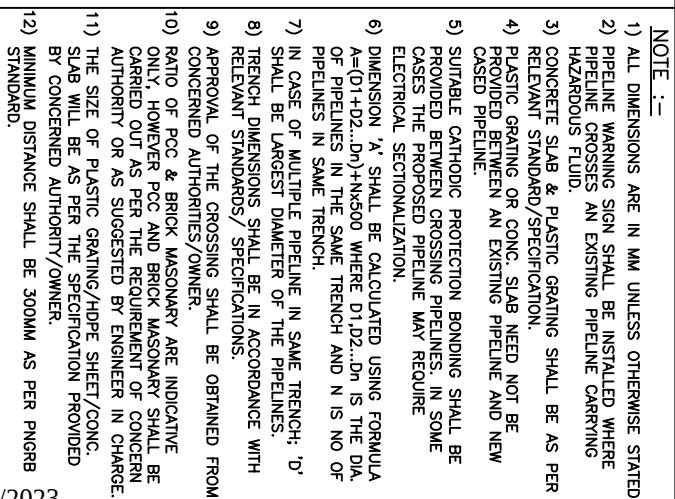






GUJARAT GAS LIMITED

TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

PROJECT NAME: TYPICAL DRAWING

STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION

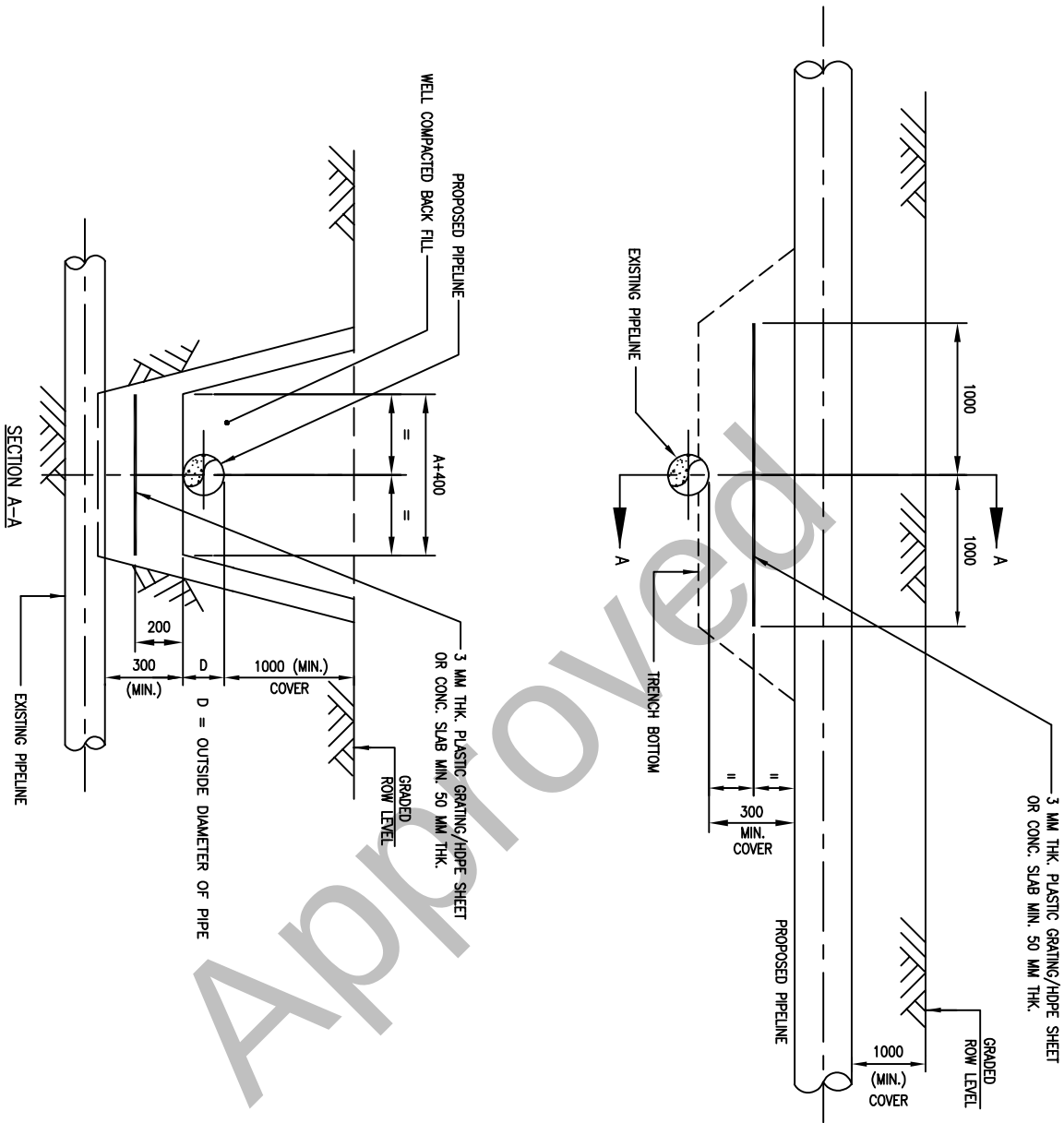
TITLE: EXISTING UNDER GROUND PIPE CROSSING TYPE-I

SCALE	SHEET	DRAWING NO.	REV.
NIS	1 OF 1	GGL/TS/STEEL/T/P. CONST./DRW-01	0

Approved by: _____
 Checked by: _____
 Prepared by: _____
 Date: 22.02.2023
 For: GGL GGL GGL

Project Id : 90874 Approved by: Upendrakumar...
 Title: Existing Under Ground Pipe Crossing Type-I
 Status: Issued for Information cum Construction
 Scale: NIS Sheet No.: 1 of 1 Drawing No.: GGL/TS/STEEL/T/P.CONST./DRW-01 Rev.: 0

EXISTING UNDER GROUND PIPE CROSSING TYPE-II



NOTE :-

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
- 2) PIPELINE WARNING SIGN SHALL BE INSTALLED WHERE PIPELINE CROSSES AN EXISTING PIPELINE CARRYING HAZARDOUS FLUID.
- 3) CONCRETE SLAB & PLASTIC GRATING SHALL BE AS PER RELEVANT STANDARD/SPECIFICATION.
- 4) PLASTIC GRATING OR CONC. SLAB NEED NOT BE PROVIDED BETWEEN AN EXISTING PIPELINE AND NEW CAVED PIPELINE.
- 5) SUITABLE CATHODIC PROTECTION BONDING SHALL BE PROVIDED BETWEEN CROSSING PIPELINES. IN SOME CASES THE PROPOSED PIPELINE MAY REQUIRE ELECTRICAL SECTIONALIZATION.
- 6) DIMENSION 'A' SHALL BE CALCULATED USING FORMULA $A=(D1+D2...Dn)+(N-1) \times 500$ WHERE $D1, D2...Dn$ IS THE DIAMETERS OF PIPELINES IN THE SAME TRENCH AND N IS NO OF PIPELINES IN SAME TRENCH.
- 7) IN CASE OF MULTIPLE PIPELINE IN SAME TRENCH, 'D' SHALL BE LARGEST DIAMETER OF THE PIPELINES.
- 8) TRENCH DIMENSIONS SHALL BE IN ACCORDANCE WITH RELEVANT STANDARDS/ SPECIFICATIONS.
- 9) THE SIZE OF PLASTIC GRATING/HDPE SHEET/CONC. SLAB WILL BE AS PER THE SPECIFICATION PROVIDED BY CONCERNED AUTHORITY/OWNER.
- 10) MINIMUM DISTANCE OF 300MM SHALL BE MAINTAINED AS PER PNGRB STANDARD.

NO.	DATE	REVISION	REV.BY.	SIGN.

SIGN.	PREPARED BY	CHECKED BY	APPROVED BY
NAME	HZ/HPS	SB	US
DATE	22.02.2023		
FOR	GGL	GGL	GGL



TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

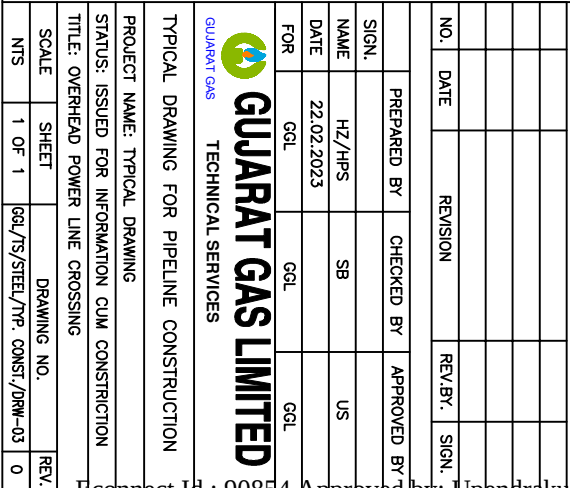
PROJECT NAME: TYPICAL DRAWING

STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION

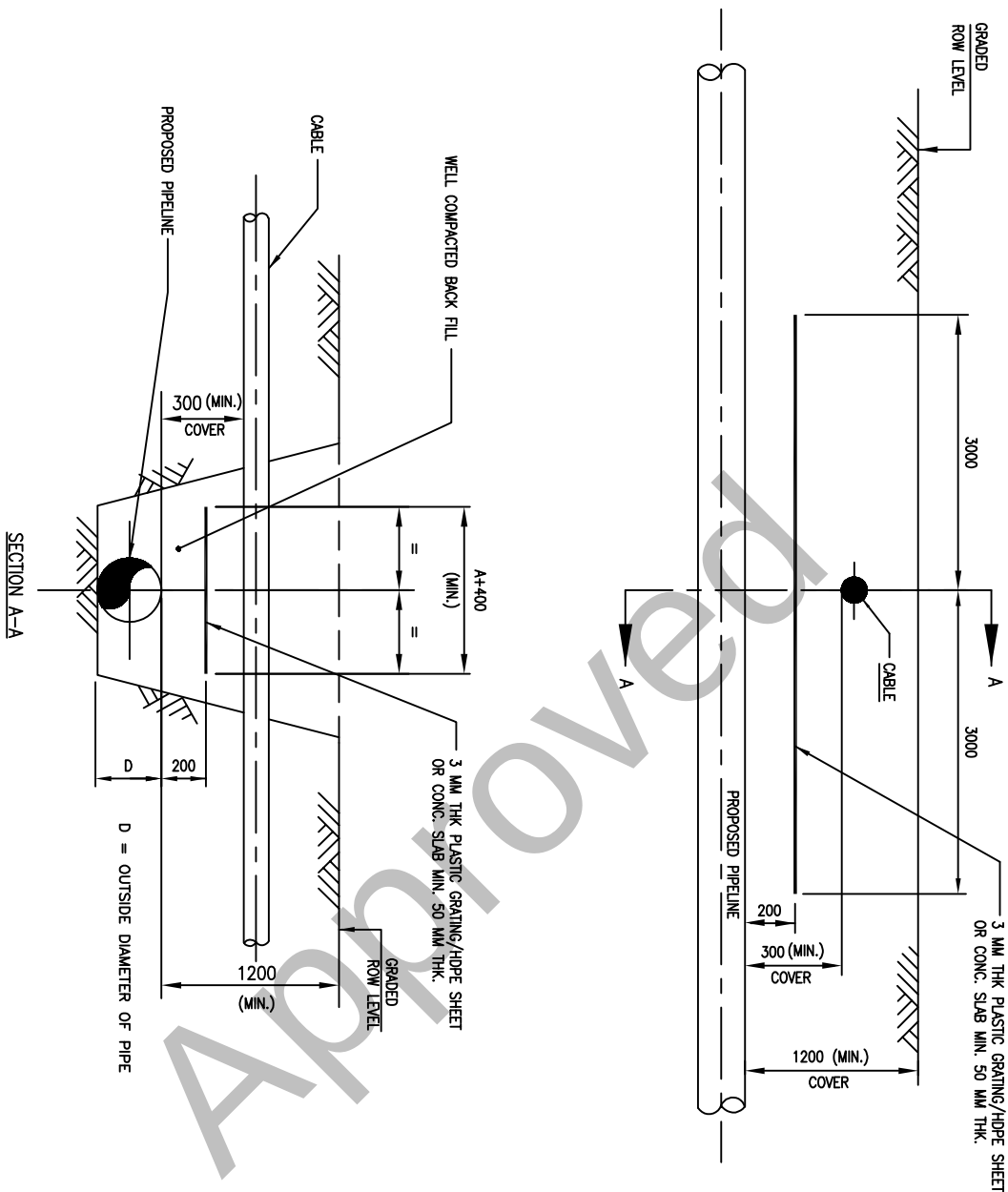
TITLE: EXISTING UNDER GROUND PIPE CROSSING TYPE-II

SCALE	SHEET	DRAWING NO.	REV.
NTS	1 OF 1	GGL/TS/STEEL/TYP.CONST./DRW-02	0

- NOTE :-
- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) CONCRETE SLAB & PLASTIC GRATING SHALL BE AS PER RELEVANT STANDARD/SPECIFICATION.
- 3) SUITABLE MEASURES SHALL BE TAKEN FOR PROTECTION OF THE LINE AND SAFETY OF PERSONAL/EQUIPMENT DURING CONSTRUCTION.
- 4) DIMENSION 'A' SHALL BE CALCULATED USING FORMULA $A=(D1+D2....Dn)/n$ WHERE $D1, D2....Dn$ IS THE DIAMETER OF RELEVANT STANDARD/SPECIFICATION, PIPELINES IN SAME TRENCH.
- 5) IN CASE OF MULTIPLE PIPELINE IN SAME TRENCH, 'D' SHALL BE LARGEST DIAMETER OF THE PIPELINES.
- 6) OTHER PROTECTION AS PER CP DESIGN.



UNDERGROUND CABLE CROSSING



NOTE :-

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
- 2) PIPELINE WARNING SIGN SHALL BE INSTALLED WHERE PIPELINE CROSSES AN EXISTING PIPELINE CARRYING HAZARDOUS FLUID.
- 3) CONCRETE SLAB & PLASTIC GRATING SHALL BE AS PER RELEVANT STANDARD/SPECIFICATION.
- 4) PLASTIC GRATING OR CONC. SLAB NEED NOT BE PROVIDED BETWEEN AN EXISTING PIPELINE AND NEW CAVED PIPELINE.
- 5) IN CASE OF ARMoured AC CABLE, C.P. BONDING IS TO BE PROVIDED BETWEEN PIPELINE AND CABLE ARMOUR. IN CASE OF UNARMoured AC CABLES, ARRANGEMENT FOR ELECTRO-MAGNETIC SHIELDING (BY PROVIDING CASING ON EITHER THE PIPE LINE OR CABLE) SHALL BE CONSIDERED.
- 6) DIMENSION 'A' SHALL BE CALCULATED USING FORMULA $A=(D1+D2...Dn)+(N-1)\times 500$ FOR MORE THAN ONE PIPELINE LAID IN COMMON TRENCH WHERE D1,D2...Dn ARE DIAMETER AND 'N' IS NUMBER OF PIPELINES IN SAME TRENCH.
- 7) IN CASE OF MULTIPLE PIPELINE IN SAME TRENCH, 'D' SHALL BE LARGEST DIAMETER OF THE PIPELINES.
- 8) TRENCH DIMENSIONS SHALL BE IN ACCORDANCE WITH RELEVANT STANDARDS/ SPECIFICATIONS.
- 9) APPROVAL OF THE CROSSING SHALL BE OBTAINED FROM CONCERNED AUTHORITIES EXECUTION.
- 10) MINIMUM DISTANCE OF 300MM SHALL BE MAINTAINED AS PER PNGRB STANDARD.

NO.	DATE	REVISION	REV.BY.	SIGN.

SIGN.	PREPARED BY	CHECKED BY	APPROVED BY
NAME	HZ/HPS	SB	US
DATE	22.02.2023		
FOR	GGL	GGL	GGL

**GUARAT GAS LIMITED**
TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION			
PROJECT NAME: TYPICAL DRAWING			
STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION			
TITLE: UNDERGROUND CABLE CROSSING			
SCALE	SHEET	DRAWING NO.	REV.
NTS	1 OF 1	GGL/TS/STEEL/TYP. CONST./DRW-04	0

A cross-sectional diagram of a canal system. The central feature is a canal with a curved bottom. On either side of the canal are embankments. Within the embankment areas, there are rectangular sections labeled 'BORROW PIT'. The top and bottom edges of the embankments are labeled 'EXISTING GROUND'. A dashed line runs vertically through the center of the canal. A curved arrow points from the text 'CANAL' to the canal's bed. The diagram is divided into horizontal sections by vertical lines.

The diagram illustrates a cross-section of a lined canal system. Key components and dimensions include:

- Top Section:** A concrete structure with a **BBOC** (Bottom Boundary of Canal) and a **P.C.C.** (Plain Cement Concrete) layer with a **1:4:8** ratio.
- Left Borrow Pit:** A **BORROW PIT** with a **2000** width and a **2000 MIN.** depth. The **EDGE OF BORROW PIT** is marked.
- Canal Section:** A **LINED CANAL** with a **WATER LEVEL** and **BED LEVEL**. The **SLOPE** is **1:100**. The **MIN.** depth is **1500**.
- Right Borrow Pit:** A **BORROW PIT** with a **2000** width and a **2000 MIN.** depth.
- Bottom Section:** A **CARRIER PIPE** and **CASING PIPE** are shown. A **HEAT SHRINKABLE END SEAL** is located at the bottom right. The **ROU LIMIT** (Right of Way Limit) is indicated.
- Ground Level:** The **NATURAL GROUND LEVEL** is shown at the bottom right.
- Dimensions:** Various dimensions are provided, including **1000** for the top concrete structure, **2000** for the borrow pit widths, and **1500** for the canal depth.

 – VENT
 – DRAIN
 – WARNING SIGN

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) FOR CASING CROSSING DESIGN AND INSTALLATION REQUIREMENT REFER API RP 1102 STANDARD.
- 3) CASING DIAMETER SHALL BE 150 MM LARGER(MINIMUM) THAN CARRIER PIPE DIAMETER OR SHALL BE AS PER AUTHORITY REQUIREMENT.
- 4) PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON BOTH SIDE OF CANAL FOR EACH CANAL CROSSING.
- 5) CATHODIC PROTECTION TEST LEAD TERMINAL BOX MAY BE MOUNTED ON VENT PIPE FOR CPU TERMINAL BOX DETAILS REFER RELEVANT STANDARDS/SPECIFICATIONS.
- 6) CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS WITH RESPECT TO SURVEY DETAILS OF EACH CROSSING AND PREPARE DETAILED DRAWING FOR INDIVIDUAL CROSSING AND SUBMIT IT TO CONCERNED AUTHORITY FOR APPROVAL BEFORE STARTING EXECUTION.
- 7) PIPELINE SECTION OF CROSSING SHALL BE PRE-TESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN PIPE SECTION HYDRO TESTING. ALL PIPELINE JOINTS SHALL BE TESTED BY USING RADIOGRAPHY.
- 8) ELECTRICAL INSULATION BETWEEN CASING AND CARRIER PIPES SHALL BE CHECKED WITH SUITABLE MEGGER.
- 9) AFTER INSTALLATION OF CASING AND CARRIER PIPES, THE CANAL RESTORATION SHALL BE DONE TO THE SATISFACTION OF CANAL AUTHORITIES/OWNER.
- 10) FOR CASING PIPE INSULATOR SPACING END SEALS ETC REFER RELEVANT STD.
- 11) ANGLE OF INTERSECTION BETWEEN PIPELINE AND THE CANAL SHALL BE AS CLOSED TO 90° AS POSSIBLE; IN NO CASE LESS THAN 85°.
- 12) DETAILS OF VENT & DRAIN REFER DRG. NO. SCM/GGL-PR/C&C/DRG/CON/012.
- 13) FOR CASING PIPE DETAIL REFER DWG.
- 14) FOR WARNING SIGN REFER DWG.
- 15) AS PER PNGRB MIN. 1.5 MTR COVER SHALL BE MAINTAINED BETWEEN CANAL BOTTOM AND PIPELINE TOP.

[illegible]

		EXISTING GROUND
		BORROW PIT
		EMBANKMENT
LINED		CANAL
		85° TO 90°
		EMBANKMENT
		BORROWPIT
		EXISTING GROUND

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON BOTH SIDE OF CANAL FOR EACH CANAL CROSSING.
- 3) CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS WITH RESPECT TO SURVEY DETAILS OF EACH CROSSING AND PREPARE DETAILED DRAWING FOR INDIVIDUAL CROSSING AND SUBMIT IT TO CONCERNED AUTHORITY FOR APPROVAL BEFORE STARTING EXECUTION.
- 4) PIPELINE SECTION OF CROSSING SHALL BE PRE-TESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN PIPE SECTION HYDRO TESTING. ALL PIPELINE JOINTS SHALL BE TESTED BY USING RADIOGRAPHY.
- 5) AFTER INSTALLATION OF CASING AND CARRIER PIPES, THE CANAL RESTORATION SHALL BE DONE TO THE SATISFACTION OF CANAL AUTHORITIES/OWNER.
- 10) ANGLE OF INTERSECTION BETWEEN PIPELINE AND THE CANAL SHALL BE AS CLOSED TO 90° AS POSSIBLE; IN NO CASE LESS THAN 85°.
- 7) FOR WARNING SIGN DETAIL REFER DWG.
- 8) 1.5 MTR TOP COVER SHALL BE MAINTAINED FOR PROPOSED PIPELINE AS PER PNGRB TECH. STANDARD



GUJARAT GAS LIMITED
TECHNICAL SERVICES

TECHNICAL SERVICES

PROJECT NAME: TYPICAL DRAWING

STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION

TITLE: MAJOR CANAL CROSSING OPEN CUT

SCALE

SHEET

DRAWING

NO.	RE
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Technical drawing showing a cross-section of a trench crossing a road. The trench is labeled "STRAIGHT PIPE RUN" and has a minimum width of 1500. The trench is filled with "WATER LEVEL" and "BED LEVEL". The trench is lined with "GROUT BAGS SAND MIXTURE 4:1". The trench is covered with "COVER" and has a minimum cover of 1500. The trench is located on "NATURAL GROUND LEVEL". The width of the crossing is labeled "WIDTH OF CROSSING" and is 3000. The length of the crossing is labeled "LENGTH OF CROSSING 'X'" and is 3000. The trench is shown with a minimum width of 1500 and a minimum cover of 1500. The trench is filled with "WATER LEVEL" and "BED LEVEL". The trench is lined with "GROUT BAGS SAND MIXTURE 4:1". The trench is covered with "COVER" and has a minimum cover of 1500. The trench is located on "NATURAL GROUND LEVEL". The width of the crossing is labeled "WIDTH OF CROSSING" and is 3000. The length of the crossing is labeled "LENGTH OF CROSSING 'X'" and is 3000.

 - CROSSING OF CENTERLINE

- WARNING SIGN

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON BOTH SIDE OF CANAL FOR EACH CANAL CROSSING.
- 3) CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS WITH RESPECT TO SURVEY DETAILS OF EACH CROSSING AND PREPARE DETAILED DRAWING FOR INDIVIDUAL CROSSING AND SUBMIT IT TO CONCERNED AUTHORITY FOR APPROVAL BEFORE STARTING EXECUTION.
- 4) AFTER INSTALLATION OF CASING AND CARRIER PIPES, THE CANAL RESTORATION SHALL BE DONE TO THE SATISFACTION OF CANAL AUTHORITIES/OWNER.
- 5) ANGLE OF INTERSECTION BETWEEN PIPELINE AND THE CANAL SHALL BE AS CLOSED TO 90° AS POSSIBLE; IN NO CASE LESS THAN 85°.
- 6) GROUT BAGS IS PROVIDED WIDTH = TRENCH WIDTH + 1.5 MTR ON BOTH SIDE OF THE PIPE L&D.
- 7) ADDITIONAL DRAWING SHALL BE PROPOSED FOR CASSED CROSSING IN CASE REQUIRED BY AUTHORITY.
- 8) "X" SHALL BE REINFORCED CONCRETE COATING INCASE OF KHAADI AND NALA.
- 9) REQUIREMENT OF COAT COATING SHALL BE BASED ON HYDROGRAPHIC SURVEY OR AUTHORITY REQUIREMENT.

NO.	DATE	REVISION	REV.BY.	SIGN.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGN.			
NAME	HZ/HPS	SB	US
DATE	22.02.2023		
FOR	GGL	GGL	GGL



GUJARAT GAS LIMITED
TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

PROJECT NAME: TYPICAL DRAWING

STATUS: ISSUED FOR INFORMATION CUM CONST

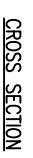
TITLE : MINOR CANAL /KHADI/NALA CROSSING

SCALE	SHEET	DRAWING NO.	RE
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NTS	1 OF 1	GGL/TS/STEEL/TP. CONST./DRW-07	C
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NOTE :-

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) FOR CASED CROSSING DESIGN AND INSTALLATION



Ⓢ

– DRAIN

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) FOR CASD CROSSING DESIGN AND INSTALLATION REQUIREMENT REFER API RP 1102 STANDARD.
- 3) CASING DIAMETER SHALL BE 150 MM LARGER(MINIMUM) THAN CARRIER PIPE DIAMETER OR SHALL BE AS PER AUTHORITY REQUIREMENT.

- 4) PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON BOTH SIDE OF ROAD FOR EACH ROAD CROSSING.
- 5) CATHODIC PROTECTION TEST LEAD TERMINAL BOX MAY BE MOUNTED ON VENT PIPE FOR CPD TERMINAL BOX DETAILS REFER RELEVANT STANDARDS/SPECIFICATIONS.
- 6) CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS WITH RESPECT TO SURVEY DETAILS OF EACH CROSSING AND PREPARE DETAILED DRAWING FOR INDIVIDUAL CROSSING AND SUBMIT IT TO CONCERNED AUTHORITY FOR APPROVAL BEFORE STARTING EXECUTION.
- 7) PIPELINE SECTION OF CROSSING SHALL BE PRE-TESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN PIPE SECTION HYDRO TESTING. ALL PIPELINE JOINTS SHALL BE TESTED BY USING RADIOGRAPHY.
- 8) ELECTRICAL INSULATION BETWEEN CASING AND CARRIER PIPES SHALL BE CHECKED WITH SUITABLE MEGGER.
- 9) AFTER INSTALLATION OF CASING AND CARRIER PIPES, THE ROAD RESTORATION SHALL BE DONE TO THE SATISFACTION OF ROAD AUTHORITIES/OWNER.
- 10) FOR CASING PIPE INSULATOR SPACING END SEALS ETC REFER RELEVANT STD.
- 11) ANGLE OF INTERSECTION BETWEEN PIPELINE AND THE ROAD HIGHWAY SHALL BE AS CLOSED TO 90° AS POSSIBLE; IN NO CASE LESS THAN 85°.
- 12) DETAILS OF VENT & DRAIN REFER DRG. NO. SCM/SG/L PRJ/0&C/DRG-CSD/012.
- 13) DETAILS OF CASING DESIGN REFER DWG.
- 14) FOR PIPELINE CROSSING WARNING SIGN DETAIL REFER DWG.
- 15) 1.2 MTR TOP COVER SHALL BE MAINTAINED FROM TOP OF THE COATED PIPE AS PER PNGRB STANDARD
- 16) WHENEVER ABOVE COVER CANNOT BE PROVIDED DUE TO SITE CONSTRAINTS ADDITIONAL PROTECTION IN FORM OF CASING/CONCRETE ETC. SHALL BE PROVIDED.

NO.	DATE	REVISION	REV. BY.	SIGN.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGN.			
NAME	HZ/HPS	SB	US
DATE	22.02.2023		
FOR	GCL	GCL	GCL

 **GUJARAT GAS LIMITED**
TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

TITLE: MAJOR CANAL CASSED CROSSING

SCALE	SHEET	DRAWING NO.	REV
NTS	1 OF 1	CGI /TS/STEEL /TYP CONST /DWG-05	0

Diagram illustrating a proposed pipeline crossing a road at an angle. The pipeline is shown as a dashed line with arrows indicating flow direction. The road is a solid horizontal line. The angle of crossing is labeled as 85° TO 90°. The areas above and below the road are labeled "EXISTING GROUND". The area to the left of the pipeline is labeled "PROPOSED PIPELINE".

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON BOTH SIDE OF ROAD FOR EACH ROAD CROSSING.
- 3) CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS, WITH RESPECT TO SURVEY DETAILS OF EACH CROSSING AND PREPARE DETAILED DRAWING FOR INDIVIDUAL CROSSING AND SUBMIT IT TO CONCERNED AUTHORITY FOR APPROVAL BEFORE STARTING EXECUTION.
- 4) PIPELINE SECTION OF CROSSING SHALL BE PRE-TESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN PIPE SECTION HYDRO TESTING. ALL PIPELINE JOINTS SHALL BE TESTED BY USING RADIOGRAPHY.
- 5) AFTER INSTALLATION OF CASING AND CARRIER PIPES, THE ROAD RESTORATION SHALL BE DONE TO THE SATISFACTION OF ROAD AUTHORITIES/OWNER.
- 6) ANGLE OF INTERSECTION BETWEEN PIPELINE AND THE ROAD HIGHWAY SHALL BE AS CLOSED TO 90° AS POSSIBLE; IN NO CASE LESS THAN 85°.
- 7) DETAIL OF WARNING SIGN DETAIL REFER DWG.
- 8) 1200MM TOP COVER SHALL BE MAINTAINED FROM TOP OF THE COATED PIPE AS PER PUGRB STANDARD
- 9) NOTE AS PER PREV. DRAWING.



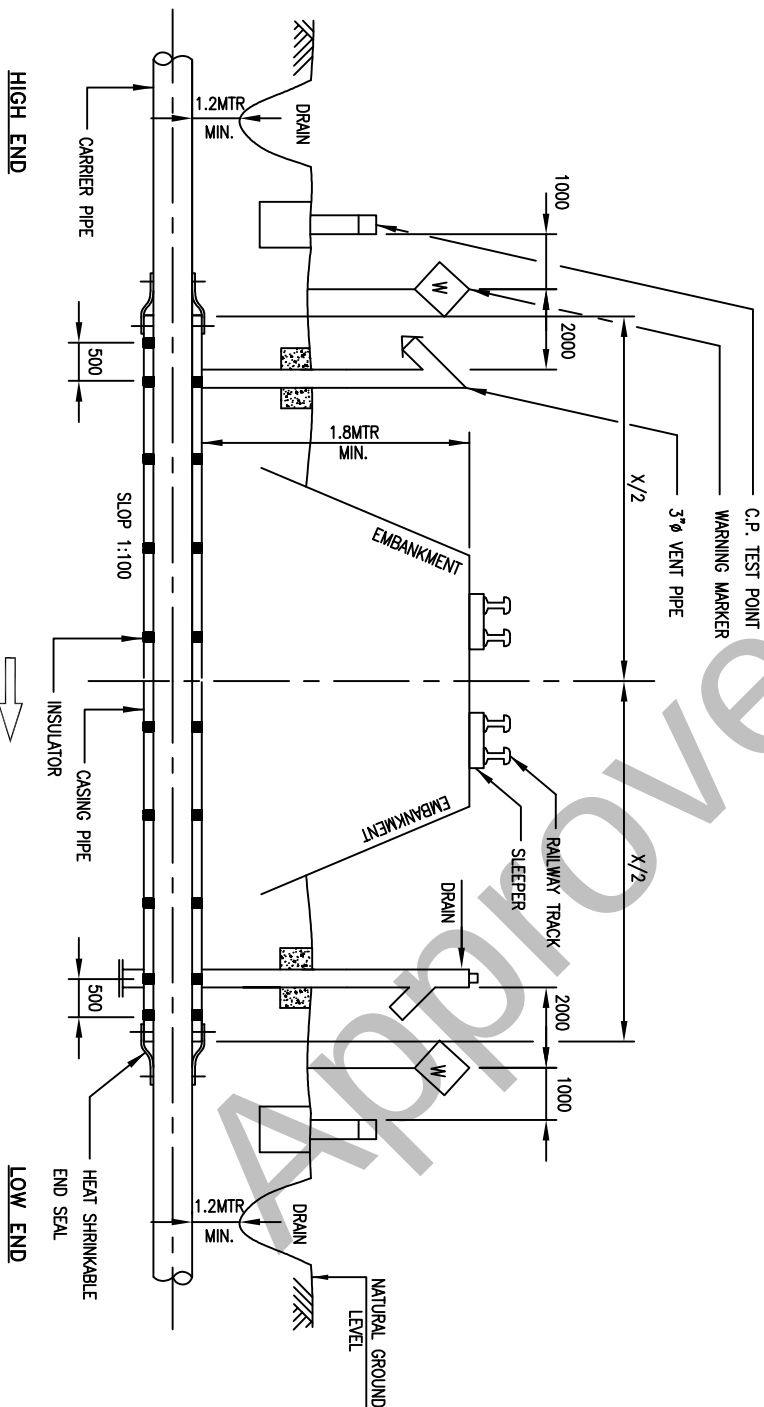
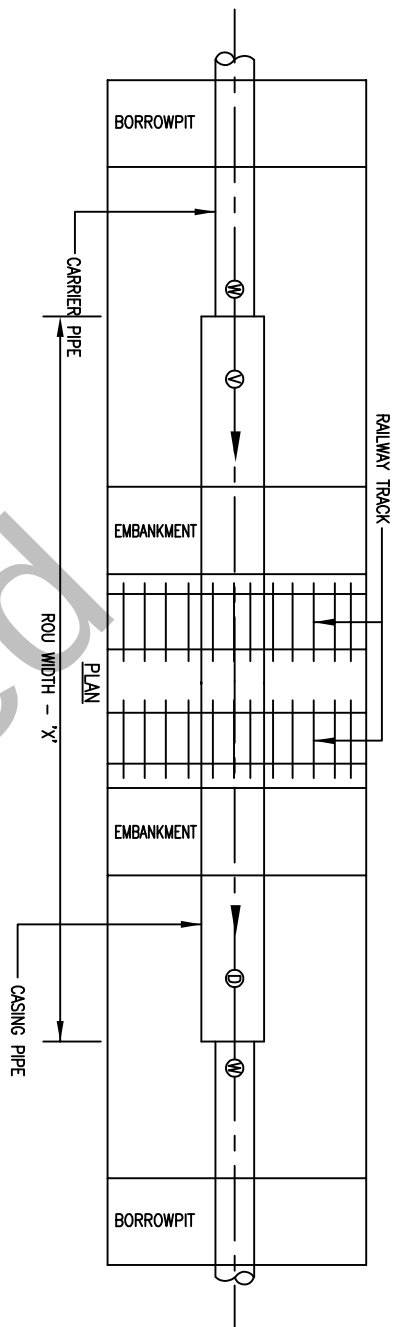
— - — — — - CROSSING OF CENTERLINE



– WARNING SIGN

[illegible]

RAILWAY CROSSING



NOTE :-

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
- 2) FOR Cased CROSSING DESIGN AND INSTALLATION REQUIREMENT REFER API RP 1102 STANDARD.
- 3) CASING PIPE DIAMETER SHALL BE AS PER LATEST RAILWAY GUIDELINES.
- 4) AT EACH CROSSINGS, PIPELINE CROSSING WARNING SIGN SHALL BE INSTALLED ON BOTH SIDE OF RAILWAY. BE MOUNTED FOR CP TERMINAL BOX DETAILS RELEVANT STANDARD/SPECIFICATIONS.
- 5) CATHODIC PROTECTION TEST LEAD TERMINAL BOX SHALL BE INSTALLED ON BOTH FOR CP TERMINAL BOX DETAILS REFER RELEVANT STANDARDS/SPECIFICATIONS.
- 6) CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS WITH RESPECT TO SURVEY DETAILS OF EACH CROSSING AND PREPARE DETAILED DRAWING FOR INDIVIDUAL CROSSING AND SUBMIT IT TO CONCERNED AUTHORITY FOR APPROVAL BEFORE STARTING EXECUTION.
- 7) PIPELINE SECTION OF CROSSING SHALL BE PRE-TESTED HYDROSTATICALLY SEPARATELY FROM THE MAIN PIPE SECTION HYDRO TESTING. ALL PIPELINE JOINTS SHALL BE TESTED BY USING RADIOGRAPHY.
- 8) ELECTRICAL INSULATION BETWEEN CASING AND CARRIER PIPES SHALL BE CHECKED WITH SUITABLE MEGGER.
- 9) AFTER INSTALLATION OF CASING AND CARRIER PIPES, THE RAILWAY TRACK RESTORATION SHALL BE TO THE SATISFACTION OF RAILWAY AUTHORITIES/OWNER.
- 10) FOR CASING PIPE INSULATOR SPACING END SEALS ETC REFER RELEVANT STD.
- 11) ANGLE OF INTERSECTION BETWEEN PIPELINE AND THE ROAD HIGHWAY SHALL BE AS PER REQUIREMENT OF AUTHORITY.
- 12) DETAILS OF VENT & DRAIN REFER DRG. NO. SCM/GGL-PRD/C&C/DRG-CSD/012.
- 13) FOR CASING DETAIL, REFER DWG.

NO.	DATE	REVISION	REV. BY.	SIGN.

SIGN.	PREPARED BY	CHECKED BY	APPROVED BY
NAME	HZ/HPS	SB	US
DATE	22.02.2023		
FOR	GGL	GGL	GGL

GUARAT GAS LIMITED
TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

PROJECT NAME: TYPICAL DRAWING

STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION

TITLE: RAILWAY CROSSING

SCALE	SHEET	DRAWING NO.	REV.
NTS	1 OF 1	GGI/TS/STEEL/TYP.CONST./DRW-010	0

Technical drawing of a carrier pipe casing pipe assembly, showing the high end and low end details.

HIGH END

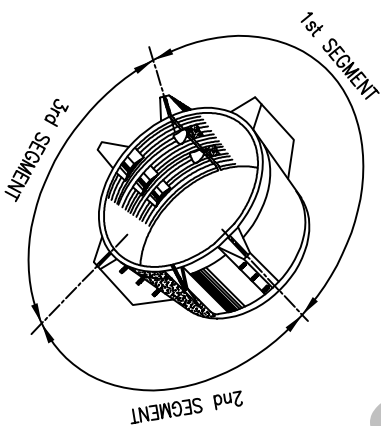
Labels and Dimensions:

- HEAT SHRINKABLE END SEAL
- 600
- VENT
- 9
- INSULATORS
- NOTE 4
- B
- B/2
- 50

LOW END

Labels and Dimensions:

- END SEAL
- 600
- 9
- INSULATORS
- NOTE 4
- B
- B/2
- 50
- DRAIN OFF
- CARRIER PIPE
- CASING PIPE



CASING INSULATOR

CADMIUM COATED BOLTS/NUTS SHALL ONLY BE PERMITTED ON INSULATOR

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) FOR CASING CROSSING DESIGN AND INSTALLATION REQUIREMENT REFER API RP 1102 STANDARD.
- 3) CASING PIPE IS NORMALLY TO BE COATED WITH ANTI CORROSION PAINT, BUT IN HIGHLY CORROSIVE AREAS THE CASING SHALL BE COATED, WRAPPED AND CATHODIC PROTECTION SHALL BE PROVIDED WITH SACRIFICIAL ANODES.
- 4) AT BOTH ENDS OF CASING PIPE, DOUBLE SET OF INSULATORS SHALL BE INSTALLED.
- 5) THE MAXIMUM SPACING (B) OF THE INSULATORS SHALL BE AS PER MANUFACTURES RECOMMENDATION BUT IN NO CASE MORE THAN 2500 MM.
- 6) ELECTRICAL INSULATION BETWEEN CASING AND CARRIER PIPES SHALL BE CHECKED WITH SUITABLE MEGGER.
- 7) CASING INSULATORS AND END SEALS SHALL BE AS PER THE SPECIFICATION.
- 8) END SEALS SHOWN HERE ARE ONLY INDICATIVE. POSSIBILITY OF PROVIDING OTHER TYPES OF FLEXIBLE END SEALS MAY BE CONSIDERED.
- 9) TO PREVENT DAMAGE TO COATING AND WRAPPING (IF APPLIED) TO CASING PIPE IN CASE OF BORED JACKED CROSSING A PROTECTIVE COATING OF CONCRETE OR SUITABLE MATERIAL SHALL BE PROVIDED ON CASING PIPE
- 10) ZINC RIBBON ANODES (ON CARRIER PIPE) IN BETWEEN INSULATORS (1.5 MTR INTERVAL).
- 11) CASING PIPE SHALL BE API 5L ERY/SAW & HAVE MINIMUM 9.5 MM WALL THICKNESS REFER COMPANY MATERIAL SPECIFICATION FOR REFERENCE.

NO.	DATE	REVISION	REV. BY :	SIGN.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGN.			
NAME	HZ/HPS	SB	US
DATE	22.02.2023		
FOR	GGL	GGL	GGL



GUJARAT GAS LIMITED
TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

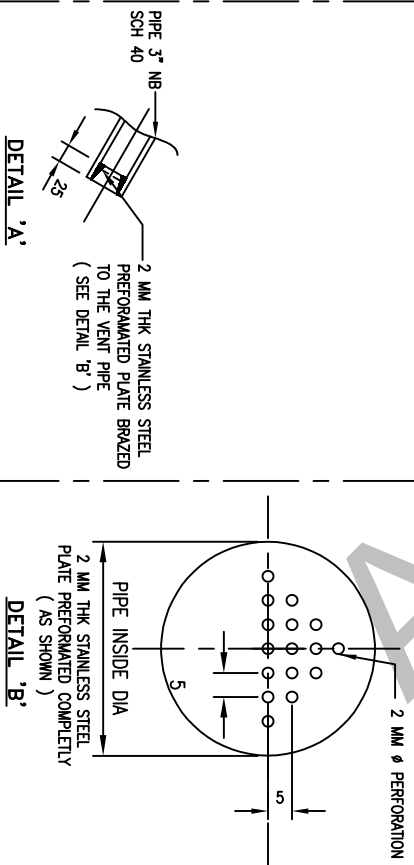
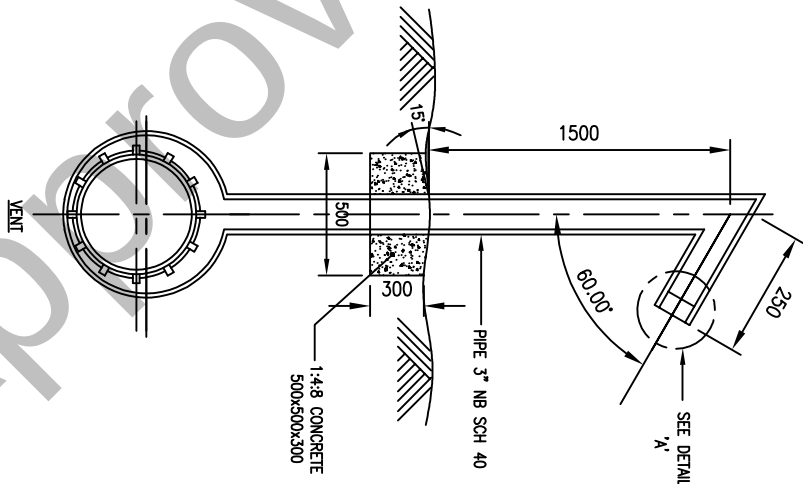
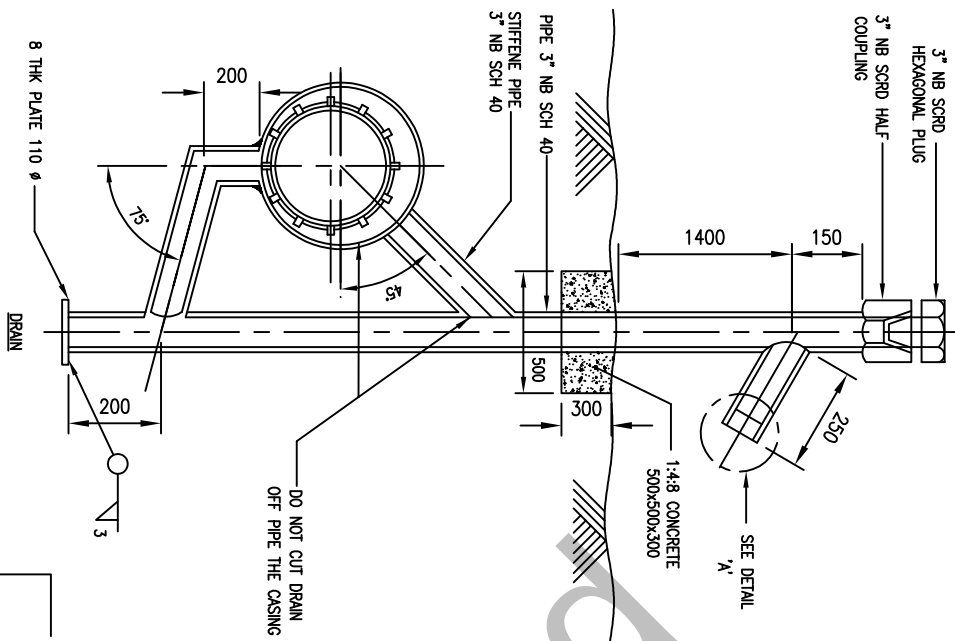
PROJECT NAME: TYPICAL DRAWING

STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION

TITLE: CASING PIPE DETAIL

SCALE	SHEET	DRAWING NO.	REV.
NTS	1 OF 1	GGL/TS/STEEL/TP. CONST./DRW-011	C

DETAILS OF VENT & DRAIN OFF ARRANGEMENT



- NOTE :-
- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
 - 2) VENT AND DRAIN SHALL HAVE FACE LEFT WHEN LOOKING IN DIRECTION OF CONSTRUCTION AND SHALL BE PARALLEL TO CROSSING.
 - 3) VENT AND DRAIN OFF PIPE SHALL BE API-5L-GRB OR EQUIVALENT AND SHALL BE FINALIZED IN CONSULTATION PROJECT ENGINEER/SITE IN-CHARGE.
 - 4) PORTION OF VENT AND DRAIN-OFF PIPES WHICH ARE UNDER GROUND OR WHICH MAY BE UNDER WATER LEVEL ARE TO BE COATED WITH COLD APPLIED POLYETHYLENE TAPE OF APPROVED QUALITY OR EQUIVALENT MATERIAL. PORTION WHICH ARE ABOVE GROUND SHALL BE PAINTED WITH ONE COAT OF PRIMER AND TWO COATS OF ZINC PAINT.

NO.	DATE	REVISION	REV. BY.	SIGN.

SIGN.	PREPARED BY	CHECKED BY	APPROVED BY
NAME	HZ/HPS	SB	US
DATE	22.02.2023		
FOR	GGL	GGL	GGL

GUARAT GAS LIMITED
TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

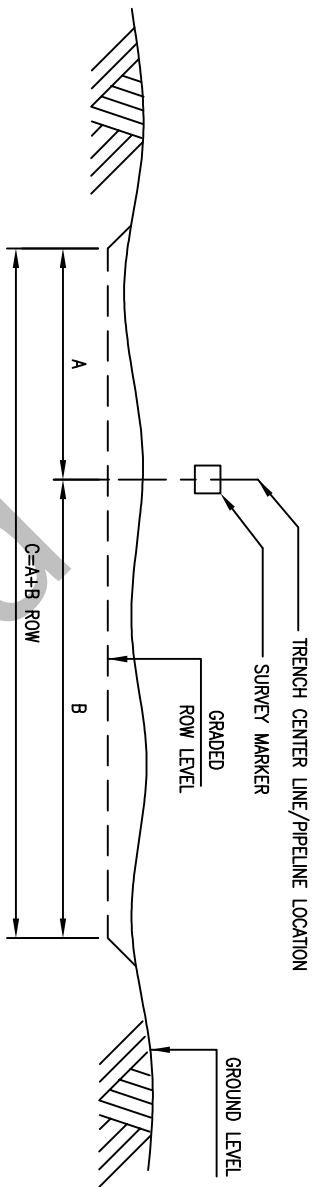
PROJECT NAME: TYPICAL DRAWING

STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION

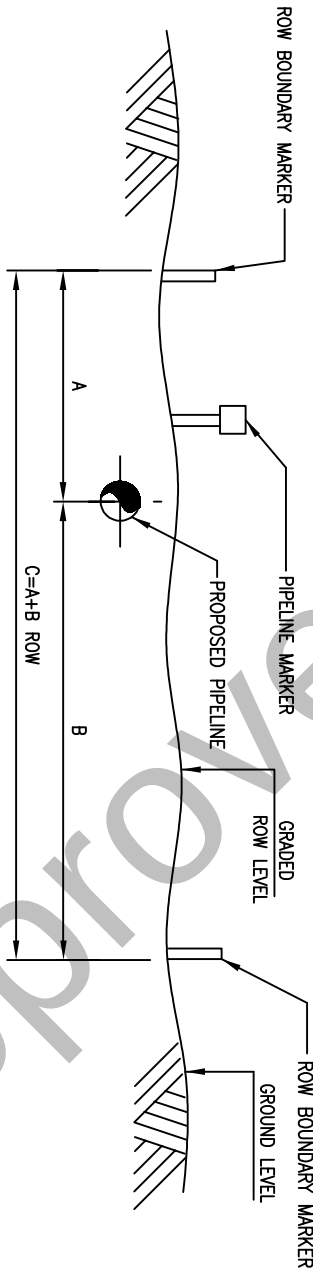
TITLE : DETAILS OF VENT AND DRAIN OFF ARRANGEMENT

SCALE	SHEET	DRAWING NO.	REV.
NTS	1 OF 1	GGL/TS/STEEL/TYP.CONST./DRW-012	0

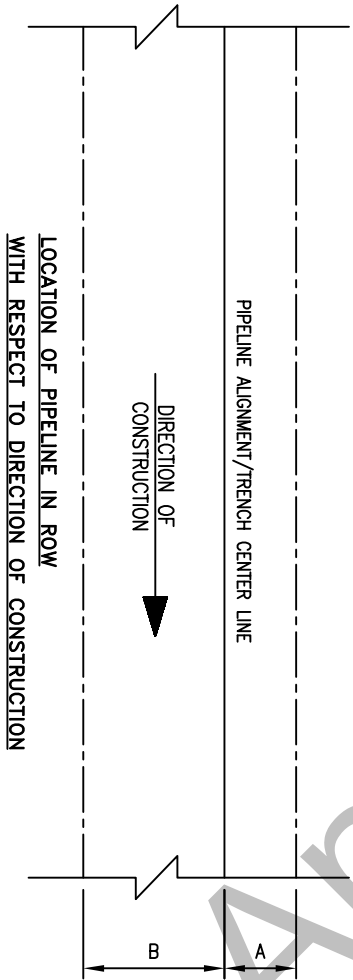
RIGHT OF WAY (ROW) FOR PIPELINES



RIGHT OF WAY DURING CONSTRUCTION



RIGHT OF WAY AFTER COMPLETION OF WORK



LOCATION OF PIPELINE IN ROW
WITH RESPECT TO DIRECTION OF CONSTRUCTION

NOTE :-

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
- 2) DIFFERENT ROW DIMENSIONS MAY BE ADOPTED BASED ON PIPE SIZE, SITE CONDITION, CONSTRUCTION METHOD, NUMBER OF PIPELINES TO BE LAY AND OTHER PROJECT REQUIREMENTS.
- 3) THE LOCATION OF PIPELINE IN ROW MAY VARY TO SUIT SITE CONDITIONS IN CONSULTATION WITH PROJECT ENGINEER/SITE IN-CHARGE.
- 4) DIFFERENT ROW DIMENSION BASED ON PIPE SIZE AS PER TABLE-1.
- 5) THE DISTANCES ARE INDICATIVE ONLY, ROW WIDTH WOULD BE DECIDED ON INDIVIDUAL PROJECT BASIS AND LOCATION TO BE ROUTED.
- 6) FOR PIPELINE MARKER REFER DWG.
- 7) FOR ROW BOUNDARY MARKER REFER DWG.

TABLE-1

PIPE SIZE IN INCH.	A MM	B MM	C MM
UP TO 12"	3000	9000	12000
14" TO 18"	6000	14000	20000
20" TO 36"	8000	16000	24000

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DATE	22.02.2023		
FOR	GGL	GGL	GGL



TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

PROJECT NAME: TYPICAL DRAWING			
STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION			
TITLE : RIGHT OF WAY (ROW) FOR PIPELINES			
SCALE	SHEET	DRAWING NO.	REV.
NTS	1 OF 1	GGL/TS/STEEL/TYP. CONST./DRW-013	0

TRENCH NORMAL SOIL
TYP. SECTION



- 1) ALL DIMENSIONS ARE IN MM.
- 2) THE MINIMUM COVER TO BE ADOPTED SHALL BE MINIMUM 1000 MM. ANY EXTRA COVER REQUIREMENT SHALL BE IN ACCORDANCE WITH PNGRB STANDARD.
- 3) MINIMUM COVER REQUIREMENT SHALL BE SUBJECT TO APPROVAL OF PROJECT ENGINEER/SITE IN-CHARGE AND CONCERNED AUTHORITIES WHEREVER REQUIRED.
- 4) EXTRA COVER REQUIREMENT SHALL BE ESTABLISHED AT ALL OVER BENDS & SAG BENDS AND HORIZONTAL BENDS WHEREVER REQUIRED.
- 5) FOR MINIMUM COVER REQUIREMENTS AT PIPELINE CROSSING ROADS, RAILWAY TRACKS, RIVERS, MARSHY AREAS, ETC. REFER PNGRB STANDARD.

NO.	DATE	REVISION	REV. BY.	SIGN.

	PREPARED BY	CHECKED BY	APPROVED BY
SIGN.			
NAME	HZ/HPS	SB	US
DATE	22.02.2023		
FOR	GCL	GCL	GCL



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TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

PROJECT NAME: TYPICAL DRAWING

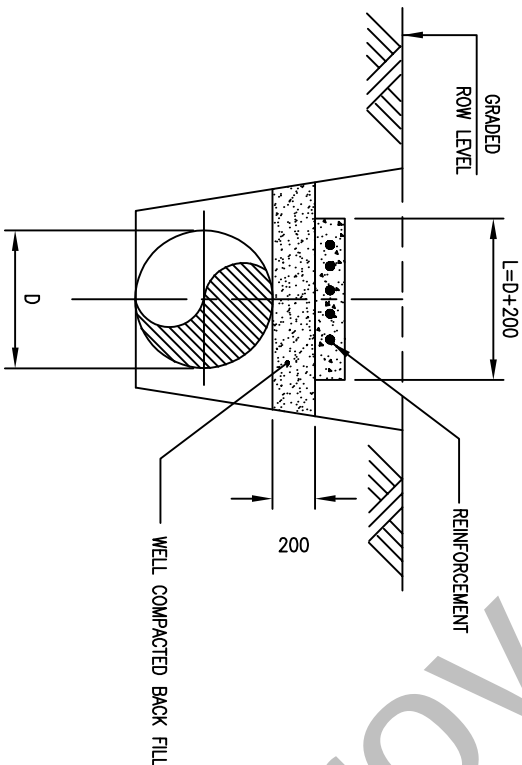
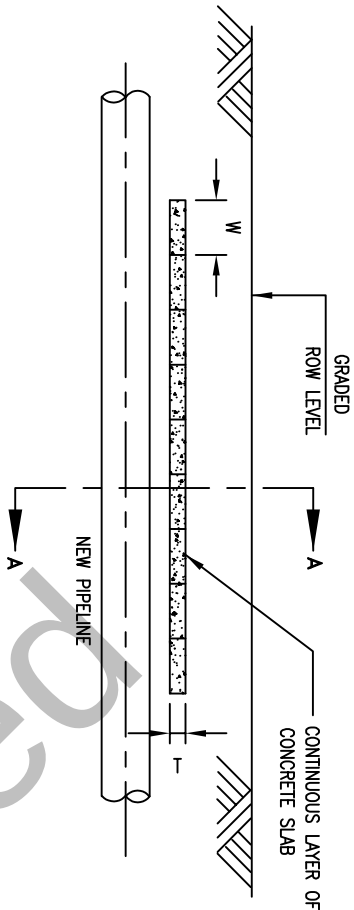
STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION

TITLE : TRENCH DIMENSION FOR PIPELINE

SCALE	SHEET	DRAWING NO.	REV.
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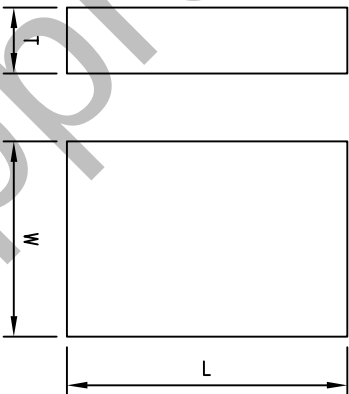
NTS	1 OF 1	GGL/TS/STEEL/TYP. CONST./DRW-014	0
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SLAB PROTECTION TO PIPELINE



SECTION A - A
D = OUTSIDE DIAMETER OF PIPELINE

DETAILS OF REINFORCED CONCRETE SLAB



T = 50 MIN.
L = D + 200
W = 500
COMPRESSIVE STRENGTH = M20 MINIMUM
WITH NORMAL STEEL REINFORCEMENT.

NOTE :-

- 1) ALL DIMENSIONS ARE IN MM.
- 2) A MODIFIED PIPELINE WARNING SIGN SHALL BE INSTALLED WHERE THE CONTINUOUS LAYER OF RCC CONCRETE SLAB ARE PLACED ON PIPELINE.
- 3) CONCRETE SLAB SHALL BE INSTALLED ON WELL COMPACTED & LEVELLED SOIL.
- 4) DISTANCE BETWEEN TWO CONCRETE SLAB SHALL NOT BE MORE THAN 25 MM AT THE TIME OF PLACEMENT.
- 5) DESIGN OF REINFORCEMENT & MANUFACTURING OF CONCRETE SLAB SHALL BE IN ACCORDANCE WITH RELEVANT STANDARD.
- 6) TRENCH DIMENSIONS SHALL BE IN ACCORDANCE WITH AS PER DRG.NO. SCM/GGL-PRJ/C&C/DRG-CSD/014 & RELEVANT SPECIFICATION.
- 7) TO BE USED EITHER FOR LOCATION CLASS REQUIREMENTS AND/OR MECHANICAL PROTECTION.

NO.				DATE				REVISION				REV.BY.				SIGN.			
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DATE				22.02.2023															
FOR				GGL				GGL				GGL							



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TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION

PROJECT NAME: TYPICAL DRAWING

STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION

TITLE : TRENCH DIMENSION FOR PIPELINE

SCALE

SHEET

DRAWING NO.

REV.

NTS

1 OF 1

GGL/TS/STEEL/TYP.CONST./DRW-015

0

Figure 1 is a schematic diagram of a pile foundation system. It shows a central vertical pile with a 'CONCRETE COATING' layer. On either side of the pile, there are 'RUBBLE PITCHING' regions. The distance from the pile centerline to the start of the rubble pitching is 3000 units. The rubble pitching is shown in two sections, each with a width of 3000 units. The pile is shown with a cross-section of 65° to 90°.

The diagram illustrates the cross-section and plan view of a river crossing. The cross-section shows a concrete pipe with a concrete coating, surrounded by rubble pitching. The pipe is labeled 'OVER & SAG BEND' and 'CONCRETE COATING'. The rubble pitching is labeled 'RUBBLE PITCHING'. The river water level is indicated by a dashed line labeled 'RIVER WATER LEVEL'. The scour is indicated by a dashed line labeled 'SCOUR'. The ground level is indicated by a dashed line labeled 'NATURAL GROUND LEVEL'. The cover is indicated by a dashed line labeled 'COVER'. The dimensions are: 2000 MIN. (cover), 12000 (pipe diameter), 2500 MIN. (rubble pitching), 2500 (width of crossing), and 2500 (width of crossing). The plan view shows the crossing with 'N' and 'W' markers and dimensions of 2500 and 2500. The labels 'STRAIGHT PIPE RUN' and 'LENGTH OF CROSSING "x"' are also present.

LEGEND :

	WARNING SIGN
	NAVIGABLE MARKER

- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
- 2) PIPELINE CROSSING WARNING SIGN & NAVIGABLE MARKER SHALL BE INSTALLED ON BOTH SIDE OF RIVER FOR EACH RIVER CROSSING.
- 3) CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS WITH RESPECT TO SURVEY DETAILS OF EACH RIVER CROSSING AND PREPARE DETAILED DRAWING FOR INDIVIDUAL RIVER CROSSING AND SUBMIT IT TO CONCERNED AUTHORITY FOR APPROVAL BEFORE STARTING EXECUTION.
- 4) AFTER INSTALLATION OF CASING AND CARRIER PIPES, THE RIVER RESTORATION SHALL BE DONE TO THE SATISFACTION OF RIVER AUTHORITIES/OWNER.
- 5) ANGLE OF INTERSECTION BETWEEN PIPELINE AND THE RIVER SHALL BE AS CLOSED TO 90° AS POSSIBLE; IN NO CASE LESS THAN 85°.
- 6) RUBBLE PITCHING IS PROVIDED BOTH SIDE OF THE RIVER.
- 7) FOR WARNING SIGN REFER DWG.
- 8) FOR NAVIGABLE WATERWAY MARKER REFER DWG.

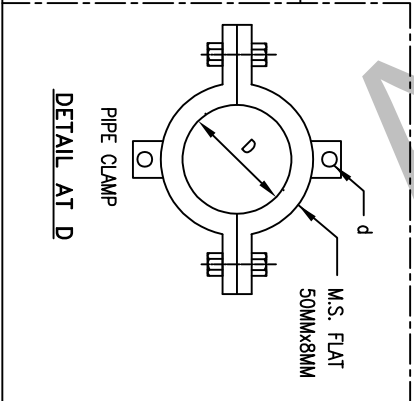
[illegible]

I BEAM (100MMx50MM)

500

500

ORIENTATION OF I-SECTION WITH RESPECT TO VENT PIPE



- 1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED
- 2) ORIENTATION OF FOUNDATION IS TO BE DONE BASED ON AVAILABILITY OF SPACE IN CONSULTATION WITH ENGG. IN CHARGE.

[illegible]

Technical drawing of a mechanical part, likely a valve or fitting, showing a cross-section. The part is symmetrical and features a central vertical axis. The drawing includes dimension lines indicating the width of the part at different sections. The width of the base is labeled as 150. The width of the main body is labeled as X. The width of the top section is labeled as 150.

ELEVATION

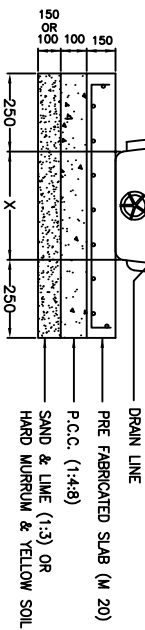
Diagram illustrating the elevation view of a manhole assembly, showing the internal structure and components. The assembly is shown in cross-section, revealing the internal components and the surrounding structure.

Key components and dimensions labeled:

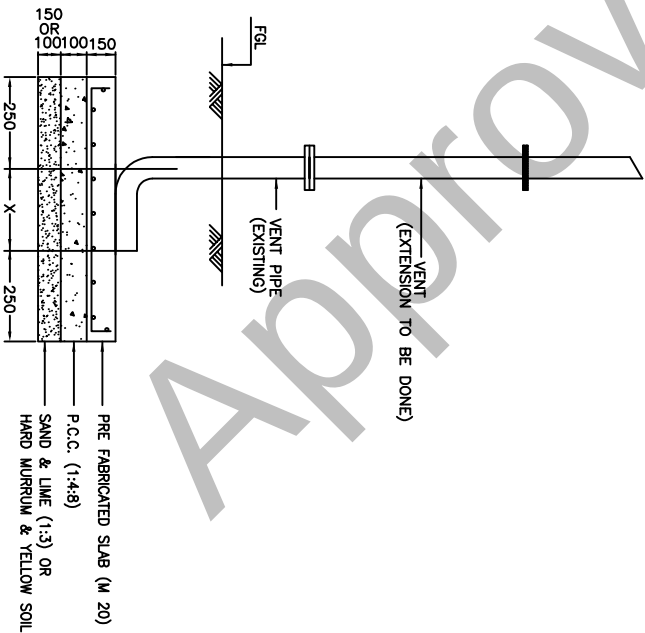
- VENT LINE**: A vertical line extending from the top of the manhole structure.
- GROUND LEVEL**: The horizontal line indicating the ground surface.
- APPROX. 800 MMA**: A dimension indicating the approximate height of the manhole structure above ground level.
- SEALANT LINE**: A horizontal line indicating the location of the sealant.
- DRAIN LINE**: A horizontal line indicating the location of the drain.
- PRE FABRICATION**: The main body of the manhole structure.
- P.C.C. (1:4:8)**: The concrete layer below the pre-fabrication.
- SAND & LIMB**: The bedding layer below the P.C.C.
- HARD MURR**: The base layer below the bedding.

Dimensions and offsets are also indicated:

- 150 OR 100**: Vertical dimension for the top section.
- 100**: Vertical dimension for the middle section.
- 150**: Vertical dimension for the bottom section.
- 250**: Horizontal dimension for the top section.
- X**: Horizontal dimension for the middle section.
- 250**: Horizontal dimension for the bottom section.

ELEVATION

ELEVATION



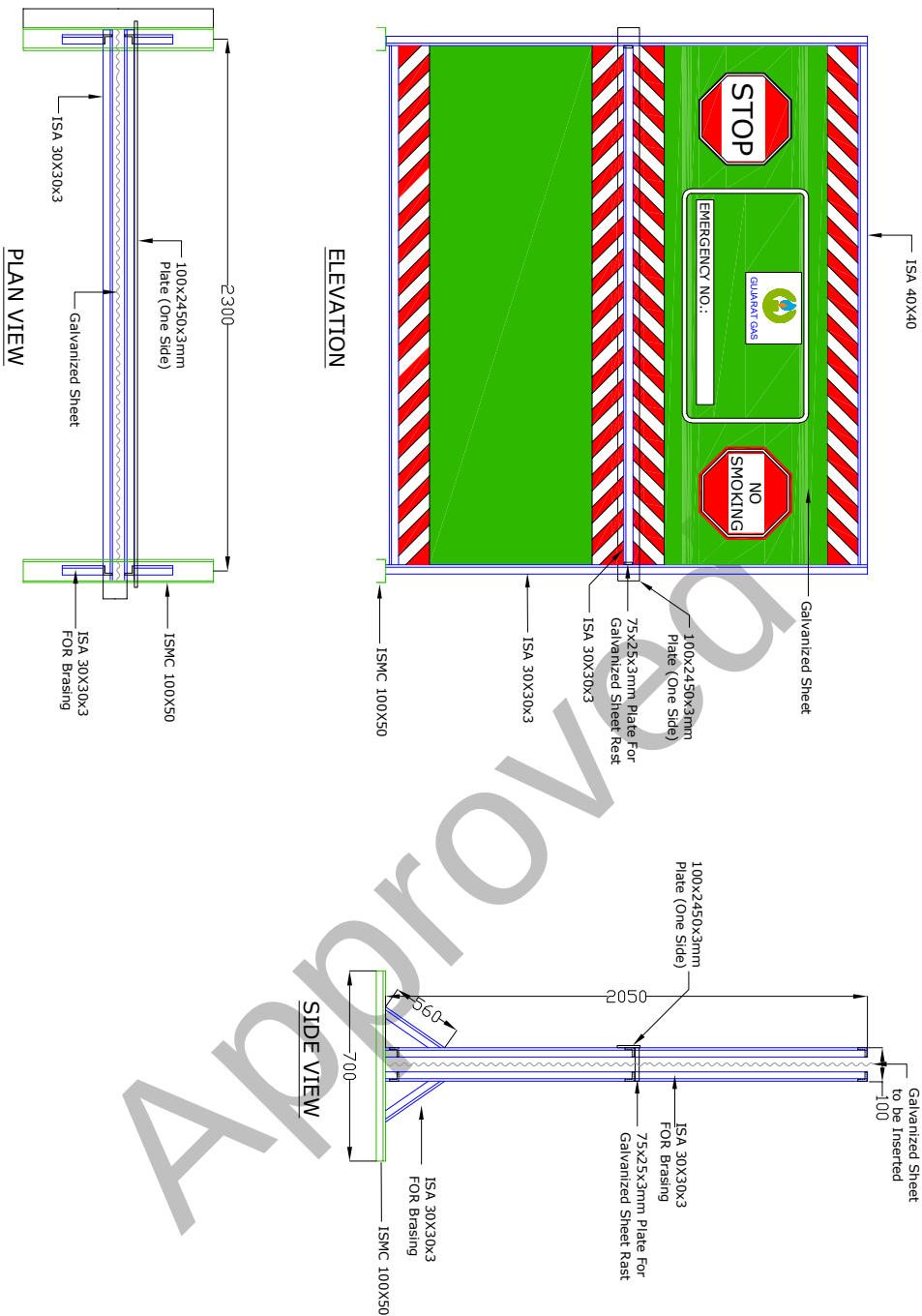
1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.

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FOR	GCL	GCL	GCL

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TYPICAL DRAWING FOR PIPELINE CONSTRUCTION	
PROJECT NAME: TYPICAL DRAWING	
STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION	
TITLE : TYPICAL SKETCH FOR SUPPORT TO VALVE & VENT PIPE	
SCALE	SHEET
DRAWING NO.	
NTS	1 OF 1
[GGL/TS/STEEL/TPP CONST./DPM-020]	
C	RE

TYPICAL DRAWING FOR HARD BARRICADING



NOTE :-

1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED

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DATE	22.02.2023		
FOR	GGL	GGL	GGL

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TECHNICAL SERVICES

TYPICAL DRAWING FOR PIPELINE CONSTRUCTION			
PROJECT NAME: TYPICAL DRAWING			
STATUS: ISSUED FOR INFORMATION CUM CONSTRUCTION			
TITLE: EXISTING UNDER GROUND PIPE CROSSING TYPE-I			
SCALE	SHEET	DRAWING NO.	REV.
NTS	1 OF 1	GGL-TS/STEEL/TYP. CONST./DRW-21	0