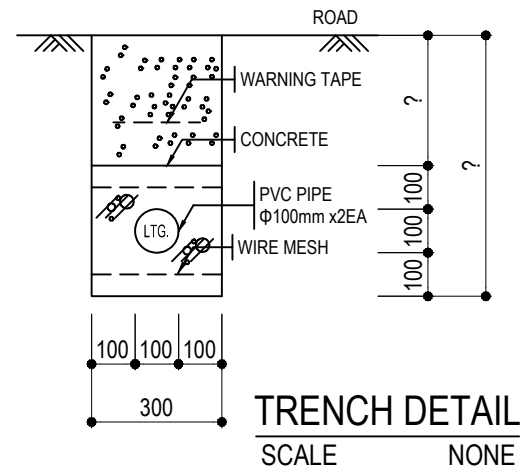
| ITEM NO. | DESCRIPTION | UNIT | QTY | REMARK |
|----------|----------------------------------|------|-----|--------|
| 1 | GV WIRE | M | - | |
| 2 | CONNECTOR CLAMP (CABLE TO ROD) | EA | 1 | |
| 3 | CONNECTOR CLAMP (19x3000mm LONG) | EA | 1 | |
| 4 | GROUNDING ROD (19x3000mm LONG) | EA | 1 | |





DETAIL - G08
GROUND ROD FOR CONNECTION

NOTE:
 ALL DIMENSION ARE IN MILLIMETERS AND ALL ELEVATIONS ARE METERS ABOVE MSL.
 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER GENERAL DRAWINGS

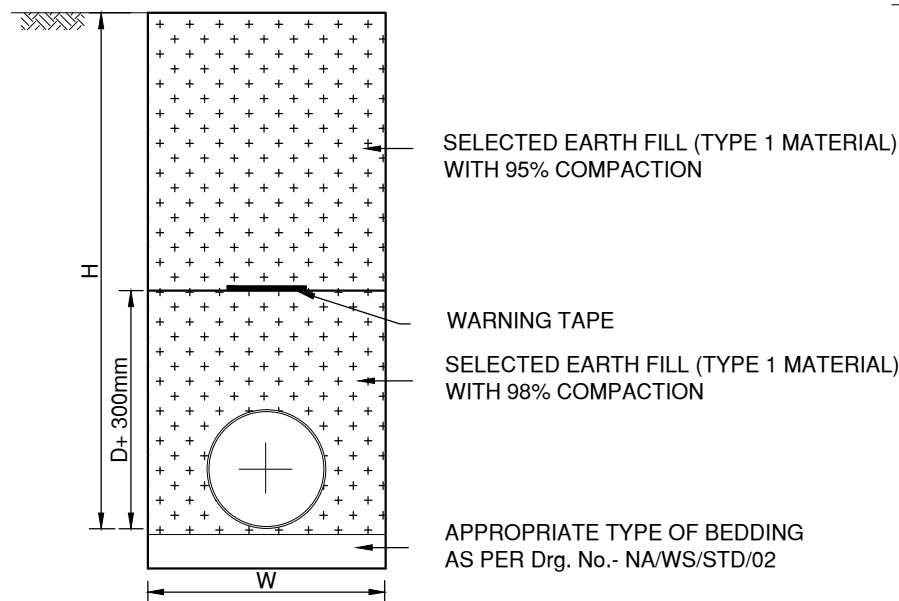
| | | | | | | | | | | | | |
|--|---------|---|---|--|--|----------------------|-------|---------------------|-----------------------|-------|-----------|-------------|
| | CLIENT: | MINISTRY OF ENVIRONMENT AND ENERGY | CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO ,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 | | | | GROUNDING NAIFARU | DATE | DRG.NO: NA/WS/EL/0□ | SCALE: 1 : 100 | | | |



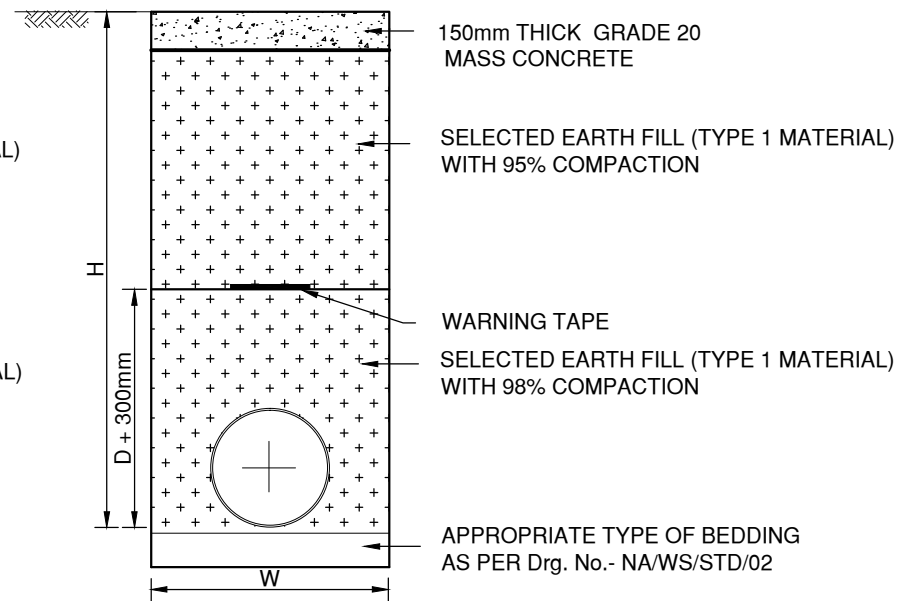
NOTE:
 ALL DIMENSION ARE IN MILLIMETERS AND ALL ELEVATIONS ARE METERS ABOVE MSL.
 THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER GENERAL DRAWINGS

| | | | | | | | | | |
|---|---|---|----------------------------------|-------|---------------------------------------|-----------------------|-------|-----------|-------------|
|  | 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 | | CABLE TRENCH SCHEDULE NAIFARU | DATE | DRG.NO: NA/WS/EL/0□ SCALE: 1 : 100 | | | | |

STANDARD DRAWINGS



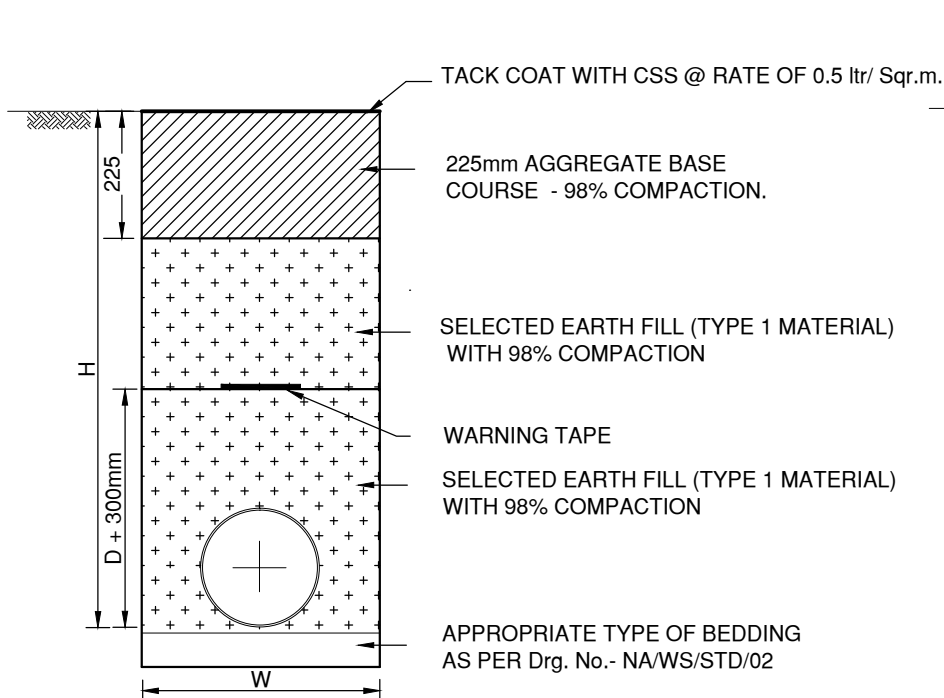
BACK FILLING & PERMANENT/ TEMPORARY REINSTATEMENT
PIPE LOCATED AWAY FROM THE ROAD SHOULDER / SHOULDER/
EARTH CARRIAGEWAY



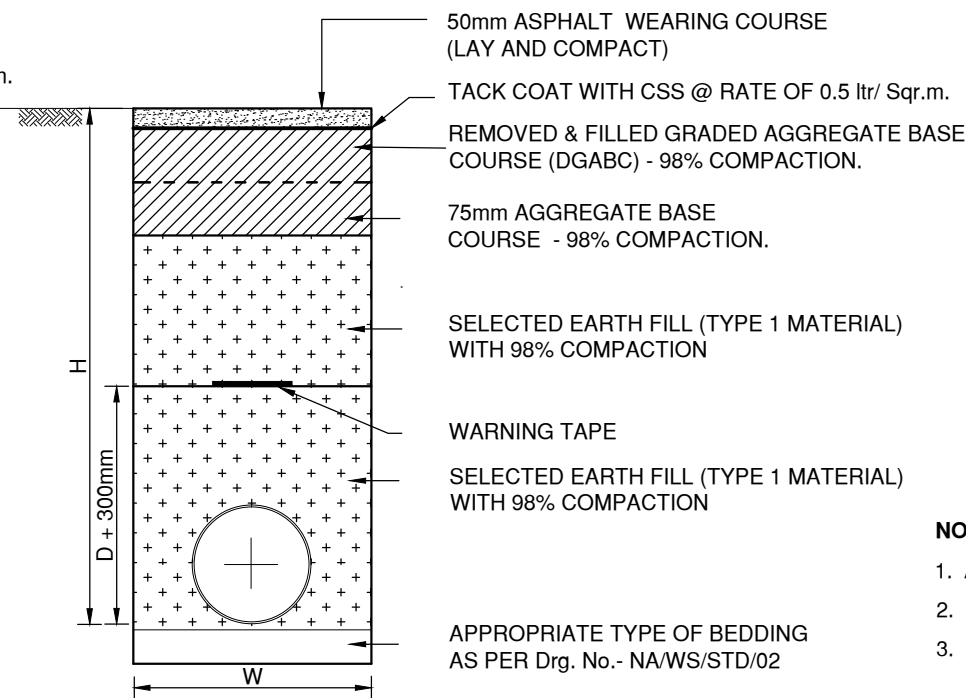
BACK FILLING & PERMANENT REINSTATEMENT
CONCRETE ROAD

| DIA(Ø) (mm) | PVC | | PE | |
|----------------|-----------------|-----------------|-----------------|-----------------|
| | WIDTH(W) (m) | DEPTH(H) (m) | WIDTH(W) (m) | DEPTH(H) (m) |
| 63 | 0.30 | 0.90 | | |
| 90 | 0.45 | 1.10 | 0.30 | 1.00 |
| 110 | 0.45 | 1.20 | 0.40 | 1.12 |
| 125 | - | - | 0.40 | 1.14 |
| 140 | - | - | 0.40 | 1.15 |
| 160 | 0.60 | 1.20 | 0.45 | 1.17 |
| 180 | - | - | 0.45 | 1.19 |
| 200 | - | - | 0.45 | 1.21 |
| 225 | 0.60 | 1.30 | 0.50 | 1.24 |
| 250 | - | - | 0.50 | 1.26 |
| 280 | 0.60 | 1.30 | 0.60 | 1.29 |
| 315 | 0.75 | 1.35 | 0.60 | 1.33 |

| DIA(Ø) (mm) | WIDTH(W) (m) | DEPTH(H) (m) |
|----------------|-----------------|-----------------|
| 80 | 0.60 | 0.95 |
| 100 | 0.60 | 0.95 |
| 150 | 0.60 | 1.00 |
| 200 | 0.60 | 1.20 |
| 250 | 0.60 | 1.25 |
| 300 | 0.60 | 1.30 |
| 350 | 0.75 | 1.35 |
| 400 | 0.90 | 1.40 |
| 450 | 0.90 | 1.45 |
| 500 | 0.90 | 1.50 |
| 600 | 1.10 | 1.60 |
| 700 | 1.20 | 1.70 |
| 800 | 1.30 | 1.90 |



BACK FILLING & TEMPORARY REINSTATEMENT
ASPHALT / TARRED ROADS/ CARRIAGEWAY





BACK FILLING & PERMANENT REINSTATEMENT
ASPHALT / TARRED ROADS/ CARRIAGEWAY

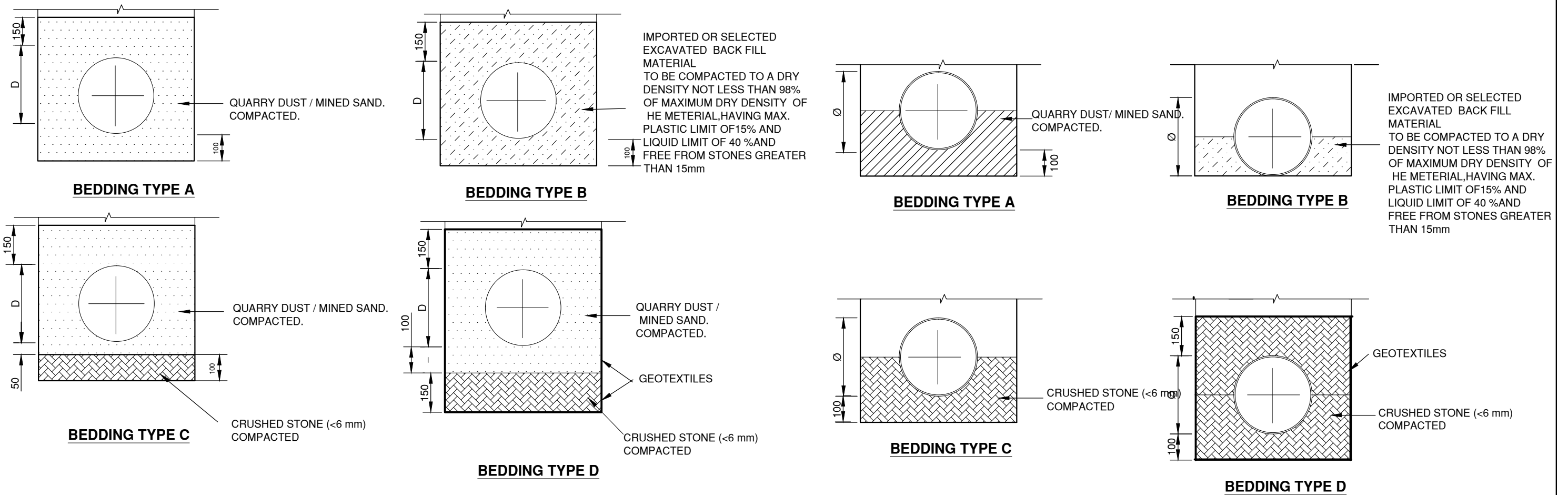
| TYPE OF SOIL | APPROXIMATE BEARING CAPACITY KN/m ² | BEDDING TYPE |
|------------------|--|--------------|
| HARD SOIL/ROCK | >200 | A |
| NORMAL SOIL | 100-200 | B |
| LOOSE SOIL | <200 | C |
| CLAY | >75 | C |
| | <75 | D |
| PEAT/MASHY AREAS | <75 | D |

NOTE:

- ALL DIMENSIONS ARE IN MILLIMETERS.
- CSS-CATIONIC SLOW SETTING
- FOR NORMAL SOIL BACKFILLING MATERIAL SHALL BE SOIL (TYPE 1 MATERIAL) HAVING THE MAXIMUM DRY DENSITY UNDER STANDARD CONDITIONS OF PROCTOR COMPACTION NOT LESS THAN 1600KG/M³. WITH THE PROPERTIES OF PLASTIC LIMIT LESS THAN 15, LIQUID LIMIT LESS THAN 40 AND CBR > 20. EXCAVATED SOIL CAN BE USED AS BACK FILLING MATERIAL IF THEY CONFORM TO THE REQUIRED SPECIFICATION MATERIAL TO BE COMPACTED TO A DRY DENSITY NOT LESS THAN 98% OF MAXIMUM DRY DENSITY.

NOT TO SCALE

| | | | | | | | | |
|--|---|----------|----------------------|--------------|----------|-------|-----------|-------------|
|  CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY | CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R. UNGOOFARU, Lh.NAIFARU, Dh.KUDAHUVADHOO, Th.GURAIHOO 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 | TITLE: BACKFILLING AND TEMPORARY / PERMANENT REINSTATEMENT OF TRENCHES NAIFARU | DATE | DRG.NO: NA/WS/STD/0□ | | | | | |
| | | | SCALE: NOT TO SCALE | | | | | |



| TABLE TO SELECT APPROPRIATE BEDDING TYPE | | |
|--|--|--------------|
| TYPE OF SOIL | APPROXIMATE BEARING CAPACITY KN/m^2 | BEDDING TYPE |
| HARD SOIL/ROCK | >200 | A |
| NORMAL SOIL | 100-200 | B |
| LOOSE SOIL | <200 | C |
| CLAY | >75 | C |
| | <75 | D |
| PEAT/MASHY AREAS | <75 | D |

| DETAIL OF TRENCH FOR D.I PIPES | | |
|--------------------------------|--------------|--------------|
| DIA(Ø) (mm) | WIDTH(W) (m) | DEPTH(H) (m) |
| 80 | 0.60 | 0.95 |
| 100 | 0.60 | 0.95 |
| 150 | 0.60 | 1.00 |
| 200 | 0.60 | 1.20 |
| 250 | 0.60 | 1.25 |
| 300 | 0.60 | 1.30 |
| 350 | 0.75 | 1.35 |
| 400 | 0.90 | 1.40 |
| 450 | 0.90 | 1.45 |
| 500 | 0.90 | 1.50 |
| 600 | 1.10 | 1.60 |

| DIA(Ø) (mm) | PVC | | PE | |
|-------------|--------------|--------------|--------------|--------------|
| | WIDTH(W) (m) | DEPTH(H) (m) | WIDTH(W) (m) | DEPTH(H) (m) |
| 63 | 0.30 | 0.90 | | |
| 90 | 0.45 | 1.10 | 0.30 | 1.00 |
| 110 | 0.45 | 1.20 | 0.40 | 1.12 |
| 125 | - | - | 0.40 | 1.14 |
| 140 | - | - | 0.40 | 1.15 |
| 160 | 0.60 | 1.20 | 0.45 | 1.17 |
| 180 | - | - | 0.45 | 1.19 |
| 200 | - | - | 0.45 | 1.21 |
| 225 | 0.60 | 1.30 | 0.50 | 1.24 |
| 250 | - | - | 0.50 | 1.26 |
| 280 | 0.60 | 1.30 | 0.60 | 1.29 |

NOTE:

- ALL DIMENSIONS ARE IN MILLIMETRES.
- FOR NORMAL SOIL BACKFILLING MATERIAL SHALL BE SOIL (TYPE 1 MATERIAL) HAVING THE MAXIMUM DRY DENSITY UNDER STANDARD CONDITIONS OF PROCTOR COMPACTION NOT LESS THAN 1600KG/M^3 . WITH THE PROPERTIES OF PLASTIC LIMIT LESS THAN 15, LIQUID LIMIT LESS THAN 40 AND CBR > 20. EXCAVATED SOIL CAN BE USED AS BACK FILLING MATERIAL IF THEY CONFORM TO THE REQUIRED SPECIFICATION MATERIAL TO BE COMPACTED TO A DRY DENSITY NOT LESS THAN 98% OF MAXIMUM DRY DENSITY .
- FOR PIPES IN SOFT OR PEATY GROUND THE GRANULAR BEDDING SHALL BE COMPLETELY SURROUNDED BY A GEOTEXTILE AS SHOWN IN THE DRAWING AND AS DIRECTED BY THE ENGINEER TO PREVENT THE INGRESS OF FINES GEOTEXTILE FABRIC SHALL BE WOVEN POLYPROPYLENE THERMALLY BONDED HAVING FOLLOWING PROPERTIES
WEIGHT 150 G/M (MINIMUM) (ASTM D5261)
TENSILE STRENGTH 9KN/m (MINIMUM) (ASTM D4595) @ 5% ELONGATION
PERMEABILITY $30 \text{L/m}^2/\text{S}$ (MINIMUM) (BS 6906/3)(100mm WATER HEAD)
PORE SIZE (O_{90}) <300 MICRONS (BS 6906/2)



CLIENT:
MINISTRY OF ENVIRONMENT
AND ENERGY

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

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

TITLE:
TYPICAL DRAWING FOR BEDDING TYPES DI/PE/PVC PIPES
NAIFARU

DESIGN
ENGINEER
DATE

DRAWN
CHECKED
DESIGN CHIEF

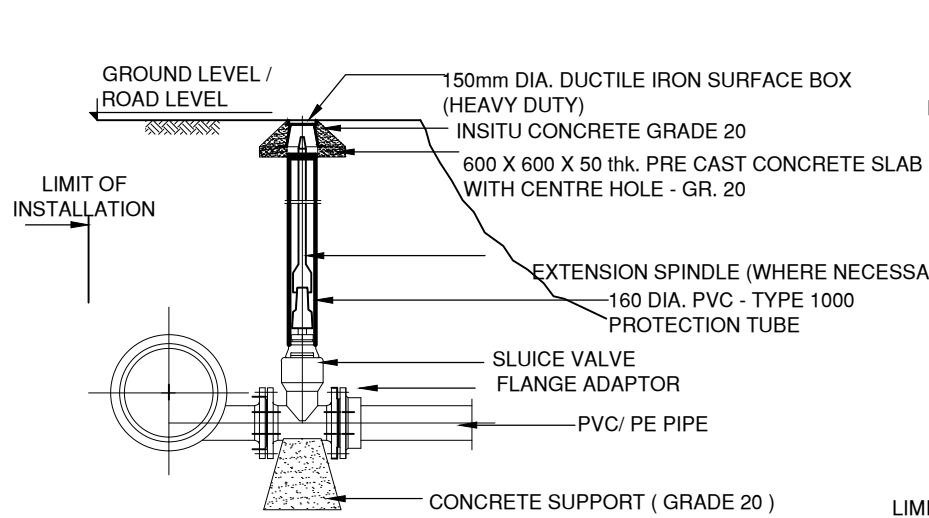
APPROVED

DRG.NO: NA/WS/STD/0□
SCALE: NOT TO SCALE

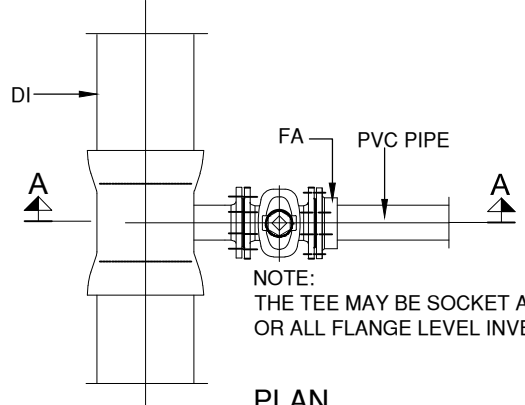
SL.NO

DRWING NO

DESCRIPTION

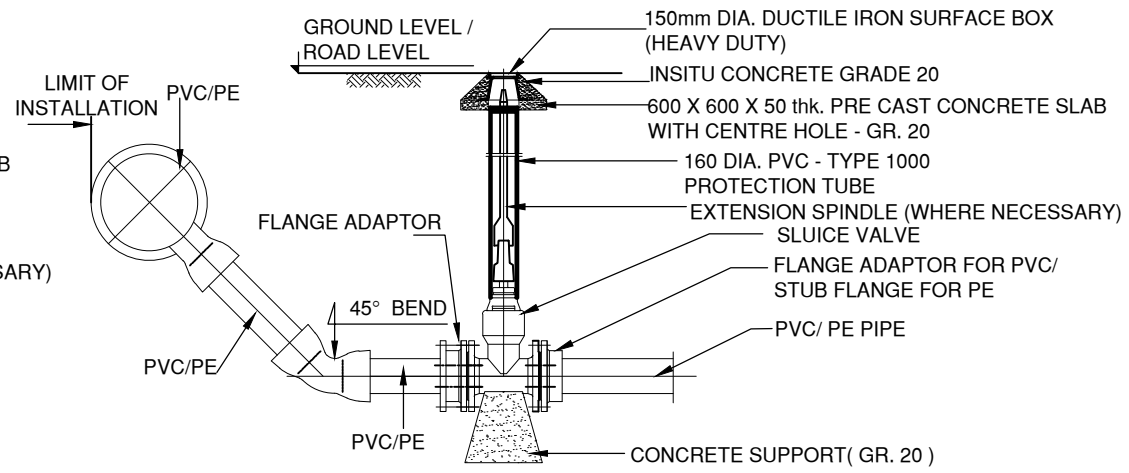


SECTION A - A

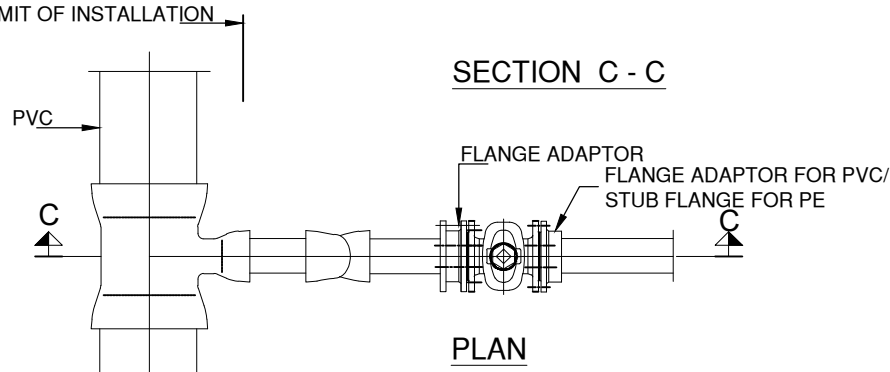


PLAN

FOR DI PIPES (250 AND ABOVE)/ PE PIPES (280 AND ABOVE)

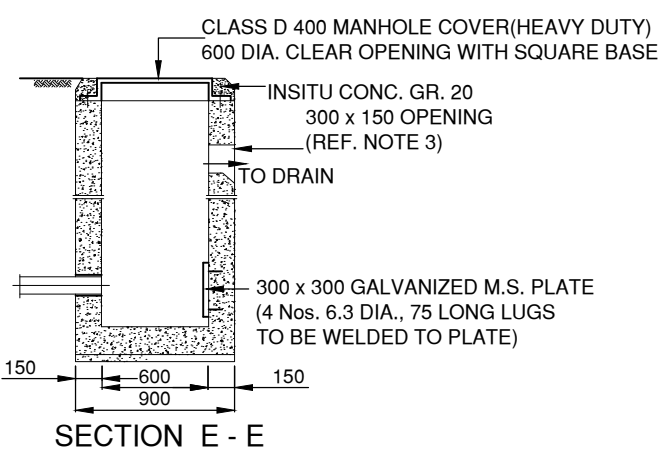


SECTION C - C

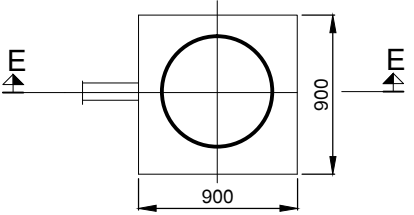


PLAN

FOR PVC PIPES 280 AND BELOW/PE PIPES 225 BELOW



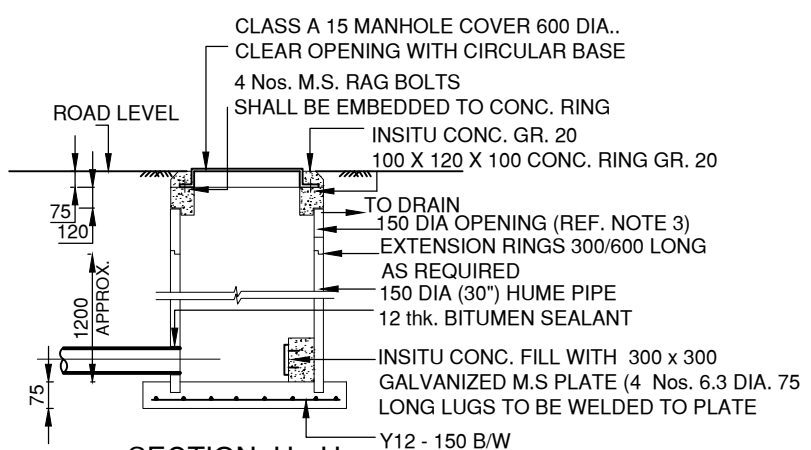
SECTION E - E



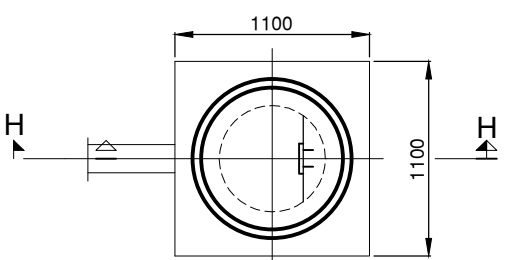
PLAN

OUTLET CHAMBER - TYPE A

DISCHARGE LEVEL ABOVE PIPE LINE AND CHAMBER SUBJECT TO TRAFFIC LOADS



SECTION H - H

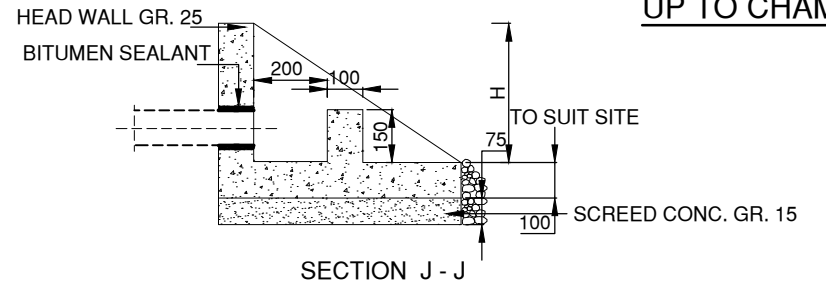


PLAN

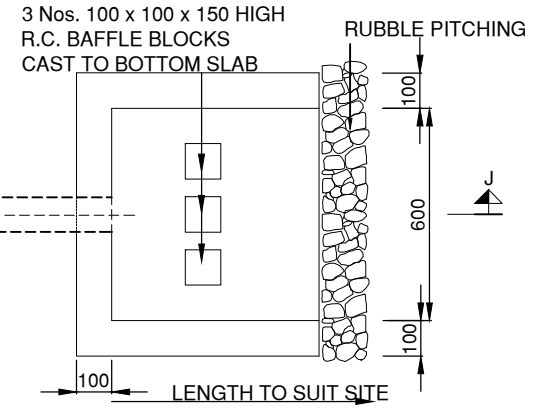
OUTLET CHAMBER - TYPE B

DISCHARGE LEVEL ABOVE PIPE LINE AND CHAMBER NOT SUBJECT TO TRAFFIC LOADS

DETAILS OF CONNECTION FROM MAIN PIPE LINE UP TO CHAMBER



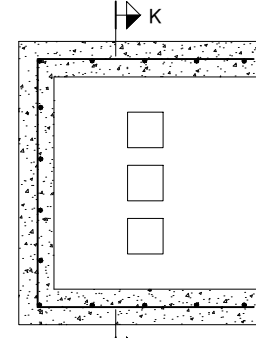
SECTION J - J



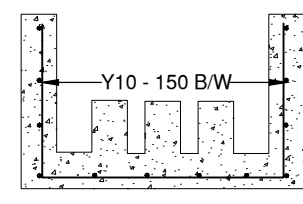
PLAN

OUTLET CHAMBER - TYPE C

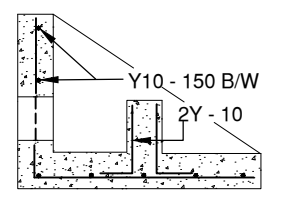
DISCHARGE LEVEL BELOW PIPE LINE AND STRUCTURE NOT SUBJECT TO TRAFFIC LOADS



PLAN



SECTION K - K



REINFORCEMENT DETAILS FOR PRECAST CONCRETE STRUCTURE OF WASHOUT TYPE - A AND TYPE - C CHAMBER

| SIZE OF MAIN PIPE LINE | SIZE OF WASHOUT VALVE | SIZE OF LEAD AWAY PIPE FROM MAIN PIPE TO CHAMBER |
|------------------------|-----------------------|--|
| UP TO 280 PVC/ PE | 80 | 90 PVC/ PE |
| 250 - 300 DI | 80 | 90 PVC/ PE |
| 350 - 400 DI | 100 | 110 PVC/ PE |
| 600 DI | 100 | 110 PVC/ PE |

NOTES

- ALL DIMENSIONS ARE IN MILLIMETRES.
- LENGTH OF PIPE FROM THE VALVE TO THE DISCHARGE POINT SHALL BE TO SUIT THE SITE
- FOR TYPE A & TYPE B IF THE LOCATION OF CHAMBER DOES NOT PERMIT DIRECT DISCHARGE TO A NATURAL DRAINAGE OUTLET, THEN A LEAD PIPE FROM THE CHAMBER SHALL BE USED UP TO A SUITABLE LOCATION.
- PRE-CAST CONCRETE TO BE GRADE 35 A.



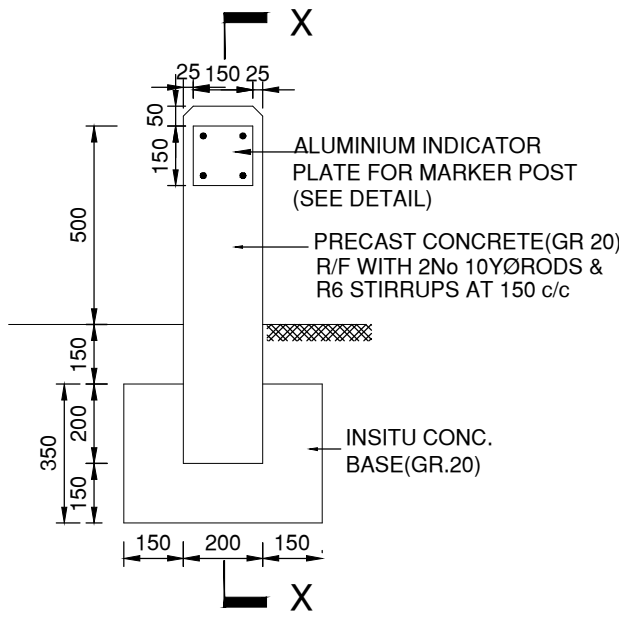
CLIENT:
MINISTRY OF ENVIRONMENT
AND ENERGY

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

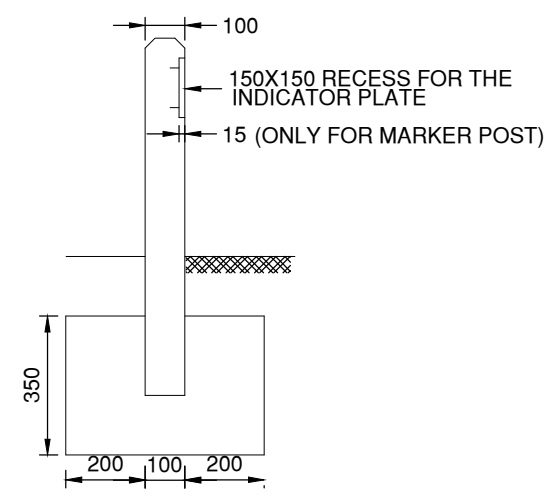
| DESIGN ENGINEER | DRAWN | CHECKED | APPROVED | SL.NO | DRWING NO | DESCRIPTION |
|-----------------|---------------------|--------------|----------|-------|-----------|-------------|
| DATE | DRG.NO: NAWS/STD/0□ | DESIGN CHIEF | | | | |
| | SCALE: NOT TO SCALE | | | | | |

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

TITLE:
WASHOUT VALVE CHAMBERS
NAIFARU



FRONT ELEVATION

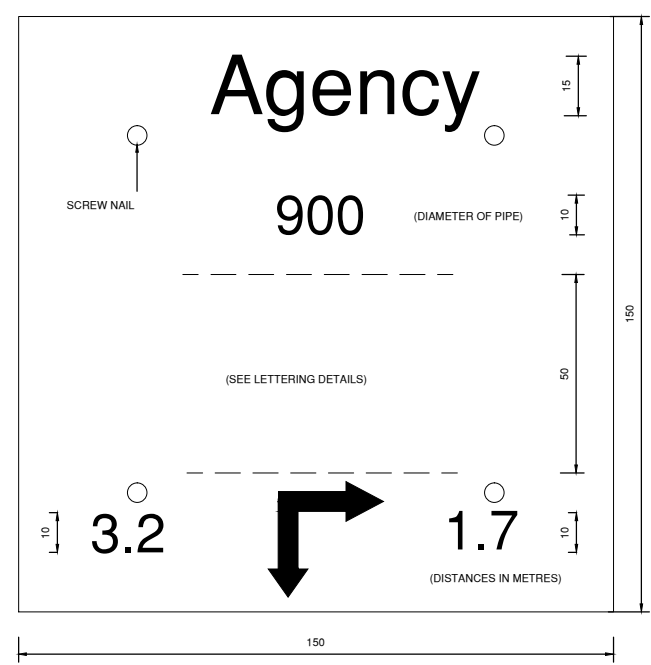


SECTION X-X

DETAIL OF MARKER POST & BOUNDARY POST

SCALE :- 1:20

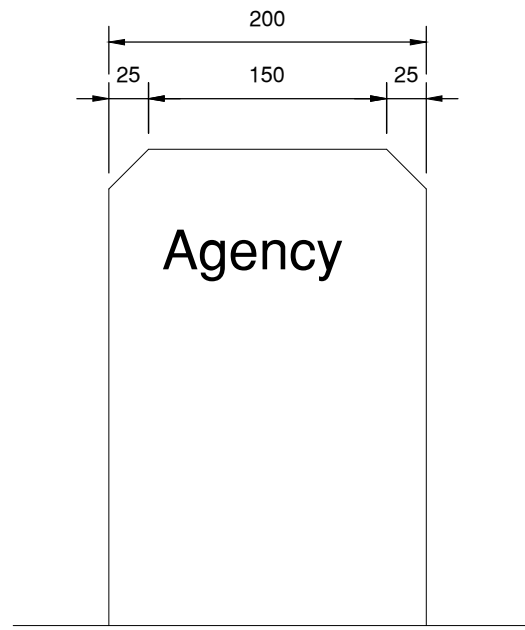
NOTE
FOR BOUNDARY POST AN ENGRAVING SHOULD BE MADE IN THE CONCRETE INSTEAD OF THE INDICATOR PLATE (REFER DETAIL)



NOTE:- PLATE SHALL BE 5 mm TH. ALUMINIUM PLATE, WITH LETTERING ETCHED OR ENGRAVED.

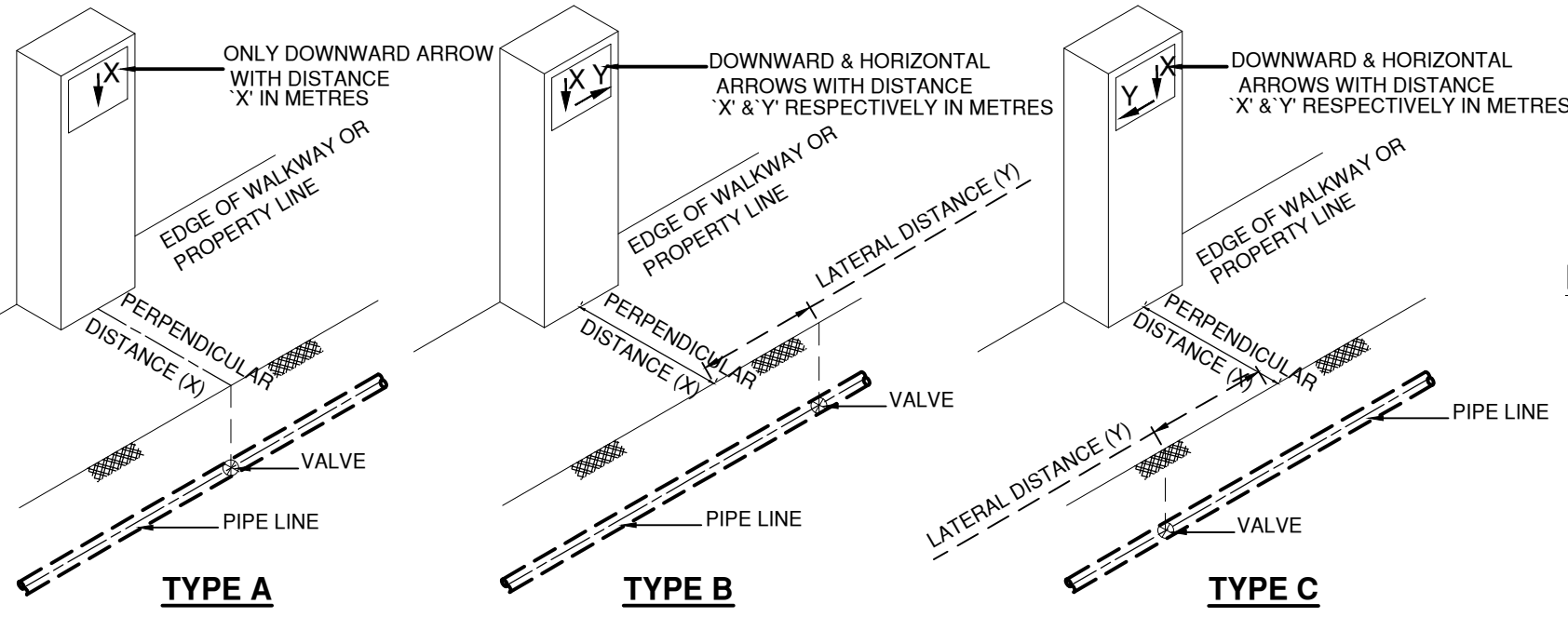
DETAIL OF INDICATOR PLATE FOR MARKER POST

SCALE:-1:1



DETAIL OF ENGRAVING FOR BOUNDARY POST

SCALE:-1:5



TYPES OF INSTALLATION OF MARKER POST



SCALE :- NOT TO SCALE

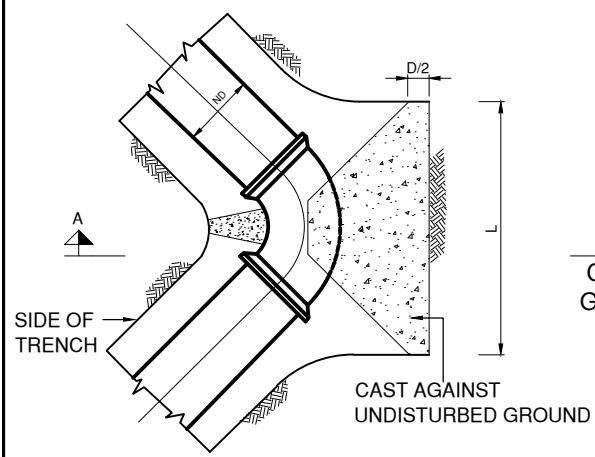
- GV — FOR GATE VALVE
- WO — FOR WASHOUT
- AV — FOR AIR VALVE
- FM — FOR FLOW METER

LETTERING DETAIL

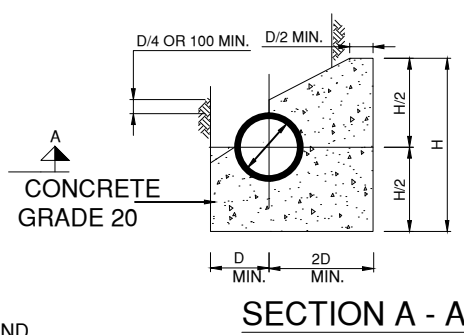
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. INDICATOR PLATE SHALL BE FIXED TO THE RECESS IN THE POST WITH 4 Nos. OF 25 mm LONG BRASS SCREW NAIL AND PLASTIC RAWL PLUGS
3. MARKER POST SHALL BE INSTALLED ON THE SAME SIDE OF THE ROAD WHERE THE FITTING IS INSTALLED.
4. TYPE 'A' INSTALLATION SHALL BE USED WHERE EVER POSSIBLE.
5. IF MORE THAN ONE FITTING ARE INSTALLED CLOSE TO EACH OTHER, RELEVANT PLATES SHALL BE INSTALLED ON THE SAME POST ONE BELOW THE OTHER, WITH NECESSARY MODIFICATIONS.
6. BOUNDARY POSTS SHALL BE INSTALLED ON THE BOUNDARY OF ACQUIRED LAND, AT ALL CORNERS.

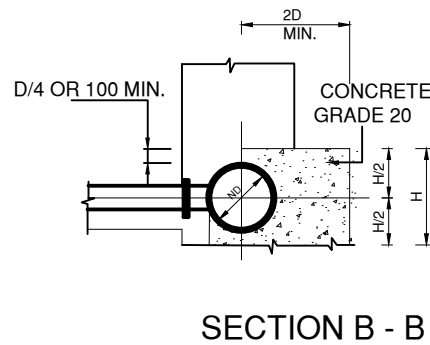
| | | | | | | | | |
|--|--|----------|---------|--------------|----------|-------|-----------|-------------|
|  <p>CLIENT: MINISTRY OF ENVIRONMENT AND ENERGY</p> | <p>CONSULTANCY SERVICES FOR DESIGN OF WATER SUPPLY FACILITIES IN Ha.HORAFUSHI, Hdh.HANIMAADHOO, Sh.MILANDHOO, R. UNGOOFARU, Lh. NAIFARU, 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: TYPICAL DRAWING FOR MARKER POSTS NAIFARU</p> | DATE | DRG.NO: | NAWS/STD/0□ | | | | |
| | | | SCALE: | NOT TO SCALE | | | | |



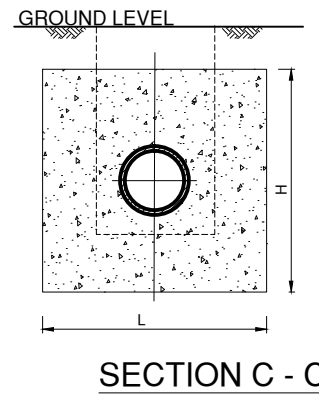
PLAN
90° HORIZONTAL BEND



SECTION A - A



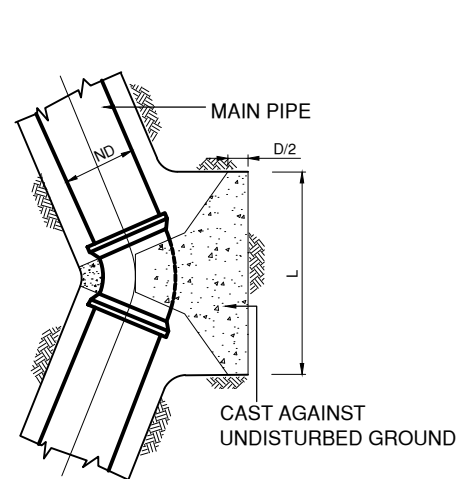
SECTION B - B



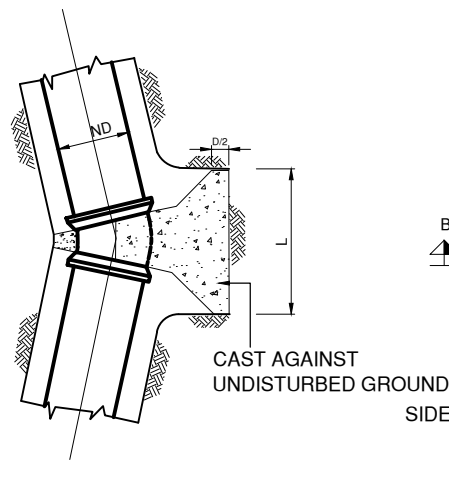
SECTION C - C

DIMENSIONS OF THRUST BLOCKS FOR DIFFERENT TEST PRESSURES

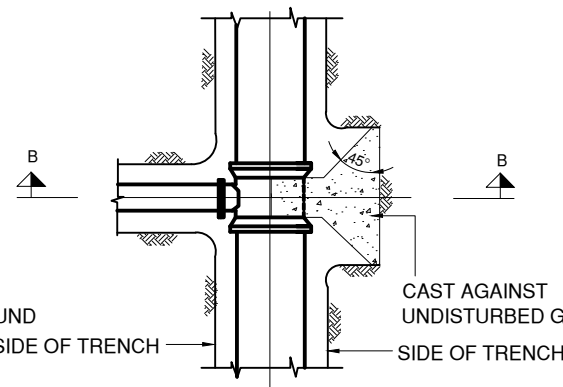
| TEST PRESSURE | D mm DI PIPE | D mm PE PIPE | BENDS | | | | | | | | TEES | |
|---------------|--------------|--------------|---------|------|---------|------|------|------|------|------|------|------|
| | | | 11 1/4° | | 22 1/2° | | 45° | | 90° | | L | H |
| | | | L | H | L | H | L | H | L | H | | |
| 6 bar | 80 | 90 | 0.16 | 0.16 | 0.16 | 0.16 | 0.24 | 0.16 | 0.26 | 0.26 | 0.22 | 0.22 |
| | 100 | 110 | 0.20 | 0.20 | 0.20 | 0.20 | 0.29 | 0.20 | 0.33 | 0.33 | 0.27 | 0.27 |
| | 150 | 160 | 0.23 | 0.23 | 0.28 | 0.23 | 0.55 | 0.23 | 0.48 | 0.48 | 0.40 | 0.40 |
| | 200 | 225 | 0.30 | 0.30 | 0.36 | 0.30 | 0.71 | 0.30 | 0.63 | 0.63 | 0.53 | 0.53 |
| | 250 | 280 | 0.38 | 0.38 | 0.43 | 0.38 | 0.85 | 0.38 | 0.77 | 0.77 | 0.64 | 0.64 |
| 10 bar | 300 | - | 0.38 | 0.38 | 0.60 | 0.38 | 1.17 | 0.38 | 0.90 | 0.90 | 0.76 | 0.76 |
| | 50 | 63 | 0.10 | 0.10 | 0.13 | 0.10 | 0.25 | 0.10 | 0.22 | 0.22 | 0.18 | 0.18 |
| | 80 | 90 | 0.16 | 0.16 | 0.20 | 0.16 | 0.39 | 0.16 | 0.34 | 0.34 | 0.29 | 0.29 |
| | 100 | 110 | 0.20 | 0.20 | 0.25 | 0.20 | 0.48 | 0.20 | 0.42 | 0.42 | 0.35 | 0.35 |
| | 150 | 160 | 0.24 | 0.23 | 0.47 | 0.23 | 0.91 | 0.23 | 0.61 | 0.62 | 0.52 | 0.52 |
| | 200 | 225 | 0.30 | 0.30 | 0.60 | 0.30 | 1.18 | 0.30 | 0.81 | 0.81 | 0.68 | 0.68 |
| | 250 | 280 | 0.38 | 0.38 | 0.72 | 0.38 | 1.41 | 0.38 | 0.99 | 0.99 | 0.83 | 0.83 |
| | 300 | - | 0.50 | 0.38 | 1.00 | 0.38 | 1.96 | 0.38 | 1.16 | 1.16 | 0.98 | 0.98 |



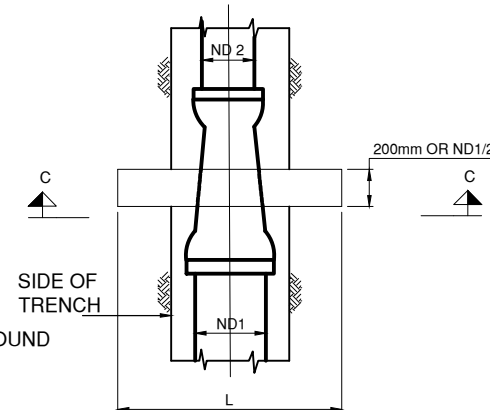
PLAN
45° HORIZONTAL BEND



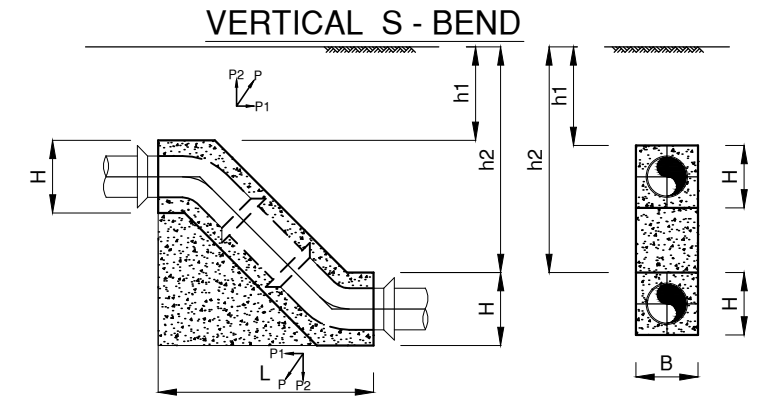
PLAN
22 1/2° HORIZONTAL BEND



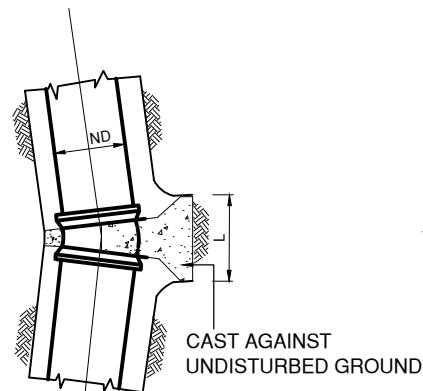
PLAN
THRUST BLOCK FOR TEE



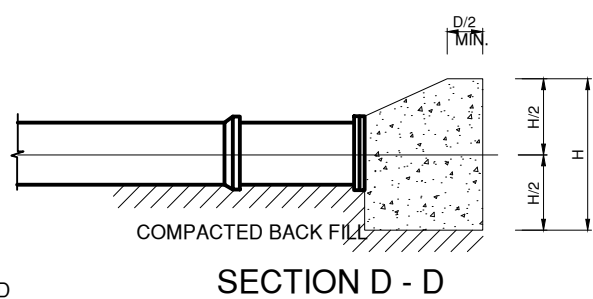
PLAN
THRUST BLOCK FOR TAPER



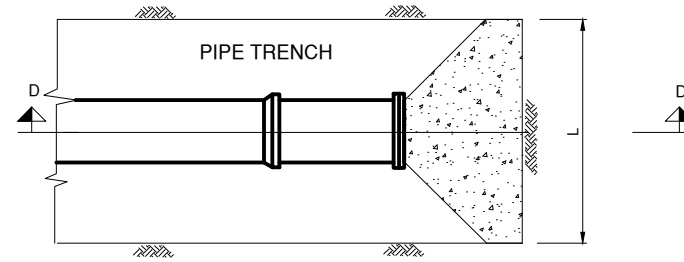
| WATER PRESSURE (Bar) | PIPE NOMINAL OUTSIDE DIAMETER D (mm) | DEGREE OF BEND (Deg) | DIMENSION | | | | |
|----------------------|--------------------------------------|----------------------|-----------|-------|-------|--------|--------|
| | | | B (m) | H (m) | L (m) | h1 (m) | h2 (m) |
| 6/10 | 90 | 45 | 0.30 | 0.30 | 2.00 | 0.90 | 1.90 |
| 6/10 | 100 | 45 | 0.60 | 0.60 | 2.00 | 0.75 | 1.75 |
| 6/10 | 110 | 45 | 0.60 | 0.60 | 2.00 | 0.76 | 1.76 |
| 6/10 | 160 | 45 | 0.75 | 0.60 | 2.50 | 0.78 | 1.78 |
| 6/10 | 200 | 45 | 0.80 | 0.80 | 3.00 | 0.70 | 1.70 |
| 6/10 | 225 | 45 | 0.85 | 0.85 | 3.00 | 0.69 | 1.69 |
| 6/10 | 280 | 45 | 1.00 | 0.90 | 4.00 | 0.70 | 1.70 |
| 10/16 | 150 | 45 | 0.80 | 0.60 | 2.80 | 0.78 | 1.78 |
| 10/16 | 200 | 45 | 1.00 | 0.50 | 3.20 | 0.85 | 1.85 |
| 10/16 | 250 | 45 | 1.00 | 0.70 | 4.00 | 0.78 | 1.78 |
| 10/16 | 300 | 45 | 1.00 | 0.90 | 5.00 | 0.70 | 1.70 |
| 10/16 | 350 | 45 | 1.30 | 0.90 | 5.00 | 0.73 | 1.73 |
| 10/16 | 400 | 45 | 1.50 | 0.70 | 5.00 | 0.85 | 1.85 |
| 10/16 | 500 | 45 | 1.80 | 0.80 | 5.60 | 0.85 | 1.85 |
| 10/16 | 600 | 45 | 2.20 | 0.90 | 6.00 | 0.85 | 1.85 |



PLAN
11 1/4° HORIZONTAL BEND



SECTION D - D



PLAN
THRUST BLOCK FOR ENDCAP/BLANK FLANGE

1. THE DIMENSIONS OF THRUST BLOCKS ARE GIVEN IN METERS.
2. WHEN TWO PIPELINES ARE LAID IN COMMON TRENCH, THE BENDS SHALL BE STAGGERED TO MAKE WAY FOR INDEPENDENT THRUST BLOCKS. WHEN STAGGERING OF BENDS IS NOT POSSIBLE, THE THRUST BLOCK SHALL HAVE THE COMBINED AREA OF L X H REQUIRED FOR BOTH BENDS.
3. THE ABOVE DIMENSIONS OF THRUST BLOCKS ARE VALID FOR NON SUBMERGED CONDITION ONLY. FOR SUBMERGED CONDITION, DOUBLE THE EFFECTIVE LATERAL AREA (LXH).
4. L AND H MAY BE ALTERED TO SUIT SITE, BUT THE LATERAL AREA (LXH) SHALL REMAIN THE SAME OR GREATER.

5. WHEN ANCHOR GASKETS ARE USED, THE AREA (LXH) MAY BE REDUCED BY 50%.
6. THE THRUST BLOCKS SHALL EXTEND FROM THE FITTING UP TO THE UNDISTURBED FACE OF THE PIPE TRENCH.
7. ALL THRUST BLOCKS SHALL BE OF GRADE 20 CONCRETE.



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.GURAIHOO AND Ga.VILLINGILI, MALDIVES

DESIGN

DRAWN

CHECKED

APPROVED

SL.NO

DRWING NO

DESCRIPTION

ENGINEER

DESIGN CHIEF

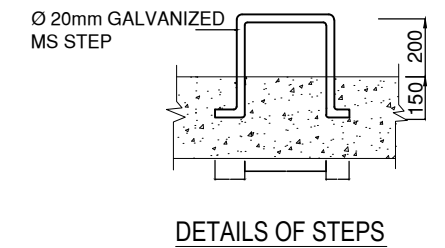
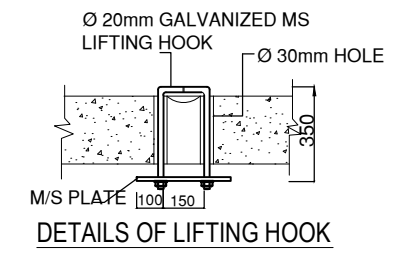
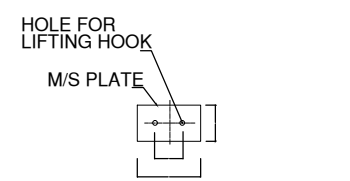
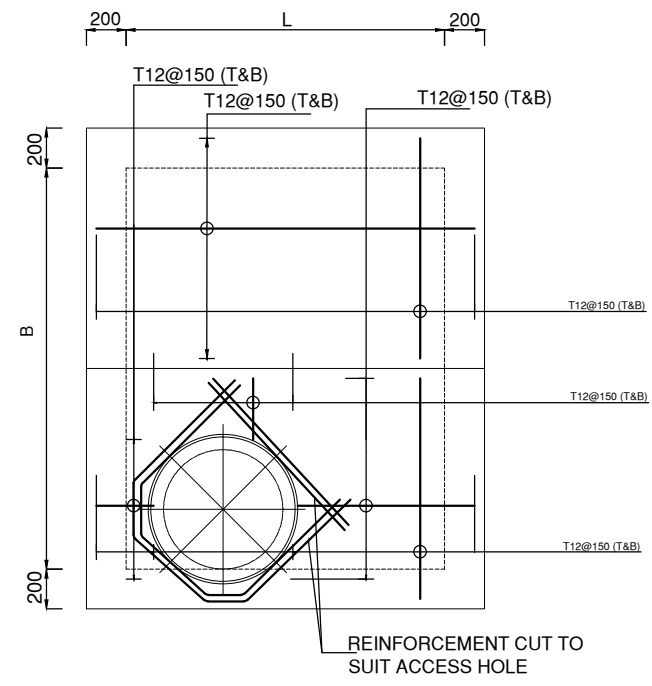
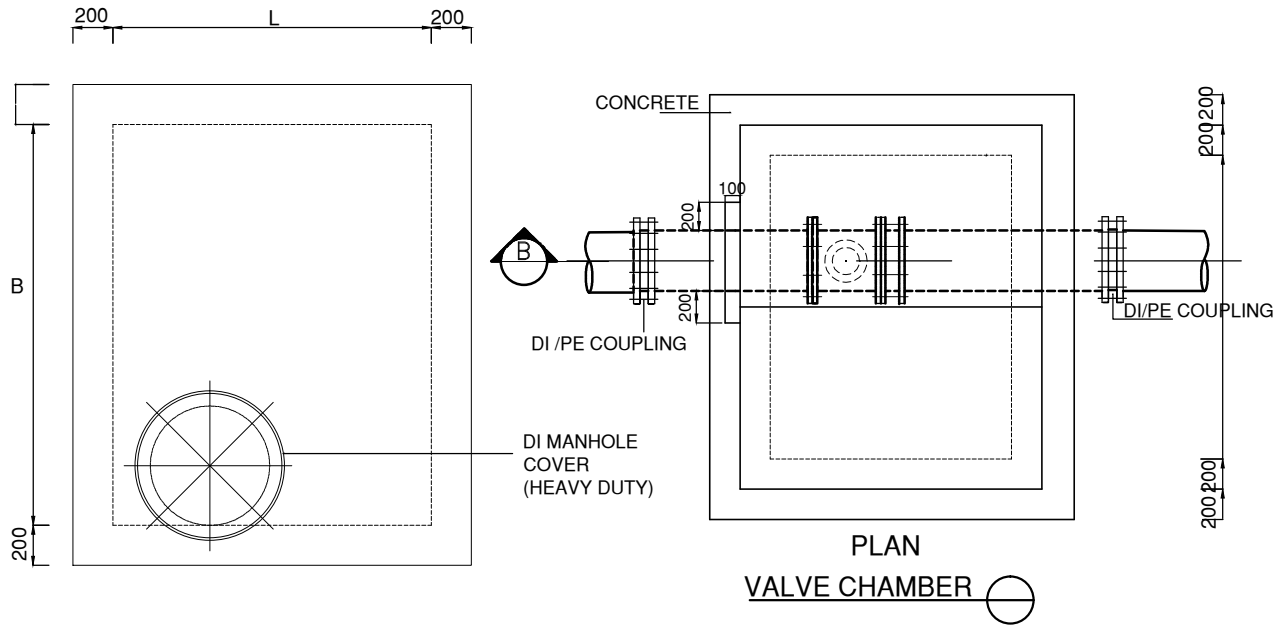
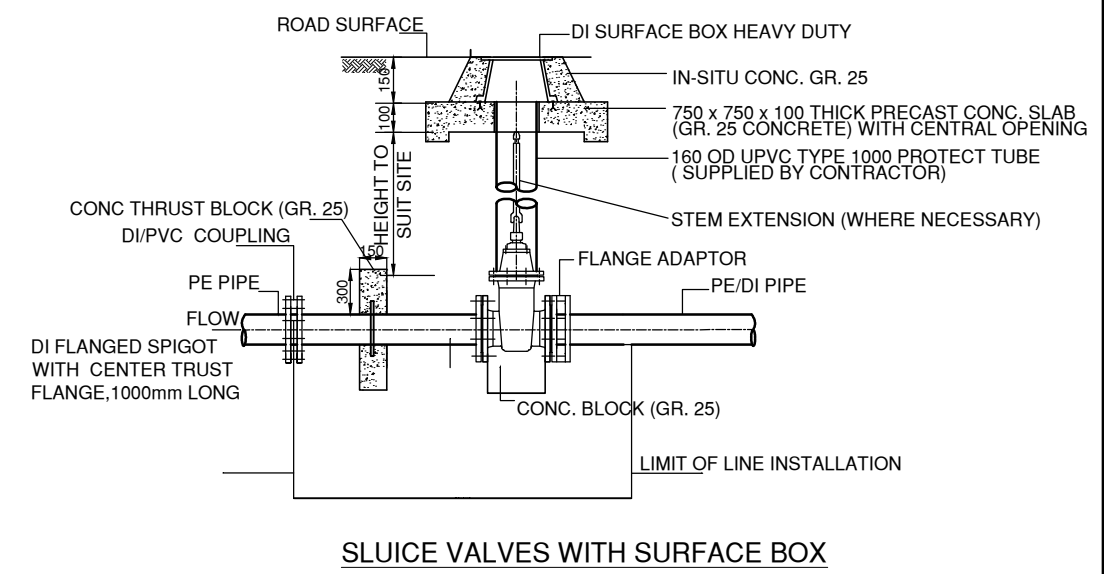
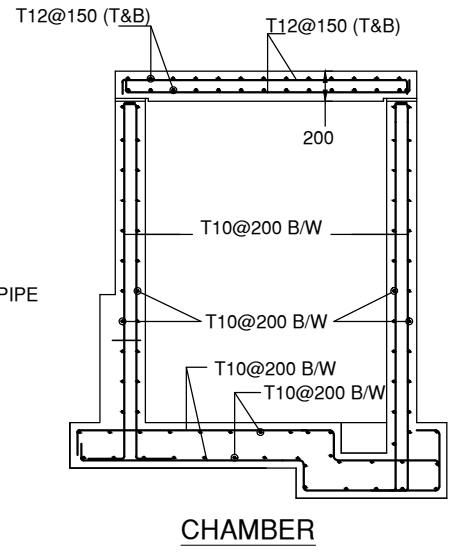
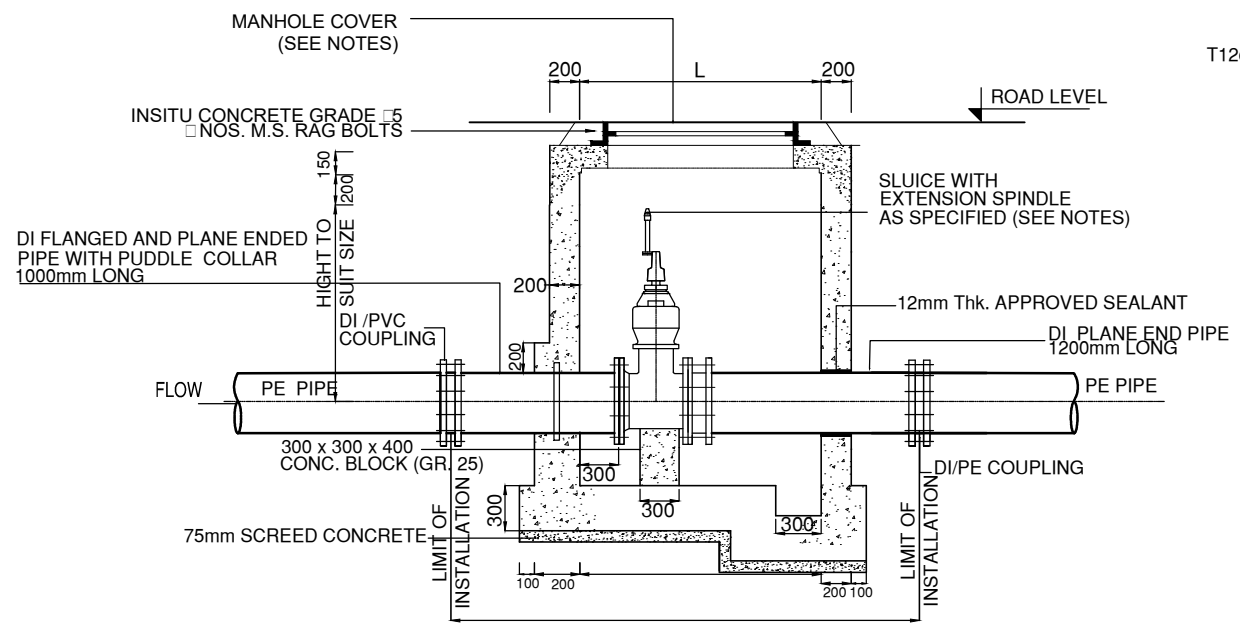
DATE

DRG.NO: NA/WS/STD/05
SCALE: NOT TO SCALE

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

TITLE:

**THRUST BLOCKS
DISTRIBUTION NETWORK
NAIFARU**



| SELECTION OF VALVES AND CHAMBERS | | | |
|----------------------------------|-----------------|---------------------|-----------------|
| LINE DIA. (mm) & TYPE | VALVE DIA. (mm) | VALVE OPERATION | TYPE OF CHAMBER |
| 250/300 DI | 250/300 | GEARED KEY OPERATED | VALVE CHAMBERS |
| 280 PVC | 250 | GEARED KEY OPERATED | VALVE CHAMBERS |
| 225 PVC | 200 | GEARED KEY OPERATED | VALVE CHAMBERS |
| 160 PVC | 150 | GEARED KEY OPERATED | VALVE CHAMBERS |
| 110 PVC | 100 | GEARED KEY OPERATED | VALVE CHAMBERS |

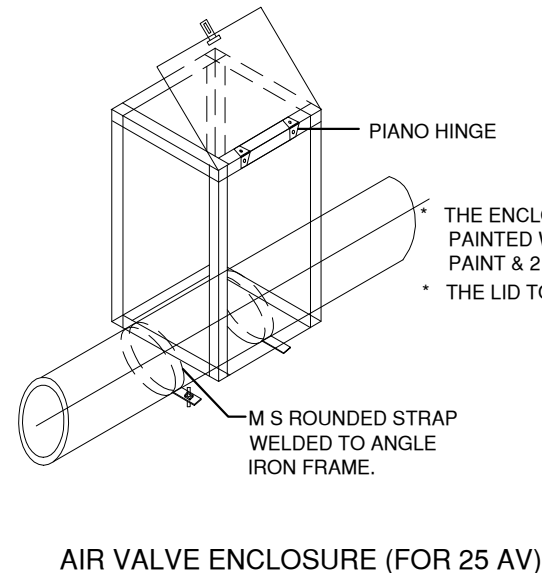
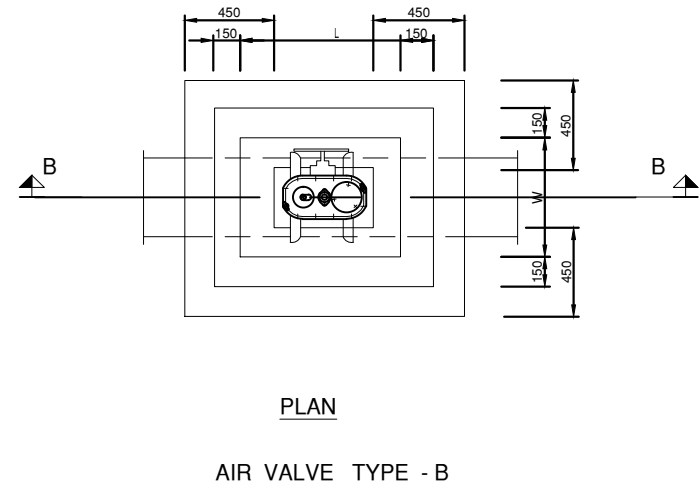
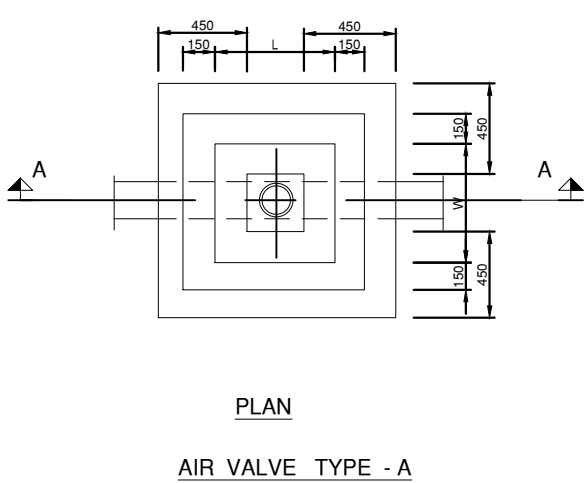
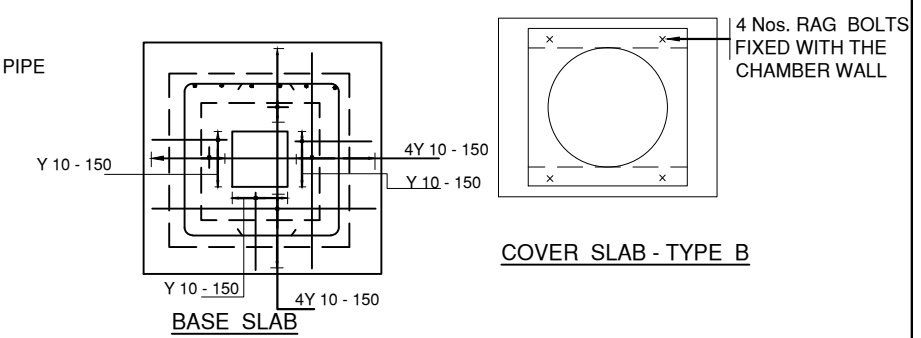
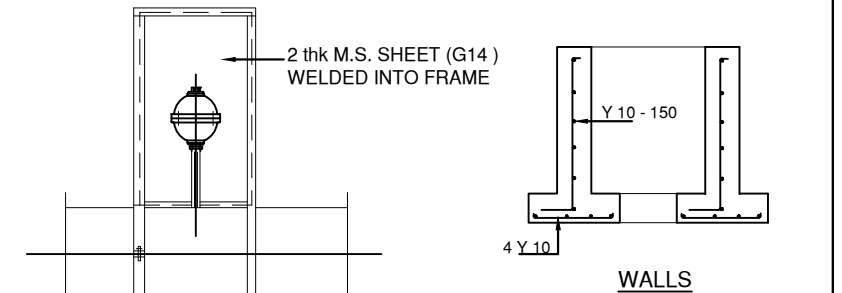
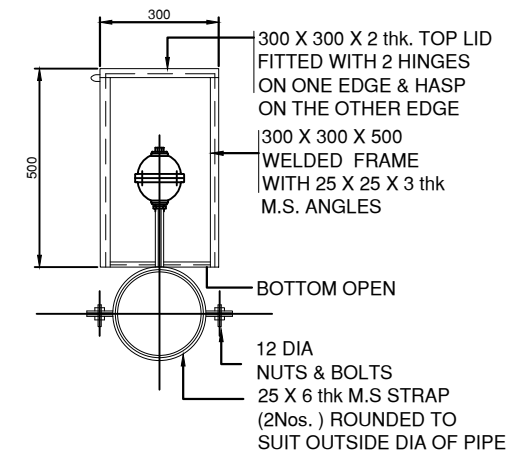
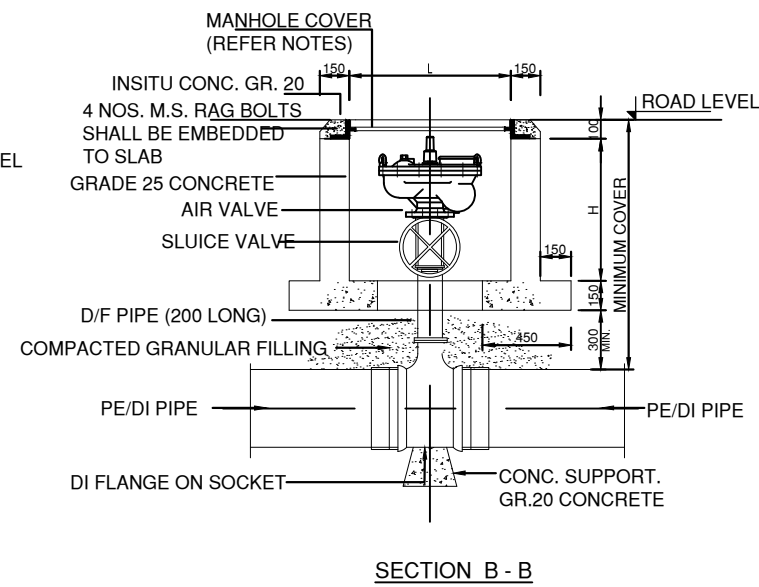
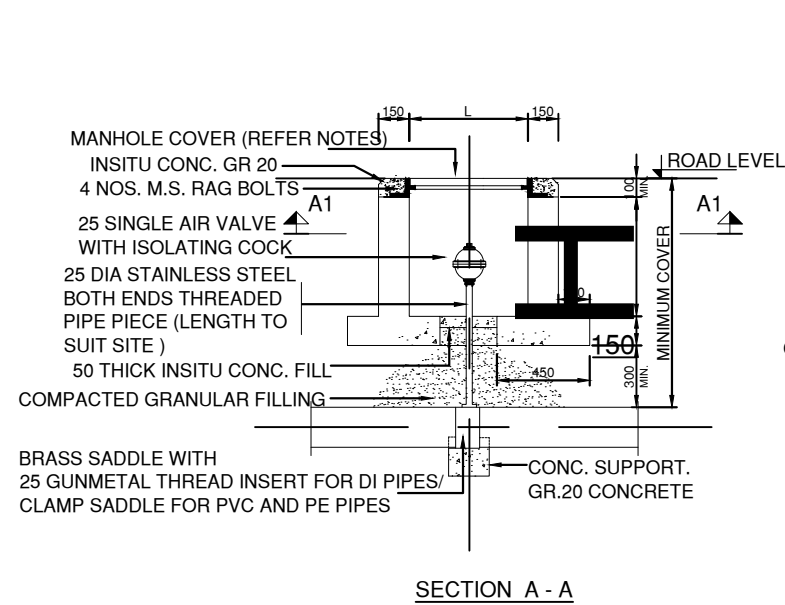
INTERNAL DIMENSIONS OF GATE VALVE CHAMBERS :

| VALVE DIA.(mm) | L (mm) | B (mm) |
|----------------|--------|--------|
| Upto 200 | 1000 | 1000 |
| 250 / 300 | 1500 | 1500 |

NOTES

- ALL DIMENSIONS ARE IN MILIMETRES
- CONCRETE PROTECTION TO BE AS SPECIFIED
- THE SEALANT SHALL BE ELASTIC, ONE COMPONENT, GUN APPLIED SEALANT ON POLYURETHANE BASIS CONFORMING TO BS 4254 SUITABLE FOR METAL WORK AND CONCRETE.
Eg. SIKAFLEX - 1A OR APPROVED EQUAL.
- MANHOLE FRAME SHALL BE FIRMLY FIXED TO THE CHAMBER WITH 4 Nos. RAG BOLTS OR SIMILAR MANNER.
- MANHOLE COVER SHALL BE OF HINGED, HEAVY DUTY (CLASS D 400) VENTILATED TYPE WITH 600 DIA. MINIMUM CLEAR OPENING.

| | | | | | | | | | |
|--|---|---|----------|---------------------|---------------------|----------|-------|-----------|-------------|
| | 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 | DRAWN | CHECKED | 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 | | ENGINEER | | DESIGN CHIEF | | | | |
| | TITLE: | GATE VALVE CHAMBERS DISTRIBUTION NETWORK NAIFARU | DATE | DRG.NO: NAWS/STD/0□ | SCALE: NOT TO SCALE | | | | |



THE ENCLOSURE AND STRAPS SHALL BE PAINTED WITH ONE COAT OF ANTI-CORROSIVE PAINT & 2 COATS BITUMINOUS PAINT.
THE LID TO BE SECURED WITH A PADLOCK.

TYPICAL REINFORCEMENT DETAILS

NOTES

1. CHAMBER SIZE GIVEN IN THE DRG. ARE THE MINIMUM.
2. CHAMBER SIZE AND THE MINIMUM EARTH COVER DETERMINED ACCORDING TO THE DIMENSIONS SHOWN IN TABLE THESE SIZES SHALL BE REVISED WHEN OTHER PRODUCTS ARE USED.
3. MANHOLE COVER SHALL BE OF HINGED, HEAVY DUTY (CLASS D 400) VENTILATED TYPE WITH 600 DIA. MINIMUM CLEAR OPENING.
4. MANHOLE FRAME SHALL BE FIRMLY FIXED TO THE CHAMBER WITH 4 Nos. RAG BOLTS OR SIMILAR MANNER.
5. ALL INSITU CONCRETE, SUPPORTS AND THRUST RESTRAINTS SHALL BE GRADE 20 UNLESS OTHERWISE STATED.

SINGLE ORIFICE AIR VALVE FOR DI, PVC AND PE PIPES UP TO 160

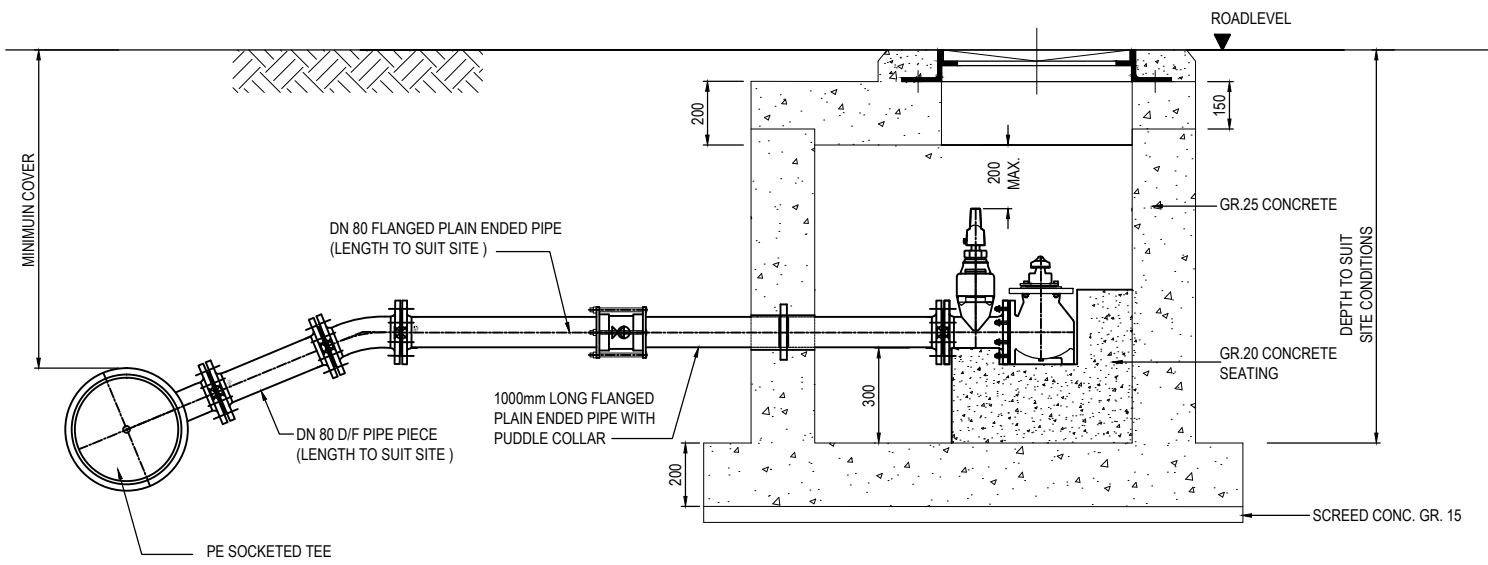
SIZE OF AIR VALVE ASSEMBLY

| TYPE | DIAMETER OF MAIN PIPE | INTERNAL DIMENSION | | | MIN. COVER |
|------|-----------------------|--------------------|-----|-----|------------|
| | | L | W | H | |
| A | UP TO 280 PVC/ PE | 600 | 600 | 600 | 1200 |
| B | 250 - 350 DI | 800 | 600 | 600 | 1200 |
| B | 400 - 600 DI | 800 | 600 | 600 | 1200 |

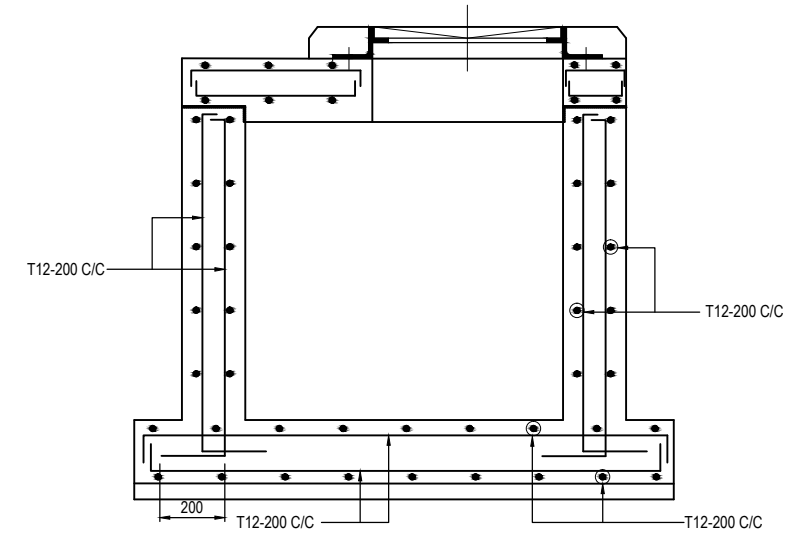
DOUBLE ORIFICE AIR VALVE FOR DI/PVC/PE PIPES ABOVE THE 160

SIZE OF AIR VALVE ASSEMBLY

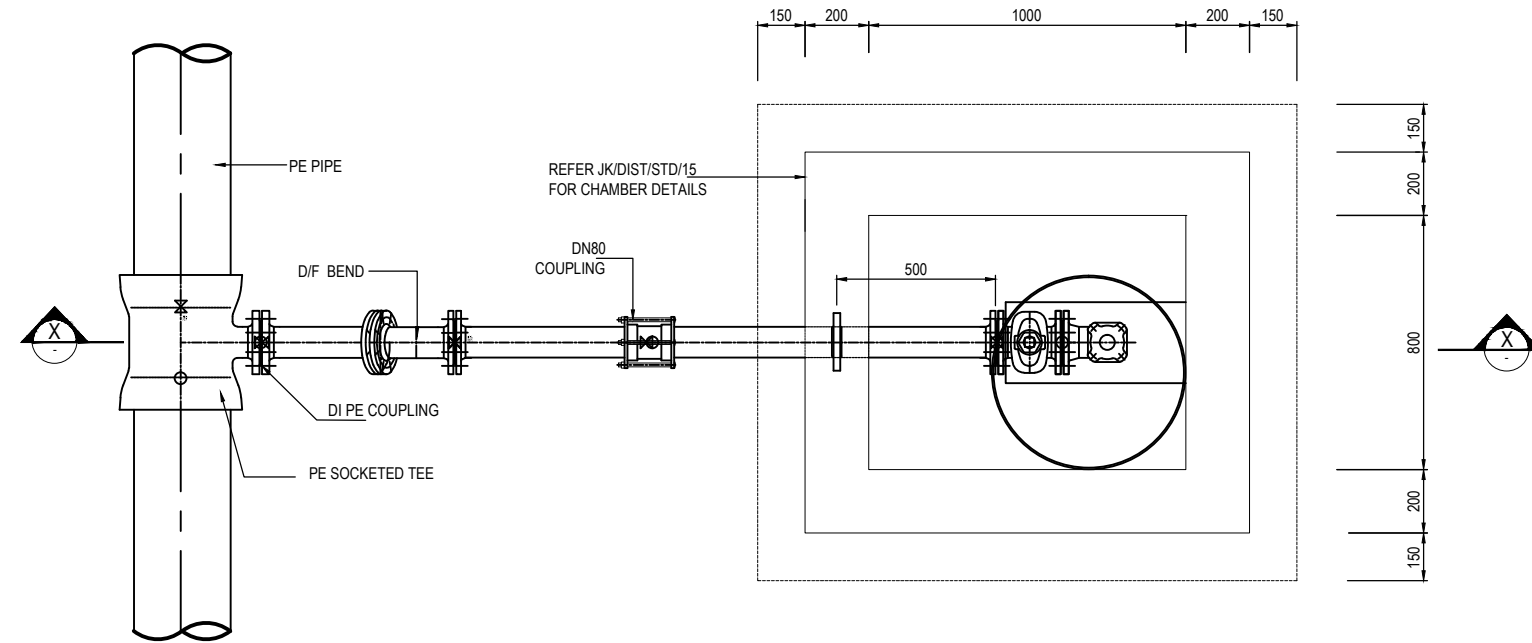
| DIAMETER OF MAIN PIPE | SIZE OF AIR VALVE (PN 16) | SIZE OF ISOLATING SLUICE VALVE (HAND WHEEL OPERATED) | SIZE OF FLANGED BRANCH OFF | LENGTH OF BRANCH PIECE |
|-----------------------|-----------------------------|--|----------------------------|------------------------|
| UP TO 160 PVC/ PE | 25 SINGLE ORIFICE AIR VALVE | 25 ISOLATING COCK | □ | □ |
| 225&280 PVC/PE | 80 DOUBLE ORIFICE AIR VALVE | 80 D/F SLUICE VALVE | 80 | 80 DI, D/F 200 LONG |



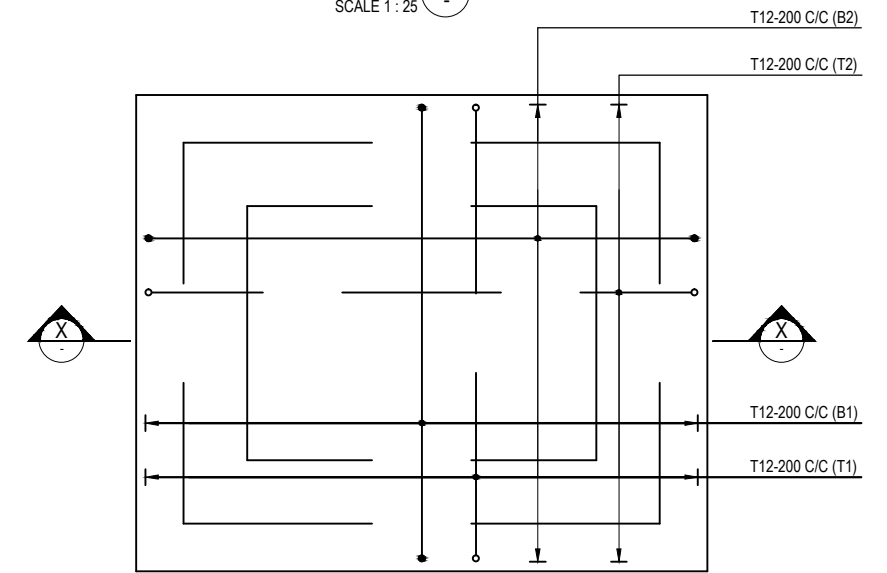
SECTION X
SCALE 1 : 25



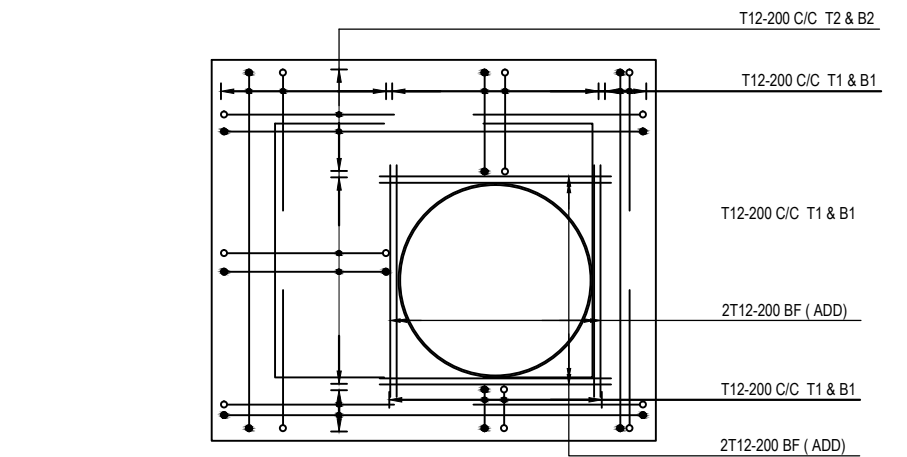
SECTION X
SCALE 1 : 25



PLAN
SCALE 1 : 25



BASE PLAN
SCALE 1 : 25



COVER SLAB
SCALE 1 : 25

REINFORCEMENT DETAILS

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS .
2. EXACT LOCATION OF THE FIRE HYDRANT IS TO BE VERIFIED AT SITE.
3. MANHOLE COVER SHALL BE OF HINGED, HEAVY DUTY (CLASS - D 400) VENTILATED TYPE WITH 600 DIA. MINIMUM CLEAR OPENING.
4. MANHOLE FRAME SHALL BE FIRMLY FIXED TO THE CHAMBER WITH 4 Nos. RAG BOLTS OR SIMILAR MANNER.
5. STRUCTURAL CONCRETE SHALL BE GRADE 25.
6. ALL INSITU CONCRETE SUPPORTS AND THRUST RESTRAINTS SHALL BE GRADE 20 UNLESS OTHERWISE STATED.
7. CHAMBER TOP LEVEL TO BE MATCHED WITH FINAL ROAD FORMATION LEVEL.



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.GURAIHOO AND Ga.VILLINGILI , MALDIVES

DESIGN

DRAWN

CHECKED

APPROVED

SL.NO

DRWING NO

DESCRIPTION

ENGINEER

DESIGN CHIEF

DATE

DRG.NO:

NAWS/STD/0□

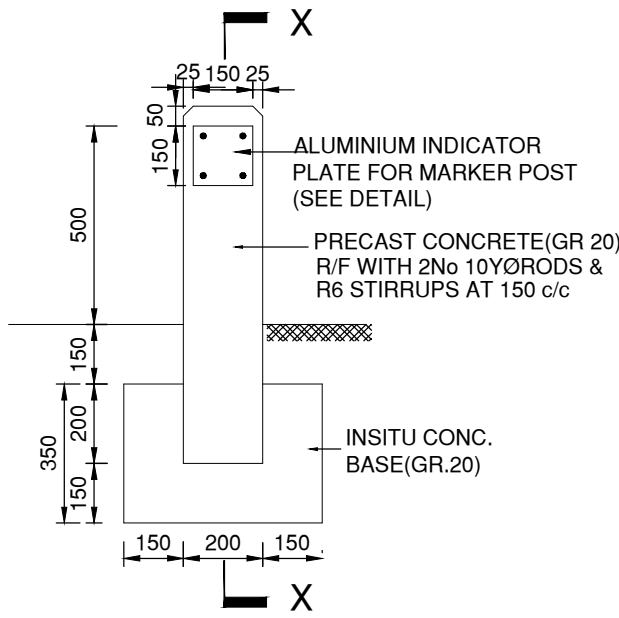
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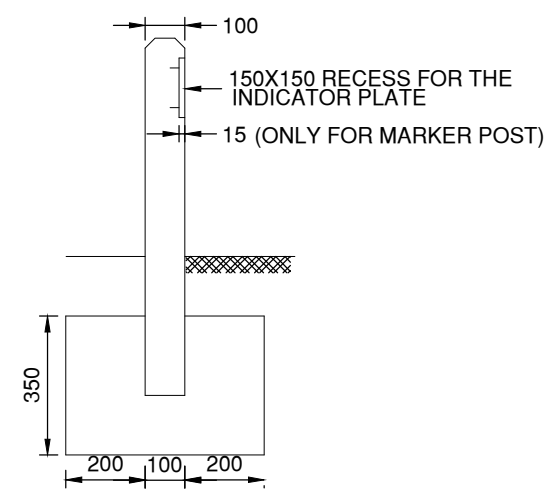
GREENTECH CONSULTANTS (Pvt.) Ltd IN ASSOCIATION WITH
DEVELOPMENT COLLABORATION PARTNERSHIP (Pvt.) Ltd MALDIVES
AND OPTIMUM SOLOUTIONS (Pvt) Ltd, MALDIVES

TITLE:

FIRE HYDRANT TYPICAL DRAWING
NAIFARU



FRONT ELEVATION

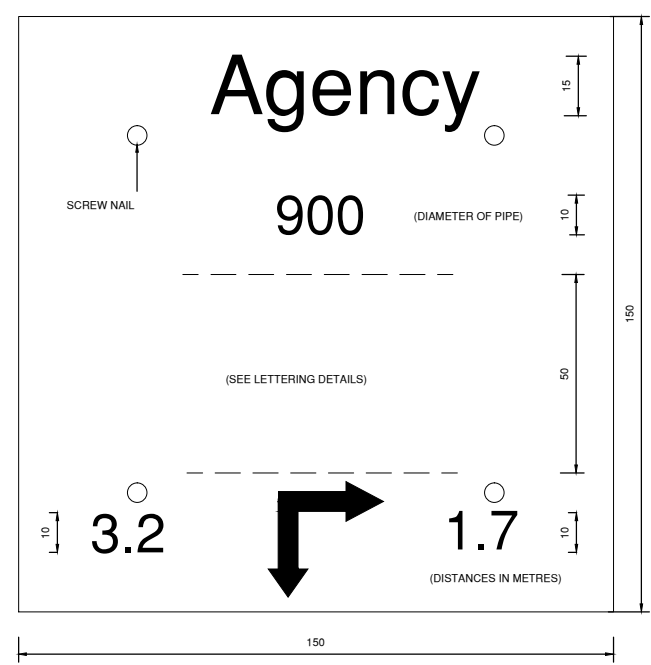


SECTION X-X

DETAIL OF MARKER POST & BOUNDARY POST

SCALE :- 1:20

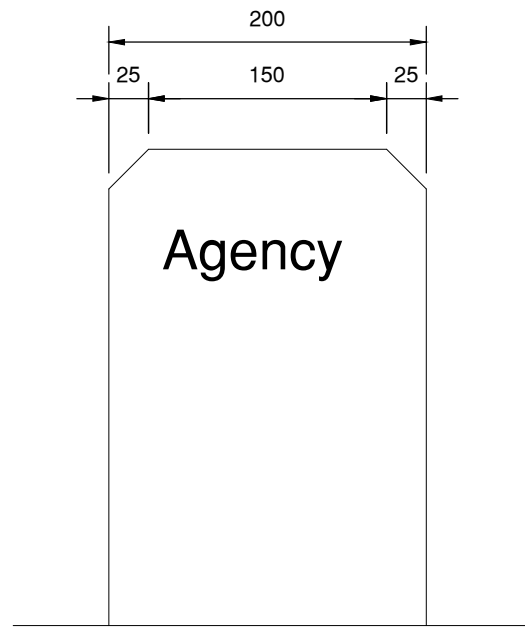
NOTE
FOR BOUNDARY POST AN ENGRAVING SHOULD BE MADE IN THE CONCRETE INSTEAD OF THE INDICATOR PLATE (REFER DETAIL)



NOTE:- PLATE SHALL BE 5 mm TH. ALUMINIUM PLATE, WITH LETTERING ETCHED OR ENGRAVED.

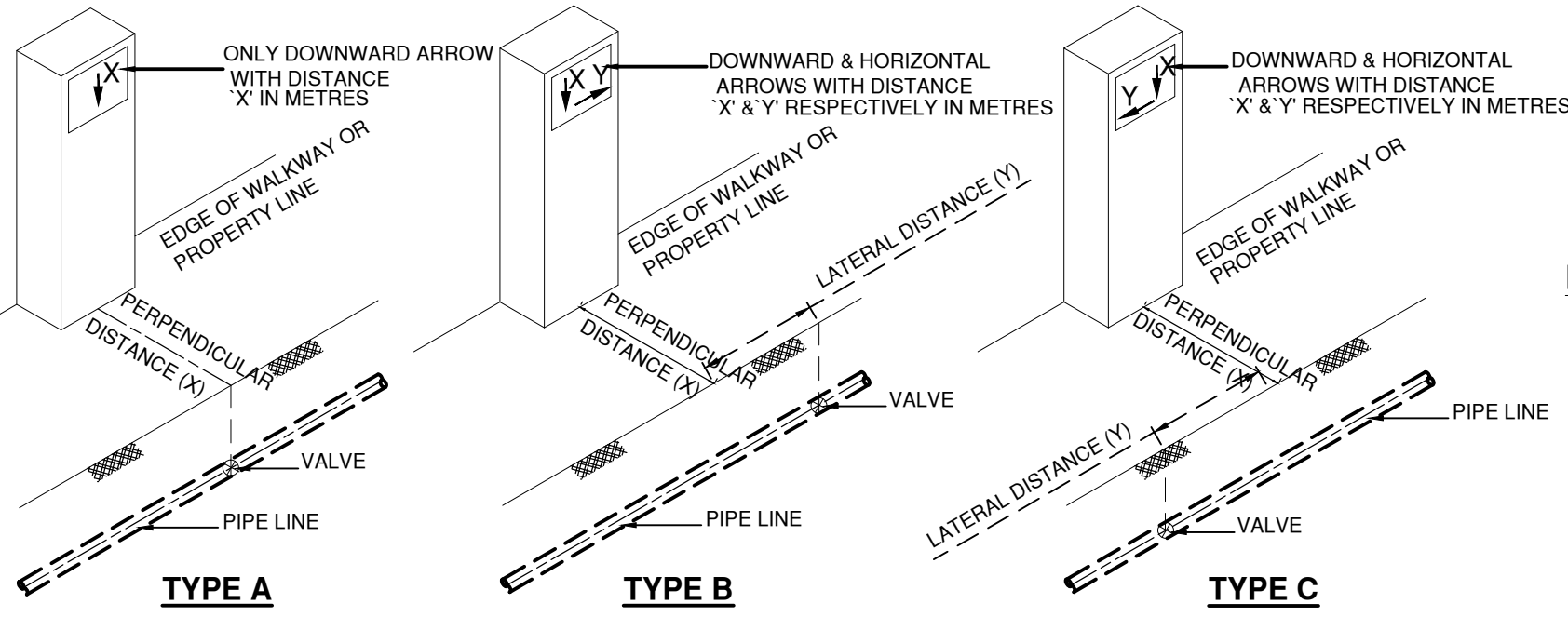
DETAIL OF INDICATOR PLATE FOR MARKER POST

SCALE:-1:1



DETAIL OF ENGRAVING FOR BOUNDARY POST

SCALE:-1:5



TYPES OF INSTALLATION OF MARKER POST



SCALE :- NOT TO SCALE

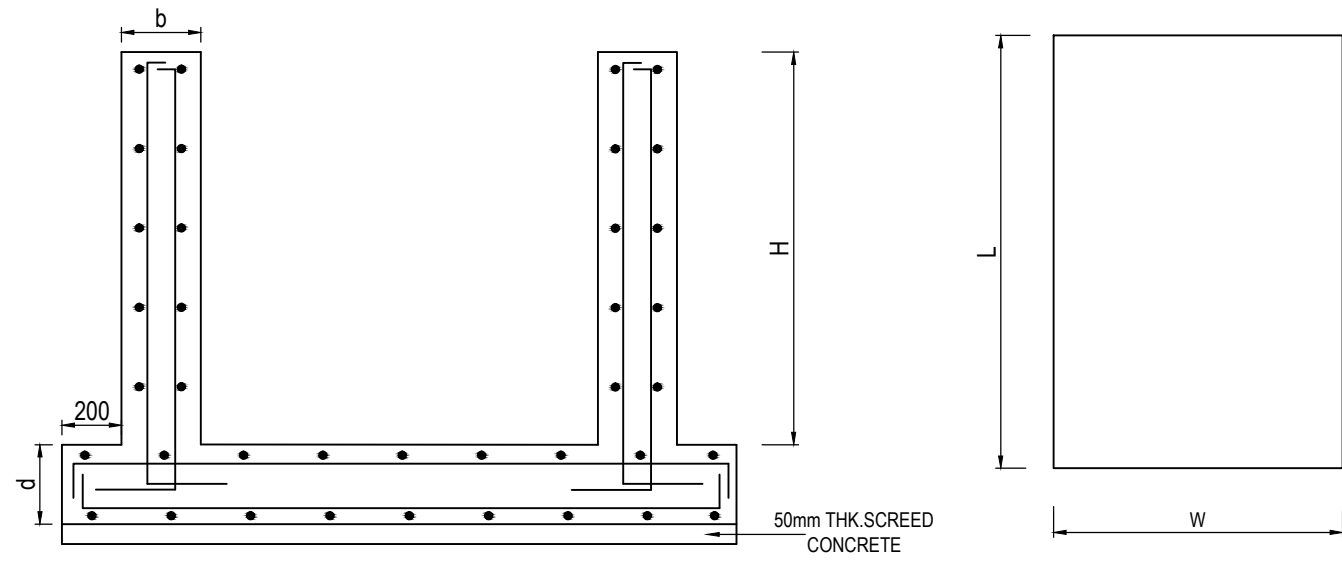
- GV — FOR GATE VALVE
- WO — FOR WASHOUT
- AV — FOR AIR VALVE
- FM — FOR FLOW METER

LETTERING DETAIL

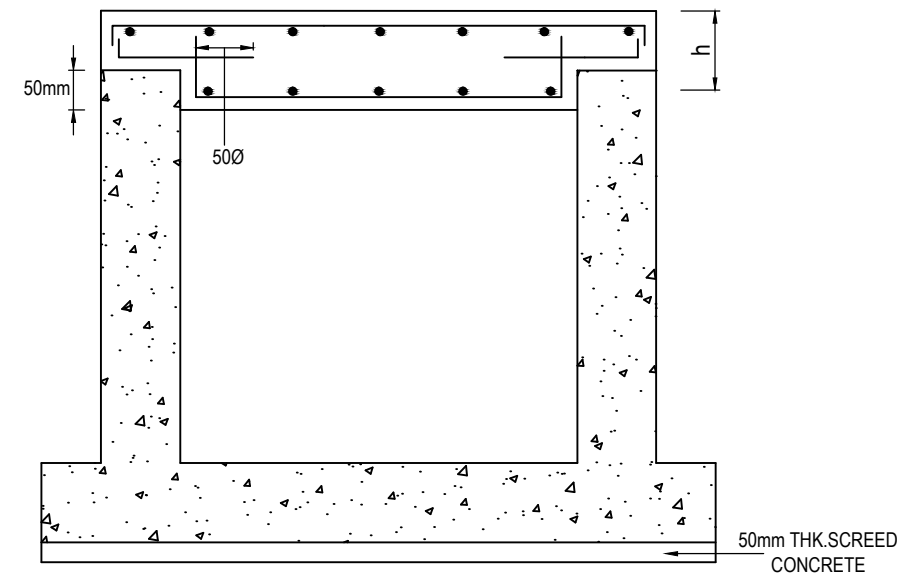
NOTES

- ALL DIMENSIONS ARE IN MILLIMETRES.
- INDICATOR PLATE SHALL BE FIXED TO THE RECESS IN THE POST WITH 4 Nos. OF 25 mm LONG BRASS SCREW NAIL AND PLASTIC RAWL PLUGS
- MARKER POST SHALL BE INSTALLED ON THE SAME SIDE OF THE ROAD WHERE THE FITTING IS INSTALLED.
- TYPE 'A' INSTALLATION SHALL BE USED WHERE EVER POSSIBLE.
- IF MORE THAN ONE FITTING ARE INSTALLED CLOSE TO EACH OTHER, RELEVANT PLATES SHALL BE INSTALLED ON THE SAME POST ONE BELOW THE OTHER, WITH NECESSARY MODIFICATIONS.
- BOUNDARY POSTS SHALL BE INSTALLED ON THE BOUNDARY OF ACQUIRED LAND, AT ALL CORNERS.

| | | | | | | | | |
|--|--|----------|---------|--------------|----------|-------|-----------|-------------|
|  <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. UNGOOFARU, 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: TYPICAL DRAWING FOR MARKER POSTS NAIFARU</p> | DATE | DRG.NO: | NAWS/STD/0□ | | | | |
| | | | SCALE: | NOT TO SCALE | | | | |



PLAN VIEW OF COVER SLABS

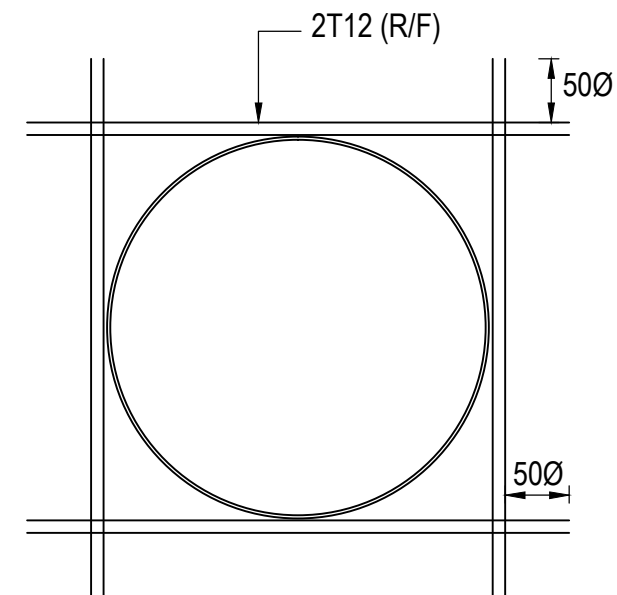


| TYPE | HEIGHT(H) | WALL THK.(b) | BASE SLAB THK.(d) | VERTICAL R/F(WALL) | HORIZONTAL R/F (WALL) | BOTTOM R/F (BASE) | TOP R/F (BASE) |
|------|-------------|--------------|-------------------|---------------------------|---------------------------|---------------------------|--------------------------|
| A | - | 150mm | 200mm | T10-150 C/C (OUTER FACE) | - | - | T10-200 C/C (BOTH WAYS) |
| B | - | 200mm | 250mm | - | - | - | - |
| C | - | 200mm | 250mm | T12 - 200 c/c (BOTH FACE) | - | T12 - 200 c/c (BOTH WAYS) | - |
| D | 2.5m ~ 3.0m | 200mm | 250mm | T12 - 150 c/c (BOTH FACE) | T12 - 150 c/c (BOTH FACE) | T12 - 150 c/c (BOTH WAYS) | T12 - 150 c/c (BOTHWAYS) |

TYPICAL / STRUCTURAL DETAILS OF BASE SLAB & WALLS

| TYPE | LENGTH / WIDTH (L) (W) | COVER SLAB THICK (h) | BOTTOM R/F | TOP R/F |
|------|------------------------|----------------------|-------------------------|---------------------------|
| 1 | - | 200mm | T10-150 C/C (BOTH WAYS) | T10-250 C/C (BOTH WAYS) |
| 2 | - | 200mm | T12-200 C/C (BOTH WAYS) | - |
| 3 | - | 250mm | T12-200 C/C (BOTH WAYS) | T10 - 250 c/c (BOTH WAYS) |
| 4 | 2.5m ~ 3.0m | 250mm | T12-150 C/C (BOTH WAYS) | T10 - 250 c/c (BOTH WAYS) |

TYPICAL / STRUCTURAL DETAILS OF COVER SLABS



ADDITIONAL R/F DETAIL FOR WALL / SLAB OPENINGS.

NOTES :

IF L,W >1.5m,SLAB SHALL BE CASTED AS TWO PARTITIONS (AS TWO SLABS)



CLIENT:
MINISTRY OF ENVIRONMENT
AND ENERGY

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Hdh.HANIMAADHOO,Sh.MILANDHOO,R.UNGOOFAARU,Lh.NAIFARU,Dh,KUDAHUVADHOO
,Th.GURAIHOO AND Ga.VILLINGILI , MALDIVES

DESIGN
ENGINEER

DRAWN

CHECKED
DESIGN CHIEF

APPROVED

SL.NO

DRWING NO

DESCRIPTION

TITLE:

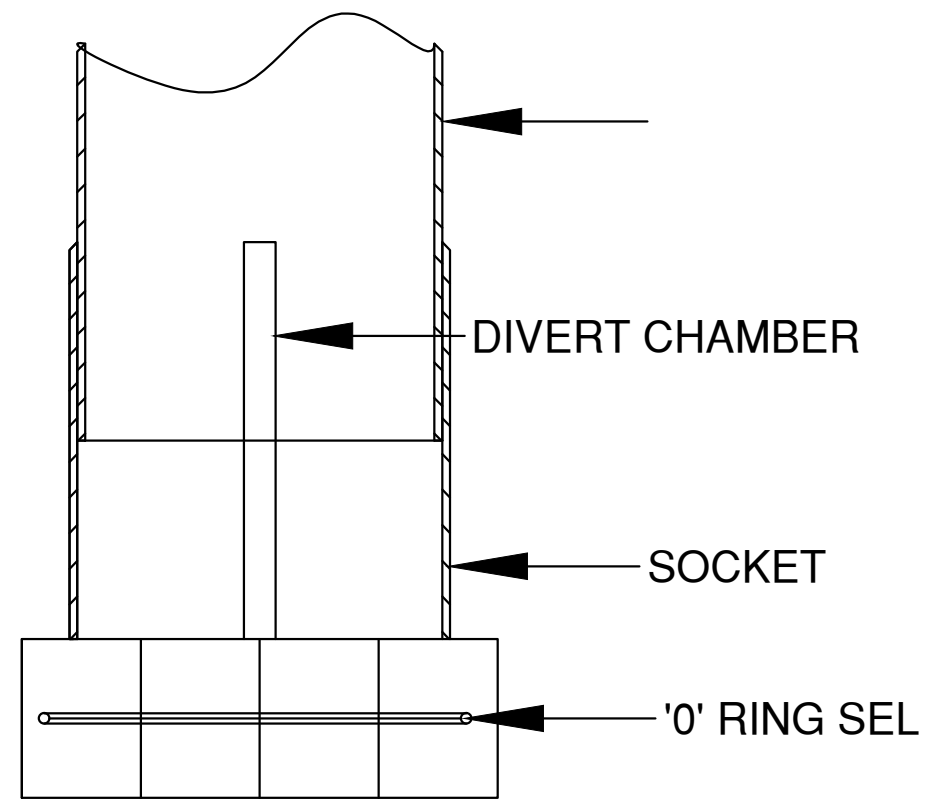
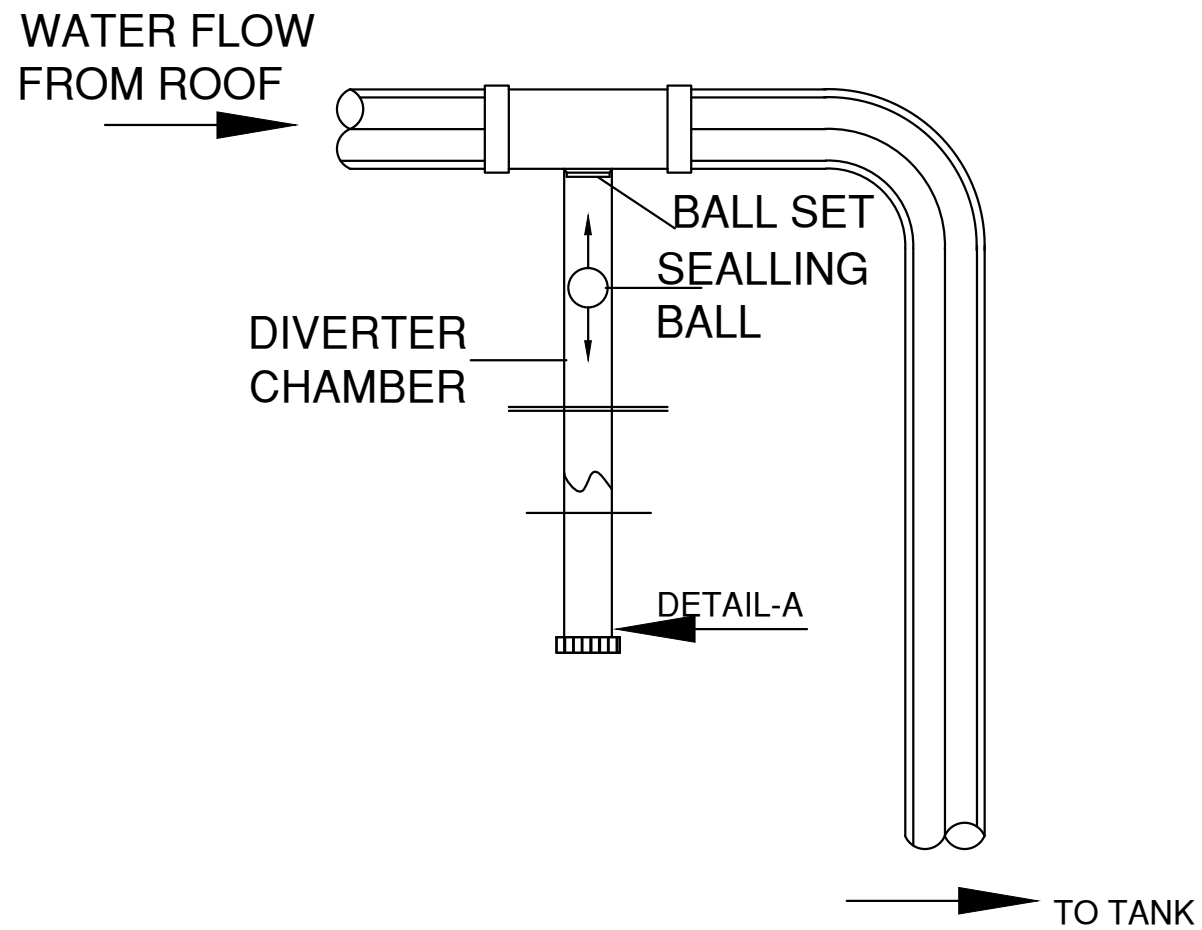
FIRE HYDRANT CHAMBER STRUCTURAL DRAWING
NAIFARU

DATE

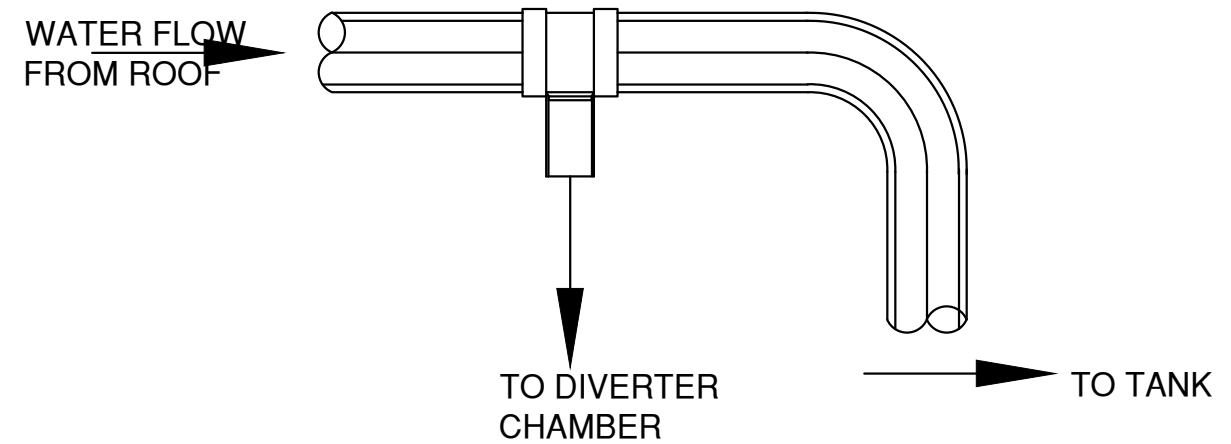
DRG.NO: NAWS/STD/□□

SCALE: NOT TO SCALE



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

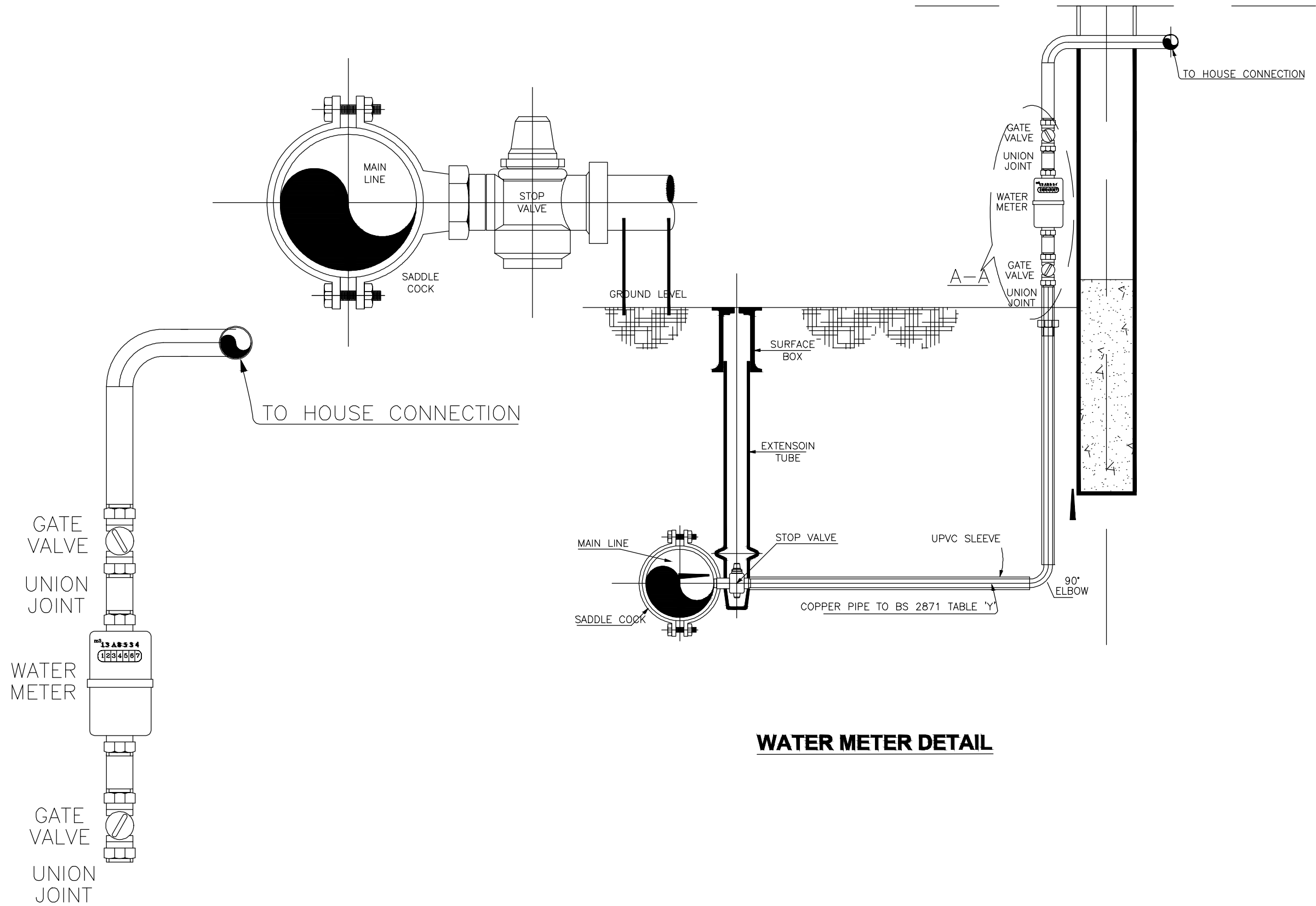


DETAIL-A





TYPICAL FIRST FLUSH DIVERTER

| | | | | | | | | | |
|---|---|--|---|------------------|--------------|--|-------|-----------|-------------|
|  | 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.GURAIHOO AND Ga.VILLINGILI , MALDIVES | DESIGN | DRAWN | CHECKED | 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 | ENGINEER DATE | DESIGN CHIEF | DRG.NO: NAWS/STD/□□ SCALE: NOT TO SCALE | | | |
| TITLE: FIRST FLUSH SYSTEM OF RAIN WATER COLLECTION NAIFARU | | | | | | | | | |



WATER METER DETAIL

ENLARGED VIEW A-A

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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.GURAIIDHOO AND Ga.VILLINGILI , MALDIVES | DESIGN | DRAWN | CHECKED | 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 | ENGINEER DATE | DRG.NO: NAWS/STD/□□ SCALE: NOT TO SCALE | | | | |