



# **MAHARASHTRA NATURAL GAS LIMITED**

**(MNGL)**

**TENDER DOCUMENT  
FOR  
LAYING OF SUB TRANSMISSION PIPELINE (STPL) AND  
ASSOCIATED WORKS FROM MULUGU TO BHIKNOOR FOR  
NIZAMABAD GA.**

**UNDER OPEN DOMESTIC  
COMPETITIVE BIDDING  
(THROUGH E-TENDERING MODE)**

**Bid Document No.: MNGL/CP/2023-24/79**

**VOLUME III OF III**

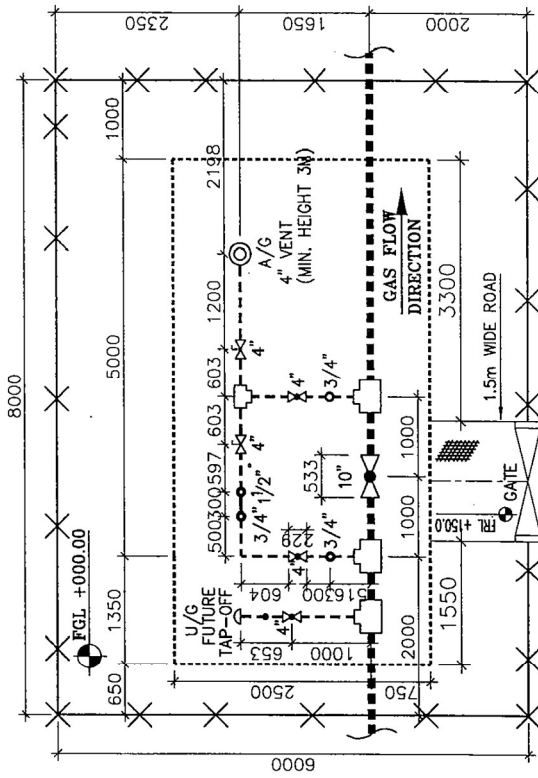
## **A) GENERAL PIPELINE & MECHANICAL DRAWINGS**

- |  |                       |
|--|-----------------------|
| 1. Typical Detail of SV Stations (type-I)  | - MNGL/PIng./Steel/01 |
| 2. Typical Detail of SV Stations (type-II) | - MNGL/PIng./Steel/02 |
| 3. Trench cross section detail             | - MNGL/PIng./Steel/03 |
| 4. Barricading                             | - MNGL/PIng./Steel/04 |
| 5. Cautions Board                          | - MNGL/PIng./Steel/05 |
| 6. Typical Detail of Marker                | - MNGL/PIng./Steel/06 |

## **B) CP DRAWINGS**

- |  |                       |
|--|-----------------------|
| 1. Prepacked Zinc Anode  | - MNGL/PIng./Steel/14 |
| 2. Magnesium Ribbon Anode for Grounding                          | - MNGL/PIng./Steel/16 |
| 3. Test Station with Foundation Details                          | - MNGL/PIng./Steel/18 |
| 4. Test Station Connection Schemes                               | - MNGL/PIng./Steel/19 |
| 5. Prepacked Permanent Ref. Electrode & Installation Details     | - MNGL/PIng./Steel/20 |
| 6. Details of Zinc Grounding Cell                                | - MNGL/PIng./Steel/21 |
| 7. Pipeline Grounding through Polarization Cell & Galvanic anode | - MNGL/PIng./Steel/23 |
| 8. Galvanic Anode Installation                                   | - MNGL/PIng./Steel/24 |
| 9. Test Station for Polarization Cell                            | - MNGL/PIng./Steel/27 |
| 10. Zinc Ribbon Anode for Cased Crossings with Coated Casing     | - MNGL/PIng./Steel/22 |
| 11. Std. detail of backfill for Drain Crossing                   | - MNGL/PIng./Steel/29 |
| 12. Restoration of roads, footpath, channel                      | - MNGL/PIng./Steel/30 |
| 13. Vent & Drain for Line 2" & Above                             | - MNGL/PIng./Steel/31 |

14. Wells Installation 1 ½" & Above (1 of 2)	- MNGL/Plng./Steel/32
15. Wells Installation 1 ½" & Above (2 of 2)	- MNGL/Plng./Steel/33
16. Pressure Tapping	- MNGL/Plng./Steel/34
17. Barred Tees (10" NB x 10" NB x 4"NB)	- MNGL/Plng./Steel/37
18. Barred Tees (6" NB x 6" NB x 6"NB)	- MNGL/Plng./Steel/38
19. Barred Tees (6" NB x 6" NB x 4"NB)	- MNGL/Plng./Steel/39
20. Valve Chamber Details	
21. RCC Slab Typical Drawing	
22. PE stop off valve drawing	-MNGL/ENG/CIVIL/0A
23. Typical drawing of isolation/tap-off valve assembly	- MNGL/Plng./Steel/40



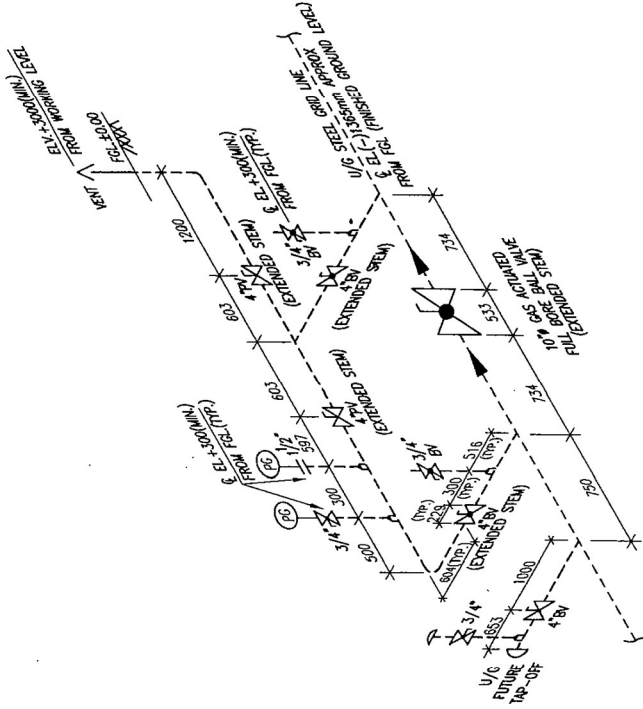
**TYPE-II**  
SV STATION WITH A/G VENT AND TAP-OFF  
TYP. PLOT PLAN WITH PLOT SIZE (8.0M x 6.0M)

**LEGEND:**

- BALL VALVE
- PLUG VALVE
- DISC END
- F.G.L.
- F.R.L.
- I.J.
- VALVE PIT AREA
- ROAD
- CHAINLINK FENCING

**BILL OF MATERIAL**

S.No.	DESCRIPTION	QTY.
1	10" BALL VALVE (EXTENDED STEM) WITH ACTUATOR	- 01 NOS.
2	4" BALL VALVE (EXTENDED STEM)	- 02 NOS.
3	4" PLUG VALVE (EXTENDED STEM)	- 02 NOS.
4	4" BALL VALVE	- 01 NOS.
5	3/4" BALL VALVE	- 04 NOS.
6	BARRER TEE 10"x10"x4"	- 03 NOS.
7	TEE 4"x4"x4"	- 01 NOS.
8	ELBOW (1.5D) 4"	- 01 NOS.



**TYPICAL ISOMETRIC DETAIL OF SECTIONALISING VALVE (TYPE-II)**



**महाराष्ट्र नैचुरल गॅस लिमिटेड**  
MAHARASTRA NATURAL GAS LTD

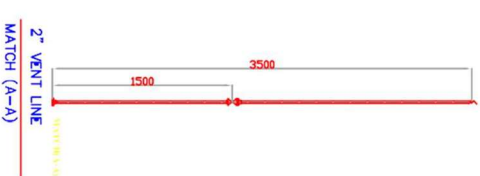
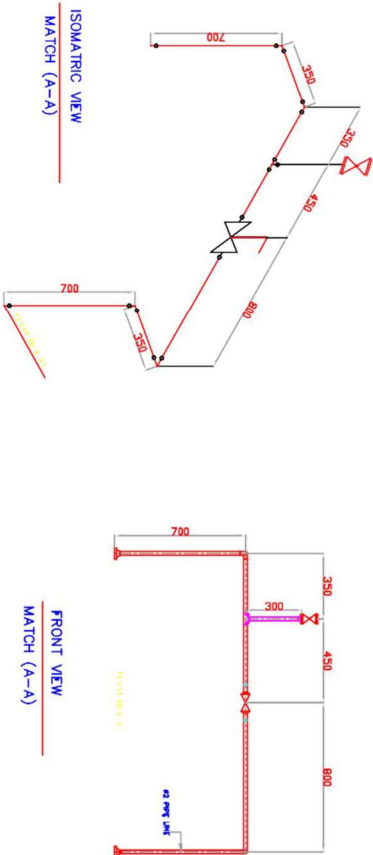
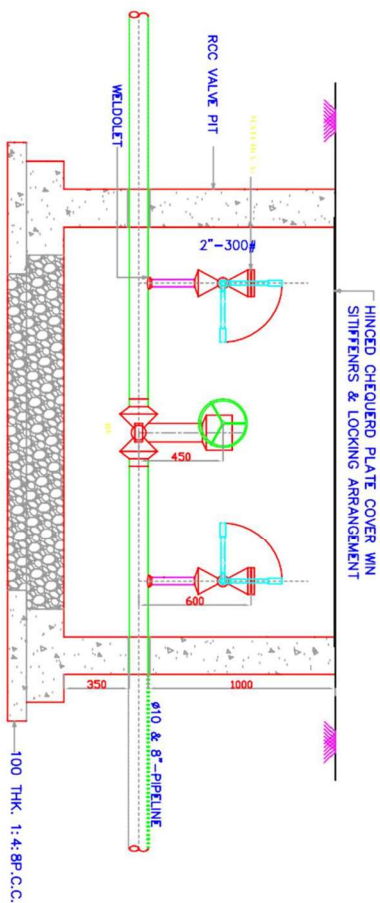
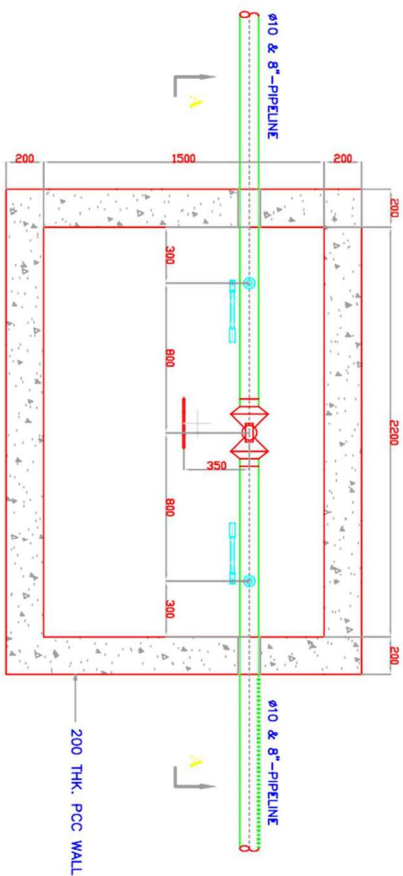
DRG No. MNG-L/Plng./Steel/02

CNG & CITY GAS DISTRIBUTION IN PUNE	
TYPICAL DETAIL OF SV STATION (TYPE-II)	
SCALE: MTS	SHEET 1 OF 1
DRG. NO.	REV.
	0

- NOTES:**
- ALL DIMENSIONS ARE IN MM, UNLESS OTHERWISE MENTIONED.
  - FINISHED GROUND LEVEL +0.00 CORRESPONDS TO THE TOP OF THE NEAREST EXISTING ROAD LEVEL.
  - LOCATION OF GATE SHOWN ABOVE ARE OF INDICATIVE ONLY, HOWEVER FIRM LOCATION OF GATE SHALL BE DECIDED AS PER SITE CONDITION.

REV.	INST.	CONCURRED BY	DATE





1. ALL DIMENSIONS IN MM, & ALL LEVELS ARE IN METERS.
2. VALVE PIT DIMENSION ARE TENTATIVE WILL BE DECIDED DURING DETAILING

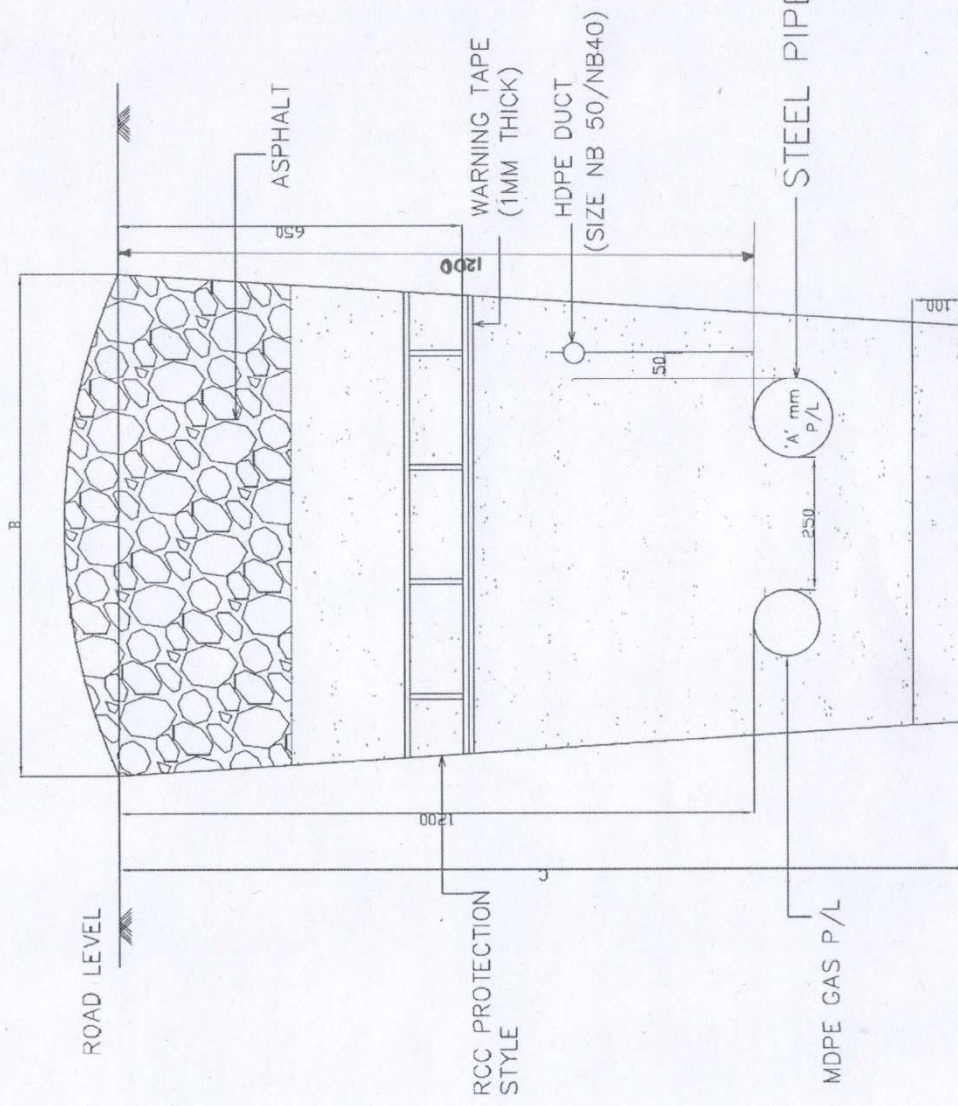
## GENERAL NOTES

### LEGEND

- NEW PIPE (BELO GROUND)
- NEW PIPE (BELO GROUND)
- NEW PIPE (BELO GROUND)
- BUTT WELD BALL VALVE (B.V.)
- FLANGED PLUG VALVE (F.V.)
- FLANGED BALL VALVE
- ONE SIDE B.W. & ONE SIDE F.L.G. BALL VALVE
- ONE SIDE B.W. & ONE SIDE F.L.G. PLUG VALVE
- CENTER OF PIPE
- TOP OF PIPE

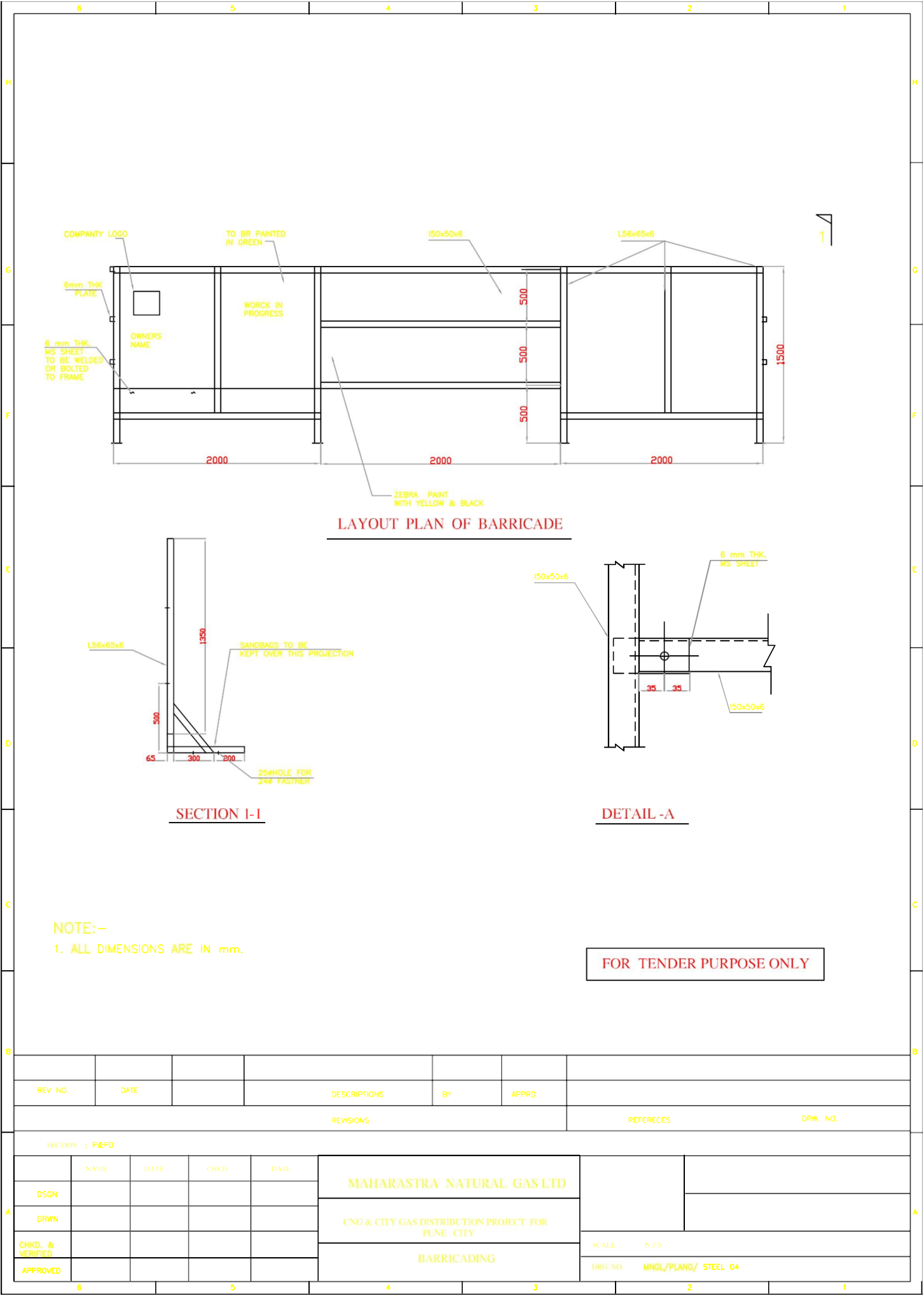
### REFERENCE DRAWING / EXPLANATIONS

NO.	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



ALL DIMENSIONS ARE IN MM

DRG. NO.- MNGL /PLANG /STEEL/ 03



LAYOUT PLAN OF BARRICADE

SECTION I-I

DETAIL -A

NOTE:-  
1. ALL DIMENSIONS ARE IN mm.

FOR TENDER PURPOSE ONLY

REV. NO.		DATE		DESCRIPTONS		BY		APPRD					
REVISIONS							REFERECES					DRW. NO.	
SECTION : P&PD													
	NAME	DATE	CHKD	DATE	MAHARASTRA NATURAL GAS LTD								
DSGN													
DRWN					CNG & CITY GAS DISTRIBUTION PROJECT FOR PUNE CITY								
CHKD. & VERIFIED					BARRICADING			SCALE : S.T.S					
APPROVED								DRG.NO. MNGL/PLANG/ STEEL 04					

5	1	24	3	3	42	15	
G							G
F							F
E							E
D							D
C							C
B							B
A							A

1000 500 1000 MS PIPE

IN RED ——— C A U T I O N

IN BLACK ——— O W K I N P R O G R E S S

— L A T I N G O F H I T H P R E S S U R E P I P E L I N E

— C L I E N T : C L I E N T ' S N A M E

— C O N T R A C T O R : C O N T R A C T O R ' S N A M E

— E M E R G E N C Y P H O N E N O S :

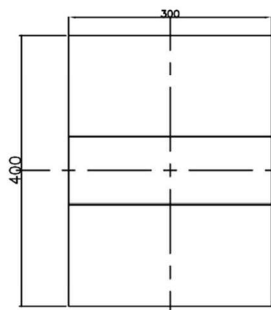
NOTES: –

1. ALL DIMENSIONS ARE IN mm

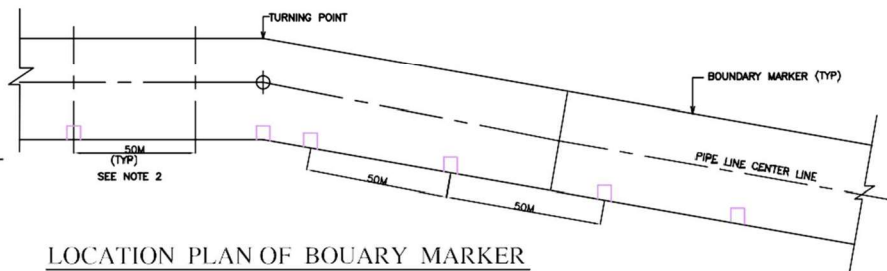
FOR TENDER PURPOSE ONLY

REV NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REFERENCES	DRG NO.
REVISIONS							
MAHARAstra NATURAL GAS LTD.							
CNG & CITY GAS DISTRIBUTION IN PUNE							
CAUTION BOARD							
SCA F :- NTS							
DRG. NO. M N G L / PLANG STEEL/05							

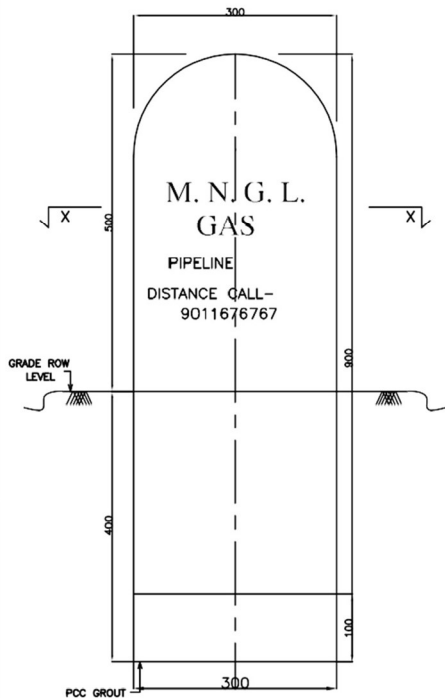
5	4	3	2	1
---	---	---	---	---



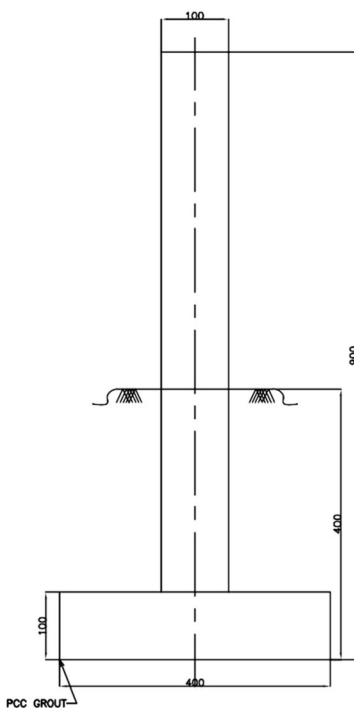
PLAN



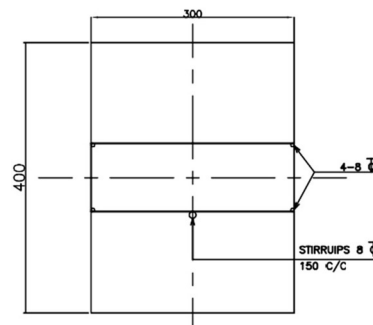
LOCATION PLAN OF BOUARY MARKER



ELEVATION



SIDE VIWE

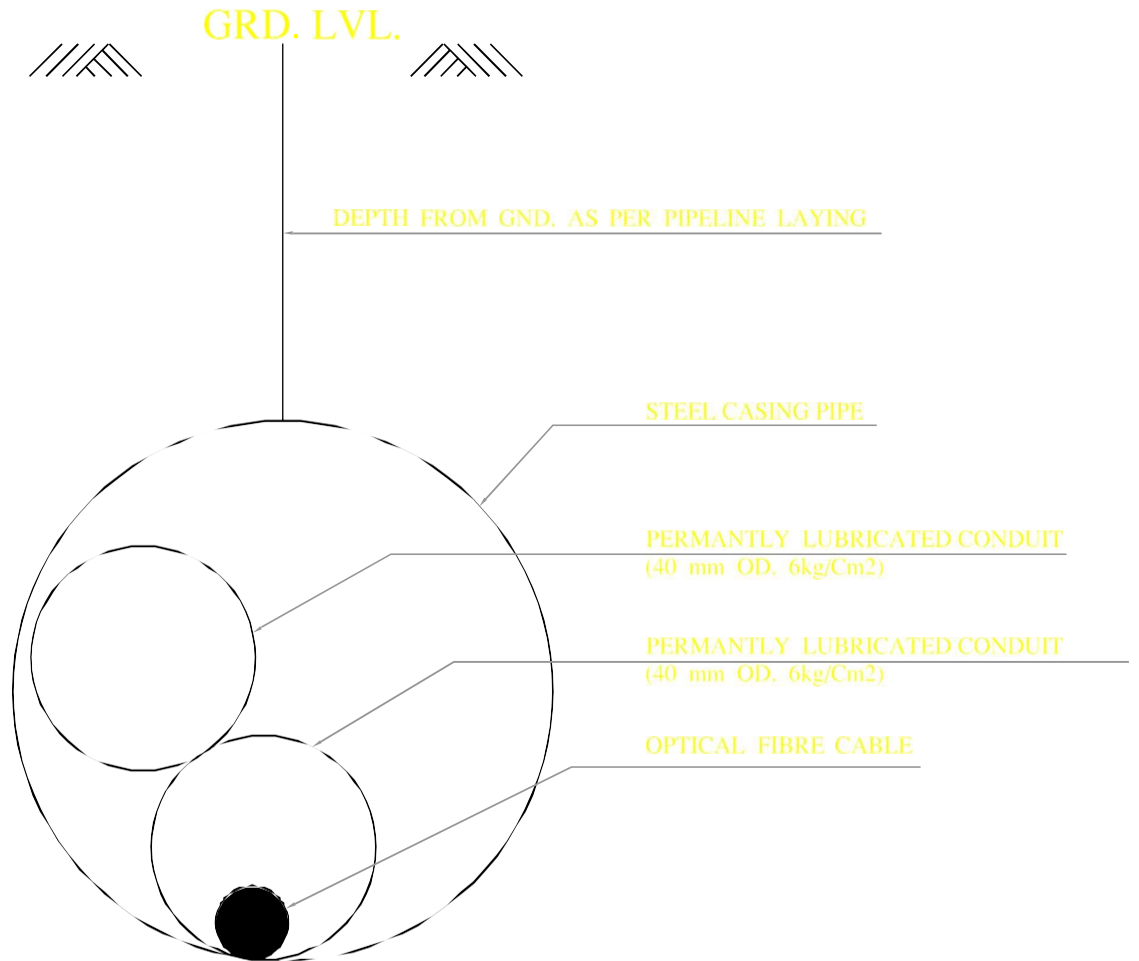


SECTION X-X

NOTES:-

1. ALL DIMENSIONS ARE MM UNLESS OTHARWISE SPECIFIED.
2. MARKERS SHALL BE INSTALLED IN EVERY 50M INTERVAL AS PER INSTRUCTION OF EIC
3. ALL BOUNDRY MARKERS SHALL BE PRECAST AND INSCRIPTIONS SHALL BE ENGAVED CENTRALLY IN THE MOLULD ON ONE FACE .
4. LETTERS SHALL BE 60 HIGH AND 5 DEEP.
5. INSCRIPTIONS SHALL THE PIPELINE.
6. CONCRETE FOR BOUNDARY MARKERS SHALL BE 20.
7. ABOVE GROUND PART OF BOUNDARY MARKERS BE PAINTED YELLOW WITH MINIMUM THREE COATS OF APPROVED QUALITY PAINT INSCRIPTIONS SHALL BE PAINTED BLACK.(35MICRONS COAT)

REV NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	DRG . NO.
REVISIONS					REFFRECNCES	
MAHARASTRA NACHURAL GAS LTD						
CNG & CITY GAS DISTRIBUTION IN PUNE					SCALE :	N.T.S
ROUTE BOUNDARY MARKER					DRG. NO.	M N G L / PLAN / STEEL /06



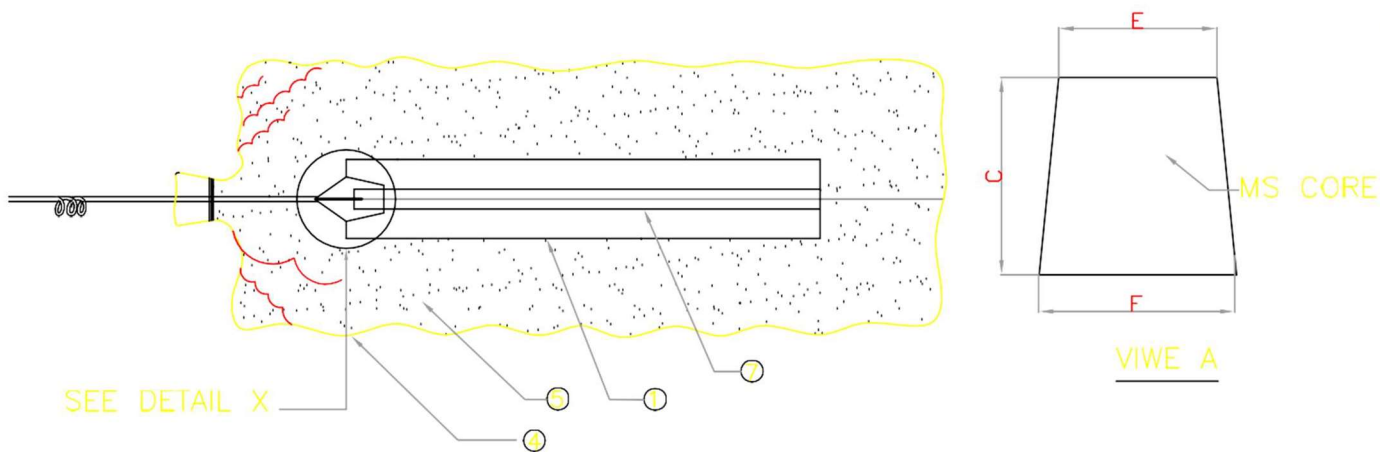
**NOTE :-**

1. OPTICAL FIBER SHALL BE LAID ON RIGHT SIDE OF THE PIPELINE IN THE DIRECTION OF GAS FLOW.
2. OFC SHALL BE LAID AS PER THE SPECIFICATION NO. MEC/S/05/E5/T/001 REV-0

REV NO.	DATE		DESCRIPTIONS	BY	APPRD		
REVISIONS						REFERECES	DRW. NO.
SECTION : P&PD							
	NAME	DATE	CHKD	DATE	OPTICAL FIBER CABLE LAYING (CASSED CROSSING) 2 Nos. HDPE DUCT		
DSGN							
DRWN							
CHKD& VERIFIED							
APPROVED							
						SCALE : NTS	
						DRWG. NO. MNDL/PLANS/ STEEL 11	
6	5		4	3	2		1







### PER-PACKED ZINC ANODE

### CHEMICAL COMPOSITION OF ANODE (% WEIGHT)

CHEMICAL	TYPE- I	TYPE- II
Al	: 0.1% - 0.5 %	0.005% MAX
Cd	: 0.25% - 0.07%	0.003% MAX
Cu	: 0.005% MAX	0.002% MAX
Fe	: 0.005% MAX	0.0014% MAX
Pb	: 0.006% MAX	0.003% MAX
OTHERS	: 0.1% MAX	—
Zn	: REMAINDER	REMAINDER

### NOTES:—

1. ANODE COMPOSITION, NET WEIGHT, CROSS WEIGHTS, DIMENSIONS SHALL BE FURNISHED BY CONTRACTOR.
2. ANODE TAIL CABLE SHALL BE HIGH CONDUCTIVITY, STRANDED, COPPER CONDUCTOR, 600/1100 V GRADE XLPE INSULATED, PVC SHEATHED & UNARMED.

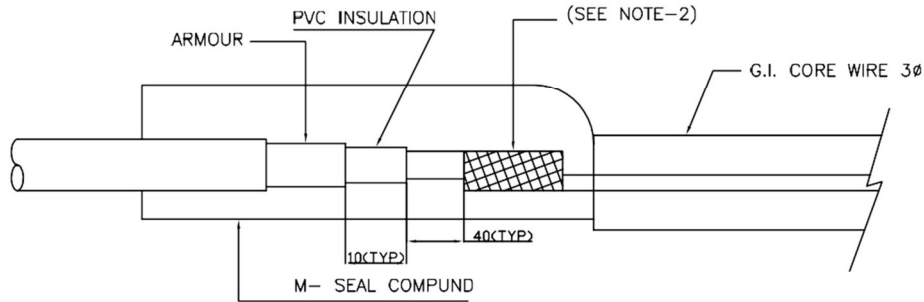
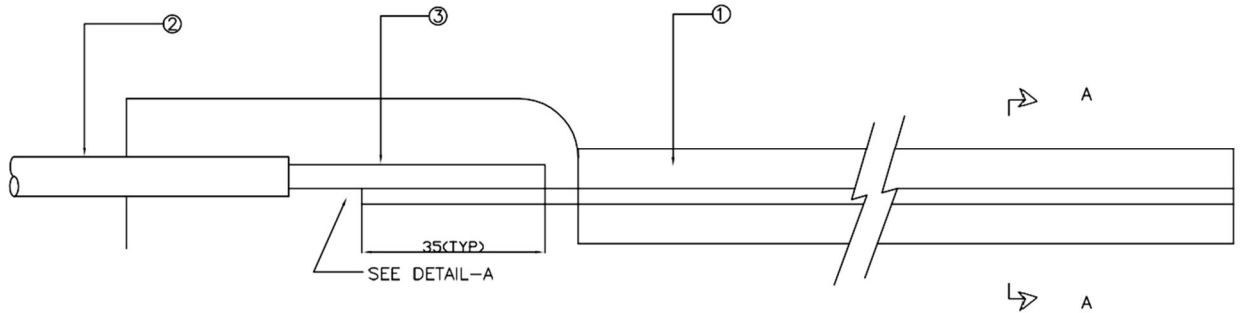
7	2.5 THICK X 15 WIDE GI CORE STRIP (PART OF ZINC ANODE)	
6	SILVER SOLDER	AS REQD.
5	BACKFILL MATERIAL	AS REQD.
4	COTTON BAG	1
3	M- SEAL COMPOUND	AS REQD.
2	ANODE TAIL CABLE, PE INSULATED, PVC SHEATHED, UNARMED 6 mm <sup>2</sup> SINGLE CORE COPPER, 600/1100 V.	AS REQD.
1	ZINC ANODE, WEIGHT 17 lbs (7.7kg)	1
ITEM	DESCRIPTION	QTY.
BILL OF MATERIALS		

REV. NO.	DATE	DESCRIPTIONS	BY	APPROD.	REVISED	REF. NO.
REVISIONS						DRW. NO.

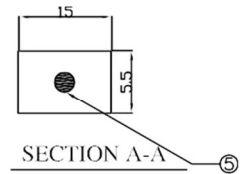
REVISION 1 P&PD

NAME	DATE	CHG	DATE
DSGN			
DRWN			
APPROVED			
PREPACKAGED ZINC ANODE			
SCALE : 1/8" = 1"			
Dwg No: MNGL/PLANO/ STEEL 14			





DETAIL - A



NOTES:-

1. ALL DIMENSIONS ARE IN mm.
2. CABLE CONNECTION WITH G.I. CORE WIRE WILL BE SILVER SOLDERED AT SITE.

CHEMICAL COMPOSITION OF ANODE

Al : 0.10% MAX.

Mn : 0.2% MAX.

CU : 0.02% MAX.

Fe : 0.03%MAX

Ni: 0.001%MAX

OTHER METALLIC ELEMENTS:

ETCH 0.05% MAX.

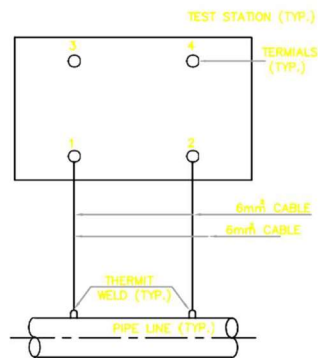
TOTAL : 0.3MAX

Mg ;REMAINDER

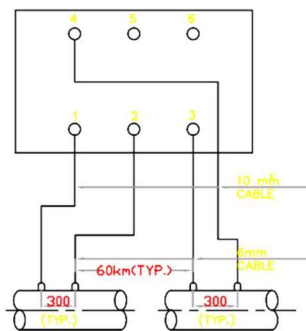
WEIGHT : 0.39 kg PER LINER METER

5.	SHEATHED GI ARMoured 3φ GI CORE WIRE (PART OF MAGNESIUM ANODE)	1
4	SILVER SOLDER	AS REQD
3	M- SEAL COMPOUND	AS REQD
2	ANODE LEAD CABLE 25mm <sup>2</sup> COPPER XLPE INSULATED PVC SHATHED GI ARMoured COMPLETE WITH LUG	10m
1	MAGNESIUM ANDE, WEIGHT 0.39kg	1
ITEM NO.	DESCRIPTION	QTY.

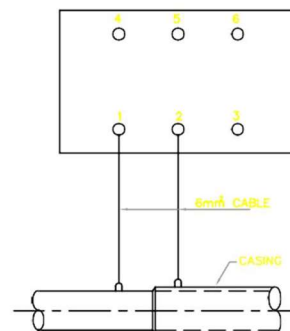
REV NO.	DATE	DESCRIPTIONS	BY	APPRD	REVISIONS	REFERECES	DRW. NO.
SECTION : P&PD							
DSGN	NAME	DATE	CHKD	DATE	MAGNESIUM RIBBON ANODE FOR GROUNDING		
DRWN							
APPROVED					SCALE : N.T.S		
					DRG NO MNG/PLANG/ STEEL 16		



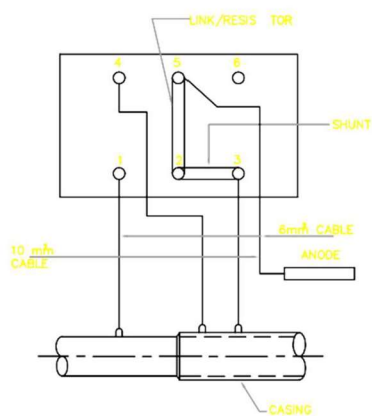
POTENTIAL MEASUREMENT  
(CONNECTION SCHEME-A)



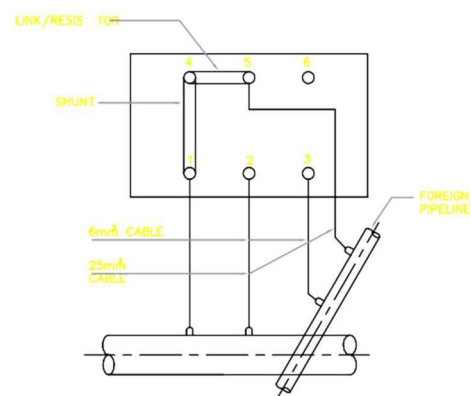
CURRENT MEASUREMENT  
(CONNECTION SCHEME-B)



CASED CROSSING WITH  
UNCOATED CASING  
(CONNECTION SCHEME-C)

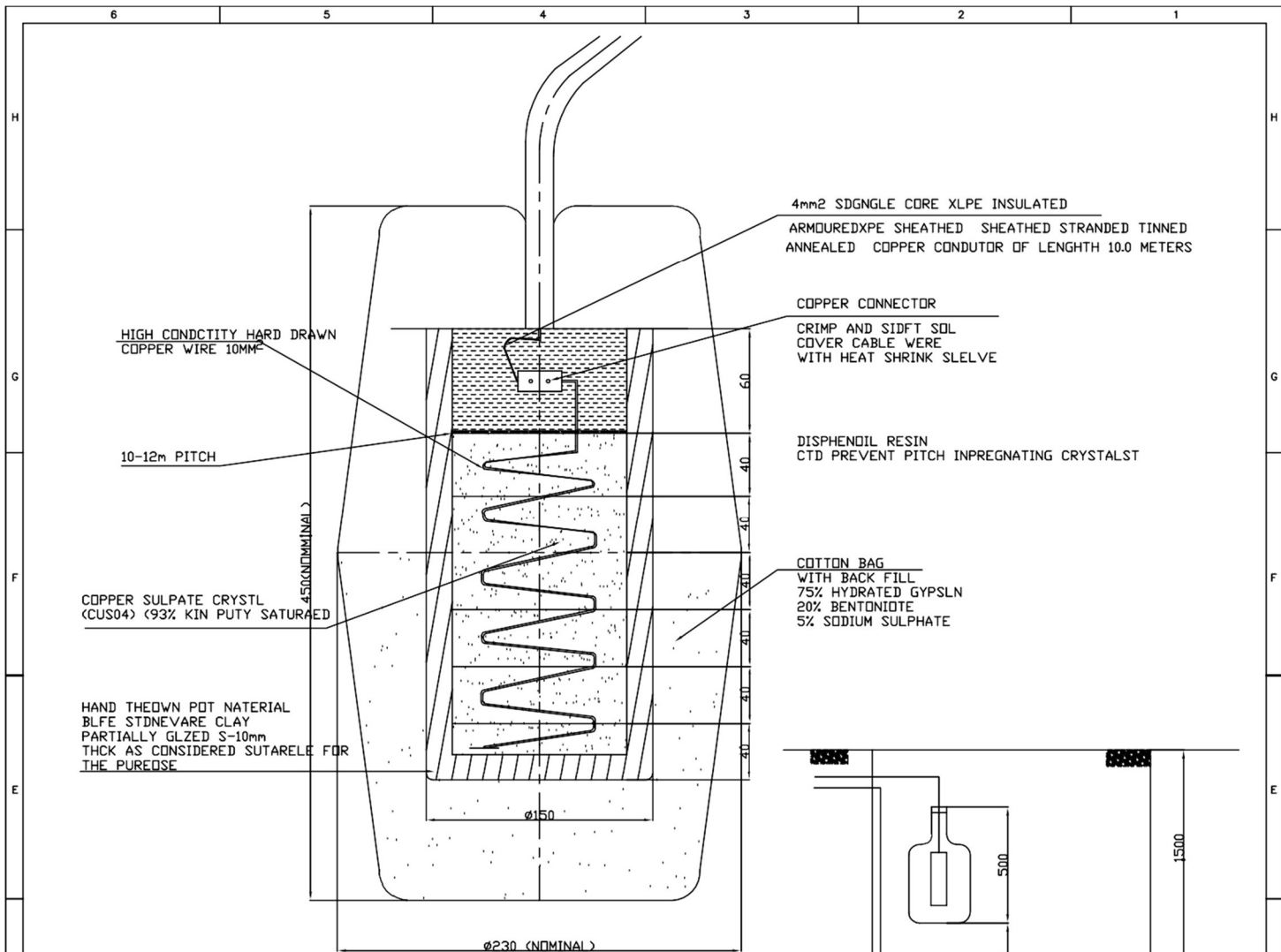


CASED CROSSING WITH  
COATED CASING  
(CONNECTION SCHEME - D)



FOREIGN PIPELINE CROSSING  
(CONNECTION SCHEME -E)

REV. NO.	DATE		DESCRIPTIONS	BY	APPRO		
REVISIONS						REFERENCE'S	DRW. NO.
SECTION : P&PD							
	DATE	DATE	CREG	DATE	TEST STATION CONNECTION SCHEMES		
DSGN							
DRWN							
APPROVED							
					SCALE : 1/2"=1'		
					DWG. NO. MNG/PLNG/ STEEL 19		



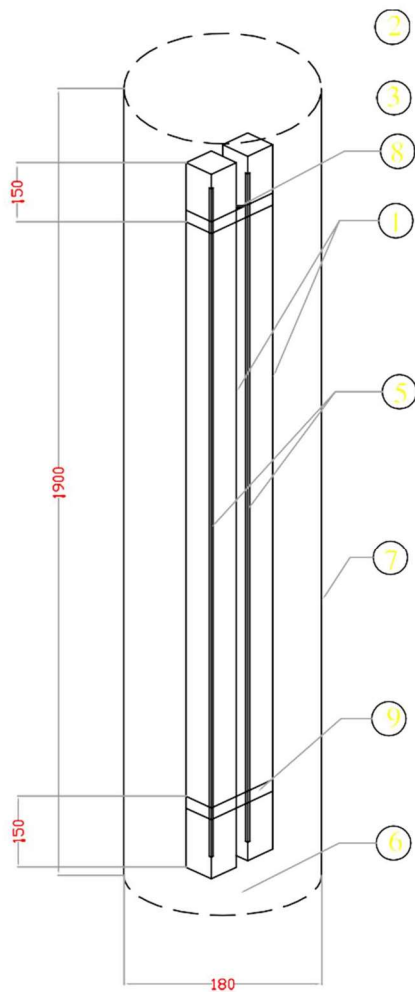
REF. CELL WEIGHT- 9.0 kg (APPROX)  
GROSS WEIGHT =25.0 kg ( APPROX )

REFERENCE : ELECTRODE  
INSTALLATION.

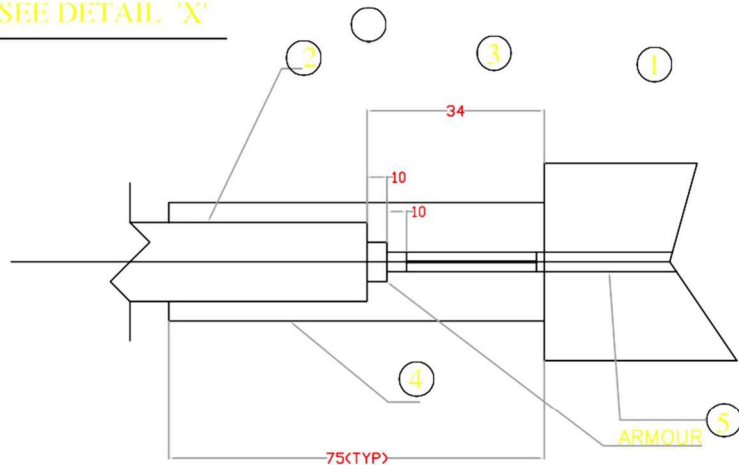
NOTE :-

1. THE DEVERALL DIMENSION ARE FOR GUIDDACE ONLY
2. ALL DIMENSION ARE IN MM.
3. REFERENCE CELL SHALL BE BACK FILLED WITH BACK FILL MATERIAL SPECIFIED.
4. REFERENCE CELL SHALL BE INSTALLED APPEDXIMELY AT 500 mm (MAX) ABOVE THE TOP LEVEL OF THE PIPE LINE ALOING WITH COTTON
5. BACK FILL REFERENCE ELCTIRDDE SHALL BE SDAKED IN 20 LITERS OF CLEAN FRESH WATER FOR 24 HRS PRIIR TO INSTALLATION
6. REFERENCE CELL CABLE SHALL BE ROUTED ALOING THE TOP OF THE CARRIER PIPE LINE BY SECURILY STRAPPING IT WITH ADHESIVE TYPE AT APPROXIMATELY 3 mt INTERVALS.
7. CALLIBRATION OF REERENCE CELL w<r<t STANDARD CUL/CUSO4 CELL TO BE MADE PRIOR TO INSTALLATION

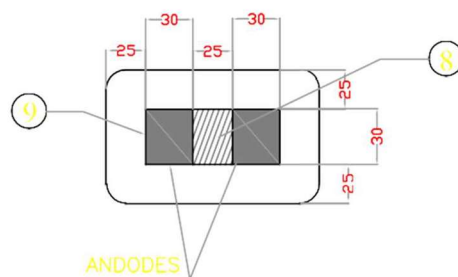
B									
REV NO.		DATE		DESCRIPTONS		BY		APPRD	
REVISIONS						REFERECES		DRW. NO.	
SECTION : P&PD									
		NAME	DATE	CHKD	DATE	PREPACKAGED PERMAENT REF. ELECTRODE (Cu/CuSO4 TYPE) & INSTALLATION DETAILS			
DSGN									
DRWN									
		APPROVED						SCALE : N.T.S	
								DRG NO MNGL/PLANG/ STEEL 20	
6		5		4		3		2	
								1	
A									



SEE DETAIL 'X'



DETAIL 'X'



### NOTES :-

1. ALL DIMENSIONS ARE IN mm.
2. ZINC GROUNDING CELLS SHALL BE INSTALLED VERTICALLY SUCH THAT THE TOP OF THE CELL IS APPROX AT THE SAME ELEV. AS PIPE BOTTOM.
3. ALL CABLE LEADS FOR ZINC GROUNDING CELL SHALL BE AS SHORT AND DIRECT AS POSSIBLE.
4. GROUNDING CELL CABLE ARMOUR SHALL NOT HAVE ELECT. CONNECTION TO ANODE

### ZINC ANODE COMPOSITION (% WEIGHT)

ALUMINIUM	0.005% MAX
MAGNESIUM	0.003% MAX
COPPER	0.002% MAX
IRON	0.0014% MAX
LEAD	0.003% MAX
OTHERS	—
ZINC	REMAINDER

ZINC ALLOY CONFORMING TO ASTM-B-418-G7

### BACKFILL COMPOSITION

GYPSUM	75%
BENTONITE	20%
SODIUM SULPHATE	5%

1	TAP STRAP	AS REQD.
1	BAKELITE INSULATING SPACER 25X30X50	2 NOS.
1	COTTON BAG 100#	1 NO.
1	BACK FILL MAT.	AS REQD.
1	8mm GALVANISED STEEL CORE	AS REQD.
1	HEAT SHRINK SLEEVE	2 NOS.
1	SILVER BRAZED CONNECTION	2 NOS.
1	ANODE TAIL CABLE 25mm Sq 10.6k BULC/PVC BY AITL2 ARMOURED 1000 V	30 MTR.
1	ZINC ANODE 38X38X1525	2 NOS.
ITEM NO.	DESCRIPTION	QTY.
BILL OF MATERIALS		

REV NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REVISIONS	REFERENCES	DRW. NO.
<div style="display: flex; justify-content: space-between;"> <div> <p>REVISIONS</p> <p>DATE</p> <p>BY</p> <p>APPRD</p> </div> <div> <p>DETAILS OF</p> <p>ZINC GROUNDING CELL</p> </div> <div> <p>SCALE : 1/5</p> <p>UNIT : MM/PLANO/ STEEL/21</p> </div> </div>								

6

5

4

3

2

1

H

H

G

G

F

F

E

E

D

D

C

C

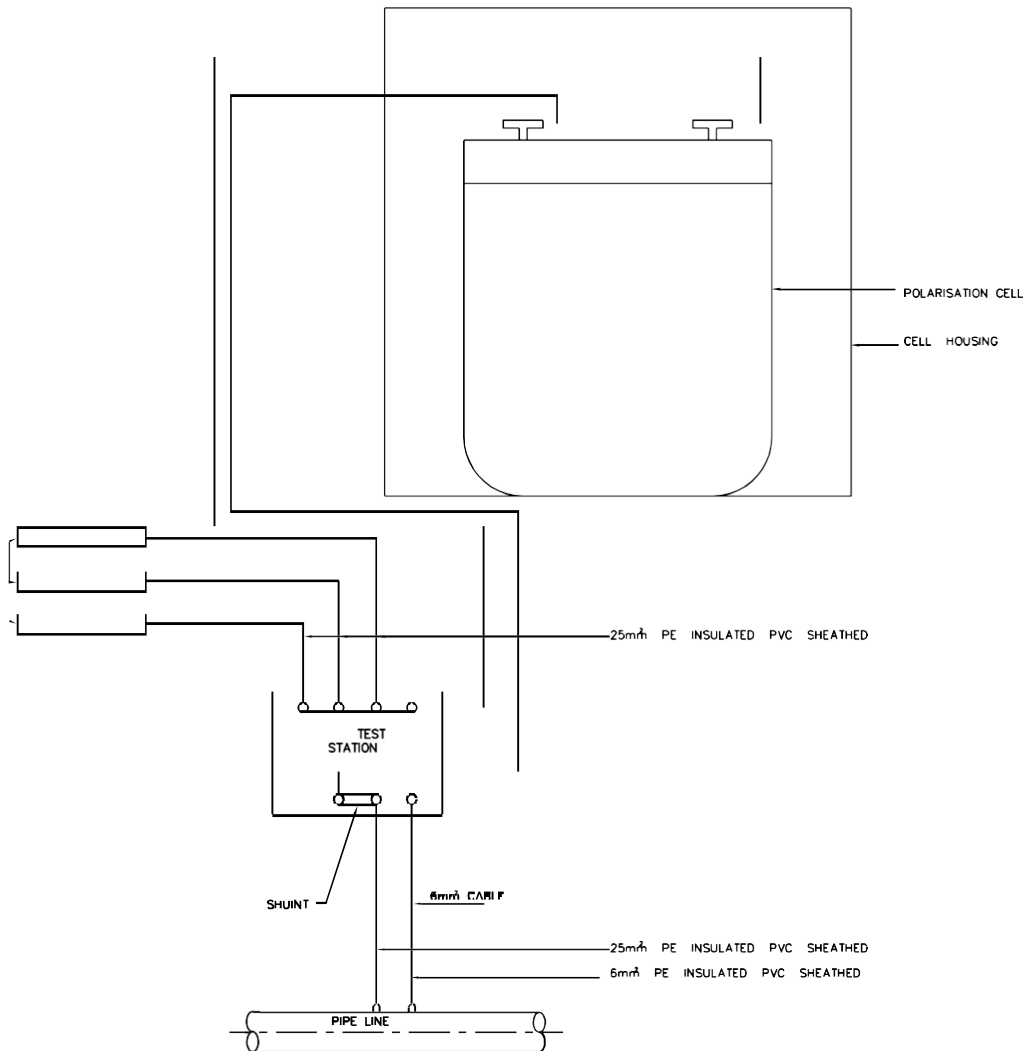
B

B

A

A

GALVANIC ANODES

**NOTES :-**

1. THE POLARISATION CELL, CABLE, JOINT ETC., SHALL MINIMUM BE RATED FOR THE EXPECTED FAULT CURRENT AT THE INSTALLATION & FOR PERMANENT C.P. LIFE.
2. THE POLARISATION CELL SHALL BE HOUSED IN A VANDAL-PROOF HOUSING
3. CELL SHALL HAVE GOOD VENTILATION TO ATMOSPHERE BE PROTECTED AGAINST DIRECT SUN LIGHT & RAIN/WATER
4. ANODE TAIL CABLES OF EACH ANODE SHALL BE TERMINATED INDIVIDUALLY IN TEST STATION.
5. CONTRACTOR TAIL CABLES OF EACH ANODE SHALL FURNISH DRAWING WITH ACTUAL DIMENSIONS & RATING.
6. EASY ACCESS TO CELL SHALL BE PROVIDED FOR PERIODIC INSPECTION

REV. NO.

DATE

DESCRIPTIONS

BY

APPROVED

REVISIONS

REFERENCES

DWG. NO.

SECTION : P&amp;PD

	NAME	DATE	CHKD	DATE	PIPELINE GROUNDING THROUGH POLARISATION CELL & GALVANIC ANODE	SCALE : N.T.S DRG. NO. MNG/PLANG/ STEEL 23
DSGN						
DRWN						
CHKD & VERIFIED						
APPROVED						

6

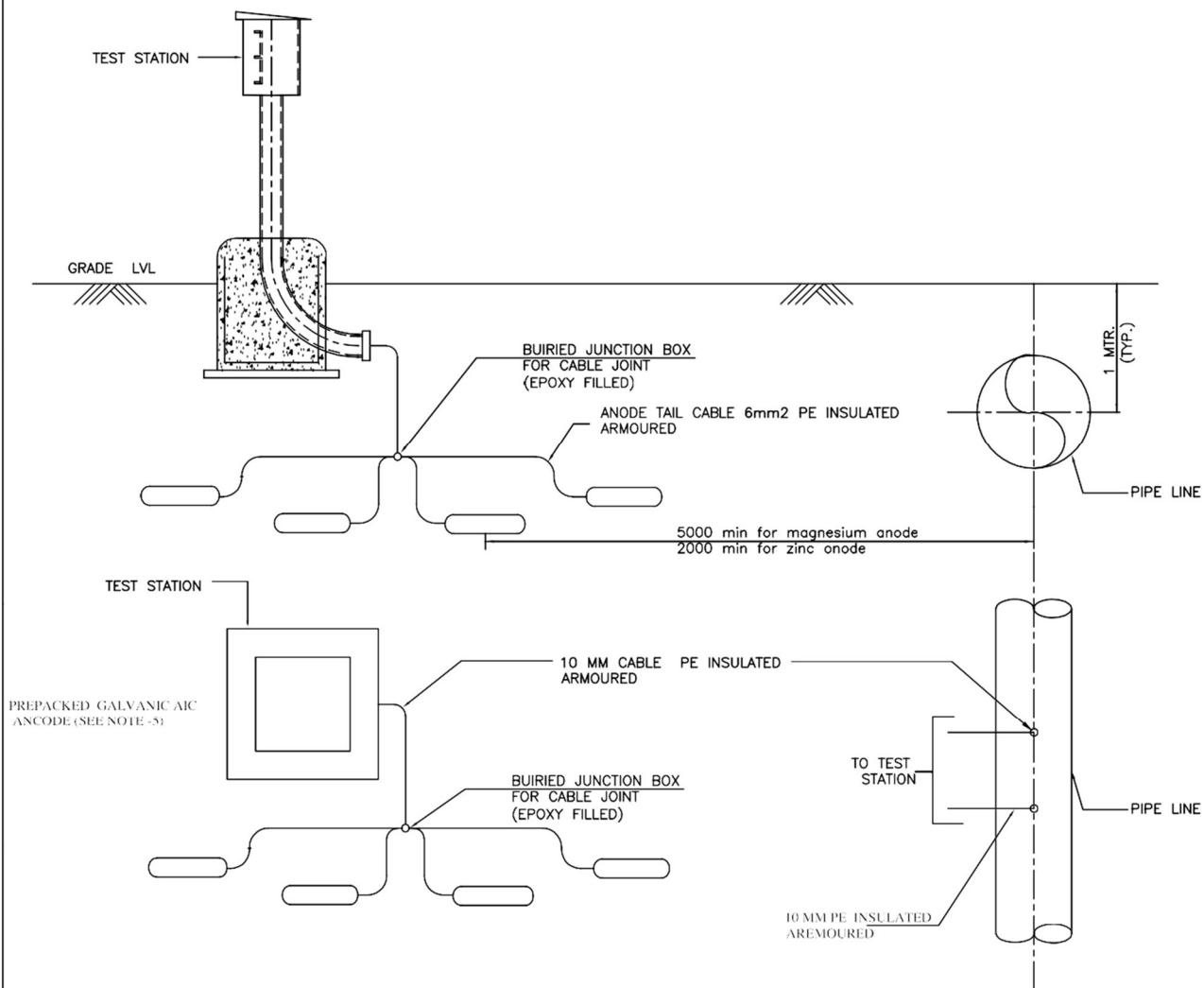
5

4

3

2

1



### NOTES :-

1. THE PREPACKED GALVANIC ANODE SHALL BE INSTALLED AT MINIMUM DEPTH, EQUAL TO BOTTOM LEVEL OF PIPELINE.
2. ALL NATIVE BACKFILL SHALL BE FREE OF ROCKS, GARBAGE, PAPERS, ETC.
3. CABLE SHALL BE LAID WITH ENOUGH SLACKNESS TO AVOID DAMAGED TO CABLES DURING BACKFILLING ETC.
4. THE GALVANIC ANODES IN A SIMILAR MANNER AS SHOWN BUT ANODE TAIL CABLES OF EACH ANODE SHALL BE BROUGHT UP TO TEST STATION AND TERMINATED NO BURIED JUNCTION BOX SHALL BE USED
5. THE ANODE ARE SHOWN HORIZONTALLY LAID, ALTRNIVELY NO BURIED JUNCTION BOX SHALL BE USED
6. ANODE TAIL CABLE & CABLE FROM BURIED JUNCTION BOX TO TEST STATION OR TEMPERATURE C.P. ANODE MAY BE PVC INSULATED TYPE.

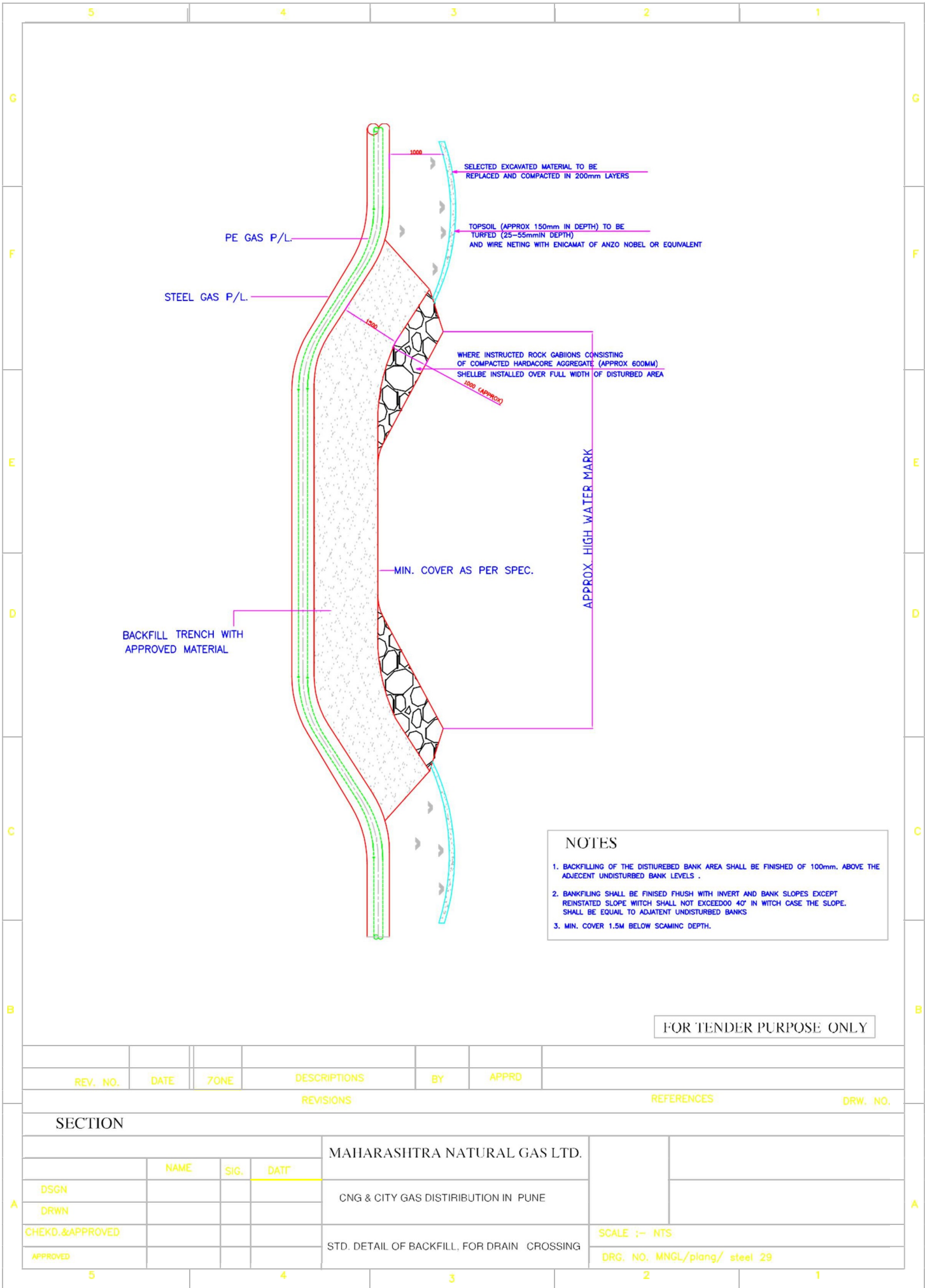
REV NO.	DATE	DESCRIPTIONS	BY	APPRD	REVISIONS	REFERECES	DRW. NO.
SECTION : P&PD							
NAME	DATE	CHKD	DATE	GALVANIC ANODE INSTALLATION			
DSGN							
DRWN							
CHKD & VERIFIED							
APPROVED							
SCALE : N.T.S				DRG. NO. MNG/PLANG/ STEEL 24			

## NOTES

1. TEST STATION SHALL HAVE WEATHRPROOF ENCLOSURE HAVING DEGREE OF PROTECTION IP-55,DEFINED IN AS DEFINED IP AS DEFINED INIEC-529(1989)/IS:2147 (1962) THE SHUTTER AND THE BOX HINGED TYPE WITH CONCEALED LOCK AND SHALL HAVE DOOR GASKET
2. THE HINGES SHALL BE WELDED TO THE SHUTTER AND THE BOX SUITABLY.
3. THE MS ANGLES SHALL BE WELDED TO THE SIDES THE ANGLES SHALL HAVE TAPPED HOLES FOR FIXING TERMINAL PLATE.
4. THE INNER SURFACE OF THE TEST STATION SHALL BE PAPPED WITH LAED OXIDE TAPPED FOR FIXING PRIMER GRADE.
5. THE OUTSIDE OF TEST STATION SHALL BE PANTED WITH TWO COATS OF ZINC RED EPOXY PRIMER AND THREE COATS OF GREY COLOURED EXPOXY PAINT COMPLETE WITH CABLE PIPE & FDN PLATE.
6. THE NAME PLATE SHALL BE OF ANODISED OF ALUMINIUM WITH BLACK BACKGROUND AND WHITE LETTERS (SIZE 3mm) THE NAME PLATE SHALL BE FIXED TO INNER SIDE OF SHUER BY ARALDITE OR EQUIVALENT
7. THE NAME PLATE OF EACH TEST STATION SHALL CARRY THE FOLLOWING INFORMATION.
  - A) TEST STACION CONNECTION SCHEME TYPE
  - B) RELEVANT TEST STACION CONNECTION SCHEME DIAGRAM
  - C) TEST STATION NO.
  - D) CHAINAGE IN KM
  - E) DISTANCE FROM PIPE IN m
  - F) DISTANCE OF GAS FLOW
8. WHEN ERECTED THE TEST STAION SHALL BE IN UPRIGHT POSITION.
9. TEST STACION SHALL BE SO ERCTED AS TO SERVE ALSO AS PIPELINE MARKER. AND ANODE GRAUNDBED MARKER .THEIR SHUTTER SHALL BE TO THE LINE OF AXIS OF
10. THE NUMBER OF ALL TEST STATION SHALL BE WRITTEN WITH BLACK PAINT USING 40mm STENCIL BLOCK ON THE OUTER SIDE OF THE SHUTTER IN A UNIFORM MANNER AN ARROW SHOWING DIRECTION OF OF FLOW OF GAS SHALL BE MARKED TO UNDERLINE THE TEST STECHTION NUMBER ON SHUTTER PIPELINE AND FACING IT.
11. HEIGHT OF THE STATION ABOVE GROUND LEVEL SHOWN IN THE DRAWING IS TYPICAL.
12. ALL CABLES COMMING TO TEST STACION SHALL BE LABELLED ON BOTH ENDS WHITH INDENTIFICATION NUMBERS
13. TOTAL NUMMBER OF TEST STATIONS AND THEIR TYPE ARE MENITIONED IN CONSOLIDATED B.O.M.
14. TEST BETWEEN BRASS TERMINALS AND BODY AT 2kV FOR ONE MINUTE
15. ALL DIMENSION ARE APPROXIMATE AND CAN VARY SLIGHTLY.
17. THE ENTRY SHALL BE SEALED WITH BITUIMEN COMPOUND AFTER CABLE LAYING TO PREVENT WATER ENTRY.
16. ALL DIMENSION ARE IN MM.

30	VARIABLE RESISTANCE 0-0.1 OHM.	Q1
29	100 MM #M.S. SCH.40 90° ELBLOW R=50	Q1
28	BILDING WIRE MS.	AS REQD.
27	PCC MIX 1:5:10	0.064m3
26	PCC MIX M20	0.324m3
25	ROD, 8# MS	28m
24	STIFFENER PLATE 8 THK	Q4
23	FONDATION BLOT M12	Q4
22	RUBBER BUSH MATCHING WITH PIPE	Q1
21	FOUNDATION PLATE 6THKX400X400MS PLATE	Q2
20	NEOPRENE RUBBER GASKET 6THK.	Q1SET
19	MS PIPE 100# IS: 1239 P,1 ( 1990)- HAVY GRADYE	Q1
18	COUPLING PLATE 5THKX180X150 MS PLATE , 100#HOLE AT CENTRE	Q1
17	LATCH FOR SHUTTER	Q1
16	BRASS SCREW M6XM16	Q4
15	ANGLE 5THK,X 50 X 50 X30	Q4
14	SHUNT , 0.1 OHM, 0.5 A, 50 mV	Q1
13	COPPER LINK 2.5 THK ,X 12 X LENGTH AS REQD.	Q1
12	BRASS WASHER	AS REQD
11	BRASS NUT,M6	AS REQD
10	BRASS STUD, M6 X 50	AS REQD
9	TEMINAL PLATE,6THKX180X200PHLINOLICLAM SHT	Q1
8	HINGE FOR SHUTTER	Q2
7	CASTLE LOCK WITH ONE KEY PER TEST STATION	Q1
6	NAME PLATE 0.9THKX 120 X 160 X ANODISED ALUMINUM	Q1
5	SHUTTER 3mm THK MS SHT	Q1
4	TOP 475X350X3mm THK MS SHT	Q1
3	SIDE PLATE 300X420X300X3mm THK MS SHT	Q1
2	REAR PLATE 425X420X3mm THK. MS SHT	Q1
1	BOTTOM PLATE 250X175X3mmTHK, MS 100# HOLE AT CENTER	Q1
ITEM	DESCRIPTION	QTY
BILL OF MATERIALS		

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPROD.		
REVISIONS						REFERECES	DRW. NO.
SECTION : P&PD							
DESIGN	NAME	DATE	CHIEF	TEXT	DETAILS OF TEST STATION  POLARISATION CELL		
DRWN							
APPROVED							
					SCALE : 1:1		
					DRWG. NO.	MNGL/PLNG/ STEEL/ 27	



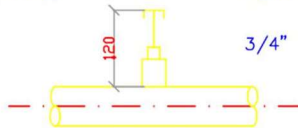
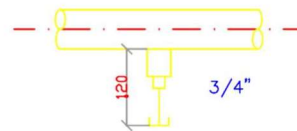




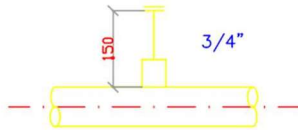
TYPE

VENT

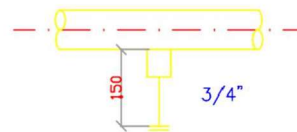
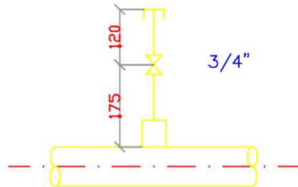
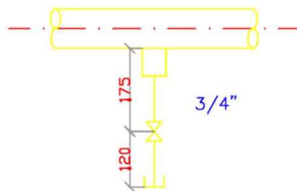
DRAIN

V1  
V1PD1  
D1P

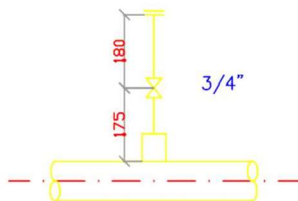
V2



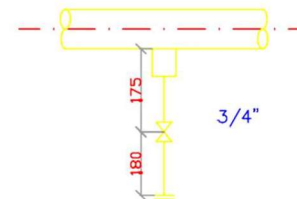
D2

V3  
V3PD3  
D3P

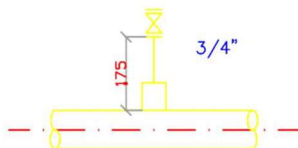
V4



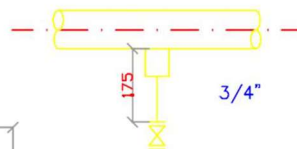
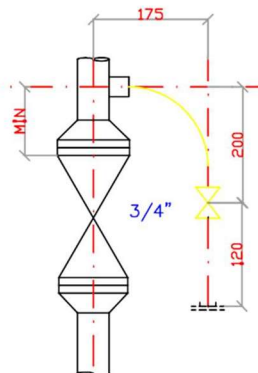
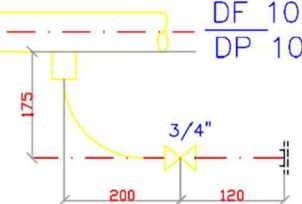
D4



V5



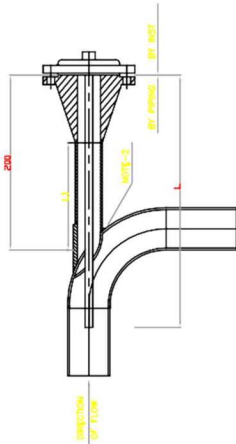
D5

DC 9  
DF 9  
DP 9DC 10  
DF 10  
DP 10

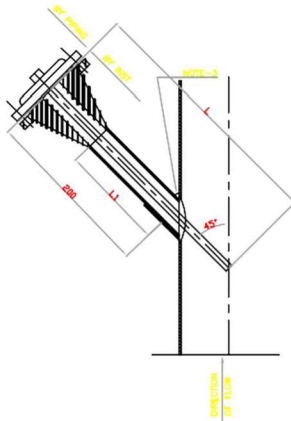
## NOTES

1. DIMENSIONS ARE VALID FOR 75mm (MAX) THICKNESS INSULATION FOR HIGHER INSULATION THICKNES INCASE DIMENSION AS REQUIRED.
2. VENTS & DRANS SHALL BE PROVIDED WITH GATE GLOBE OR PLUG VALVE WITH HALF COUPLING OR STUB IN WITH CAP OR FLANGE BLIND FLANGE AS PER PIPEING SPECIFICATIONS
3. VENTS/DRAINS CAN BE PROVIDED ON FLAT SIDE OF ECCENTRIC REDUCERS ON SIZES 4" & ABOVE
4. LEGND V=VENT, D=DRAIN, C=CAP, F=FLANGE, P=PLUG
5. PLUGGED END OF VELVE OR FITTING AHALL BE THREADED

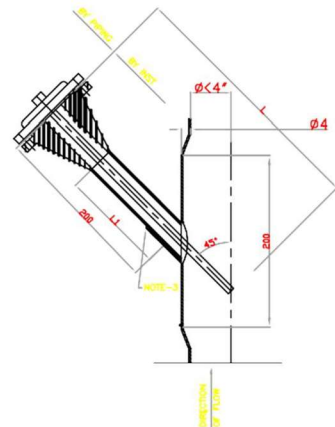
REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD		
REVISIONS						REFERENCEES	DRW. NO.
SECTION 2 P&PD							
	NAME	DATE	CHRGD	DESK	VENT & DRAIN  FOR LINE 2" & ABOVE		
DSGN							
DRWN							
APPROVED					SCALE : 1/8" = 1'-0"		
					DWG. NO. MNGL/PLANG/ STEEL/31		



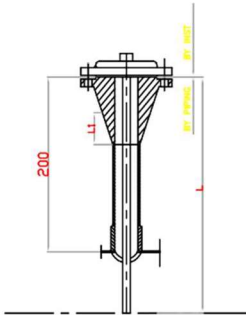
TYPE TW-6



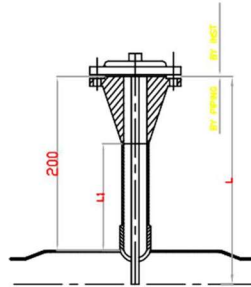
TYPE TW-7



TYPE TW-8



TYPE TW-9



TYPE TW-10

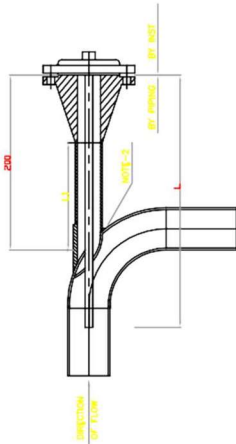
LINE DIA	1.5" FLANGED WELD
4"	200
6"	300
8"	300
10"	300
12"	300
14"	300
16"	400
18"	400
20" & LARGER	500
VESSELS	AS REQUIRED

6. ELABOLW MIN. 4" OR LARGER
7. VERTICAL LINE 4" OR LARGER
8. HORIZONTAL LINE 4" OR LARGER
9. VERTICAL LINE LESS THAN 4"
10. HORIZONTAL LINE DIA LESS THAN 4"

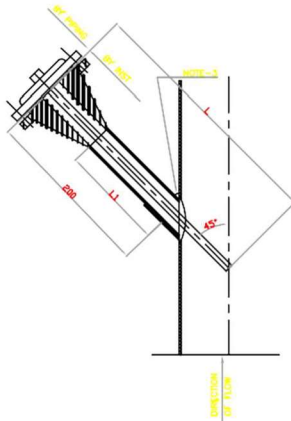
NOTES:

1. BOLTS, NUTS AND GASKETS BY PIPING.
2. MIN. CLERANCE FOR REMOVAL BY PIPING.
3. COUPLING TO SPECIAL LENGTH.

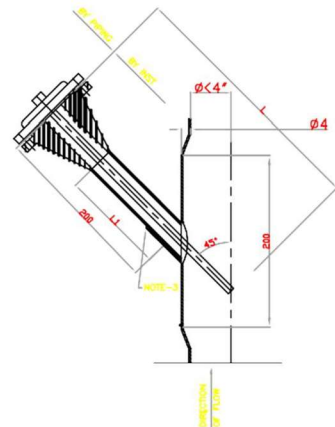
REV. NO.	DATE	DESCRIPTIONS	BY	APPRD	REVISED	DRW. NO.															
<table border="1"> <tr> <td>DESIGN</td> <td>NAME</td> <td>DATE</td> <td>CHECKED</td> <td>DATE</td> </tr> <tr> <td>DRAWN</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="5">APPROVED</td> </tr> </table>							DESIGN	NAME	DATE	CHECKED	DATE	DRAWN					APPROVED				
DESIGN	NAME	DATE	CHECKED	DATE																	
DRAWN																					
APPROVED																					
<p>WELLS INSTALLATION</p> <p>1 1/2" DIA TAPS</p>																					
<p>SCALE: N.T.S.</p> <p>DRW. NO. MNGI/PLANO/ STEEL 32</p>																					



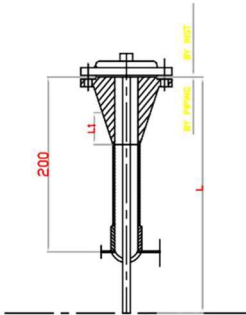
TYPE TW-6



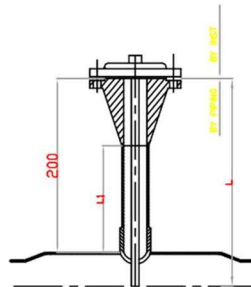
TYPE TW-7



TYPE TW-8



TYPE TW-9



TYPE TW-10

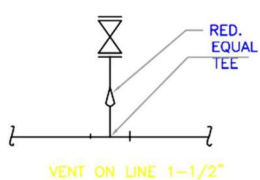
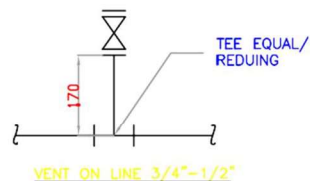
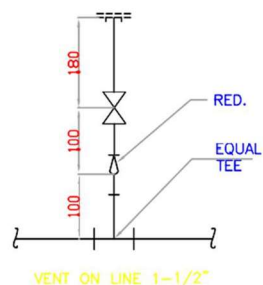
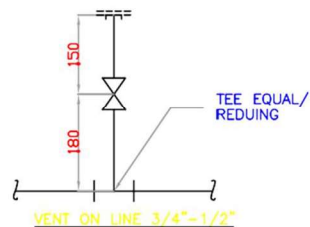
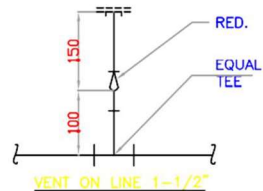
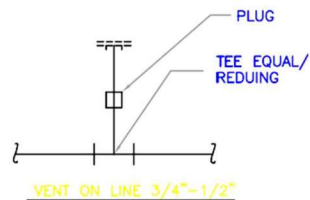
LINE DIA	1.5" FLANGED WELD
4"	200
6"	300
8"	300
10"	300
12"	300
14"	300
16"	400
18"	400
20" & LARGER	500
VESSELS	AS REQUIRED

6. ELABOLW MIN. 4" OR LARGER
7. VERTICAL LINE 4" OR LARGER
8. HORIZONTAL LINE 4" OR LARGER
9. VERTICAL LINE LESS THAN 4"
10. HORIZONTAL LINE DIA LESS THAN 4"

NOTES:

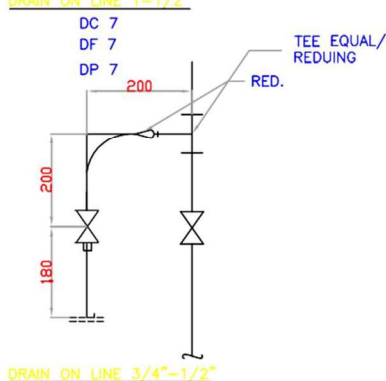
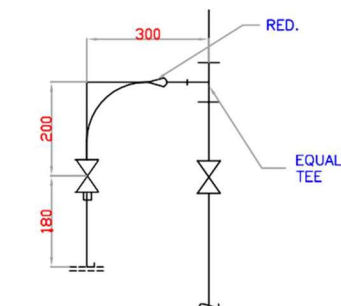
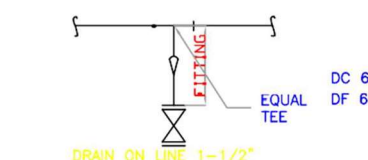
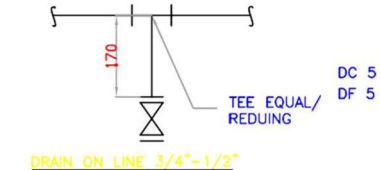
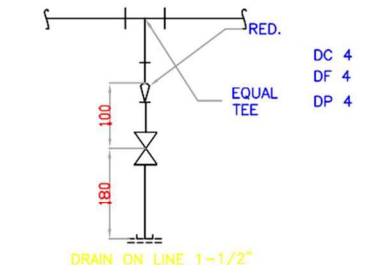
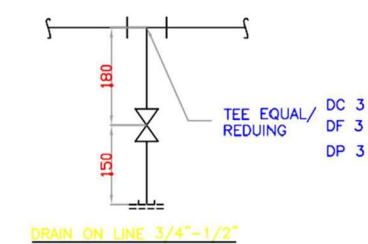
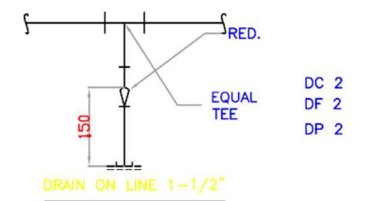
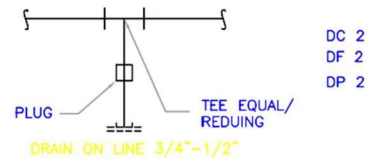
1. BOLTS, NUTS AND GASKETS BY PIPING.
2. MIN. CLERANCE FOR REMOVAL BY PIPING.
3. COUPLING TO SPECIAL LENGTH.

REV. NO.	DATE	DESCRIPTIONS	BY	APPROD	REVISED	DRW. NO.															
<table border="1"> <tr> <td>DESIGN</td> <td>NAME</td> <td>DATE</td> <td>CHECK</td> <td>DATE</td> </tr> <tr> <td>DRAWN</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="5">APPROVED</td> </tr> </table>							DESIGN	NAME	DATE	CHECK	DATE	DRAWN					APPROVED				
DESIGN	NAME	DATE	CHECK	DATE																	
DRAWN																					
APPROVED																					
<p>WELLS INSTALLATION</p> <p>1 1/2" DIA TAPS</p>																					
<p>SCALE: N.T.S.</p> <p>FILE NO: MNGI/PLANO/ STEEL 32</p>																					



NOTES:-

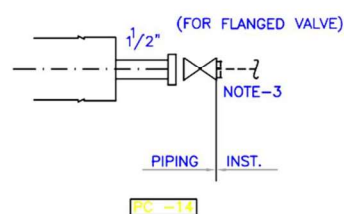
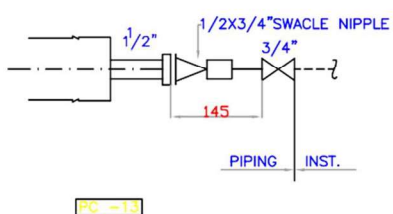
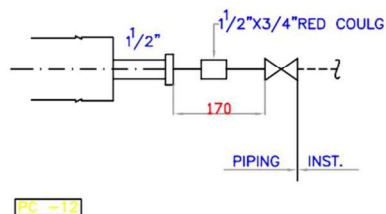
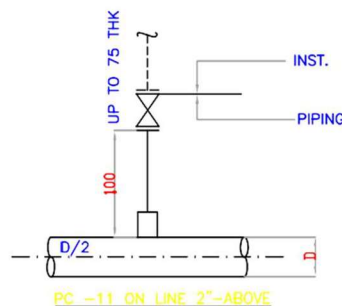
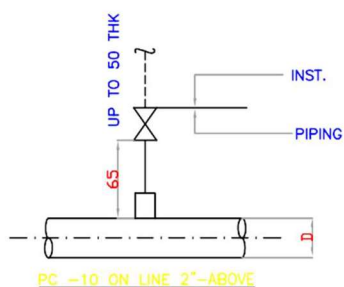
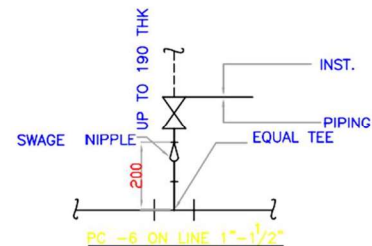
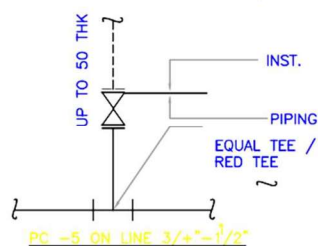
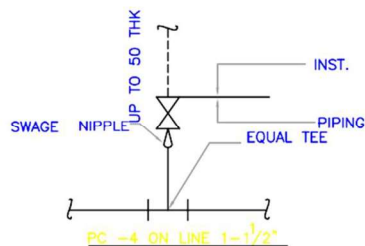
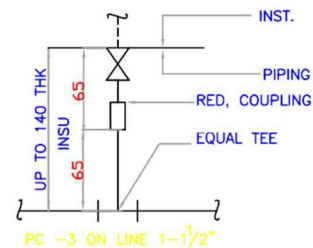
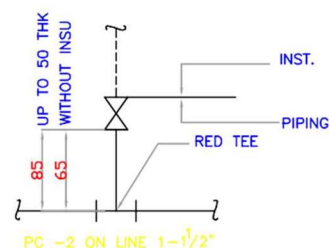
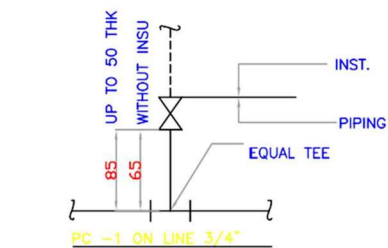
1. DIMENSIONS ARE VALID FOR 50mm (MAX) THICKNESS INSULATION FOR HIGHER INSULATION THICKNESS INCREASE DIMENSIONS AS PREQUIRED.
2. VENTS & DRAINS SHALL BE PROVIDED WITH GATE GLOBE OR PLUG VALVE
3. LEGEND V=VENT D=DRAIN C=CAP F=LANGE R=REDUCER
4. PLUGGED END OF VALVE OR FITTING SHALL BE THREADED



REV. NO.	DATE	DESCRIPTIONS	BY	APPROD.	REVISIONS	REFRECEES	DRW. NO.

SECTION 2 P&PD

WAVE	DATE	CHIEF	TEXT	WELLS INSTALLATION ON LINES 1 1/2" DIA TAPS			
DSGN							
DRWN				APPROVED			
				SCALE : 1/8" = 1'			
				MATERIAL: MNG/L/PLANG/ STEEL 33			



PC -15 WITH 2 VALVE

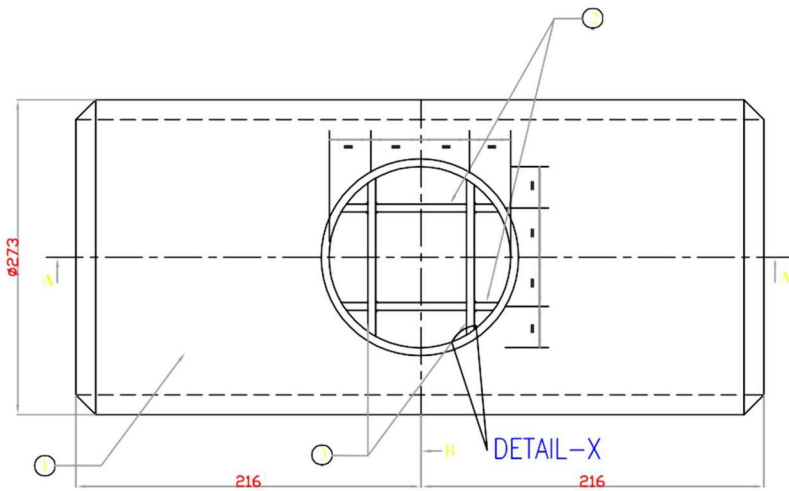
## ON VESSELS/COLUMNS

### NOTES:-

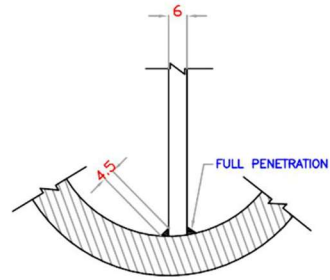
1. THE INDICATED DIMENSIONS ARE IN MINIMUM WHICH ALSO COVER INSULATION TO THE EXTENT SHOWN ABOVE IN HIGHER THICKNESS OF INSULATION THAN INDICATED THE DIFFERENCE SHALL BE ADDED IN THE DIMENSIONS SHOWN
2. PRESSURE TAPPING SHALL BE PROVIDED THE DIFFERENCE SHALL BE ADDED IN THE DIMENSION SHOWN ABOVE ACCORDINGLY TEE, HALF COUPLING OR STUB - IN AS PER PIPING SPECIFICATION
3. IN CASE OF FLGD VALVES BOLTING & GASKET ON BOTH SIDE OF VALVE BE IN PIPING SCOPE.
4. IN CASE OF TAPPING PROVID OTHER THAN INDICATED IN THIS STD FOR LAYOUT REASONS DETAILS DIMENSIONS WILL BE CALLED OUT.

REV. NO.	DATE	DESCRIPTIONS	BY	APPROD	REFERENCES	DRW. NO.
REVISIONS						
SECTION 2 P&PD						
NAME	DATE	CHG	TEXT	PRESSURE TAPPING		
DSGN						
DRWN						
APPROVED				SCALE :	N/A	
				DRG. NO.	MNG/PLNG/ STEEL 34	

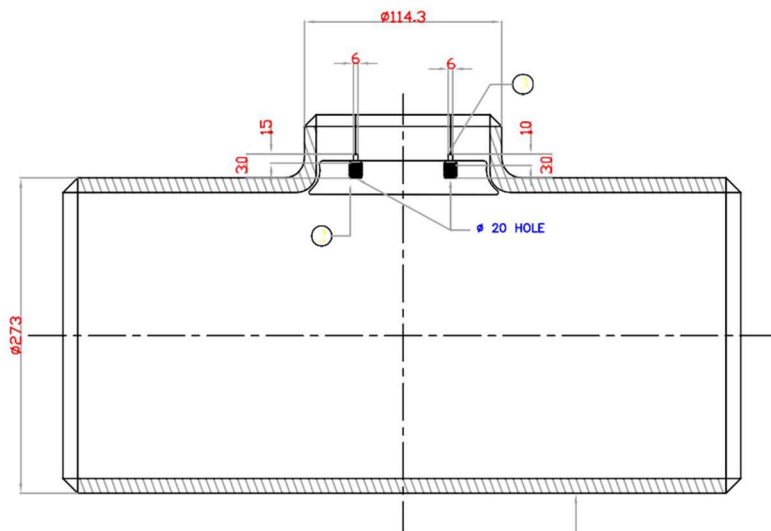




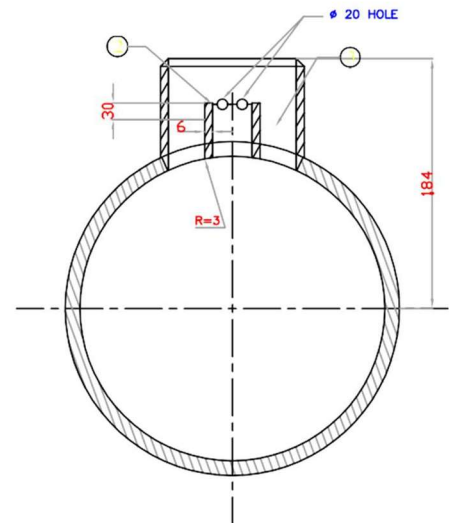
PLAN



DETAIL-X



SECTION A-A



SECTION B-B

QUANTITY - AS per SOR

NOTES :-

1. THE BARRED TEE IS INTENDED TO BE SUITABLE FOR SCRAPER PIGS AND USE LINE IN LINE FOR BIDICTIONAL GAS FLOW
2. THE GUDEE BARS SHALL BE EXTENDED NTC SO THAT THY GET FLUSHED WITH THE INSIDE DAMATER OF THE SAME.
3. THE CNTROUR OF THE GUADE BARS SHALL BE THAT THEY GO ANDNG THE INTERNAL SHAPE OF THE BRANCH
4. THE CONNNECTIONG PLATE SHALL BE WELDED WITH THE STAGHT OF THE BRANCH
5. RED THIS DROING TOGETHER WITH MNGL TECHNICAL SPECIFICATOIN NO. MNGL SHEET /TS/19FOR BARRED TEES
6. THE BARRED TEE IS INTENDED TO BE SUITABLE FOR UNDER INSTALLATION.
7. BUTT-WELD ENDS SHALL BE BELVELS IN ACCRDNCE WITH MSS-SP-75 / B 16.25 AND SHOLD MATCH WITH RUN AND BRANCH PIPES WILL THICKNESS AS INDNNACATED PIPE DATELS

ITEM NO.	DESCRIPTION	QTY.	MATERIAL
1	RED TEE B.W. END PER ASME 16.9 SIZE 10"X10"X4"	1	A 234 WP SchwabKadhi thk(mm)
2	GUDE BAR	2	ASTMA-36/ ASTMA-516Gr.70
3	CONNECTING PLATE	2	ASTMA-36/ ASTMA-516Gr.70

DESIGN DA-A

1. SERVICE	: NATURAL GAS
2. DESIGN PRESSURE	: 10 KG/cm
3. DESIGN TEMP.	: 0 TO 65°C
4. CORROSION ALLOWANCE	: 1.5mm
5. HYDRO-TEST PRESSURE	: 28.5 Kg/cm

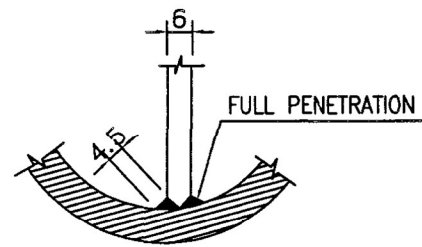
CONNECTING PIPE DETAILS:

1. RUN PIPE	: Ø10" (273) WT 8.4mm.
2. BRANCH PIPE	: Ø4" (114.3) XWT 8mm. API 5L Gr.B

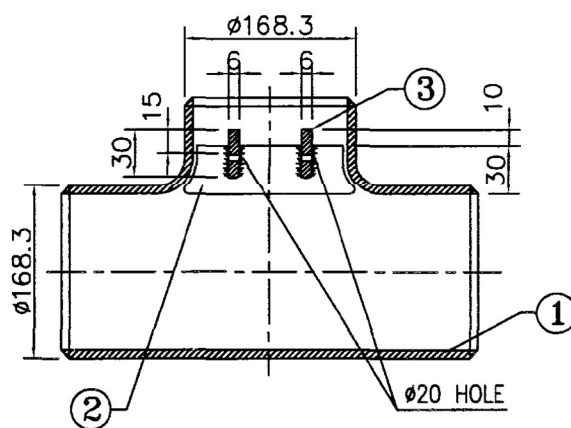
REV. NO.	DATE	DESCRIPTIONS	BY	APPROD.	REVISIONS	REFRECEES	DRW. NO.

SECTION 2 P&PD

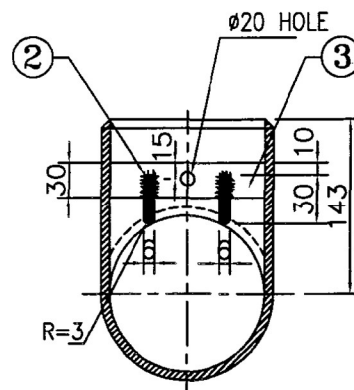
NAME	DATE	CHIEF	TEXT	MAHARASTRA NATURAL GAS LTD			
DSGN							
DRWN				CNG & CITY GAS DISTRIBUTION PROJECT FOR PUNE CITY			
APPROVED				BARRALED TEES		SCALE : 1:1	
						DRG. NO. MNGL/PLANG/ STEEL 37	



### DETAIL-X



**SECTION A-A**



SECTION B-B

ITEM NO.	DESCRIPTION	QTY.	MATERIAL
1	TEE B.W. END AS PER ASME16.9 SIZE 6"x6"x6"	1	A 234 WPB, SCH. STD. x SCH. STD. THK.(MIN.)
2	GUIDE BAR	2	ASTMA - 36 / ASTMA - 516 Gr. 70
3	CONNECTING PLATE	2	ASTMA - 36 / ASTMA - 516 Gr. 70


1. THE BARRED TEE IS INTENDED TO BE SUITABLE FOR SCRAPER PIGS AND USE IN LINE FOR BIRDIRECTIONAL GAS FLOW.
2. THE GUIDE BARS SHALL BE EXTENDED INTO THE RUN SO THAT THEY GET FLUSHED WITH THE INSIDE DIAMETER OF THE SAME.
3. THE CONTOUR OF THE GUIDE BARS SHALL BE SUCH THAT THEY GO ALONG THE INTERNAL SHAPE OF THE BRANCH.
4. THE CONNECTING PLATE SHALL BE WELED WITH THE STRAIGHT PORTION OF THE BRANCH.
5. READ THIS DRAWING TOGETHER WITH MINGEL TECHNICAL SPECIFICATION NO. MINGEL/Steel/T-119 FOR BARRED TEES

1. SERVICE	:	NATURAL GAS
2. DESIGN PRESSURE	:	19 Kg/cm <sup>2</sup>
3. DESIGN TEMP.	:	0 TO 65°C
4. COEEOSION ALLOWANCE	:	0.5mm
5. HYDRO-TEST PRESSURE	:	28.5 Kg/cm <sup>2</sup>

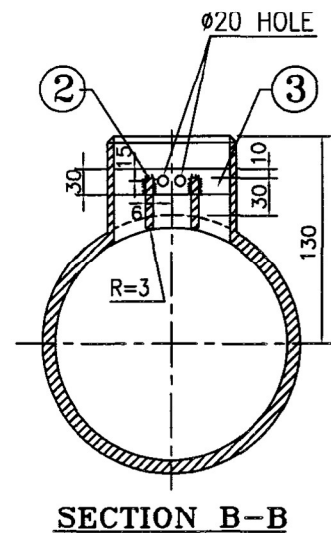
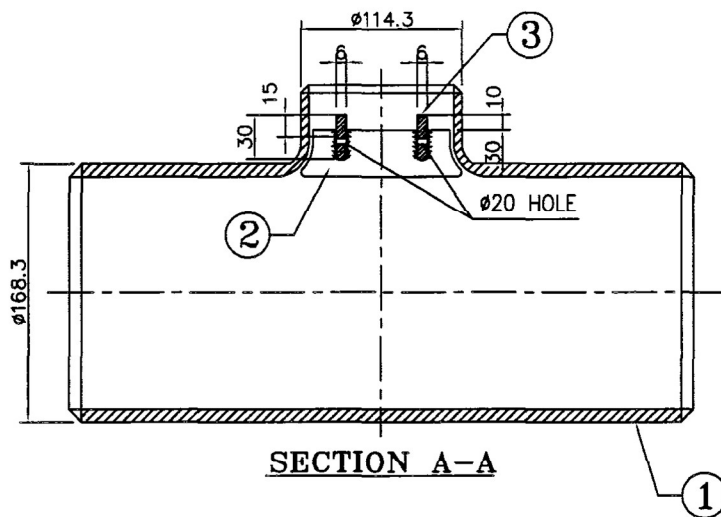
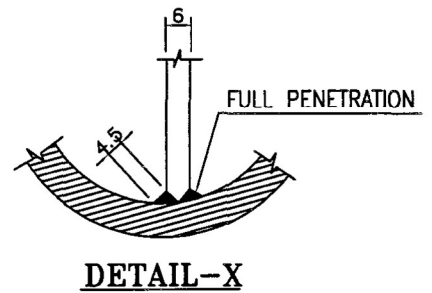
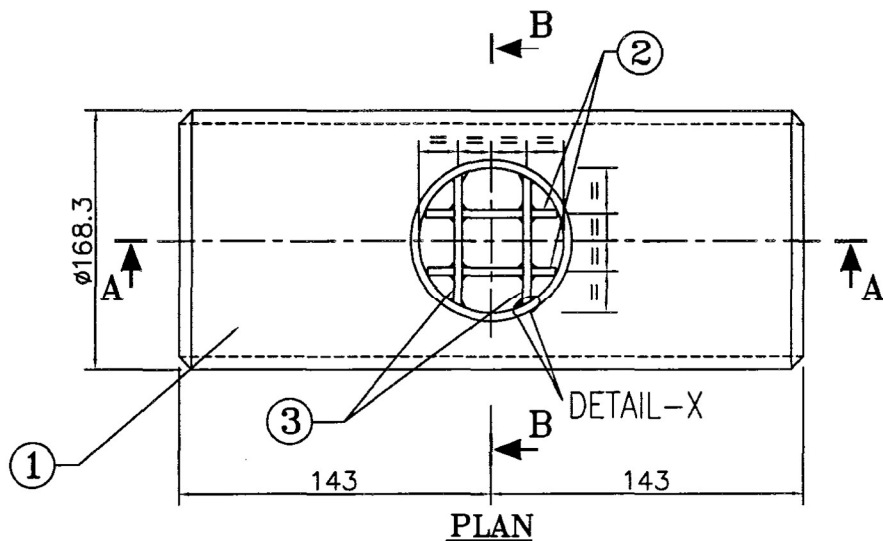
1. RUN PIPE : 06"(168.3) x WT 6.4 mm,  
API 5L GR. B

2. BRANCH PIPE : 06"(168.3) x WT 6.4 mm,  
API 5L GR. B

REV NO	DATE	ZONE	DESCRIPTIONS	BY	APPRO		
REVISIONS					REFERENCES		DRG. NO.

					महाराष्ट्र नैचुरल गॅस लिमिटेड MAHARASTRA NATURAL GAS LTD	
				CNG & CITY GAS DISTRIBUTION PROJECT FOR PUNE CITY		
				SCALE : NTS DRG.NO MNGI/Plng./Steel/38		





QUANTITY - As per SOR

#### NOTES:-

1. THE BARRED TEE IS INTENDED TO BE SUITABLE FOR SCRAPER PIGS AND USE IN LINE FOR BIRDIRECTIONAL GAS FLOW.
2. THE GUIDE BARS SHALL BE EXTENDED INTO THE RUN SO THAT THEY GET FLUSHED WITH THE INSIDE DIAMETER OF THE SAME.
3. THE CONTOUR OF THE GUIDE BARS SHALL BE SUCH THAT THEY GO ALONG THE INTERNAL SHAPE OF THE BRANCH.
4. THE CONNECTING PLATE SHALL BE WELDED WITH THE STRAIGHT PORTION OF THE BRANCH.
5. READ THIS DRAWING TOGETHER WITH MNGL TECHNICAL SPECIFICATION NO MNGL/Steel/TS/19 FOR BARRED TEES
6. THE BARRED TEE IS INTENDED TO BE SUITABLE FOR UNDER GROUND INSTALLATION.
7. BUTT-WELD ENDS SHALL BE BEVELED IN ACCORDANCE WITH MSS-SP-75 / B 16.25 AND SHOULD MATCH WITH RUN PIPE AND BRANCH PIPE'S WALL THICKNESS AS INDICATED IN CONNECTING PIPE DETAILS.

ITEM NO.	DESCRIPTION	QTY.	MATERIAL
1	RED. TEE B.W. END AS PER ASME16.9 SIZE 6"x6"x4"	1	A 234 WPB, Sch.Std X Sch. XS Thk.(Min.)
2	GUIDE BAR	2	ASTMA - 36 / ASTMA - 516 Gr. 70
3	CONNECTING PLATE	2	ASTMA - 36 / ASTMA - 516 Gr. 70

#### DESIGN DATA

1. SERVICE : NATURAL GAS
2. DESIGN PRESSURE : 19 Kg/cm<sup>2</sup>
3. DESIGN TEMP. : 0 TO 65°C
4. CORROSION ALLOWANCE : 1.5mm
5. HYDRO-TEST PRESSURE : 28.5 Kg/cm<sup>2</sup>

#### CONNECTING PIPE DETAILS

1. RUN PIPE : 6"(168.3) x WT 6.4 mm. API 5L Gr. B
2. BRANCH PIPE : 4"(114.3) x WT 6.4 mm. API 5L Gr. B

REV NO	DATE	ZONE	DESCRIPTIONS	BY	APPRO	REFERENCES	DRG. NO.
--------	------	------	--------------	----	-------	------------	----------

	<b>महाराष्ट्र नैचुरल गॅस लिमिटेड</b> <b>MAHARASHTRA NATURAL GAS LTD</b>	
	<b>CNG &amp; CITY GAS DISTRIBUTION</b> <b>PROJECT FOR PUNE CITY</b>	
	<b>BARRED TEES</b>	
SCALE : NTS DRG.NO MNG/Plng/Steel/739		



G

F

E

D

C

B

A

5

5

4

4

3

3

2

2

1

1

G

F

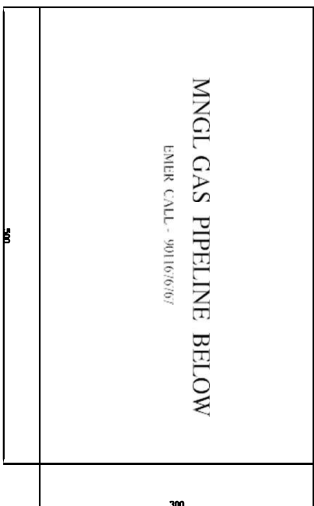
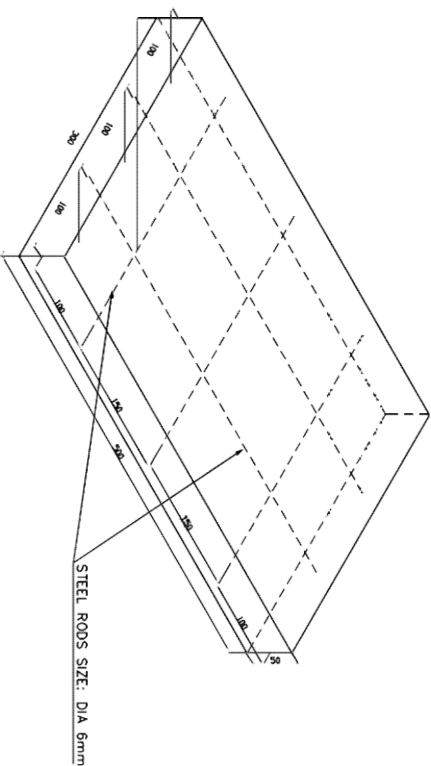
E

D

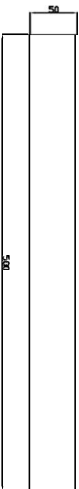
C

B

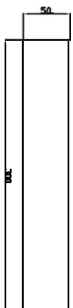
A



PLAN



FRONT VIEW

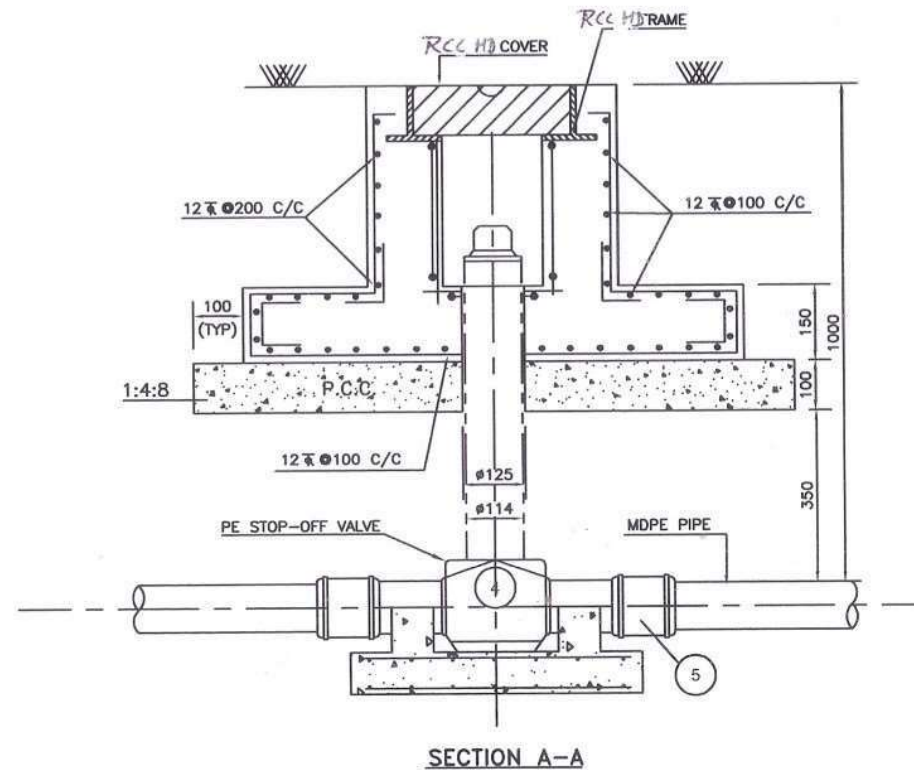


SIDE VIEW

NOTES:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE SPECIFIER SPECIFIED.
2. CONCRETE FOR MARKER SHALL BE M-20.

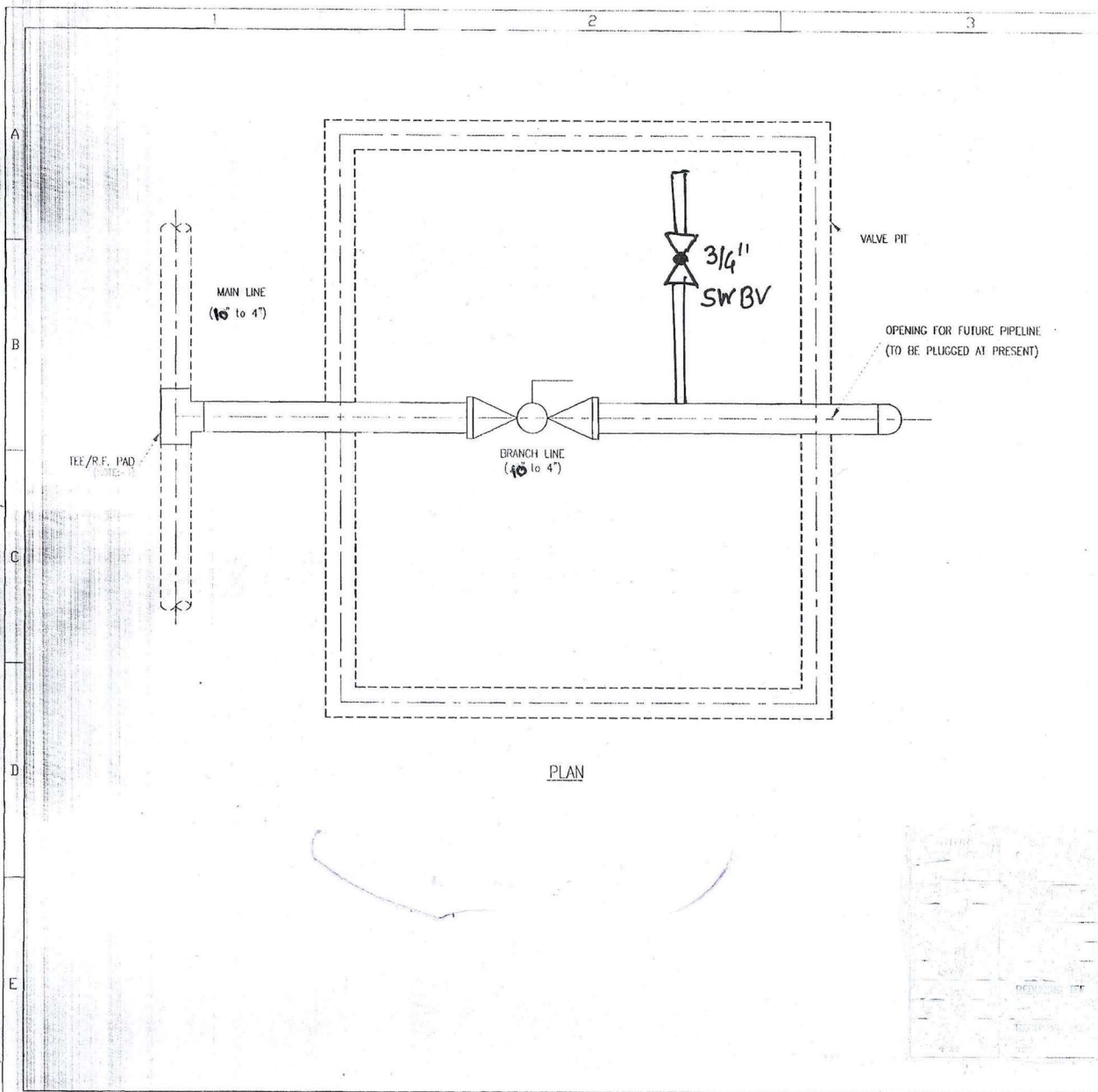
F
E
D
C
B
A



NOTES -

1. ALL DIMENSIONS ARE IN MM.
2. THE CONCRETE SHALL HAVE A CHARACTERISTIC STRENGTH OF 20 N/MM<sup>2</sup>
3. THE COVER FOR REINFORCEMENT SHALL BE 50 MM ON OUTER FACES AND 50 MM ON INNER FACE.
4. THE SFRC COVER SHALL HAVE REINFORCED CONCRETE OF GRADE M-35 CONFORMING TO IS:456-1978.
5. DEBRIS BACKFILL TO BE REMOVED & GOOD EARTH TO BE FILLED IN AREA OF 1.5 M x 1.5 M WITH PROPER COMPACTION AND CONSOLIDATION BY WATER.
6. GASKET OF RUBBER OR ANY OTHER EQUIVALENT MATERIAL OF MATCHING DIMENSIONS SHALL BE SUPPLIED & USED BY THE CONTRACTOR TO PREVENT INGRESS OF WATER INTO THE VALVE PIT.
7. 75mm THICK PCC(1:2:4) OF DIMENSION 300mm X 300mm FOR VALVE OF SIZES FROM 63mm TO 125mm SHOULD BE PROVIDED FOR SUPPORTING THE PE STOP OFF VALVE AT THE BASE.
8. RUBBER SHEET OF MIN. 6mm THICK SHOULD BE PROVIDED BETWEEN BASE OF THE VALVE AND PCC TOP SURFACE.

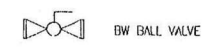
MAHARASHTRA NATURAL GAS LIMITED			
DRAWN BY PLNG	DATE: 06/05/04	TITLE - RCC PIT FOR PE STOP-OFF VALVE(ø63 TO 125 mm)	
CHECKED BY	DATE:		
APPRD. BY —	DATE:	DRAWING NO: MNG/L/ENG/CIVIL/10A	REV. 0



NOTES

1. TOP OF THE PIPE SHALL BE AT MINIMUM 1.2M DEPTH.
2. APPROXIMATE SIZE OF THE PIT WILL BE 2Mx2M & 2Mx1.5M. IT DEPENDS ON THE SITE CONDITION.
3. BRANCHING CONNECTIONS (TEE/ R.F. PAD) SHALL DEPEND UPON THE MAIN LINE & BRANCH LINE.

LEGEND



BW BALL VALVE

STATUS

NO.	REV.	DATE	BY	CHKD.	APPD.	REVISION
1						

TITLE: GENERAL ARRANGEMENT DRAWING FOR FUTURE TAP-OFF POINTS

CLIENT: MINGL. PUNE

PROJECT: CGD. PUNE

MINGL/Ping/1 Steel/40



LEGENDS:

- |      |      |                               |
|------|------|-------------------------------|
| ℄    | ---- | CENTRE LINE                   |
| OGI  | ---- | ORIGINAL GROUND LEVEL         |
| NGI  | ---- | NATURAL GROUND LEVEL          |
| EL   | ---- | ELEVATION                     |
| FFL  | ---- | FINISHED FLOOR LEVEL          |
| TYP. | ---- | TYPICAL                       |
| LVL. | ---- | LEVEL                         |
| THK. | ---- | THICK / THICKNESS             |
| DET. | ---- | DETAIL                        |
| RCC  | ---- | REINFORCED CEMENT<br>CONCRETE |
| PCC  | ---- | PLAIN CEMENT CONCRETE         |

NOTES:

- 1) IF DOUBT ASK, DO NOT SCALE THE DRAWING.
- 2) BEARING CAPACITY = 400 KN/SQM IS CONSIDERED FOR DESIGN
- 3) GRADE OF MATERIAL:-  
CONCRETE:- M25 WITH 20MM DOWN GRADED AGGREGATES.  
STEEL:- FE500 DEFORMED BARS AS PER IS-1786.

## ENGINEERING REFERENCE

## CONSTRUCTION REFERENCE

HOLD

---

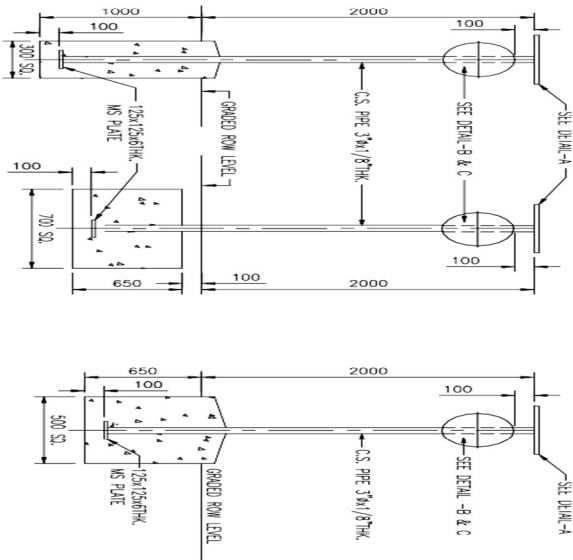
## REVISION STATUS

DO NOT SCALE

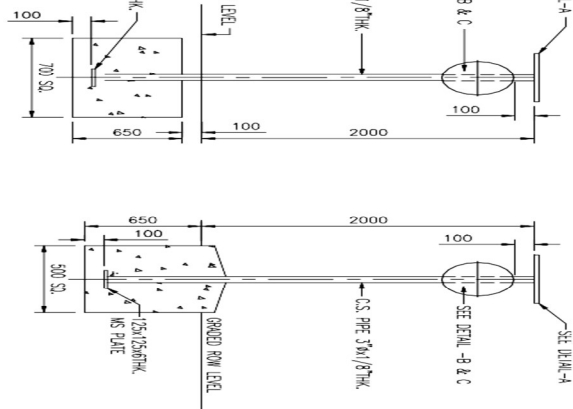
FOR RO ISSUE ONLY			ISSUE	REVISIONS			DRN	CLEARED					APPO	DATE	FILE NAME :33339999	MAHARASHTRA NATURAL GAS LTD.	CHAMBER RC DETAILS		
								CHEM	CIVIL	ELEC	I&C	MECH							
DEPT	SIGNATURE	DATE						<div>IF THIS DRAWING IS USED BY ANY OTHER PROJECT, THE USER SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED. THE USER SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED. THE USER SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.</div>											
CIVIL																			
														CONSULTANT :					
														PROJECT :					
														DRN: SKL					
														DWO NO. ECS-2019-MNGL-DK-02-RC-07					
														ISSUE NO.					



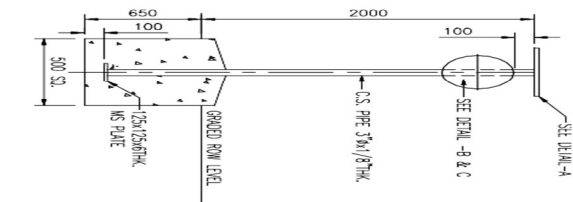
# Steel Markers Drawing



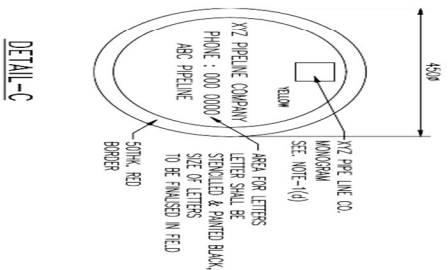
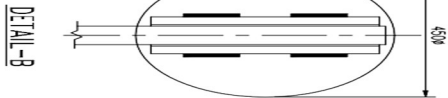
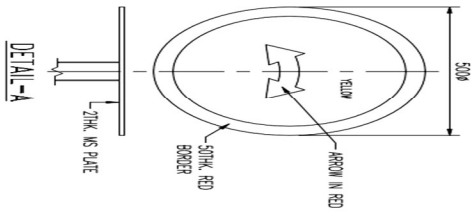
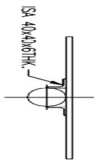
TYPE-I  
FOR NORMAL SOIL



TYPE-II  
FOR DRIFTING SAND SOIL



TYPE-III  
FOR ROCKY AREAS



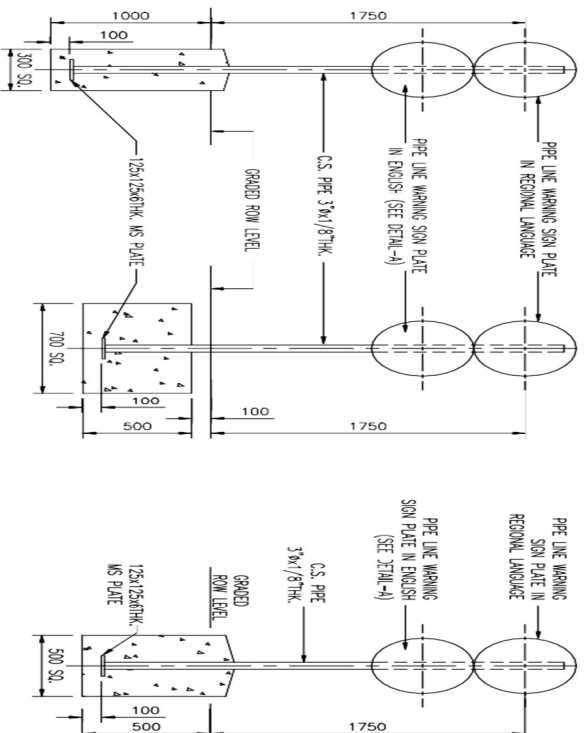
## NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. SCHEME OF PAINTING & COLOURING:
  - (a) UNDERGROUND STEEL STRUCTURE EXCEPT THAT EMBEDDED IN CONCRETE: COAL TAR EPOXY MIN. 300 MICRON THK.
  - (b) OVERGROUND STEEL STRUCTURE : ONE COAT OF PRIMER & TWO COATS SPECIFIED COLOUR PAINT.
  - (c) FIGURES SHALL BE STENCILED ON BOTH SIDES OF THE POSTS IN BLACK.
  - (d) COLOUR SCHEME FOR XYZ PIPELINE CO. MONOGRAM SHALL BE AS DIRECTED BY OWNER.
  - (e) POST SHALL BE PAINTED WITH 250 MM ALTERNATE BANDS OF BLACK AND WHITE PAINT.
  - (f) ALL OTHER ABOVEGROUND STEEL SHALL BE PAINTED YELLOW.
3. LOCATION:
  - (a) DIRECTION MARKERS SHALL BE INSTALLED AS PER SPECIFICATIONS AS DIRECTED IN APPROVED DRAWINGS AND AS DIRECTED BY OWNER.
  - (b) TWO NOS. ADDITIONAL DIRECTIONAL MARKERS SHALL BE PROVIDED 200M AWAY FROM CHANGE IN DIRECTION ON EITHER SIDE.
  - (c) OWNER NAME PLATE SHALL FACE THE PIPELINE.
  - (d) DIRECTION MARKERS SHALL BE INSTALLED 100MM TO LEFT OF THE PIPE CENTER LINE/JOINTS TOWARDS THE DIRECTION OF FLOW AND AS INDICATED IN LOCATION SPECIFIC.
  - (e) THE FOUNDATION SHALL BE MADE OF CONCRETE W/20.
  - (f) SON PLATE IN REGIONAL LANGUAGE SHALL BE PREPARED BY CONTRACTOR ON SQUARE LINES AND APPROVED BY THE OWNER.
  - (g) ALL WELDS SHALL BE 4 MM.
  - (h) IN ADDITION TO THIS, DSD AND PHASE GUIDELINES MUST BE COMPLIED WITH.

TYPICAL DIRECTION MARKER DETAILS

## NOTES

1. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
2. SCHEME OF PAINTING & COLORING.
  - (a) UNDERGROUND STEEL STRUCTURE (EXCEPT THAT EMBEDDED IN CONCRETE) COAT TAR EPOXY MIN. 300 MICRON THK.
  - (b) OVERGROUND STEEL STRUCTURE : ONE COAT OF PRIMER & TWO COATS SPECIFIED COLOR PAINT.
  - (c) ALL LETTERS EXCEPT WARNING SHALL BE PAINTED BLACK.
  - (d) COLOR SCHEME FOR XYZ PIPELINE CO. WINDSCREEN SHALL BE AS DIRECTED BY OWNER.
  - (e) POST SHALL BE PAINTED WITH 150 MM ALTERNATE BANDS OF BLACK AND WHITE PAINT.
3. LOCATION.
  - (i) ALL OTHER ABOVEGROUND STEEL SHALL BE PAINTED YELLOW.
  - (ii) (a) THE PIPE LINE WARNING SIGN SHALL BE INSTALLED IN ACCORDANCE WITH CONTRACT REQUIREMENTS AND AS DIRECTED BY OWNER IT SHALL BE INSTALLED TO THE LEFT OF THE PIPE CENTER LINE, MINIMUM IN THE DIRECTION OF FLOW AT 300MM FROM PIPELINE C.D. AND THE WARNING SIGN PLATE SHALL FACE THE UTILITY BEING CROSSED.
  - (b) THE WARNING SIGN PLATE MAY BE MOUNTED ON VENT PIPES OR RM POST WHERE EVER POSSIBLE.
  - (c) THE FOUNDATION SHALL BE MADE OF CONCRETE M20.
  - (d) SIGN PLATE IN REGIONAL LANGUAGE SHALL BE PREPARED BY CONTRACTOR ON SIMILAR LINES AND APPROVED BY THE OWNER.
  - (e) IN ADDITION TO THIS, OSD AND PAGER GUIDELINES MUST BE COMPLIED WITH.



TYPE-I

FOR NORMAL SOIL

TYPE-II

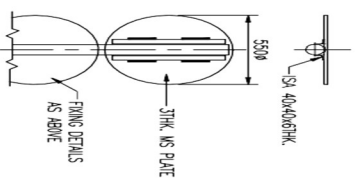
FOR DRIFTING SAND SOIL

TYPE-III

FOR ROCKY AREAS



DETAIL-A



WARNING SIGN PLATE

FIXING DETAILS

SHEET

TYPICAL PIPE LINE WARNING SIGN DETAILS



1

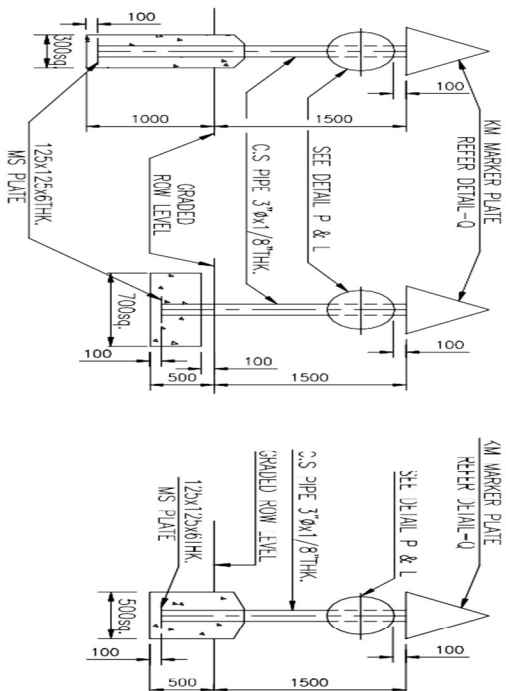
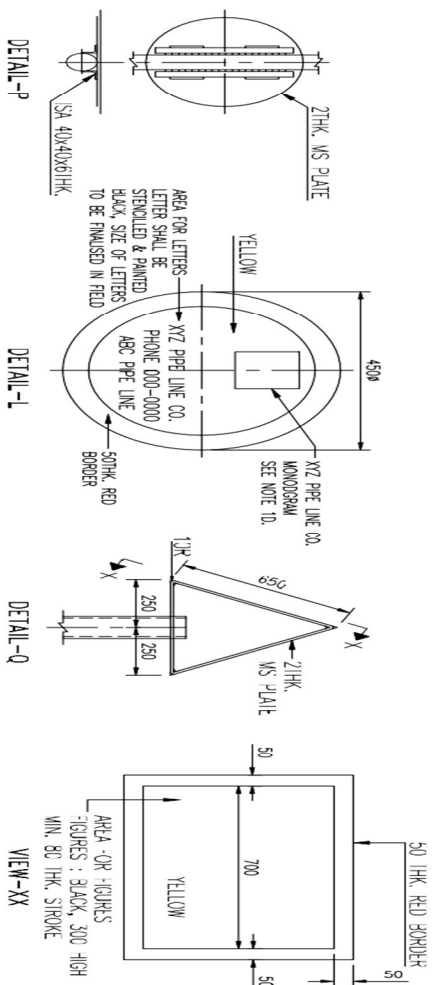
2

3

4

## NOTES

- ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
- SPECIE OF PAINTING & COLORING:
  - UNDERGROUND STEEL STRUCTURE (EXCEPT THAT EMBEDDED IN CONCRETE) COAL TAR EPOXY MIN. 300 MICRON THK.
  - OVERGROUND STEEL STRUCTURE : ONE COAT OF PRIMER & TWO COATS SPECIFIED COLOR PAINT.
  - FIGURES SHALL BE STENCILED ON BOTH SIDES OF THE POSTS IN BLACK.
  - COLOR SCHEME FOR XYZ PRELINE CO. MONOGRAM SHALL BE AS DIRECTED BY OWNER.
  - POST SHALL BE PAINTED WITH 150 MM WIDE ALTERNATE BANDS OF BLACK AND WHITE PAINT.
  - ALL OTHER ABOVEGROUND STEEL SHALL BE PAINTED YELLOW.
- LOCATION
  - K.M. POST SHALL BE INSTALLED AT EVERY KILOMETERS AS PER REQUIREMENTS OF CONTRACT AND AS DIRECTED BY OWNER.
  - OWNER NAME PLATE SHALL FACE THE PIPELINE.
  - K.M. POST SHALL BE 500MM TO THE LEFT OF THE PIPE CENTRE LINE VIEWING TOWARDS THE DIRECTION OF FLOW AND AS INDICATED IN SKETCH.
  - THE FOUNDATION SHALL BE MADE OF CONCRETE M20.
  - THE HEIGHT OF THE K.M. POST MAY BE VARED TO SUIT FIELD REQUIREMENTS.
  - IN ADDITION TO THIS, OSD AND RRBGRG GUIDELINES MUST BE COMPLIED WITH.

TYPE-I  
FOR NORMAL SOILTYPE-II  
FOR DRIFTING SAND SOILTYPE-III  
FOR ROCKY AREAS

TYPICAL K.M. POST DETAILS